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### Section 9 Reference

- **Pediatric Dosing Guide**
- Approved Abbreviations
- Drug Reference
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Contra Costa County Emergency Medical Services

Universal Patient Care

Required Vital Signs:
- Blood pressure as age appropriate
- Palpated pulse rate
- Respiratory rate
- Pulse oximetry

if indicated:
- Blood glucose
- 12-Lead ECG
- Lung sounds
- Temperature
- Pain scale
- EtCO₂ monitoring

Trauma Patient
- Evaluate mechanism of injury
- Consider spinal motion restriction if indicated
- High Risk Mechanism
- Primary and secondary trauma assessment
- Obtain VS
- Obtain SAMPLE
- Exit to appropriate TG

Medical Patient
- Mental status
- Unresponsive
- Responsive
- Chief complaint
- Obtain SAMPLE
- Primary and secondary assessment
- Focused assessment on specific complaint
- Obtain VS
- Exit to appropriate TG

Trauma patient does not fit specific TG

Primary and secondary trauma assessment
- Focused assessment on specific injury
- Obtain VS

Notify receiving facility.
Contact Base Hospital for medical direction

Repeat assessment while preparing for transport
- Continue on-going assessment
- Repeat VS
- Evaluate interventions / procedures
- Patient transfer to hospital staff
- Include summary of care and patient property

Initial assessment
- BLS care
- Initiate oxygen if indicated
- Adult assessment procedure

Pediatric assessment procedure
- Use PediaTape for measurement

E

Bring all necessary equipment to patient
Demonstrate professionalism and courtesy
For mass assembly, consider WMD
- Utilize appropriate PPE
- Consider airborne or droplet isolation if indicated

General Treatment Guidelines


Effective Jan. 2019
Scene Safety Evaluation: Identify potential hazards to prehospital providers, patient, and public. Identify number of patients and utilize triage protocol if indicated. Observe patient position and surroundings.

General: All patient care must be appropriate to the provider level of training and documented in the EHR. The EHR narrative should be considered a story of the circumstances, events, and care of the patient and should allow the reader to understand the complaint, assessment, treatment, why procedures were performed, and why indicated procedures were not performed as well as ongoing assessments and response to treatment and interventions.

Adult Patient: An adult should be suspected of being acutely hypotensive when systolic blood pressure is less than 90mmHg. Diabetic patients and women may have atypical presentations of cardiac-related problems such as MI. General weakness can be the symptom of a very serious underlying process. Beta blockers and other cardiac drugs may prevent a reflexive tachycardia in shock with low to normal pulse rates.

Geriatric Patient: Hip fractures and dislocations have high mortality rates. Altered mental status is not always dementia. Always check BGL and assess for signs for stroke, trauma, etc. with any alteration in a patient’s baseline mental status. Minor or moderate injury in the typical adult may be very serious in the elderly.

Pediatric Patient: A pediatric patient is defined by those <15 years of age. Initial assessment should utilize the Pediatric Assessment Triangle which encompasses appearance, work of breathing, and circulation to skin. The order of assessment may require alteration dependent on the developmental state of the patient. Generally, the child or infant should not be separated from the caregiver unless absolutely necessary during assessment and treatment.

Patient Refusal: Patient refusal is a high risk situation. Encourage the patient to accept transport to a medical facility. Encourage the patient to allow an assessment, including vital signs. Documentation of the event is very important including a mental status assessment describing the patient’s capacity to refuse care. Guide to assessing capacity:

Patient should be able to communicate a clear choice: This should remain stable over time. Inability to communicate a choice or an inability to express the choice consistently demonstrates incapacity.

Relevant information is understood: Patient should be able to display a factual understanding of their illness or situation that requires further medical attention, the options, and risks and benefits.

Appreciation of the situation: Ability to communicate an understanding of the facts of the situation. Patient should be able to describe the significance of the potential outcome from his or her decision.

Manipulation of information in a rational manner: Demonstrate a rational process to come to a decision. Should be able to describe the reasoning they are using to come to the decision, whether or not the EMS provider agrees with the decision.

Special note on oxygen administration and utilization: Oxygen in prehospital patient care is probably over utilized. Oxygen is a pharmaceutical drug with indications, contraindications as well as untoward side effects. Utilize oxygen when indicated, not because it is available. A reasonable target oxygen saturation for most patients is ≥ 94% regardless of delivery device.

Pears
- A pediatric patient is defined as being <15 years of age.
- Timing of transport should be based on the patient’s condition and the destination policy.
- Never hesitate to contact the Base Hospital as a high risk refusal resource for any patient who refuses transport.
- SAMPLE: Signs / Symptoms; Allergies; Medications; PMH; Last oral intake; Events leading to injury/illness.
Contra Costa County Emergency Medical Services

Death with Dignity

History
• Terminal illness
• Hospice care
• POLST or DNR
• Death with Dignity attestation

Signs and Symptoms
• AMS
• Congestion
• Change in breathing
• Change in pulse
• Fever

Differential
• Natural end of life
• Medication OD

---

EMS may be summoned by family for a patient who has taken a lethal dose of medication under the Death with Dignity Act.

Respect the patient’s wishes, but if family objects and requests intervention or transport, initiate comfort care.

Review POLST, DNR, or Death with Dignity Final Attestation form (if present). Honor wishes listed on legal form.

If needed, provide comfort care: 
• Oxygen
• Open and maintain the airway using non-invasive means only (e.g. chin lift or jaw thrust)
• Suction as necessary

Form present and family objects
Provide comfort care and contact the Base Hospital to have physician speak with family.

Do not start resuscitation if the patient is in cardiopulmonary arrest

Administration of Naloxone is not advised

Notify receiving facility. Contact Base Hospital for medical direction

---

Pearls
• Patients who have been deemed terminally ill by two independent physicians have the right under the California End of Life Act to end their life with dignity at a time that they choose themselves. EMS personnel should be aware of and familiar with this act. Refer to Policy 1003 for additional information.
• Naxolone will not have an affect on the drugs prescribed for death with dignity patients.
• It is important to recognize that families may be educated on what to expect with a dying family member, but no amount of preparation can eliminate the stress and grief of watching a loved one die.
• Contact the Base Hospital for direction or assistance with family if necessary.
Contra Costa County Emergency Medical Services

End of Life Care

**History**
- Terminal illness
- Hospice care
- POLST or DNR

**Signs and Symptoms**
- AMS
- Congestion
- Change in breathing
- Change in pulse
- Fever

**Differential**
- Natural end of life
- Medication OD

---

**If needed, provide immediate supportive care**
- Oxygen
- Open and maintain the airway using non-invasive means **only** (e.g., chin lift or jaw thrust)
- Suction as necessary
- Position for comfort
- Control external hemorrhaging
- Immobilize obvious fractures using techniques to minimize pain

**Review POLST or DNR form**
- Honor wishes listed on legal form

**Honor and respect patient/family wishes for transport after discussion**

---

**Is the patient on hospice?**

**Yes**

- **If family member with decision-making authority is not present, ask family for the phone number for their Hospice Nurse if not already on scene**
- **Contact Hospice Nurse**
- **Let Hospice Nurse discuss options with family, even if only over the phone**
- **The family and Hospice Nurse should decide on an appropriate course of treatment or decision to transport**
- **Transport to appropriate receiving center or requested facility of choice**

**No**

- **Administration of Naloxone is not advised**

**Determine level of pain and treat if indicated**

- **If an existing patent IV is available**
  - Fentanyl 25 – 200mcg IV
  - Titrated in 25 – 50mcg increments to pain relief. Consider 25mcg increments in elderly patients
- **If no IV access**
  - Fentanyl 100mcg IN
  - May repeat once after 15 minutes
- **If no IV access and IN route not advisable**
  - Fentanyl 50 – 100mcg IM
  - May repeat once after 15 minutes

- **Max of 200mcg total**
- Monitor and reassess 5 minutes following administration
- If transport is declined, complete Refusal and thoroughly document encounter

**Notify receiving facility. Contact Base Hospital for medical direction**

---

**General Treatment Guidelines**

---

**Effective Jan. 2019**
**Pears**

- Hospice patients and those on palliative end of life care are often heavily medicated with pain medications. Administration of Naxolone, even in small amounts, can result in unnecessary suffering.

- Follow the wishes outlined in a signed POLST or DNR order. A competent patient or designated decision maker acting on behalf of the patient can override POLST.

- If a POLST or DNR order is not immediately available, immediately initiate BLS supportive care. Do not delay care while waiting for the form.

- If transport is initiated at the request of the family and the patient subsequently goes into cardiac or respiratory arrest during transport, continue to the closest approved receiving facility.

- Always involve the patient’s assigned Hospice Nurse, even if it is by phone. It is important to recognize that families may be educated on what to expect with a dying family member, but no amount of preparation can eliminate the stress and grief of watching a loved one die.

- Contact the Base Hospital for direction or assistance with family in the absence of a Hospice Nurse if necessary.

**Treatment Guideline G03**

**Effective Jan. 2019**

**Contra Costa County Emergency Medical Services**

**End of Life Care**

**POLST forms are generally copied on pink paper to help ensure that the document stands out and is followed. However, POLST on any paper color is valid.**

Unlike POLST, there is no standardized DNR order form. If you have doubt of a DNR order authenticity, initiate BLS care and contact the Base Hospital for guidance.
**History**
- Age
- Duration of fever
- Severity of fever
- Past medical history
- Medications
- Immunocompromised (transplant, HIV, diabetes, cancer)
- Environmental exposure
- Recent travel to emerging infectious disease affected regions
- Time of last acetaminophen or ibuprofen

**Signs and Symptoms**
- Warm
- Flushed appearance
- Sweaty
- Chills

**Associated symptoms (helpful to localize source)**
- Myalgia, cough, chest pain, headache, dysuria, abdominal pain, mental status changes, rash

**Differential**
- Infections/sepsis
- Cancer/tumors/lymphomas
- Medication or drug reaction
- Connective tissue disease
  - Arthritis
  - Vasculitis
- Hyperthyroidism
- Heat stroke
- Meningitis or other airborne disease
- Emerging infectious disease

---

**Use universal, contact, droplet, and airborne precautions, as indicated**

Complete a thorough and complete history of any recent travel or exposure to sick contacts; follow any/all current EMS system guidance based on this history

Establish IV/IO, if indicated

Notify receiving facility if communicable disease requiring isolation is suspected

Exit to appropriate TG

**Sepsis Indicators**

Obvious or suspected infection AND any TWO of the following criteria:
- Respiratory rate ≥ 22
- AMS with GCS ≤ 13
- Systolic blood pressure ≤ 100mmHg

Exit to Suspected Sepsis TG

---

**Pearls**

- UTILIZE UNIVERSAL PRECAUTIONS FOR ALL PATIENTS WITH SUSPECTED INFECTION.
- Febrile seizures are more likely in children with a history of febrile seizures and may be caused by a rapid elevation in temperature.
- All-hazards precautions include standard PPE plus airborne and contact precautions. This level of precaution is utilized during the initial phases of an outbreak when the etiology of the infection is unknown or when the causative agent is found to be highly contagious (e.g. Ebola, MERS, SARS).
- Droplet precautions include standard PPE plus a standard surgical mask for providers who accompany patients in the back of the ambulance and a surgical mask or NRB O₂ mask for the patient. This level of precaution should be utilized when influenza, meningitis, mumps, streptococcal pharyngitis and other illnesses spread via large particle droplets are suspected. A patient with a potentially infectious rash should be treated with droplet precautions.
- Contact precautions include standard PPE plus utilization of a gown, change of gloves after every patient contact and strict hand washing precautions. This level of precaution is utilized when multi-drug resistant organisms (e.g. MRSA and VRE), scabies, herpes zoster (shingles), or other illnesses spread by contact are suspected.
- Rehydration with fluids increases the patient’s ability to sweat and improves temperature control.
Contra Costa County Emergency Medical Services

IV and IO Access

First circulatory access for cardiac arrest?

Yes

Establish IV/IO

Assess need for IV
Emergent or potentially emergent medical or trauma condition

No

Saline lock

Peripheral IV

Intraosseous IV for life-threatening event at most suitable site available

External jugular IV for unstable patients needing emergent IV medication or fluids AND no peripheral site is available AND IO is not obtainable

Monitor saline lock/existing approved prehospital fluids

Monitor infusion

Pearls
- In the setting of cardiac arrest, any preexisting dialysis shunt or external central venous catheter may be used.
- In patients who are hemodynamically unstable, pre-existing indwelling central lines can be used to deliver fluid and medications.
- Approved prehospital IV solutions include: Isotonic (balanced) saline solution, Ringer’s lactate, and glucose solutions with no additional additives.
- Any working venous catheter already accessed prior to EMS arrival may be used for EMS IV fluids and medications.
- Use Chlorhexidine for all IV/IO attempts.
- Intraosseous access should be obtained only with the appropriate adult or pediatric device (e.g. IO drill).
- Any prehospital fluids or medications approved for IV use may also be given through IO.
- External jugular access is only indicated for patients ≥ 15 years of age.
- All IV rates should be kept at TKO (minimal rate to keep the vein open) unless administering fluid bolus.
- Use micro drip sets for all patients 6 years of age and less.
- Upper extremity IV sites are preferable to lower extremity sites; lower extremity sites are discouraged in patients with vascular disease or diabetes.
- In post-mastectomy patients and patients with a working dialysis fistula, avoid IV attempts, injections and blood pressure measurements in the upper extremity on the affected side.
Contra Costa County Emergency Medical Services

Ventricular Assist Devices

Assess the patient

Because there may be no palpable pulse, utilize other parameters for patient assessment (e.g., LOC, skin signs, capillary refill and EtCO₂).

Assess the device

Device information, implant center, and VAD Coordinator contact number may be located on the device itself, on the refrigerator, or medical alert bracelet.

If a caregiver is present, yield to their advice.

The VAD Coordinator can assist you with determining the best course of action regarding assessment of the device. Only the Base Hospital is authorized to provide medical direction.

For continuous flow devices (no palpable pulse), auscultate the left upper quadrant of abdomen and listen for the “hum” of the device.

Determine if the device has power

- If the device has power, it does not necessarily mean it is working properly
- If the device has power, you will see a green light on the Heartmate II, the most common device
- On the HeartWare device, the display will tell you the liters per minute of blood flow

Check the device for secure connections and properly charged batteries.

If the pump is functioning, the problem is usually with the patient, not the device.

Cardiac arrest or if patient is unresponsive and the VAD is functioning

Begin continuous chest compressions

If the patient’s condition appears to be related to their VAD, and it is safe and reasonable, it is preferred to transport the patient to their Bay Area VAD Center unless the patient has any of the following conditions, which warrant transport to a closer hospital:

- Minor medical or trauma with adequate perfusion
- Suspected stroke patients
- Suspected STEMI patients
- Suspected trauma patients

Notify receiving facility.

Contact Base Hospital for medical direction

Exit to appropriate TG

Exit to appropriate TG and transport to any approved receiving facility

Exit to Suspected Stroke TG

Exit to Suspected STEMI TG

Exit to Trauma TGs

Bay Area VAD Centers
Stanford – Palo Alto
Lucille Packard – Palo Alto
California Pacific Med. Ctr. – SF
UC San Francisco – SF
Kaiser Santa Clara – Santa Clara
UC Davis - Davis

General Treatment Guidelines

Page 1 of 2
Pearls

- Patients may be cardioverted or defibrillated if symptomatic, but asymptomatic dysrhythmias do not require treatment.
- If a VAD patient is unconscious, begin continuous chest compressions.
- Treatment should follow appropriate treatment guidelines. Medical direction is provided by the Base Hospital only; VAD Coordinators cannot provide medical direction.
- Contact the Base Hospital if there are questions concerning destination.
- If possible, the patient’s family member or caregiver should accompany the patient in the ambulance, and all related VAD equipment, including spare batteries, should also be transported with the patient.
- In arrest situations, determine if a POLST/DNR or advanced directive is available. Many VAD patients have made end of life care decisions.

<table>
<thead>
<tr>
<th>VAD CENTER</th>
<th>24-HOUR HOTLINE</th>
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<tbody>
<tr>
<td>Stanford Hospital</td>
<td>(650) 723-6661</td>
</tr>
<tr>
<td>Lucille Packard Children’s Hospital at Stanford*</td>
<td></td>
</tr>
<tr>
<td>California Pacific Medical Center</td>
<td>(415) 232-6057</td>
</tr>
<tr>
<td>UC San Francisco</td>
<td>(415) 443-5823</td>
</tr>
<tr>
<td>Kaiser Santa Clara</td>
<td>(408) 318-2387</td>
</tr>
<tr>
<td>UC Davis</td>
<td>(916) 734-2020</td>
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*Stanford Hospital and Lucille Packard Children’s Hospital at Stanford share the same VAD Coordinators
Diagnosed with a STEMI

Cardiac monitor
EtCO₂ monitoring

Oxygen
Titrated to SpO₂ of at least 94%

Consider
Fentanyl 50 – 200mcg IV
titrated in 25 – 50mcg increments
for pain relief if BP > 90 systolic

Notify receiving facility.
Contact Base Hospital for medical direction

Fentanyl
Contact Base Hospital for additional order

History
- Age
- Medications (e.g. Viagra, Sildenafil, Levitra, Vardenafil, Cialis or Tadalafil)
- Past medical history (e.g. MI, angina, diabetes, or post menopausal)
- Allergies
- Recent physical exertion
- Provocation
- Quality (e.g. pressure, constant, sharp, dull, etc.)
- Region/Radiation/Referred
- Severity (0 – 10 scale)
- Time (onset/duration/repetition)

Signs and Symptoms
- Heart rate < 60 with associated hypotension, acute altered mental status, chest pain, acute CHF, seizures, syncope, or shock secondary to bradycardia
- Chest pain
- Respiratory distress
- Hypotension or shock
- Altered mental status
- Syncope

Differential
- Acute myocardial infarction
- Hypoxia
- Pacemaker failure
- Hypothermia
- Sinus bradycardia
- Athletes
- Head injury (elevated ICP) or stroke
- Spinal cord lesion
- Sick sinus syndrome
- AV blocks (e.g. 1o, 2o, or 3o)
- Overdose

Approved STEMI Receiving Centers
- John Muir – Concord
- John Muir – Walnut Creek
- Kaiser – Walnut Creek
- San Ramon Regional
- Sutter Delta
- Highland – Oakland
- Kaiser – Vallejo
- Marin General
- Summit – Oakland
- Kaiser – Oakland
- Valley Care – Pleasanton

Pearls
- Patients with a STEMI needing interventional cardiac care require timely transfer. A scene time of 10 minutes or less at the sending facility is ideal.
- Treatment during interfacility transfer varies from field approach to chest pain/ACS:
  - Confirmatory ECG for a STEMI has already been done by the hospital and does not need to be repeated prior to transfer or during transport to receiving facility.
  - Nitroglycerin treatment is not required and is generally ineffective in patients with a confirmed STEMI.
  - Aspirin or other anti-platelet treatment, if indicated, should be administered by sending hospital prior to transport.
  - Patients generally will be directed to the cath lab upon arrival.
  - Outcome of STEMI patients is directly related to timeliness of intervention to relieve coronary artery occlusion. Minimizing time delay in transfer is essential.
### Intubated Patient Transfer

**History**
- Age
- Medications (e.g. Viagra, Sildenafil, Levitra, Vardenafil, Cialis or Tadalafil)
- Past medical history
- Allergies

**Signs and Symptoms**
- Cardiac arrest
- Respiratory distress or respiratory failure
- Hypotension or shock
- Altered mental status

**Differential**
- Acute myocardial infarction
- Hypoxia
- Hypothermia
- Head injury (elevated ICP) or stroke
- Spinal cord lesion
- Overdose

---

**Patient with an advanced airway**

- Cardiac monitor
- Ventilating at 6 breaths per minutes
- EtCO₂ monitoring
- Oxygen 100%
- Consider Midazolam 2-5mg IV/IO
  - Maximum 5mg total

**Notify receiving facility.**
- Contact Base Hospital for medical direction

**Pearls**
- Patients requiring specialty care, most commonly trauma or neurological care, may be transferred with an established endotracheal tube. Sedation may be required if patient agitation is present because of risk of inadvertent extubation.
- Some patients may need chemical paralysis and require additional nursing or physician staff to administer these medications.
- If inadvertent extubation occurs, manage with basic airway maneuvers unless ventilation cannot be adequately maintained.
Pearls

- Stroke patients who are transferred may have already received thrombolytic therapy or may not have qualified for thrombolytics based on the length of time from stroke onset or other medical contraindications.
- Ongoing administration of thrombolytic therapy requires additional qualified staff (nurse or physician) for transport.
- Thrombolytic therapy in stroke patients is associated with around a 6% incidence of symptomatic intracerebral hemorrhage, and around 1% of serious hemorrhage elsewhere.
- Close monitoring of stroke patients is important. Significant changes in patient vital signs or GCS during transport should be reported immediately to receiving facility staff as it may affect immediate treatment:
  - Hypotension may occur because of external or internal hemorrhage.
  - Hypertension may be related to an acute intracranial process or underlying disease.
  - Respiratory depression or airway compromise may occur due to stroke or intracerebral hemorrhage.
  - Decreasing level of consciousness may occur due to stroke or intracerebral hemorrhage.
- Cardiac dysrhythmias may occur in stroke patients.
- Observe for external hemorrhage in patients who have received thrombolytic therapy. Place direct pressure if hemorrhage is noted.
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Contra Costa County Emergency Medical Services

Cardiac Arrest

History
- Code status (DNR or POLST)
- Events leading to arrest
- Estimated downtime
- History of current illness
- Past medical history
- Medications
- Existence of terminal illness

Signs and Symptoms
- Unresponsive
- Apneic
- Pulseless

Differential
- Medical vs. trauma
- VF vs. pulseless VT
- Asystole
- PEA
- Primary cardiac event vs. respiratory arrest or drug overdose

Decomposition
- Rigor mortis
- Dependent lividity
- Injury incompatible with life or traumatic arrest with asystole
- Do not begin resuscitation
- Follow Policy 1004 – Determination of Death

For suspected Excited Delirium patients
Consider fluid bolus early and contact Base Hospital for Sodium Bicarbonate order

Criteria for death/no resuscitation
- Review DNR/POLST form

Follow Airway TG

AT ANY TIME
Return of spontaneous circulation
Go to Post Resuscitation TG

Begin continuous chest compressions
- Push hard (> 2 inches) and fast (100-120/min)
- Use metronome to ensure proper rate
- Change compressors every 2 minutes (Limit changes/pulse checks to < 5 seconds)
- Apply mechanical compression device if available

ALS available?

Yes

No

Apply AED if available

Shockable rhythm?

Yes

No

Continue CPR
- 5 cycles over 2 minutes
- Repeat and assess

Follow Airway TG

No

Yes

Follow Airway TG

Cardiac monitor

EtCO2 monitoring

Shockable rhythm?

Yes

No

Follow Airway TG

Follow Asystole/PEA and Airway TG as indicated

Follow VF/VT and Airway TG as indicated

Notify receiving facility.
Contact Base Hospital for medical direction

E

E

E

E

Follow FP09 - Cardiac Arrest Management


Effective Jan. 2019

Contra Costa Emergency Medical Services

A Division of Contra Costa Health Services
Pearls

• Efforts should be directed at high quality and continuous chest compressions with limited interruptions. Consider early IO placement if available or direct IV access if anticipated.

• Passive ventilation for the first three cycles (6 minutes) of CPR. After that time, the patient should be ventilated using a BLS airway and BVM at a rate of 6 ventilation/minute (1:10 seconds) with continuous CPR.

• Placement of an advanced airway should be deferred unless a provider is unable to ventilate the patient with a BLS airway and BVM.

• Do not delay chest compressions while applying any device or intervention.

• Use a metronome during chest compression to ensure proper rate.

• In cases of clear-cut traumatic arrest, epinephrine is not indicated in PEA or asystole. Epinephrine will not correct arrest caused by a tension pneumothorax, cardiac tamponade, or hemorrhagic shock. If there is any doubt as to the cause of arrest, treat as a non-traumatic arrest.

• If a non-shockable rhythm persists for 30 minutes despite aggressive resuscitative efforts, consider cessation of efforts as outlined in the Determination of Death policy.

• The AutoPulse device is limited to 80 compressions/minute, which is acceptable when using this device during cardiac arrest.

• Resuscitation is based on proper planning and organized execution. Procedures require space and patient access. Make room to work. Utilize a team focused approach assigning responders to predetermined tasks.

• Reassess and document ETT placement and EtCO₂ frequently, after every move, and at transfer of care.

• Maternal arrest: Treat mother per appropriate TG with immediate notification to the Base Hospital along with rapid transport. Place pillows or padding underneath mother to displace fetus from inferior vena cava as to ensure continued fetal blood circulation; left lateral position. IV/IO access should be preferably placed above the diaphragm. Defibrillation is safe at all energy levels.
Contra Costa County Emergency Medical Services

**Asystole/PEA**

### History
- Events leading to arrest
- Estimated downtime
- Past medical history
- Medications
- End stage renal disease
- Suspected hypothermia
- Suspected overdose
  - Tricyclic
  - Digitalis
  - Beta blockers
  - Calcium channel blockers
- DNR, POLST or living will

### Signs and Symptoms
- Pulseless
- Apneic or agonal respirations

### Differential
- Hypovolemia (e.g. trauma, AAA or other)
- Cardiac tamponade
- Hypothermia
- Drug overdose (e.g. tricyclic, digitalis, beta blockers, or calcium channel blockers)
- Massive myocardial infarction
- Hypoxia
- Tension pneumothorax
- Pulmonary embolus
- Acidosis
- Hyperkalemia

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**Cardiac Arrest TG**

- Criteria for death / no resuscitation
- Review DNR / POLST form
- Establish IV/IO

**AT ANY TIME**

- Return of spontaneous circulation

**Go to Post Resuscitation TG**

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**Resume chest compressions**

- Push hard (> 2 inches) and fast (100-120/min)
- Change compressors every 2 minutes
- (Limit changes/pulse checks to < 5 seconds)

**Shockable rhythm?**

- Yes
- Follow rhythm appropriate TG

- No
- Follow for reversible causes and treat appropriately
- Establish IV/IO
- Normal Saline bolus 1000ml IV/IO
- Epinephrine (1:10,000) 1mg IV/IO
- Consider Chest Decompression Procedure

**Early transport to a SRC is indicated for**

- Witnessed arrest with suspicion of pulmonary embolism or V. Fib arrest resistant to four (4) shocks (refractory V-Fib)

**Criteria for discontinuation?**

- Yes
- Notify receiving facility.
  - Contact Base Hospital for medical direction

- No

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**Reversible Causes**

- Hypovolemia
- Hypoxia
- Hydrogen ion (acidosis)
- Hypothermia
- Hypo/Hyperkalemia
- Hypoglycemia
- Tension pneumothorax
- Tamponade (cardiac)
- Toxins
- Thrombosis (pulmonary)(PE)
- Thrombosis (coronary)(MI)

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**Discontinue Resuscitation**

- Follow Policy 1004 – Determination of Death

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Contra Costa County Emergency Medical Services

Treatment Guideline AC 02

Page 1 of 2

Effective Jan. 2019
Pearls

- Efforts should be directed at high quality and continuous chest compressions with limited interruptions and early defibrillation when indicated. Consider early IO placement if available or direct IV access if anticipated.
- Passive ventilation for the first three cycles (6 minutes) of CPR. After that time, the patient should be ventilated using a BLS airway and BVM at a rate of 6 ventilation/minute (1:10 seconds) with continuous CPR.
- Placement of an advanced airway should be deferred unless a provider is unable to ventilate the patient with a BLS airway and BVM.
- Use a metronome during chest compression to ensure proper rate.
- If a non-shockable rhythm persists for 30 minutes despite aggressive resuscitative efforts, consider cessation of efforts as outlined in the Determination of Death policy.
- The AutoPulse device is limited to 80 compressions/minute, which is acceptable when using this device during cardiac arrest.
- SURVIVAL FROM PEA OR ASYSTOLE is based on identifying and correcting the CAUSE: consider a broad differential diagnosis with early and aggressive treatment of possible causes.
- Potential association of PEA with hypoxia may exist, so placing an effective BLS airway with oxygenation early may provide benefit.
- PEA caused by sepsis or severe volume loss may benefit from higher volume of normal saline administration.
- Return of spontaneous circulation after Asystole/PEA requires continued search for underlying cause of cardiac arrest.
- Treatment of hypoxia and hypotension are important after resuscitation from Asystole/PEA.
- Asystole is commonly an end stage rhythm following prolonged VF or PEA with a poor prognosis.
- Discussion with the Base Hospital can be a valuable tool in developing a differential diagnosis and identifying possible treatment options.
Effective Jan. 2019

Contra Costa County Emergency Medical Services

V-Fib/Pulseless V-Tach

History
- Events leading to arrest
- Estimated downtime
- Prior resuscitation attempts
- Past medical history
- Medications
- Known terminal illness

Signs and Symptoms
- Pulseless
- Apneic

Differential
- Medical vs. trauma
- VF vs. pulseless VT
- Asystole
- PEA
- Primary cardiac event vs. respiratory arrest or drug overdose
- Consider reversible causes

AT ANY TIME
Return of spontaneous circulation

Go to Post Resuscitation TG

Reversible Causes
- Hypovolemia
- Hypoxia
- Hydrogen ion (acidosis)
- Hypothermia
- Hypo/Hyperkalemia
- Hypoglycemia
- Tension pneumothorax
- Tamponade (cardiac)
- Toxins
- Thrombosis (pulmonary)(PE)
- Thrombosis (coronary)(MI)

Enter from Cardiac Arrest TG

Follow FP09 - Cardiac Arrest Management

Defibrillation 360J

Resume high quality chest compressions
Change compressors every 2 minutes (Limit changes/pulses checks < 5 seconds)

Establish IV/IO

Defibrillation 360J

Resume high quality chest compressions
Change compressors every 2 minutes (Limit changes/pulses checks < 5 seconds)

Defibrillation 360J

Epinephrine (1:10,000) 1mg IV/IO

Resume high quality chest compressions
Change compressors every 2 minutes (Limit changes/pulses checks < 5 seconds)

Amiodarone 300mg IV/IO
May repeat 150mg if rhythm persists

Early transport to a SRC is indicated for witnessed arrest with suspicion of pulmonary embolism or V. Fib arrest resistant to four (4) shocks (refractory V-Fib)

Criteria for discontinuation?
- Yes
  - Discontinue Resuscitation
  - Follow Policy 1004 – Determination of Death
- No
  - Return of spontaneous circulation?
    - Yes
      - Notify receiving facility. Contact Base Hospital for medical direction
    - No
      - Exit to Post Resuscitation TG
Pearls

• Efforts should be directed at high quality and continuous chest compressions with limited interruptions and early defibrillation when indicated. Consider early IO placement if available or direct IV access if anticipated.
• Passive ventilation for the first three cycles (6 minutes) of CPR. After that time, the patient should be ventilated using a BLS airway and BVM at a rate of 6 ventilation/minute (1:10 seconds) with continuous CPR.
• Placement of an advanced airway should be deferred unless a provider is unable to ventilate the patient with a BLS airway and BVM.
• Use a metronome during chest compression to ensure proper rate.
• If a non-shockable rhythm persists for 30 minutes despite aggressive resuscitative efforts, consider cessation of efforts as outlined in the Determination of Death policy.
• Contact Base Hospital prior to transport of non-ROSC patients.
• The AutoPulse device is limited to 80 compressions/minute, which is acceptable when using this device during cardiac arrest.
• Effective chest compressions and prompt defibrillation are the keys to successful resuscitation.
• Reassess and document ETT placement and EtCO₂ frequently, after every move, and at transfer of care.
• Do not stop chest compressions to check for placement of ETT or to give medications.
Post Resuscitation (ROSC)

History
- Respiratory arrest
- Cardiac arrest

Signs and Symptoms
- Return of spontaneous circulation

Differential
- Continue to address specific differentials associated with the original dysrhythmia

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Contra Costa County Emergency Medical Services

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Approved STEMI Receiving Centers
- John Muir – Concord
- John Muir – Walnut Creek
- Kaiser – Walnut Creek
- San Ramon Regional
- Sutter Delta
- Highland – Oakland
- Kaiser – Oakland
- Kaiser – Vallejo
- Marin General
- Summit – Oakland
- Valley Care – Pleasanton

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| Bradycardia TG |    |    |
|----------------|--------------------------|
| Yes            | E (Effective)            |
|                | P (Pertinent)            |
|                | Repeat primary assessment|
|                | Optimize ventilation and oxygenation |
|                | • Maintain SpO2 ≥ 94% |
|                | • Maintain respiratory rate between 6 – 10/minute for EtCO2 35 – 45 |
|                | • DO NOT HYPERVENTILATE |
|                | Monitor vital signs |
|                | Advanced airway placement, if indicated |
|                | Obtain 12-Lead ECG |
|                | Establish IO/IV |
|                | If systolic BP < 90 |
|                | Normal Saline bolus 500ml IV/IO |
|                | May repeat as needed if lungs are clear |
|                | Maximum 2L |
|                | Transport to STEMI Receiving Center |
|                | Symptomatic Bradycardia? |
|                | No |
|                | Consider sedation if advanced airway in place |
|                | Midazolam 2.5mg IV/IO |
|                | May repeat in 3 – 5 minutes as needed |
|                | Monitor for hypotension |
|                | Consider pain control if advanced airway in place |
|                | Fentanyl 25 – 100mcg IV/IO |
|                | May repeat 25mcg every 20 minutes as needed |
|                | Maximum 200mcg |
|                | Notify receiving facility |
|                | Contact Base Hospital for medical direction |
Contra Costa County Emergency Medical Services

Symptomatic Bradycardia

History
- Past medical history
- Medications
  • Beta blockers
  • Calcium channel blockers
  • Clonidine
  • Digoxin
  • Pacemaker

Signs and Symptoms
- Heart rate < 60 with associated hypotension, acute altered mental status, chest pain, acute CHF, seizures, syncope or shock secondary to bradycardia
- Chest pain
- Respiratory distress
- Hypotension or shock
- Altered mental status
- Syncope

Differential
- Acute myocardial infarction
- Hypoxia
- Pacemaker failure
- Hypothermia
- Sinus bradycardia
- Athletes
- Head injury (elevated ICP) or stroke
- Spinal cord lesion
- Sick sinus syndrome
- AV blocks (e.g. 1°, 2° or 3°)
- Overdose

Exit to appropriate TG

No

HR < 60 and symptomatic:
- Hypotension, acute AMS, chest pain, acute CHF, seizure, syncope, or shock secondary to bradycardia

Yes

Cardiac monitor

Establish IV/IO

12-Lead ECG

EtCO₂ monitoring

Atropine 0.5mg IV/IO
- May repeat every 3 – 5 minutes as needed
- Maximum 3mg
- Should not be used in wide-complex rhythms or in 2° or 3° heart blocks

Normal Saline bolus 500ml IV/IO
- May repeat as needed
- Maximum 1L

Transcutaneous pacing
- If not responsive to Atropine. Pacing may be considered first line therapy for severe symptoms.
- Consider early in 2° or 3° blocks and patients with suspected cardiac ischemia

Dyspnea/increased work of breathing, especially with hypoxia?

Yes

Notify receiving facility.
Contact Base Hospital for medical direction

Utilize Airway or appropriate Respiratory Distress TG

Consider sedation
- Midazolam 1mg IV/IO
- Titrate in 1-2mg increments
- May repeat if needed
- Maximum 5mg

Consider pain control
- Fentanyl 25 – 100mcg IV/IO in 25 – 50mcg increments if BP > 90
- May repeat 25mcg every 20 minutes as needed
- Maximum 200mcg

Effective Jan. 2018
Pearls

- Bradycardia causing symptoms is typically < 50/minutes. Rhythm should be interpreted in the context of symptoms and pharmacological treatment given only when symptomatic, otherwise monitor and reassess frequently.
- Identifying signs and symptoms of poor perfusion caused by bradycardia is paramount.
- Atropine vs. pacing: Caution should be exercised in the setting of a suspected acute MI. The use of Atropine for PVCs in the presence of an acute MI may worsen heart damage. Providers should NOT DELAY transcutaneous pacing for patients with poor perfusion in the setting of an acute MI or 2º or 3º heart block.
- For patients who are not in 2º or 3º heart block, pacing may be considered for bradycardia not responsive to Atropine. Prepare to utilize transcutaneous pacing early if the patient does not respond to Atropine.
- For wide complex, bizarre appearance of QRS complexes with slow rhythm, consider hyperkalemia.
- Consider treatable causes for bradycardia (e.g. beta blocker OD, calcium channel blocker OD, etc.)
- Hypoxemia is a common cause of bradycardia. Be sure to oxygenate the patient and support respiratory effort.
- Sinus bradycardia in the absence of key symptoms requires no specific treatment; monitor and observe.
- Sinus bradycardia is often seen in patients with STEMI or ischemia. An early 12-Lead ECG should be obtained to assess for STEMI.
- A fluid bolus may address hypotension and lessen the need for pacing or treatment with Atropine.
- Sedation prior to starting pacing is not required. Patients with urgent needs should be paced first and sedated afterwards.
- The objective of sedation with pacing is to decrease discomfort, not to decrease level of consciousness. Patients who are in need of pacing are unstable and sedation should be used with extreme caution.
- Monitor respiratory status closely and support ventilation as necessary.
- Atropine is not effective for bradycardia in heart transplant patients as there is no vagus nerve innervation in these patients.
- Patients with wide QRS or 2º or 3º heart blocks will not have a response to Atropine because they heart rates are not based on vagal tone. An increase in ventricular arrhythmias may occur.
Contra Costa County Emergency Medical Services

Narrow Complex Tachycardia

**History**
- Medications (e.g., Aminophylline, Adderall, diet pills, thyroid supplements, decongestants, and Digoxin)
- Diet
- Drugs (e.g., nicotine and illegal drugs)
- Past medical history
- History of palpitations/heart racing
- Syncope/near syncope

**Signs and Symptoms**
- Heart rate > 150 with narrow, regular complexes
- Systolic BP < 90
- Dizziness, chest pain, shortness of breath, altered mental status, or diaphoresis
- CHF
- Potential presenting rhythm:
  - Atrial/sinus tachycardia
  - Atrial fibrillation/flutter
  - Multifocal atrial tachycardia
  - Ventricular tachycardia

**Differential**
- Heart disease (e.g., WPW or valvular)
- Sick sinus syndrome
- Myocardial infarction
- Electrolyte imbalance
- Exertion, pain, or emotional stress
- Fever
- Hypoxia
- Hypovolemia or anemia
- Drug effect/overdose (see History)
- Hypothyroidism
- Pulmonary embolus

---

**Assess symptom severity**

**Unstable**
- HR typically > 150

- Cardiac monitor
  - Consider sedation pre-cardioversion
  - Midazolam 1mg IV/IO
  - May repeat if needed in 1-2mg increments
  - Maximum 5mg

  - EtCO₂ monitoring
  - Establish IV/IO

  - Regular rhythm (SVT)
    - (QRS ≤ 0.09 sec)

  - Irregular rhythm
    - (A-Fib/A-Flutter)

  - Synchronized cardioversion
    - 100J
    - May repeat in escalating energy (200J, 300J, 360J)

    - 12-Lead ECG or repeat if rhythm change

  - Notify receiving facility.
  - Contact Base Hospital for medical direction

**Stable**

- Cardiac monitor
  - Consider IV/IO
  - 12-Lead ECG

  - EtCO₂ monitoring

  - Attempt Valsalva maneuver

  - Regular rhythm (SVT)
    - (QRS ≤ 0.09 sec)

  - Irregular rhythm
    - (A-Fib/A-Flutter)

  - Synchronized cardioversion
    - 200J
    - May repeat in escalating energy (300J, 360J)

    - 12-Lead ECG or repeat if rhythm change

  - Adenosine 6mg IV/IO rapid push
    - May repeat 12mg IV/IO

    - If rhythm change, repeat 12-Lead ECG

---

Effective Jan. 2019
Pearls

• Most important goal is to differentiate the type of tachycardia and if STABLE or UNSTABLE.
• If at any point the patient becomes unstable, move to the unstable arm of the algorithm.
• For ASYMPTOMATIC patients (or those with only minimal symptoms, such as palpitations) and any tachycardia with a rate of approximately 100 – 120 with a normal blood pressure, consider CLOSE OBSERVATION or fluid bolus rather than immediate treatment with an anti-arrhythmic medication. For example, a patient’s “usual” atrial fibrillation may not require emergent treatment.
• All Adenosine administrations should be immediately followed by a 20ml rapid flush.
• Typical sinus tachycardia is in the range of 100 to (200 – the patient’s age) beats per minute.
• Symptomatic tachycardia usually occurs at rates of 120 – 150 and typically ≥ 150 beats per minute. Patients who are symptomatic with heart rates < 150 likely have impaired cardiac function, such as CHF.
• Serious Signs / Symptoms include: Hypotension; acutely altered mental status; signs of shock/poor perfusion; chest pain with evidence of ischemia (e.g. STEMI, T-wave inversions or depressions); and acute CHF.
• Search for underlying cause of tachycardia such as fever, sepsis, dyspnea, etc.
• If patient has a history or if 12-Lead ECG reveals Wolfe Parkinson White (WPW), use caution with Adenosine and give only with a defibrillator immediately available.
• Regular Narrow-Complex Tachycardias:
  • Adenosine may be considered to assist with rhythm diagnosis or if a patient has a history of Adenosine conversion.
  • Adenosine may not be effective with atrial fibrillation/flutter, yet is not harmful and may help identify rhythm.
• Synchronized Cardioversion is recommended to treat UNSTABLE atrial fibrillation/flutter and monomorphic-regular tachycardia (SVT).
• Monitor for respiratory depression and hypotension associated with Midazolam.
• Continue pulse oximetry and EtCO₂ monitoring is required for all narrow complex tachycardia patients.
• Providers must export all monitor data to EHR when caring for and treating narrow complex tachycardia patients.
History
- Medications (e.g. Aminophylline, Adderall, diet pills, thyroid supplements, decongestants, and Digoxin)
- Diet (e.g. caffeine and chocolate)
- Drugs (e.g. nicotine and illegal drugs)
- Past medical history
- History of palpitations/heart racing
- Syncope/near syncope
- Renal failure
- Missed dialysis

Signs and Symptoms
- Heart rate > 150
- Systolic BP < 90
- Dizziness, chest pain, shortness of breath, altered mental status or diaphoresis
- CHF
- Potential presenting rhythm:
  - Atrial/sinus tachycardia
  - Atrial fibrillation/flutter
  - Multifocal atrial tachycardia
  - Ventricular tachycardia

Differential
- Heart disease (e.g. WPW or valvular)
- Sick sinus syndrome
- Myocardial infarction
- Electrolyte imbalance
- Exertion, pain, or emotional stress
- Fever
- Hypoxia
- Hypovolemia or anemia
- Drug effect/overdose (see History)
- Hypothyroidism
- Pulmonary embolus

Assess symptom severity

Unstable (HR typically > 150)
- Cardiac monitor
- Consider sedation pre-cardioversion
  - Midazolam 1mg IV/IO
  - May repeat if needed in 1-2mg increments
  - Maximum 5mg
- EtCO2 monitoring
- Establish IV/IO
- Synchronized cardioversion 360J
  - If any delay in synchronized cardioversion and the patient is critical, defibrillate 360J
  - Contact Base Hospital for further direction if recurrent or resistant to initial three (3) shocks
  - 12-Lead ECG
  - or
  - repeat if rhythm change

Stable
- Cardiac monitor
- Establish IV/IO
- 12-Lead ECG
- EtCO2 monitoring

If symptomatic, consider
- Amiodarone 150mg IV/IO drip over 10 minutes
  - May repeat x 1 dose if needed

If rhythm change, repeat 12-Lead ECG

Notify receiving facility.
Contact Base Hospital for medical direction

Effective Jan. 2019
Pearls

- Most important goal is to differentiate the type of tachycardia and if STABLE or UNSTABLE.
- If at any point the patient becomes unstable, move to the unstable arm of the algorithm.
- For ASYMPTOMATIC patients (or those with only minimal symptoms, such as palpitations) and any tachycardia with a rate of approximately 100 – 120 with a normal blood pressure, consider CLOSE OBSERVATION or fluid bolus rather than immediate treatment with an anti-arrhythmic medication. For example, a patient’s “usual” atrial fibrillation may not require emergent treatment.
- In unstable patients with fever or other signs of sepsis, the underlying cause of the rapid heart rate is more likely fever and hypovolemia. This is particularly true in wide irregular tachycardia which is frequently underlying A fib with a bundle branch block. Initial efforts should focus on treating appropriately for underlying sepsis.
- In Polymorphic VT: (torsade de pointes) etc., the variation in QRS morphology may make it difficult to synchronize. If you cannot synchronize, move to defibrillation.
- In wide irregular rhythm such as A Fib with left or right bundle etc, synchronized cardioversion at 360J is more likely to yield first shock conversion.
- Typical sinus tachycardia is in the range of 100 to (200 – the patient’s age) beats per minute.
- Symptomatic tachycardia usually occurs at rates of 120 – 150 and typically ≥ 150 beats per minute. Patients who are symptomatic with heart rates < 150 likely have impaired cardiac function, such as CHF.
- **Serious Signs/Symptoms include:** Hypotension; acutely altered mental status; signs of shock/poor perfusion; chest pain with evidence of ischemia (e.g. STEMI, T-wave inversions, or depressions); and acute CHF.
- Search for underlying cause of tachycardia such as fever, sepsis, dyspnea, etc.
- Monitor for respiratory depression and hypotension associated with Midazolam.
- Continue pulse oximetry and EtCO₂ monitoring is required for all wide complex tachycardia patients.
- Providers must export all monitor data to EHR when caring for and treating wide complex tachycardia patients.
**History**
- Age
- Medications (e.g., Viagra, Sildenafil, Levitra, Vardenafil, Cialis or Tadalafil)
- Past medical history (e.g., MI, angina, diabetes, or post menopausal)
- Allergies
- Recent physical exertion
- Provocation
- Quality (e.g., pressure, constant, sharp, dull, etc.)
- Region/Radiation/Referral
- Severity (0 – 10 scale)
- Time (onset/duration/repetition)

** Signs and Symptoms**
- Heart rate < 60 with associated hypotension, acute altered mental status, chest pain, acute CHF, seizures, syncope, or shock secondary to bradycardia
- Chest pain
- Respiratory distress
- Hypotension or shock
- Altered mental status
- Syncope

**Differential**
- Acute myocardial infarction
- Hypoxia
- Pacemaker failure
- Hypothermia
- Sinus bradycardia
- Athletes
- Head injury (elevated ICP) or stroke
- Spinal cord lesion
- Sick sinus syndrome
- AV blocks (e.g. 1°, 2°, or 3°)
- Overdose

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**Chest Pain?**
- Signs/symptoms consistent with cardiac etiology?
  - Yes
    - Cardiac monitor
    - 12-Lead ECG
    - Aspirin 325mg PO
  - No
    - Acute MI/STEMI
      - (STEMI = 1mm ST segment elevation ≥ 2 contiguous leads; See 12-Lead Procedure)

**Establish IV/IO**
- Nitroglycerin 0.4mg sublingual if systolic BP is > 90
  - May repeat every 5 minutes until pain subsides.
  - SO Max 3 doses
- Consider Fentanyl 25 – 200mcg IV titrated in 25 – 50mcg increments for pain relief if BP > 90 systolic
  - If indicated,
    - Normal Saline bolus 500ml IV/IO
      - May repeat as needed
      - Maximum 1L

**Declare a STEMI Alert**
- Establish IV/IO
  - Consider Fentanyl 25 – 200mcg IV titrated in 25 – 50mcg increments for pain relief if BP > 90 systolic
  - If indicated,
    - Normal Saline bolus 500ml IV/IO
      - May repeat as needed
      - Maximum 1L

**Notify receiving facility. Contact Base Hospital for medical direction**

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**Approved STEMI Receiving Centers**
- John Muir – Concord
- John Muir – Walnut Creek
- Kaiser – Walnut Creek
- San Ramon Regional
- Sutter Delta
- Highland – Oakland
- Kaiser – Vallejo
- Marin General
- Summit – Oakland
- Kaiser – Oakland
- Valley Care – Pleasanton
Pearls

- Avoid Nitroglycerin in any patient who has used Viagra (Sildenafil) or Levitra (Vardenafil) in the past 24 hours or Cialis (Tadalafil) in the past 36 hours due to the potential of severe hypotension.
- Patients with a STEMI should be transported to the closest most appropriate STEMI receiving center.
- Many STEMI evolve during prehospital care and may not be noted on the initial 12-Lead ECG.
- An ECG should be obtained prior to treatment for bradycardia if patient condition permits.
- Transmit all 12-Lead ECGs whether STEMI is detected or not.
- If a patient has taken their own Nitroglycerin without relief, consider potency of medication. Provider maximum doses do not include patient administered doses.
- Monitor for hypotension after administration of nitroglycerin and opioids.
- Diabetics, geriatric, and female patients often have atypical pain, or only generalized complaints. Suspect cardiac etiology in these patients, and perform a 12-Lead ECG.
- Document the time of the 12-Lead ECG in the EHR as a procedure along with the interpretation.
Contra Costa County Emergency Medical Services

CHF/Pulmonary Edema

**History**
- Congestive heart failure
- Past medical history
- Medications (e.g. Digoxin, Lasix, Viagra, Sildenafil, Levitra, Vardenafil, Cialis, or Tadalafil)
- Cardiac history including past MI

**Signs and Symptoms**
- Respiratory distress with bilateral rales
- Apprehension or orthopnea
- Jugular vein distension
- Pink, frothy sputum
- Peripheral edema or diaphoresis
- Chest pain

**Differential**
- Myocardial infarction
- Congestive heart failure
- Asthma
- Anaphylaxis
- Aspiration
- COPD
- Pleural effusion
- Pneumonia
- Pulmonary embolus
- Pericardial tamponade
- Toxic exposure

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**Flowchart**

1. **Airway patient?**
   - Yes
     - Cardiac monitor
     - 12-Lead ECG
     - If interpretative statement indicates STEMI, treat with **Nitroglycerin** as indicated below
     - Establish IV/IO
     - EtCO₂ monitoring

2. **Assess symptom severity**
   - **MILD**
     - Normal heart rate
     - Elevated or normal BP
     - Nitroglycerin 0.4mg sublingual
     - Repeat every 5 minutes if systolic BP > 90
     - Improving?
   - No
     - Nitroglycerin 0.8mg sublingual
     - Repeat every 5 minutes if systolic BP > 150
     - Apply CPAP
     - Airway TG if indicated
     - Hypotension/Shock TG if indicated
   - Yes
     - Notify receiving facility. Contact Base Hospital for medical direction

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**Cardiac monitor**

**Nitroglycerin**

- 0.4mg sublingual
- 0.8mg sublingual

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**Effective Jan. 2019**
Pearls

- Opioids have NOT been shown to improve the outcomes of EMS patients with pulmonary edema. Even though this has historically been a mainstay of EMS treatment, it is no longer routinely recommended.
- Avoid Nitroglycerin in any patient who has used Viagra (Sildenafil) or Levitra (Vardenafil) in the past 24 hours or Cialis (Tadalafil) in the past 36 hours due to potential for severe hypotension.
- Carefully monitor the patient’s level of consciousness, chest pain, and respiratory status with the above interventions.
- If a patient has taken their own nitroglycerin without relief, consider potency of medication. Provider maximum doses do not include patient administered doses.
- Consider MI in all of these patients: Diabetic, geriatric, and female patients often have atypical pain or only generalized complaints.
- Document CPAP application using the CPAP procedure in the EHR. Document the 12-Lead ECG in the EHR as a procedure along with the interpretation.
Contra Costa County Emergency Medical Services

Abdominal Pain

History
- Age
- Past medical/surgical history
- Medications
- Onset
- Provocation
- Quality (e.g. crampy, constant, sharp, dull, etc.)
- Region / radiation/referred
- Severity (0 – 10 scale)
- Time (duration/repetition)
- Fever
- Last meal eaten
- Last bowel movement/emesis
- Menstrual history (pregnancy)

Signs and Symptoms
- Pain (location/migration)
- Tenderness
- Nausea
- Vomiting
- Diarrhea
- Dysuria (painful or difficult urination)
- Constipation
- Vaginal bleeding/discharge
- Pregnancy

Associated symptoms: (Helpful to localize source)
- Fever, headache, weakness, malaise, myalgia, cough, headache, mental status change, or rash

Differential
- Pneumonia or pulmonary embolus
- Liver (hepatitis)
- Peptic ulcer disease/gastritis
- Gallbladder
- MI
- Pancreatitis
- Kidney stone
- Abdominal aneurysm
- Appendicitis
- Bladder/prostate disorder
- Pelvic (PID, ectopic pregnancy, or ovarian cyst)
- Spleen enlargement
- Diverticulitis
- Bowel obstruction
- Gastroenteritis (infectious)
- Ovarian or testicular torsion

Assess symptom severity

Unstable
(Hypotension/poor perfusion)

Establish IV/IO

Normal Saline bolus 500ml
Repeat as needed
Titrate to systolic BP > 90
Maximum 1L

Cardiac monitor

Consider 12-Lead ECG

Pain Control TG if indicated

Yes

Signs/symptoms suggesting cardiac etiology

Appropriate Cardiac TG as indicated

Stable

Establish IV/IO

Cardiac monitor

Pain Control TG if indicated

Yes

Signs/symptoms suggesting cardiac etiology

If patient has nausea or vomiting
Ondansetron 4mg IV/IO/IM/ODT
May repeat x 1 after 15 minutes

Notify receiving facility.
Contact Base Hospital for medical direction

Improving?

Exit to Hypotension/Shock TG

Notify receiving facility.
Contact Base Hospital for medical direction


Treatment Guideline A01
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Effective Jan. 2019
**Pearls**

- Diabetic, females, and geriatric patients often have atypical pain, or only generalized complaints. Suspect cardiac etiology in these patients, perform a 12-Lead ECG, and investigate until proven otherwise.
- For chronic abdominal pain, use caution before administering Fentanyl.
- Zofran is not indicated or useful for motion sickness.
- Document the mental status and vital signs prior to administration of anti-emetics.
- Abdominal pain in women of childbearing age should be treated as pregnancy-related until proven otherwise.
- An impression of abdominal aneurysm should be considered with severe abdominal or non-traumatic back pain, especially in patients > 50 years of age or patients with shock/poor perfusion.
- Use caution when considering administration of opioids for pain control.
Contra Costa County Emergency Medical Services

Adult Airway


Basic maneuvers first
- Open airway chin lift/jaw thrust
- Nasal or oral airway
- Bag-valve mask (BVM)

Spinal motion restriction if indicated

Assess respiratory rate, effort, oxygenation
Is airway/breathing adequate?

Yes
- Supplement oxygen
Goal oxygen saturation ≥ 94%
Exit to appropriate TG

No

Airway patent?

Yes
- Supplemental oxygen via BVM

No
- Abdominal thrusts (conscious)
- Chest compression (unconscious)
- Direct laryngoscopy

Complete obstruction?

No
- Breathing/oxygenation support required?

Yes
- Monitor/reassess supplemental oxygen if indicated
Exit to appropriate TG

No
- Reassess airway procedure and adjust if necessary

E
- King Airway, as indicated in cardiac arrest
- King Airway or intubation, as indicated

P
- Midazolam 2-5mg IV/IO
Maximum 5mg total

Notify receiving facility.
Contact Base Hospital for medical direction

The maximum allowed attempts for an advanced airway placement is two (2).
If an attempt fails, reassess and approach with a different technique.
Always weigh the risks and benefits of endotracheal intubation in the field against transport. All prehospital endotracheal intubations are considered high risk. If ventilation/oxygenation is adequate, transport may be the best and safest option. The most important airway device is the BVM, not the laryngoscope.

Cormack-Lehane Difficult Airway Assessment:

<table>
<thead>
<tr>
<th>Grade I</th>
<th>Grade II</th>
<th>Grade III</th>
<th>Grade IV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Complete view of glottic opening and surrounding structures</td>
<td>Partial view of the glottic opening</td>
<td>Only the epiglottis is visible</td>
<td>No distinguishable anatomy is visible</td>
</tr>
</tbody>
</table>

Trauma: Utilize in-line cervical stabilization during intubation, BLS airway or BVM use. During intubation, the cervical collar front should be open or removed to facilitate translation of the mandible/mouth opening.

Pearls
- This TG is only for use with patients >15 years of age.
- Continuous capnometry (EtCO₂) is mandatory with all methods of airway management. Document results.
- If an effective airway is being maintained with a BVM and a basic airway adjunct with continuous pulse oximetry values of ≥ 90% or values expected based on pathophysiologic condition with otherwise reassuring vital sign (e.g., pulse oximetry of 85% with otherwise normal vital signs in a post-drowning patient), it is acceptable to continue with basic airway measures rather than placing an advanced airway.
- For the purposes of this TG, a secure airway is achieved when the patient is receiving appropriate oxygenation and ventilation.
- An intubation attempt is defined as passing the laryngoscope blade or advanced airway past the teeth with the intent to intubate.
- An appropriate ventilatory rate is one that maintains an EtCO₂ of 35 or greater. Avoid hyperventilation.
- A Bougie is strongly encouraged for all ET intubation attempts.
- Effective use of a BVM is best achieved with two (2) people.
- The airway should be reassessed with each patient move. Document findings and EtCO₂ readings for each.
- Maintain spinal motion restriction for patients with suspected spinal injury.
- Document visualization and grading scale in prehospital record.
- Hyperventilation in deteriorating head trauma should only be done to maintain an EtCO₂ of 30-35.
- It is important to secure the advanced airway well and consider c-collar use (in the absence of trauma) to better maintain advanced airway placement. Manual stabilization of advanced airway should be used during all patient moves/transfers.
History
- Situational crisis
- Psychiatric illness/medications
- Injury to self or threats to others
- Medical alert tag
- Substance abuse/overdose
- Diabetes

Signs and Symptoms
- Anxiety, agitation or confusion
- Affect change or hallucinations
- Delusional thoughts or bizarre behavior
- Combative or violent
- Expression of suicidal/homicidal thoughts

Differential
- Altered mental status
- Alcohol intoxication
- Toxin / substance abuse
- Medication effect/overdose
- Withdrawal symptoms
- Depression
- Bipolar (manic-depressive)
- Schizophrenia
- Anxiety disorders
- Hypoglycemia

Excited Delirium Syndrome
Paranoia, disorientation, extremely aggressive or violent, hallucinations, tachycardia, increased strength, hyperthermia, and clearly a danger to self or others

Midazolam 5mg IM/IN
May repeat 2.5mg every 5 minutes to effect.
Maximum 10mg

Consider restraints
Monitor restraints and PMS if indicated
Consider external cooling measures
Monitor and reassess
Establish IV
Blood glucose analysis
Cardiac monitor

Exit to appropriate TG, if indicated
Altered Mental Status TG
Overdose/Toxic Ingestion TG
Head Trauma TG
Assume patient has medical cause of behavioral change

Notify receiving facility.
Contact Base Hospital for medical direction

Midazolam
Notify receiving facility.
Contact Base Hospital for medical direction
MD
Contact Base Hospital Physician for additional order

Effective Jan. 2019
Excited Delirium Syndrome:
This is a medical emergency. The condition is a combination of delirium, psychomotor agitation, anxiety, hallucinations, speech disturbances, disorientation, violent/bizarre behavior, insensitivity to pain, hyperthermia and increased strength. The condition is life-threatening and is often associated with use of physical control measures, including physical restraints, and tasers. Most commonly seen in male patients with a history of serious mental illness or drug abuse, particularly stimulant drugs such as cocaine, crack cocaine, methamphetamine, amphetamines, bath salts, or similar agents. Alcohol withdrawal or head injury may also contribute to the condition.

Pearls
- **Crew/responder safety is the main priority. See Policy 1008 – Managing Assaultive Behavior/Patient Restraint.**
- **Avoid using benzodiazepines for patients with alcohol intoxication.**
- **Limit IN administrations to ½ dose in each nare.**
- All patients who receive either physical restraint or chemical sedation must be continuously observed by EMS personnel. This includes direct visualization of the patient as well as cardiac and pulse oximetry monitoring.
- **Consider all possible medical/trauma causes for behavior (e.g. hypoglycemia, overdose, substance abuse, hypoxia, seizure, head injury, etc.).**
- Use caution when considering the use of Midazolam with postictal patients.
- Do not irritate the patient with a prolonged exam. Be thorough but quick.
- Do not overlook the possibility of associated domestic violence or child abuse.
- If patient suspected of excited delirium and suffers cardiac arrest, consider fluid bolus and sodium bicarbonate early.
- Do not position or transport any restrained patient in a way that negatively affects the patient’s respiratory or circulatory status (e.g. hog-tied or prone positions). Do not place backboards, splints or other devices on top of the patient.
- If restrained, the extremities that are restrained will have a circulation check at least every 15 minutes. The first of these checks should occur as soon after placement of the restraints as possible. This shall be documented in the EHR.
**Contra Costa County Emergency Medical Services**

**Allergic Reaction/Anaphylaxis**

**History**
- Onset and location
- Insect sting or bite
- Food allergy / exposure
- Medication allergy / exposure
- New clothing, soap or detergent
- Past history of reactions
- Past medical history
- Medication history

**Signs and Symptoms**
- Itching or hives
- Coughing, wheezing or respiratory distress
- Chest or throat restriction
- Difficulty swallowing
- Hypotension or shock
- Edema
- Nausea or vomiting
- Feeling of impending doom

**Differential**
- Urticaria (rash only)
- Anaphylaxis (systemic effect)
- Shock (vascular effect)
- Angioedema (drug induced)
- Aspiration or airway obstruction
- Vasovagal event
- Asthma or COPD
- CHF

**Assess symptom severity**

**Systemic**

- **E** Assist patient with self-prescribed Epinephrine Auto-Injector if available
- **O** Administer Epinephrine Auto-Injector
  - **Epinephrine 1:1,000 0.3mg IM (Use 0.15mg for patients > 50 years of age)**
  - Establish IV/IO
  - Cardiac monitor
  - EtCO₂ monitoring
  - Albuterol nebulizer 5mg
  - Repeat as needed if indicated
  - Normal Saline bolus 500ml IV/IO
  - Repeat as needed to Max of 1L
  - If hypotensive or no improvement, Epinephrine 1:10,000 titrated in 0.1mg increments slow IV/IO
  - Maximum 0.5mg
  - **Consider, Diphenhydramine 50mg IV/IO/IM**
  - **Consider, 12-Lead ECG**

**Localized**

- **P** Establish IV/IO
  - Cardiac monitor
  - **Consider, Diphenhydramine 50mg IV/IO/IM**
  - Monitor and reassess
  - Monitor for worsening signs and symptoms

- **Airway Procedure if indicated**

- **Notify receiving facility. Contact Base Hospital for medical direction**

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Treatment Guideline A04

Page 1 of 2

Effective Jan. 2019
Pearls

• **Anaphylaxis** is an acute and potentially lethal multisystem allergic reaction.
• Epinephrine is the drug of choice and the first drug that should be administered in acute anaphylactic reactions with moderate or severe symptoms. IM Epinephrine should be administered as priority before or during attempts at IV or IO access.
• Anaphylaxis that is unresponsive to initial treatment of IM Epinephrine may require IV Epinephrine administration.
• Allergic reactions may occur with only respiratory and gastrointestinal symptoms and have no rash or skin involvement.
• Angioedema is seen in moderate to severe reactions and is swelling involving the face, lips, or airway structures. This can also be seen in patients taking ACE-inhibitor blood pressure medications such as Prinivil, Zesteril, or Lisinopril; medications typically ending in -il.
• Epinephrine may precipitate cardiac ischemia. The following patients should receive half the adult dose of Epinephrine (0.15mg Epinephrine 1:1,000) for the initial dose and any repeated doses:
  • Patients with a history of coronary artery disease, MI, stents, CHF, cardiac surgery; OR
  • Patients over 50 years of age.
  • **EMT Optional Scope – use an EpiPen Junior.**
• Adult patient who receive Epinephrine should receive a 12-Lead ECG at some point during their care, but this should NOT delay the administration of Epinephrine.
• All patients with respiratory symptoms must have continuous pulse oximetry and EtCO₂ measurement.
• The shorter the onset of symptoms from contact with an allergen, generally the more severe the reaction.
History
- Known diabetic or medical alert tag
- Drugs or drug paraphernalia
- Report of illicit drug use or toxic ingestion
- Past medical history
- Medications
- History of trauma or traumatic brain injury
- Change in condition
- Changes in feeding or sleep habits

Signs and Symptoms
- Change in baseline mental status
- Decrease mental status or lethargy
- Bizarre behavior
- Hypoglycemia (cool, diaphoretic skin)
- Hyperglycemia (warm, dry skin; fruity breath; Kussmaul respirations; signs of dehydration)
- Irritability

Differential
- Head trauma
- CNS (stroke, tumor, seizure, infection)
- Cardiac (MI, CHF)
- Hypothermia
- Infection or sepsis
- Thyroid
- Shock
- Diabetes
- Toxicological or ingestion
- Acidosis or alkalosis
- Environmental exposure
- Hypoxia
- Electrolyte abnormality
- Psychiatric disorder
- Sepsis

### Treatment Algorithm

**Airway TG, if indicated**
- Blood glucose analysis
- Cardiac monitor
- 12-Lead ECG
- IV/IO Procedure

- **Blood glucose ≤ 60 or ≥ 350**
  - Yes → Exit to Diabetic TG
  - No → Signs of shock/poor perfusion

- **Signs of shock/poor perfusion**
  - Yes → Exit to Hypotension/Shock TG
  - No → Signs of OD/toxic exposure

- **Signs of OD/toxic exposure**
  - Yes → Exit to Overdose/Toxic Exposure TG
  - No → Signs of stroke or seizure

- **Signs of stroke or seizure**
  - Yes → Exit to Stroke or Seizure TG as indicated
  - No → Signs of hypo/hyperthermia

- **Signs of hypo/hyperthermia**
  - Yes → Exit to Hypo / Hyperthermia TG as indicated
  - No → Arrhythmia/STEMI

- **Arrhythmia/STEMI**
  - Yes → Exit to Appropriate Cardiac TG as indicated
  - No → Signs of sepsis

- **Signs of sepsis**
  - Yes → Exit to Suspected Sepsis TG as indicated
  - No → Notify receiving facility. Contact Base Hospital for medical direction
**Pearls**

- Pay careful attention to the head exam for signs of bruising or other injury.
- Be aware of AMS as a presenting sign of an environmental toxin or Haz-mat exposure and protect personal safety and that of other responders who may already be exposed.
- It is safer to assume hypoglycemia than hyperglycemia if doubt exists. Recheck blood glucose after D-10 or Glucagon administration.
- Do not let alcohol confuse the clinical picture. Alcoholics frequently develop hypoglycemia and may have unrecognized injuries.
- Consider restraints if necessary for patient or personnel protection.
**History**
- Due date
- Time contractions started/how often
- Rupture of membranes
- Time/amount of any vaginal bleeding
- Sensation of fetal activity
- Past medical and delivery history
- Medications
- Gravida/Para status
- High risk pregnancy

**Signs and Symptoms**
- Spasmodic pain
- Vaginal discharge or bleeding
- Crowning or urge to push
- Meconium

**Differential**
- Abnormal presentation
  - Buttock
  - Foot
  - Hand
  - Prolapsed cord
  - Placenta previa
  - Abruptio placenta

---

**Place patient in left lateral recumbent position**

**Note any abnormal vaginal bleeding, hypertension or hypotension**

**Inspect perineum (No digital vaginal exam)**

**No crowning**

**Monitor and reassess**
- Document frequency and duration of contractions

**Crowning > 36 weeks gestation**

**Childbirth procedure**
- Establish IV/IO

**Prolapsed cord**
- Shoulder dystocia

**Breach birth**

**Priority symptoms:**
- Crowning at < 36 weeks gestation
- Abnormal presentation
- Severe vaginal bleeding
- Multiple gestation

**Unable to deliver**
- Create air passage by supporting presenting part of the infant
- Place 2 fingers along side of the nose and push away from face
- Insert fingers into vagina to relieve pressure on cord
- Saline dressing over cord

**Transport unless delivery imminent**
- Encourage mother to refrain from pushing
- Support presenting part(s) DO NOT PULL

**Notify receiving facility. Contact Base Hospital for medical direction**

**Delivered Baby**
- Exit to Newly Born TG
Pearls

- Document all times (delivery, contraction frequency and length, and time cord was cut).
- Document the name of the prehospital provider who cut the cord.
- After delivery, massaging the uterus (lower abdomen) will promote uterine contraction and help to control postpartum bleeding.
- Some perineal bleeding is normal with any childbirth. Large quantities of blood or free bleeding are abnormal.
History
- Past medical history
- Medications
- Recent blood glucose check
- Last meal

Signs and Symptoms
- Altered mental status
- Combative or irritable
- Diaphoresis
- Seizure
- Abdominal pain
- Nausea or vomiting
- Weakness
- Dehydration
- Deep or rapid breathing

Differential
- Alcohol or drug use
- Toxic ingestion
- Trauma or head injury
- Seizure
- Stroke
- Altered baseline mental status

Altered Mental Status TG
- Suspected hypoglycemia or patient’s glucometer results read <60mg/dl
  - Blood glucose analysis
  - Cardiac monitor
  - 12-Lead ECG procedure if indicated
  - Establish IV/IO
- Blood glucose ≤ 60mg/dl
  - Able to follow commands but symptomatic
    - Yes: Consider Oral Glucose 1 tube (30g)
    - No: D-10 100ml IV
      - No venous access
      - Glucagon 1mg IM
      - Repeat in 15 minutes if needed
      - Consider IO access as a last resort

- Improving?
  - Yes: Return to baseline mental status?
    - Yes: Patient taking oral diabetic meds?
      - Yes: Recommend transport or conduct Refusal if indicated
      - No: No
    - No: No

  - No: Notify receiving facility, Contact Base Hospital for medical direction

- Blood glucose ≥ 350mg/dl
  - If no evidence of CHF/fluid overload
  - Normal Saline bolus 500ml IV

  - Hypotension?
    - Yes: Exit to Hypotension/ Shock TG
    - No: No

  - Improving?
    - Yes: Return to baseline mental status?
      - Yes: Patient taking oral diabetic meds?
        - Yes: Recommend transport or conduct Refusal if indicated
        - No: No
      - No: No

    - No: No

Notify receiving facility, Contact Base Hospital for additional order
Pearls

- It is safer to assume hypoglycemia than hyperglycemia if doubt exists.
- Recheck BGL after each D-10 or Glucagon administration.
- Patients with prolonged hypoglycemia may not respond to Glucagon.
- Response to Glucagon can take 15-20 minutes. Consider the entire clinical picture when treating hypoglycemia, including a patient’s overall clinical condition and other vital signs. It may be safe to wait for some time for Glucagon to work instead of pursing the more aggressive course of performing IO access to give faster acting D-10 solution. Diabetics may have poor wound healing capabilities, and IO access may present a greater risk for infection or complicate the patient’s long-term condition due to poor wound healing. IO access may also present a greater risk for infection. On the other hand, consider IO access to give D-10 solution early in patients who are critically ill or peri-arrest and hypoglycemic.
- Do not administer oral glucose to patients that are not able to swallow or protect their airway.
- Quality control checks should be maintained per manufacturer’s recommendation for all glucometers.
- Patients refusing transport to a hospital after treatment of hypoglycemia:
  - **Oral agents**: Patients taking oral diabetic medications should be strongly encouraged to allow ambulance transportation to a hospital. They are at risk of recurrent hypoglycemia that can be delayed for hours and require close monitoring even after a prehospital blood glucose level of greater than 60mg/dl has been achieved. Patients who meet criteria to refuse care should be instructed to contact their physician immediately and consume a meal with complex carbohydrates and protein now.
  - **Insulin agents**: Many forms of Insulin now exist. Longer acting Insulin places the patient at risk of recurrent hypoglycemia even after a prehospital blood glucose level of greater than 60mg/dl has been achieved. Patient who meet criteria to refuse care should be instructed to contact their physician immediately and consume a meal with complex carbohydrates and protein now.
**History**
- Peritoneal or hemodialysis
- Anemia
- Catheter access noted
- Shunt access noted
- Hyperkalemia

**Signs and Symptoms**
- Hypotension
- Bleeding
- Fever
- Electrolyte imbalance
- Nausea or vomiting
- Altered mental status
- Seizure
- Cardiac arrhythmia

**Differential**
- Congestive heart failure
- Pericarditis
- Diabetic emergency
- Sepsis
- Cardiac tamponade

---

**Dialysis/Renal Failure**

**Treatment Guideline A08**

**History**
- Peritoneal or hemodialysis
- Anemia
- Catheter access noted
- Shunt access noted
- Hyperkalemia

**Signs and Symptoms**
- Hypotension
- Bleeding
- Fever
- Electrolyte imbalance
- Nausea or vomiting
- Altered mental status
- Seizure
- Cardiac arrhythmia

**Differential**
- Congestive heart failure
- Pericarditis
- Diabetic emergency
- Sepsis
- Cardiac tamponade

---

**Graft or fistula bleeding?**

- No

**Exit to CHF/Pulmonary Edema TG**

**CHF or pulmonary edema?**

- Yes
  - Exit to CHF/Pulmonary Edema TG

- No

**Serious signs/symptoms?**

- Yes
  - Exit to Hypotension TG

**Cardiac arrest?**

- No

**Establish IV/IO**

- Calcium Chloride 1g IV/IO
- Sodium Bicarbonate 50mEq IV/IO

**Blood glucose analysis**

- Yes
  - Peaked T-wave and wide QRS? (QRS ≥ 0.12 sec)
  - Calcium Chloride 1g IV / IO over 2-3 minutes
  - Sodium Bicarbonate 50mEq IV / IO
  - Albuterol nebulizer 5mg
  - May repeat x3 or until IV meds are administered

- No
  - Exit to Diabetic TG

**Blood glucose ≤ 60 or ≥ 350mg/dl?**

- Yes
  - Normal Saline bolus 500ml
  - Repeat to goal SBP > 90
  - Maximum 1L

- No
  - Establish IV/IO

**Notify destination or contact Base Hospital**
Peaked T-waves are a sign of hyperkalemia. Increased extracellular potassium reduces myocardial excitability, which results in the depression of both pace making and conducting tissues. Progressively worsening hyperkalemia leads to suppression of impulse generation by the SA node and reduced conduction by the AV node and HIS-Purkinje system, resulting in bradycardia and conduction blocks that ultimately lead to cardiac arrest.

In order to treat hyperkalemia in the prehospital setting, the QRS must be ≥ 0.12 seconds. If the patient has not yet arrested, be prepared for the patient to do so. Early recognition and treatment is essential to helping reverse this critical condition.

**Pearls**

- Do not take blood pressure or start IV in extremity which has a fistula/graft in place.
- For dialysis patients whose peripheral access site (fistula/graft) has already been accessed, the existing IV line may be used by a paramedic for administration of fluids or medications.
- Paramedics may access a dialysis fistula/graft if the patient is in cardiac arrest and attempts at IV and IO access have failed.
- If local pressure does not control significant hemorrhage from dialysis fistula or graft, utilize a tourniquet to stop bleeding. Apply the tourniquet as far away from the fistula/graft as possible.
- Always consider hyperkalemia in all dialysis or renal failure patients.
- Sodium Bicarbonate and Calcium Chloride should not be mixed. Ideally, administer in separate lines.
- Renal failure and dialysis patients generally have numerous medical problems. Hypertension and cardiac disease are prevalent.
Contra Costa County Emergency Medical Services

Dyspnea (excluding CHF)

History
- Asthma; COPD – chronic bronchitis and emphysema
- Home treatment (e.g. oxygen or nebulizer)
- Medications (e.g. Theophylline, steroids, inhalers)
- Toxic exposure or smoke inhalation

Signs and Symptoms
- Shortness of breath
- Pursed lip breathing
- Decreased ability to speak
- Increased respiratory rate and effort
- Wheezing or rhonchi
- Use of accessory muscles
- Cough
- Tachycardia

Differential
- Asthma
- Anaphylaxis
- Aspiration
- COPD (emphysema or bronchitis)
- Pleural effusion
- Pneumonia
- Pulmonary embolus
- Pericardial tamponade
- Hyperventilation
- Inhaled toxin (e.g. carbon monoxide, etc.)

History

Apply Oxygen to maintain goal SpO2 93 to 95%
Airway support
Cardiac monitor
12-Lead ECG
EtCO2 monitoring
Establish IV/IO

Obvious distress with ↓ air movement?
Yes

PERI-ARREST OR SEVERE DISTRESS
Consider administering Epinephrine 1:1,000 0.3mg IM before administering Albuterol
Albuterol nebulizer 5mg
Repeat as needed
Consider CPAP

Improving?
No

If no improvement, consider Epinephrine 1:1,000 0.3mg IM
(Use 0.15mg for patients > 50 years of age)

Notify receiving facility. Contact Base Hospital for medical direction

Yes

Support airway

E

P

Exit to CHF/Pulmonary Edema TG

Notify receiving facility. Contact Base Hospital for medical direction

Effective Jan. 2019
**Pearls**

- Patients receiving epinephrine should receive a 12-Lead ECG at some point in their care in the prehospital setting, but this should NOT delay the administration of Epinephrine.
- Epinephrine may precipitate cardiac ischemia. The following patients should receive half the adult dose of Epinephrine (0.15mg Epinephrine 1:1,000) for the initial dose and any repeated doses:
  - Patients with a history of coronary artery disease, MI, stents, CHF, cardiac surgery; OR
  - Patients over 50 years of age and has a heart rate ≥ 150.
- Pulse oximetry and continuous EtCO₂ monitoring is required for all respiratory patients.
- A silent chest in respiratory distress is a pre-respiratory arrest sign.
- CPAP is not a ventilation device. Patients with an inadequate respiratory rate or depth of respiration will need assistance with a BVM.
**History**
- Medical history
- Medications
- Abuse or recreational use of prescription medications

**Differential**
- Trauma
- Stroke
- Tumor
- Hypoxia
- Infection
- Drug reactions
- Poisoning

**Signs and Symptoms**
- Restlessness
- Muscle spasms of the neck, jaw and back
- Oculogyric crisis
- A “dragging leg”
- Speech difficulties

**Dystonic Reaction**

**Pearls**
- Common drugs implicated in dystonic reactions include many anti-emetics and anti-psychotic medications including, but not limited to:
  - Prochlorperazine (Compazine)
  - Haloperidol (Haldol)
  - Metoclopramide (Reglan)
  - Promethazine (Phenergan)
  - Fluphenazine (Prolixin)
  - Chlorpromazine (Thorazine)
  - Many other anti-psychotic and anti-emetic drugs
- Rarely, benzodiazepine drugs have been implicated as a cause of dystonic reaction.
Emergencies Involving Central Lines

History
- Central venous catheter type:
  - Tunneled catheter (Broviac/Hickman)
  - PICC (peripherally inserted center catheter)
  - Implanted catheter (Mediport)
  - Fistulas
  - Occlusion of line
  - Complete or partial dislodgement
  - Complete or partial disruption

Signs and Symptoms
- External catheter dislodgement
- Complete catheter dislodgement
- Damaged catheter
- Bleeding at catheter/fistula site
- Erythema, warmth, or drainage about catheter/fistula site indicating infection

Differential
- Fever
- Hemorrhage
- Reactions from home nutrient or medication
- Respiratory distress
- Shock
- Internal bleeding
- Blood clot
- Air embolus

Pearls
- Always talk to family/caregivers as they have specific knowledge and skills of device(s).
- If hemodynamically unstable and a peripheral IV or IO cannot be obtained, access central catheter and utilize for definitive care if device is functioning properly.
- Central venous access devices that require the penetration of skin, such as internal subcutaneous infusion ports may not be used.
- Use strict sterile techniques when accessing/manipulating a dialysis catheter device.
- Do not place a tourniquet or BP cuff on the same side where a PICC line is located.
- Do not attempt to force catheter open if occlusion is evident.
- Some infusions may be detrimental to stop. Ask family or caregiver if it is appropriate to stop or change infusion.
- Hyperalimentation infusions (IV nutrition): If stopped for any reason, monitor patient for hypoglycemia.

Exit to appropriate TGs

Clamp catheter proximal to disruption
- Stop infusion if ongoing

Apply direct pressure around catheter
- Stop infusion if ongoing

Apply direct pressure around catheter

Place patient on left side in head down position
- Stop infusion if ongoing
- Clamp catheter proximal to disruption

Continue infusion
- Do not exceed 20ml/kg

Notify receiving facility.
Contact Base Hospital for medical direction
Contra Costa County Emergency Medical Services

Hypotension/Shock

History
- Blood loss
- Fluid loss (vomiting, diarrhea or fever)
- Infection (e.g., UTI, cellulitis, etc.)
- Cardiac ischemia (MI or CHF)
- Medications
- Allergic reaction
- Pregnancy
- History of poor oral intake

Signs and Symptoms
- Restlessness or confusion
- Weakness or dizziness
- Weak, rapid pulse
- Pale, cool, clammy skin signs
- Delayed capillary refill
- Hypotension
- Coffee-ground emesis
- Tarry stools

Differential
- Shock (hypovolemic, cardiogenic, septic, neurogenic or anaphylaxis)
- Ectopic pregnancy
- Cardiac dysrhythmias
- Pulmonary embolus
- Tension pneumothorax
- Medication effect or overdose
- Vasovagal effect
- Physiologic (pregnancy)

Diabetic TG if indicated

Spinal motion restriction if indicated
CONTROL HEMORRHAGE and wound care as indicated

Normal Saline bolus 500ml IV/IO Repeat to goal SBP of 90mm
Maximum 1L

Cardiac monitor
IV/IO procedure
12-Lead ECG
Airway TGs, if indicated

Cardiac/Arrhythmia TG if indicated

History, exam and circumstances often suggest (type of shock)
WAS TRAUMA INVOLVED?

Yes
Consider hypovolemic (bleeding), neurogenic (spinal injury) and obstructive (pneumothorax) shock

No
Consider hypovolemic (dehydration or GI bleed), cardiogenic (STEMI or CHF), distributive (sepsis or anaphylaxis), and obstructive (PE or cardiac tamponade) shock

Normal Saline bolus 500ml IV/IO Repeat to goal SBP > 90
Maximum 1L

Exit to appropriate TG

Notify receiving facility.
Contact Base Hospital for medical direction

Normal Saline
Contact Base Hospital Physician for additional order

Exit to Trauma TG if indicated

Effective Jan. 2019
Pearls

- Hypotension can be defined as a systolic blood pressure of less than 90mmHg. This is not always reliable and should be interpreted in context with the patient’s typical BP, if known. Shock may be present with a seemingly normal blood pressure initially.
- Shock is often present with normal vital signs and may develop insidiously. Tachycardia may be the only manifestation.
- Consider all causes of shock and treat per appropriate Treatment Guideline.
- Hypovolemic shock:
  - Hemorrhage, trauma, GI bleeding, ruptured AAA, or pregnancy-related bleeding
- Cardiogenic shock:
  - Heart failure, MI, cardiomyopathy, myocardial contusion, ruptured ventricle/septum/valve or toxins
- Distributive shock:
  - Sepsis, anaphylactic, neurogenic, or toxins
  - Neurogenic shock generally presents with warm, dry, and pink skin with normal capillary refill time; patient typically alert
- Obstructive shock:
  - Pericardial tamponade, PE, or tension pneumothorax
  - Signs may include hypotension with distended neck veins, tachycardia, unilateral decreased breath sounds or muffled heart tones
History
• Ingestion or suspected ingestion of a potentially toxic substance
• Substance ingested, route, and quantity
• Time of ingestion
• Reason (suicidal, accidental or criminal)
• Available medications in home
• Past medical history and medications

Signs and Symptoms
• Mental status changes
• Hypo or hypertension
• Decreased respiratory rate
• Tachycardia or dysrhythmias
• Seizures
• S.L.U.D.G.E.

Differential
• Tricyclic antidepressants (TCAs)
• Acetaminophen (Tylenol)
• Aspirin
• Depressants
• Stimulants
• Anticholinergics
• Cardiac medications
• Solvents, alcohols or cleaning agents
• Insecticides (organophosphates)

California Poison Control Center
(800) 222-1222

Blood glucose analysis
• Exit to Diabetic/Behavioral TGs as indicated

Adequate respirations (>8) and oxygenation?
• Yes
• No

Altered mental status?
• Yes
• No

Systolic BP < 90
• Yes
• No

Tricyclic Antidepressant OD
• If bradycardic and symptomatic
• Exit to Symptomatic Bradycardia TG as indicated

QRS ≥ 0.12 sec and BP < 90?
• Yes
• No

Organophosphate OD
• Atropine 1-2mg IV/IO
• Repeat every 3-5 minutes until relief of symptoms achieved

Hydrofluoric Acid Exposure
• Calcium Chloride 500mg IV/IO
• (5ml of 10% solution)
• For tetany or cardiac arrest

Calcium Chloride OR
• Consider Fentanyl 50-200mcg IV
• Titrated in 25-50mcg increments to pain relief
• OR
• Fentanyl 100mcg IN/IM if no IV access
• May repeat once in 15 minutes

Sodium Bicarbonate 1mEq/kg IV/IO
• Notify receiving facility.
• Contact Base Hospital for medical direction
• Exit to Airway TG as indicated

Exit to Hypotension/Shock TG as indicated

Notify receiving facility.
• Contact Base Hospital for medical direction

Naloxone 2mg IM/IN
• Naloxone is titrated to effect of adequate ventilation and oxygenation
• NOT ADMINISTERED TO RESTORE CONSCIOUSNESS

Naloxone 2mg IN or Naloxone 1-2mg IV/IM
• Naloxone is titrated to effect of adequate ventilation and oxygenation
• NOT ADMINISTERED TO RESTORE CONSCIOUSNESS

Monitor and reassess

Notify receiving facility.
• Contact Base Hospital for medical direction

Contact Base Hospital Physician for treatment or additional Fentanyl orders

Effective Jan. 2019
**Pearls**

- Overdose or toxic ingestion patients with significant ingestion/exposures should be monitored very closely and aggressively treated as indicated. Do not hesitate to contact the Base Hospital for advice as certain critically ill overdose patients may quickly overwhelm medication supplies. For example, a tricyclic overdose with a wide QRS and altered mental status may need to receive multiple Sodium Bicarbonate boluses until QRS narrowing and clinical improvement; patients with organophosphate toxicity with SLUDGE syndrome may require more Atropine than is usually available on an ambulance.

- Do not rely on patient history of ingestion, especially in suicide attempts. Make sure patient is still not carrying other medications or has any weapons.

- Bring medication bottles, contents, and emesis to the Emergency Department.

- S.L.U.D.G.E.: Salivation, Lacrimation, Urination, Defecation, GI distress, and Emesis

- Tricyclic: 4 major areas of toxicity include decreased mental status, dysrhythmias, seizures, hypotension then coma and death.

- Acetaminophen: Initially normal or with nausea/vomiting. If not detected and treated, causes irreversible liver failure.

- Aspirin: Early sign consist of abdominal pain and vomiting. Tachypnea and altered mental status may occur later. Renal dysfunction, liver failure or cerebral edema among other things can present later.

- Depressants: Decreased heart rate, blood pressure or temperature, decreased respirations, and non-specific pupils.

- Stimulants: Increased heart rate, blood pressure or temperature, dilated pupils, and seizures.

- Anticholinergics: Increased heart rate or temperature, dilated pupils, and mental status changes.

- Cardiac medications: Dysrhythmias and mental status changes.

- Solvents: Nausea, vomiting, coughing, and mental status changes.

- Insecticides: Increased or decreased heart rate, increased secretions, nausea, vomiting, diarrhea, and pinpoint pupils. Consider restraints if necessary for patient’s or personnel’s protection per Restraint Procedure.

- Consider contacting the California Poison Control Center for Guidance.
**History**
- Age
- Location and duration
- Severity (0 – 10 scale)
- Past medical history
- Pregnancy status
- Drug allergies and medications

**Signs and Symptoms**
- Severity (pain scale)
- Quality (e.g. sharp, dull, or stabbing)
- Radiation
- Relation to movement or respiration
- Increased with palpation of area

**Differential**
- Per the specific TG
- Musculoskeletal
- Visceral (abdominal)
- Cardiac
- Pleural/respiratory
- Neurogenic
- Renal (colic)

---

**Assess pain severity**
Use combination of pain scale, circumstances, MOI, injury, or illness severity

**Moderate to severe pain**

**Consider IV/IO procedure**

- Assess and monitor respiratory status
- Monitor continuous EtCO2
- Apply and monitor cardiac rhythm
- **Fentanyl 25 – 50mcg IV/IO**
  - Titrated in 25 – 50mcg increments to pain relief. Consider 25mcg increments in elderly patients
- **Fentanyl 100mcg IN**
  - If no IV access. May repeat once after 15 minutes
- **Fentanyl 50 – 100mcg IM**
  - If no IV access and IN route not advisable. May repeat once after 15 minutes
- **Maximum of 200mcg total**
  - Monitor and reassess every 5 minutes following administration

**Mild pain**

**Position of comfort**

- **Apply cold pack if applicable**
- Monitor and reassess

**Refer to contraindications and cautions**

---

**Notify receiving facility. Contact Base Hospital for medical direction**

**Fentanyl**
- Contact Base Hospital for additional order
Pears

- Pain severity (0 – 10 scale) is a vital sign to be recorded before and after all BLS pain control measures and ALS pain medication delivery. Monitor blood pressure and respirations closely as pain control medications may cause hypotension or respiratory distress.
- Patients may display a wide variation of response to opioid pain medication (Fentanyl). Consider the patient’s age, weight, clinical condition, other recent drugs, or alcohol and prior exposure to opiates when determining initial dosing. Minimal doses of opioids may cause respiratory depression in the elderly or those patients who weigh less.
- USE EXTREME CAUTION when administering opioids together with benzodiazepines; this combination results in a deeper level of anesthesia with a significant risk for airway and respiratory compromise.
- For chronic pain and chronic abdominal pain, use judgment before administering Fentanyl; best to allow a physician to assess the patient and determine the source of pain before opioid administration.
- Contraindications of Fentanyl include:
  - Closed head injury
  - Headache
  - Childbirth or suspected active labor
  - Altered level of consciousness
  - Respiratory failure or worsening status
  - Hypotension
  - Adults BP < 90
- At a minimum, vital signs should be obtained before medication administration, 10 minutes after administration, and before patient turnover.
- Patients who are in labor should NOT receive pain medication.
- It is strongly recommended that vascular access be established for patients who receive IM or IN medication.
- Have Naloxone available to reverse respiratory depression should it occur.
- Burn patients may require higher than usual opioid doses to achieve adequate pain control. IF A PATIENT HAS SUFFERED BURNS THAT REQUIRE TRANSPORT TO A BURN CENTER, THE PATIENT MAY REQUIRE MORE THAN THE MAXIMUM TOTAL DOSE OF FENTANYL TO ACHIEVE PAIN CONTROL. CONTACT THE BASE HOSPITAL FOR ADDITIONAL ORDERS OF FENTANYL.
History
- Birth defect
- Surgical complications
- Trauma
- Medical condition involving the airway or phrenic nerve

Signs and Symptoms
- Nasal flaring
- Chest wall retractions (with or without abnormal breath sounds)
- Attempts to cough
- Copious secretions notes coming from the tube
- Faint breath sounds on both sides of the chest despite significant respiratory effort
- AMS
- Cyanosis

Differential
- Allergic reaction
- Asthma
- Aspiration
- Septicemia
- Foreign body
- Infection
- Congenital heart disease
- Medication or toxin
- Trauma

Tracheostomy tube in place?
- Yes
  - Tracheostomy tube available?
    - Yes
      - Allow caregiver to insert tracheostomy tube
    - No
      - No
- No
  - Obturator removed?
    - No
      - Tracheostomy tube available?
        - Yes
          - Place appropriately sized ETT into stoma
        - No
          - No
    - Yes
      - Remove obturator

Speaking valve or decannulation plug removed?
- Yes
  - Inner cannula (double lumen) removed?
    - Yes
      - Suction tracheostomy tube
    - No
      - No
- No
  - Remove speaking valve and decannulation plug
  - Suction tracheostomy tube

Inner cannula (double lumen) removed?
- Yes
  - Suction tracheostomy tube
- No
  - No
  - No
  - No
  - No
  - No
  - No
  - No
  - Yes
  - Assist ventilations via tracheostomy tube/ETT

Notify receiving facility, Contact Base Hospital for medical direction

Monitor and reassess

P: Pearl
- Always talk to family/caregivers as they have specific knowledge and skills of device(s).
- Use extreme caution when placing an ETT into a stoma. Placing the ETT too deep will result in right main stem positioning.
- Use patient’s equipment if available and functioning properly.
- Estimate suction catheter size by doubling the inner tracheostomy tube diameter and rounding down.
- Suction depth: Ask family or caregiver. Suction no more than 3-6cm. Introduce 2-3ml NS before suctioning.
- Do not suction for more than 10 seconds each attempt and pre-oxygenate before and between attempts.
- DO NOT force the suction catheter. If unable to pass, the tracheostomy tube should be changed.
- Always deflate tracheal tube cuff before removal. Use continuous pulse oximetry and EtCO₂ monitoring.
### Seizure

#### History
- Reported or witnessed seizure
- Previous seizure history
- Medical alert tag
- Seizure medications
- History of trauma
- History of diabetes
- History of pregnancy
- Time of seizure onset
- Document number of seizures
- Alcohol use, abuse, or abrupt cessation
- Fever

#### Signs and Symptoms
- Altered mental status
- Sleepiness
- Incontinence
- Observed seizure activity
- Evidence of trauma
- Unconscious
- Incontinence

#### Differential
- Head trauma
- Metabolic, hepatic or renal failure
- Tumor
- Hypoxia
- Electrolyte abnormality
- Drugs or medication non-compliance
- Infection or sepsis
- Alcohol withdrawal
- Eclampsia
- Stroke
- Hyperthermia
- Hypoglycemia

---

**Actively seizing?**

- Loosen any constrictive clothing and protect airway
- Blood glucose analysis
- Spinal immobilization procedure 
  *if indicated*
  
  **Consider, IV/O**

- Cardiac monitor
  
  If patient begins seizing in the presence of EMS and treatment is 
  indicated, give Midazolam 5mg IV/IM/IO/IN

  May repeat every 3 to 5 minutes for continued seizure activity 
  **Maximum 10mg**

**Diabetic TG**

*if indicated*

**Status Epilepticus?**

- Consider Altered Mental Status TG 
  *if indicated*

  OR if postictal state monitor and reassess

- No

- Yes

**Notify receiving facility.**

**Contact Base Hospital for medical direction**

**MD**

Midazolam

Contact Base Hospital Physician for additional order
Pearls

- Midazolam 5-10mg IM is effective in the termination of seizures. Do not delay IM administration to obtain IV or IO access in an actively seizing patient.
- For a seizure that begins in the presence of EMS, if the patient was previously conscious, alert and oriented, take the time to assess and protect the patient and providers and CONSIDER THE CAUSE. The seizure may stop, especially in patients who have prior history of self-limiting seizures. However, do not hesitate to treat recurrent or prolonged (> 1 minute) seizure activity.
- Limit IN administrations to ½ dose in each nare.
- Status Epilepticus is defined as two or more successive seizures without a period of consciousness or recovery, or one prolonged seizure lasting longer than 5 minutes. This is a true emergency requiring rapid airway control, treatment, and transport.
- Grand Mal seizures (generalized) are associated with a loss of consciousness, incontinence, and oral trauma.
- Focal seizures (Petit Mal) affect only a part of the body and are not associated with a loss of consciousness.
- Be prepared for airway problems and continued seizures.
- Assess the possibility of occult trauma and substance abuse.
- Be prepared to assist ventilations or manage the airway, especially if Midazolam is used.
Suspected Sepsis

History
- Age (common in elderly and very young)
- Presence and duration of fever
- Previously documented infection or illness (UTI, pneumonia, meningitis, encephalitis, cellulitis, or abscess)
- Recent surgery or invasive procedure
- Immunocompromised
- Bedridden or immobile patients
- Prosthetic or indwelling devices
- Immunization status

Signs and Symptoms
- Hyper or hypothermia
- Rash or excessive bruising
- Chills
- Myalgia
- Markedly decreased urine output
- AMS
- Delayed capillary refill
- Elevated blood glucose (unless diabetic)

Differential
- Shock (hypovolemic or cardiogenic)
- Dehydration
- Hyperthyroidism
- Medication or drug interaction
- Non-septic infection
- Allergic reaction or anaphylaxis
- Toxicological emergency

**Effective Jan. 2016**

**Effective Jan. 2019**
Pearls

- Early recognition of sepsis allows for attentive care and early administration of antibiotics.
- Aggressive IV fluid therapy is the most important prehospital treatment for sepsis. Suspected sepsis patients should receive repeated fluid boluses (to a Maximum of 2L) while being checked frequently for signs of pulmonary edema, especially in patients with a known history of CHF or ESRD on dialysis. STOP fluid administration in the setting of pulmonary edema.
- Septic patients are especially susceptible to traumatic lung injury and ARDS. If artificial ventilation is necessary, avoid ventilating with excessive tidal volumes. Use only enough tidal volume to see the chest rise. If CPAP is utilized, airway pressure should be limited to 7.5cm H₂O if using a rate adjustable device.
- Attempt to identify source of infection (e.g. skin, respiratory, etc.) and relay previous treatments and related history to receiving ED physician.
- Disseminated Intravascular Coagulation (DIC) is an ominous, late stage manifestation of sepsis characterized by frank, extensive bruising, bleeding from multiple sites, and finally tissue death.
Suspected Stroke

History
- Previous stroke or TIA
- Previous cardiac or vascular surgery
- Associated diseases (diabetes, hypertension, CAD)
- Atrial fibrillation
- Medications (blood thinners)
- History of trauma

Signs and Symptoms
- Altered mental status
- Weakness or paralysis
- Blindness or other sensory loss
- Aphasia or dysarthria
- Syncope
- Vertigo or dizziness
- Vomiting
- Headache
- Seizure
- Respiratory pattern change
- Hypertension/hypotension

Differential
- See Altered Mental Status
- TIA
- Seizure
- Todd’s paralysis
- Hypoglycemia
- Stroke
  - Thrombotic or embolic (~85%)
  - Hemorrhagic (~15%)
- Tumor
- Trauma
- Dialysis or renal failure

---

**Approved Stroke Receiving Centers**
- John Muir – Concord
- John Muir – Walnut Creek
- Kaiser – Antioch
- Kaiser – Richmond
- Kaiser – Walnut Creek
- San Ramon Regional
- Eden – Castro Valley
- Kaiser – Oakland
- Kaiser – Vallejo
- Marin General
- Summit – Oakland
- Sutter – Solano
A Stroke Alert is indicated when the Cincinnati Stroke Screen findings are abnormal and onset (time last seen normal) is less than 4 hours from time of patient contact. Report time last seen normal (clock time), the medical record number or name and birthdate, results of the Cincinnati Stroke Screen and the LAMS score, physical exam, and ETA using an approved report format.

If a family member or guardian is available, assure their availability by either transporting them in the ambulance or obtain their name and phone number to allow the receiving physician to contact them. Encourage a family member to be available to speak with hospital staff.

- If any portion of the Cincinnati Stroke Screen is abnormal and it is a new finding, the stroke screen is positive and may indicate an acute stroke.
- Pre-arrival information is necessary for the receiving hospital to make rapid treatment and potential transfer decisions.
- Because the patient may need to receive thrombolytic therapy, avoid multiple IV attempts.
- Avoid distal placement of IVs, if possible, as this is a preferred access site by Interventionalists.
- When turning over patient care to hospital staff, make sure to include common anticoagulants taken by the patient. Known use of these medications may affect the course of hospital treatment:
  - Warfarin (Coumadin)
  - Enoxaparin (Lovenox)
  - Apixaban (Eliquis)
  - Heparin
  - Dabigatran (Pradaxa)
  - Fondaparinux (Arixtra)
  - Rivaroxaban (Xarelto)

### Cincinnati Stroke Screen

<table>
<thead>
<tr>
<th>Finding</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Facial Droop</td>
<td>Normal: Symmetrical smile or face</td>
</tr>
<tr>
<td></td>
<td>Abnormal: Asymmetry</td>
</tr>
<tr>
<td>Arm Weakness</td>
<td>Normal: Both arms move symmetrically</td>
</tr>
<tr>
<td></td>
<td>Abnormal: Asymmetrical arm movement</td>
</tr>
<tr>
<td>Speech Abnormality</td>
<td>Normal: Correct words; no slurring</td>
</tr>
<tr>
<td></td>
<td>Abnormal: Slurred or incorrect words</td>
</tr>
</tbody>
</table>

### LAMS Assessment

<table>
<thead>
<tr>
<th>Finding</th>
<th>Scoring</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Facial Droop</td>
<td>Absent</td>
<td>Normal: Equal grip in both hands</td>
</tr>
<tr>
<td></td>
<td>Present</td>
<td>Abnormal: Unequal grip in one hand</td>
</tr>
<tr>
<td>Arm Weakness</td>
<td>Absent</td>
<td>Normal: Both arms move symmetrically</td>
</tr>
<tr>
<td></td>
<td>Drifts</td>
<td>Abnormal: Asymmetrical arm movement</td>
</tr>
<tr>
<td></td>
<td>Falls rapidly</td>
<td>Falls rapidly: some or no effort</td>
</tr>
<tr>
<td>Grip</td>
<td>Normal</td>
<td>Normal: Equal grip in both hands</td>
</tr>
<tr>
<td></td>
<td>Weak</td>
<td>Weak: Unequal grip in one hand</td>
</tr>
<tr>
<td></td>
<td>No grip</td>
<td>No grip: no muscle strength or contraction</td>
</tr>
</tbody>
</table>

A LAMS score of ≥ 4 indicates a high likelihood of a LVO stroke

### Pearls

- **Acute stroke care is evolving rapidly.**
- **Time last seen normal:** One of the most important items that prehospital providers can obtain, on which all treatment decisions are based. Be very precise in gathering data to establish the time of onset and report as an actual time (i.e. 13:45 NOT “about 45 minutes ago”). Without this information, patients may not be able to receive thrombolytics at the hospital. For patients with “woke up and noticed stroke symptoms,” time starts when the patient was last awake.
  - The differential listed on the Altered Mental Status TG should also be considered.
  - Be alert for airway problems (difficulty swallowing, vomiting and aspiration).
  - Hypoglycemia can present as a LOCALIZED neurologic deficit, especially in the elderly.
  - Document the Cincinnati Stroke Screen and LAMS in the EHR.
**Syncope**

**History**
- History of cardiac, stroke or seizures
- Occult blood loss (GI or ectopic)
- Females: LMP or vaginal bleeding
- Fluid loss: nausea, vomiting or diarrhea
- Past medical history
- Medications

**Signs and Symptoms**
- Loss of consciousness with recovery
- Lightheadedness or dizziness
- Palpitations, slow or rapid
- Pulse irregularity
- Hypotension

**Differential**
- Vasovagal
- Orthostatic hypotension
- Cardiac syncope
- Micturition or defecation syncope
- Psychiatric
- Seizure
- Shock
- Toxicological (alcohol)
- Medication effect (hypertension
- Pulmonary embolism
- AAA

**Flowchart**

1. **Diabetic TG if indicated**
2. **Consider orthostatic vital signs**
3. **Blood glucose analysis**
4. **Cardiac monitor**
5. **12-Lead ECG**
6. **Consider IV/IO**
7. **Suspected or evident trauma**
   - **Yes**
   - **Spinal Immobilization TG if indicated**
   - **Multiple Trauma TG if indicated**
8. **No**
9. **Altered mental status**
   - **Yes**
   - **Altered Mental Status TG if indicated**
   - **No**
10. **Hypotension or poor perfusion**
    - **Yes**
    - **Hypotension / Shock TG if indicated**
    - **No**
11. **Contact the Base Hospital for all AMA requests**
12. **Notify receiving facility. Contact Base Hospital for medical direction**

**Effective Jan. 2019**
Pearls

- Utilize the Base Hospital for syncopal patients who do not want transport to a hospital.
- Assess for signs and symptoms of trauma or head injury if associated with a fall or if it is questionable whether the patient fell due to syncope.
- Consider dysrhythmias, GI bleed, ectopic pregnancy, and seizure as possible cause of syncope.
- Syncope patients should be transported to a hospital for physician evaluation.
- More than 25% of geriatric syncope is cardiac dysrhythmia based.
Contra Costa County Emergency Medical Services

Vomiting and Diarrhea

**History**
- Age
- Time of last meal
- Last emesis/bowel movement
- Improvement or worsening with food or activity
- Duration of problem
- Other sick contacts
- Past medical history
- Past surgical history
- Medications
- Menstrual history (Pregnancy)
- Travel history
- Bloody emesis/diarrhea

**Signs and Symptoms**
- Abdominal pain
- Character of pain (constant, intermittent, dull, sharp, etc.)
- Distension
- Constipation
- Diarrhea
- Anorexia
- Radiation

**Associated symptoms (helpful to localize source):**
- Fever, headache, blurred vision, weakness, malaise, myalgia, cough, dysuria, mental status changes, and rash

**Differential**
- CNS (increased pressure, headache, stroke, CNS lesions, trauma or hemorrhage, vestibular)
- MI
- Drugs (NSAIDs, antibiotics, narcotics, chemotherapy)
- GI or renal disorders
- Diabetic ketoacidosis
- Gynecologic disease (ovarian cyst, PID)
- Infections (pneumonia, influenza)
- Electrolyte abnormalities
- Food or toxin induced
- Medication or substance abuse
- Pregnancy
- Psychological

**Pearls**
- Ondansetron is not indicated or useful for motion sickness.
- Document the mental status and vital signs prior to administration of anti-emetics.

---

**Treatment Guideline A20**

**Page 1 of 1**

**Effective Jan. 2016**
Contra Costa County Emergency Medical Services

Pediatric Cardiac Arrest

History
- Code status (DNR or POLST)
- Events leading to arrest
- Estimated downtime
- Prior resuscitation attempts
- Past medical history
- Medications
- Existence of terminal illness
- Suspected physical abuse

Signs and Symptoms
- Unresponsive
- Apneic
- Pulseless

Differential
- Respiratory failure (foreign body, secretions, infection)
- Hypovolemia (dehydration)
- Congenital heart disease
- Trauma
- Hypothermia
- Tension pneumothorax, cardiac tamponade, or PE
- Toxin or medication
- Electrolyte abnormalities (glucose, potassium)
- Acidosis

AT ANY TIME
- Return of spontaneous circulation
  - Go to Post Resuscitation TG
  - Exit to Newly Born TG

Criteria for death/no resuscitation
- Review DNR/POLST form

Decomposition
- Rigor mortis
- Dependent lividity
- Injury incompatible with life or traumatic arrest with asystole
- Do not begin resuscitation
- Follow Policy 1004 – Determination of Death

Newly born <31 days old
Begin chest compressions
Use 3:1

Begin chest compressions
- Children 1 month to 8 years, use 15:2
- Children over 8 years, use 30:2
- Push hard (1.5 inches Infant / 2 inches Children) and fast (100-120/min)
- Use metronome to ensure proper rate
- Change compressors every 2 minutes
  (Limit changes/pulse checks to < 5 seconds)

ALS available?

Yes

Apply AED if available

No

Shockable rhythm?

Apply AED if available

No

Continue CPR
5 cycles over 2 minutes
Repeat and assess

Yes

Automated defibrillation
Continue CPR
5 cycles over 2 minutes
Repeat and assess

No

Basic airway procedure

Notify receiving facility.
Contact Base Hospital for medical direction

Yes

Cardiac monitor

EtCO2 monitoring

Shockable rhythm?

No

Follow Pediatric Asystole/PEA and Airway TGs as indicated

Yes

Follow Pediatric VF/VT
Pediatric Tachycardia and Airway TGs as indicated

Effective Jan. 2019

Newly born <31 days old
Begin chest compressions
Use 3:1

Begin chest compressions
- Children 1 month to 8 years, use 15:2
- Children over 8 years, use 30:2
- Push hard (1.5 inches Infant / 2 inches Children) and fast (100-120/min)
- Use metronome to ensure proper rate
- Change compressors every 2 minutes
  (Limit changes/pulse checks to < 5 seconds)

ALS available?

Yes

Apply AED if available

No

Shockable rhythm?

Apply AED if available

No

Continue CPR
5 cycles over 2 minutes
Repeat and assess

Yes

Automated defibrillation
Continue CPR
5 cycles over 2 minutes
Repeat and assess

No

Basic airway procedure

Notify receiving facility.
Contact Base Hospital for medical direction

Yes

Cardiac monitor

EtCO2 monitoring

Shockable rhythm?

No

Follow Pediatric Asystole/PEA and Airway TGs as indicated

Yes

Follow Pediatric VF/VT
Pediatric Tachycardia and Airway TGs as indicated

Effective Jan. 2019
Pearls

- Efforts should be directed at high quality chest compressions with limited interruptions and early defibrillation when indicated. Compress 1.5 inches in infants and 2 inches in children. Consider early IO placement if available or direct IV access if anticipated.
- DO NOT HYPERVENTILATE.
- Do not delay chest compressions while applying any device or intervention.
- In cases of clear-cut traumatic arrest, epinephrine is not indicated in PEA or asystole. Epinephrine will not correct arrest caused by a tension pneumothorax, cardiac tamponade, or hemorrhagic shock. If there is any doubt as to the cause of arrest, treat as a non-traumatic arrest.
- Use a metronome during chest compression to ensure proper rate.
- Airway is a more important intervention in pediatric arrests. This should be accomplished quickly with a BVM and appropriately sized mask. Patient survival is often dependent on proper ventilation and oxygenation.
- Resuscitation is based on proper planning and organized execution. Procedures require space and patient access. Make room to work. Utilize team focused approach assigning responders to predetermined tasks.
- Prevent hypothermia by moving to a warm environment and avoid unnecessary exposure.
**Pediatric Asystole / PEA**

**History**
- Events leading to arrest
- Estimated downtime
- Past medical history
- Medications
- Existence of terminal illness
- Airway obstruction
- Hypothermia
- Suspected abuse (shaken baby syndrome, pattern of injuries)
- SIDS

**Signs and Symptoms**
- Apneic
- Pulseless

**Differential**
- Respiratory failure
- Foreign body
- Hypothermia
- Hypoxia
- Neonatal abstinence
- Congenital heart disease
- Trauma
- Hypovolemia
- Tension pneumothorax
- Toxin or medication
- Acidosis
- Hyperkalemia
- Hypoglycemia

**Pearls**
- Patients with a rapid pulseless rate are most likely hypovolemic. Fluid will likely reverse this condition.
- In order to be successful in pediatric arrests, a cause must be identified and corrected.
- Respiratory arrest is a common case of cardiac arrest. Unlike adults, early airway intervention is critical.
- In most cases, pediatric airways can be maintained with basic interventions.
Pediatric V-Fib/Pulseless V-Tach

**History**
- Events leading to arrest
- Estimated downtime
- Past medical history
- Medications
- Existence of terminal illness
- Airway obstruction
- Hypothermia

**Signs and Symptoms**
- Apneic
- Pulseless

**Differential**
- Respiratory failure/airway obstruction
- Hyper/hypokalemia
- Hypovolemia
- Hypothermia
- Hypoglycemia
- Acidosis
- Tension pneumothorax
- Tamponade
- Toxin or medication
- Thrombosis: Coronary or Pulmonary Embolism
- Congenital heart disease

**AT ANY TIME**
Return of spontaneous circulation

**Establish IO/IV**
P

**Defibrillation**
Use Pediatape and refer to dosing guide

**Resume chest compressions**
Change compressors every 2 minutes
(Limit changes/pulses checks < 5 seconds)

**Epinephrine (1:10,000) IO/IV**
Repeat every 3 to 5 minutes
Use Pediatape and refer to dosing guide

**Defibrillation**
Use Pediatape and refer to dosing guide

**Resume chest compressions**
Change compressors every 2 minutes
(Limit changes/pulses checks < 5 seconds)

If V-Fib/ Pulseless V-Tach is refractory after 3 shocks
Continue aggressive CPR and give medications during compressions

**Amiodarone IO/IV**
Use Pediatape and refer to dosing guide
*Maximum 300mg*

**Exit to Post Resuscitation TG**

**Return of spontaneous circulation?**
Notify receiving facility.
Contact Base Hospital for medical direction

**Effective Jan. 2019**

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Pediatric Treatment Guidelines

Pediatric Cardiac Arrest TG
Pearls
• Efforts should be directed at high quality chest compressions with limited interruptions and early defibrillation when indicated. Compress 1.5 inches in infants and 2 inches in children. Consider early IO placement if available or direct IV access if anticipated.
• DO NOT HYPERVENTILATE.
• Use a metronome during chest compression to ensure proper rate.
• Airway is a more important intervention in pediatric arrests. This should be accomplished quickly with a BVM. Patient survival is often dependent on proper ventilation and oxygenation with airway intervention.
• In order to be successful in pediatric arrests, a cause must be identified and corrected.
• Respiratory arrest is a common cause of cardiac arrest. Unlike adults, early ventilation intervention is critical.
• In most cases, pediatric airways can be managed by basic intervention with a BVM.
• Reassess and document ETT placement (patients above 40kg) and EtCO₂ frequently, after every move, and at transfer of care.
• Do not stop chest compressions to check for placement of ETT or to give medications.
Contra Costa County Emergency Medical Services

Post Resuscitation (ROSC)

History
- Respiratory arrest
- Cardiac arrest

Signs and Symptoms
- Return of spontaneous circulation

Differential
- Continue to address specific differentials associated with the original dysrhythmia

Pearls
- Hyperventilation is a significant cause of hypotension/recurrence of cardiac arrest in the post resuscitation phase and must be avoided at all costs.
**Pediatric Bradycardia**

**History**
- Past medical history
- Foreign body exposure
- Respiratory distress or arrest
- Apnea
- Possible toxic or poison exposure
- Congenital disease
- Medication (maternal or infant)

**Signs and Symptoms**
- Decreased heart rate
- Delayed capillary refill or cyanosis
- Mottled, cool skin
- Hypotension or arrest
- Altered mental status
- Syncope

**Differential**
- Respiratory failure
- Foreign body
- Secretions
- Infection (e.g. croup, epiglottitis)
- Hypovolemia
- Congenital heart disease
- Trauma
- Tension Pneumothorax
- Hypothermia
- Toxin or medication
- Hypoglycemia
- Acidosis

**Peals**
- The majority of pediatric bradycardia is due to airway problems.
- Hypoglycemia, severe dehydration and narcotic effects may produce bradycardia.
- Most maternal medications pass through breast milk to the infant.
Pediatric Tachycardia

History
- Past medical history
- Medications or toxic ingestion (e.g., Aminophylline, Adderall, diet pills, thyroid supplements, decongestants and Digoxin)
- Drugs (e.g., nicotine and illegal drugs)
- Congenital heart disease
- Respiratory distress
- Syncope / near syncope

Signs and Symptoms
- Heart rate: Child > 180
  Infant > 220
- Pale or cyanosis
- Diaphoresis
- Tachypnea
- Vomiting
- Hypotension
- Altered mental status
- Pulmonary congestion
- Syncope

Differential
- Heart disease (congenital)
- Hypo / Hyperthermia
- Hypovolemia or anemia
- Electrolyte imbalance
- Anxiety / Pain / Emotional stress
- Fever / Infection / Sepsis
- Hypoxia
- Hypoglycemia
- Medication / Toxin / Drugs
- Pulmonary embolus
- Trauma
- Tension Pneumothorax

Assess symptom severity

Unstable
- Cardiac monitor
- Establish IV/IO
- 12-Lead ECG
- EtCO₂ monitoring
- Attempt Valsalva maneuver

Base Hospital orders are required for all of the following treatments

Probable SVT
(QRS ≤ 0.09 sec)

Adenosine IV/IO Rapid push
Use Pediatape and refer to dosing guide

Rhythm change?

No

Probable V-Tach
(QRS ≥ 0.09 sec)

Cardioversion Procedure

Consider sedation pre-cardioversion
Midazolam IV/IO
Use Pediatape and refer to dosing guide
Max 5mg

Synchronized cardioversion
Use Pediatape and refer to dosing guide
May repeat if necessary – refer to dosing guide for repeat energy doses

Notify receiving facility.
Contact Base Hospital for medical direction

Stable
- Cardiac monitor
- 12-Lead ECG
- EtCO₂ monitoring
- Consider, IV/IO

Monitor and reassess

Cardiac monitor

EtCO₂ monitoring
Pearls

- Most important goal is to differentiate the type of tachycardia and if STABLE or UNSTABLE.
- Unstable is defined by poor perfusion with AMS, abnormal pulses, delayed capillary refill, or difficult or unable to palpate a blood pressure.
- If at any point the patient becomes unstable, move to the unstable arm of the algorithm.
- Early transport is always appropriate in unstable patients.
- For ASYMPTOMATIC patients (or those with only minimal symptoms, such as palpitations) and any tachycardia with a rate of < 150 with a normal blood pressure, consider CLOSE OBSERVATION or fluid bolus rather than immediate treatment with an anti-arrhythmic medication.
- Use Pediatape for pediatric weight measurement. ALWAYS use the weight-based dosing guide.
- Separating the child from the caregiver may worsen the child’s clinical condition.
- Pediatric pads should be used in children < 10kg or Pediatape measurement of Purple.
- Monitor for respiratory depression and associated hypotension associated if Midazolam is used.
Basic maneuvers first
- Open airway chin lift/jaw thrust
- Nasal or oral airway
- Bag-valve mask (BVM)

Spinal motion restriction
*if indicated*

Airway foreign body obstruction procedure

Complete obstruction?

- Yes
  - Abdominal thrusts (conscious)
  - Chest compression (unconscious)

- No
  - No
  - Yes

Transport to closest receiving facility

Assess respiratory rate, effort, oxygenation
Is airway/breathing adequate?

No

Yes

Goal oxygen saturation ≥ 94%

Exit to appropriate TG

Monitor/reassess supplemental oxygen
*if indicated*

Exit to appropriate TG

Supplement oxygen via BVM

Monitor continuous EtCO₂

Reassess airway procedure and adjust if necessary

For patients > 4ft and > 40kg in cardiac arrest
Place King Airway as appropriate

For patients > 40kg
Intubate with ETT as appropriate

For patients > 4ft and > 40kg
Place King Airway as appropriate

Consider, sedation
*if King Airway or ETT in place*

Midazolam IV/IM/IO
Use Pediatape and refer to dosing guide

Notify receiving facility.
Contact Base Hospital for medical direction

Notify receiving facility.
Contact Base Hospital for medical direction

BVM effective?

Yes

No

The maximum allowed attempts for an advanced airway placement is two (2).

If an attempt fails, reassess and approach with a different technique.
Pears

• Placement of an advanced airway is not a priority during the first five minutes of resuscitation unless ventilation is unable to be maintained with basic maneuvers.
• Advanced airways are only approved for patients over 40kg. A height of > 4ft is also required for the King Airway.
• Capnometry is mandatory with all methods of airway management. Document results.
• Continuous capnometry (EtCO₂) is mandatory for the monitoring of all respiratory patients.
• If an effective airway is being maintained with a BVM and a basic airway adjunct with continuous pulse oximetry values of ≥ 90% or values expected based on pathophysiologic condition with otherwise reassuring vital sign (e.g. pulse oximetry of 85% with otherwise normal vital signs in a post-drowning patient), it is expected to continue with basic airway measures.
• For the purposes of this TG, a secure airway is achieved when the patient is receiving appropriate oxygenation and ventilation.
• An intubation attempt is defined as passing the laryngoscope blade or advanced airway past the teeth with the intent to intubate.
• An appropriate ventilatory rate is one that maintains an EtCO₂ of 35 or greater. Avoid hyperventilation.
• Patients with perfusing pulses should be managed with a BLS airway unless unable to successfully ventilate.
• Contraindications for King Airway:
  • Presence of gag reflex
  • Caustic ingestion
  • Known esophageal disease
  • Laryngectomy with stoma (alternatively place ET in stoma)
  • Height < 4ft
• Effective use of a BVM requires two (2) people.
• Airway is a more important intervention in pediatric arrests. This should be accomplished quickly with a BVM and appropriately sized mask. Patient survival is often dependent on proper ventilation and oxygenation.
• Maintain spinal immobilization for patients with suspected spinal injury.
• Hyperventilation in deteriorating head trauma should only be done to maintain an EtCO₂ of 30-35.
• It is important to secure the advanced airway well and consider c-collar (in the absence of trauma) to better maintain advanced airway placement. Manual stabilization of advanced airway should be used during all patient moves/transfers.
**History**
- Onset and location
- Insect sting or bite
- Food allergy / exposure
- Medication allergy / exposure
- New clothing, soap or detergent
- Past history of reactions
- Past medical history
- Medication history

**Signs and Symptoms**
- Itching or hives
- Coughing, wheezing or respiratory distress
- Chest or throat restriction
- Difficulty swallowing
- Hypotension or shock
- Edema
- Nausea or vomiting
- Feeling of impending doom

**Differential**
- Urticaria (rash only)
- Anaphylaxis (systemic effect)
- Shock (vascular effect)
- Angioedema (drug induced)
- Aspiration or airway obstruction
- Vasovagal event
- Asthma or COPD
- CHF

---

**Assess symptom severity**

**Systemic**

E: Assist patient with self-prescribed Epinephrine Auto-Injector
   **if available**

O: Administer Epinephrine Auto-Injector

Epinephrine 1:1,000 IM
   Use Pediatape and refer to dosing guide

Establish IV/IO
Cardiac monitor
EtCO2 monitoring

P: Albuterol nebulizer 5mg
   Repeat as needed to Max of 3 doses
   **if indicated**

Normal Saline bolus
   Use Pediatape and refer to dosing guide

If hypotensive or no improvement,
Epinephrine 1:10,000 slow IV/IO
   Use Pediatape and refer to dosing guide

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Airway Procedure **if indicated**

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**Localized**

Consider IV/IO
Cardiac monitor

P: Diphenhydramine IM/IV/IO
   Refer to weight-based dosing guide

Monitor and reassess
Monitor for worsening signs and symptoms

---

Notify receiving facility.
Contact Base Hospital for medical direction
Pearls

- Anaphylaxis is an acute and potentially lethal multisystem allergic reaction.
- Epinephrine is the drug of choice and the first drug that should be administered in acute anaphylaxis reactions with moderate or severe symptoms. IM Epinephrine should be administered as priority before or during attempts at IV or IO access.
- Anaphylaxis unresponsive to repeat doses of IM Epinephrine may require IV Epinephrine administration. Contact the Base Hospital for refractory anaphylaxis.
- Allergic reactions may occur with only respiratory and gastrointestinal symptoms and have no rash or skin involvement.
- All patients with respiratory symptoms must have continuous pulse oximetry and EtCO₂ measurement.
- The shorter the onset of symptoms from contact with an allergen, generally the more severe the reaction.
**Pediatric Altered Mental Status**

**History**
- Past medical history
- Medications
- Recent illness
- Irritability
- Lethargy
- Changes in feeding/sleeping
- Diabetes
- Potential ingestion
- Trauma

**Signs and Symptoms**
- Decrease/change in mentation
- Decrease/increase in blood sugar
- Cool, diaphoretic skin
- Warm, dry skin; fruity breath; Kussmaul respirations; signs of dehydration

**Differential**
- Hypoxia
- CNS (stroke, tumor, seizure, infection)
- Thyroid
- Shock
- Diabetes
- Toxicological
- Acidosis or alkalosis
- Diabetes
- Environmental exposure
- Psychiatric disorder
- Sepsis

---

**Decision Tree**

1. **History**
   - Past medical history
   - Medications
   - Recent illness
   - Irritability
   - Lethargy
   - Changes in feeding/sleeping
   - Diabetes
   - Potential ingestion
   - Trauma

2. **Signs and Symptoms**
   - Decrease/change in mentation
   - Decrease/increase in blood sugar
   - Cool, diaphoretic skin
   - Warm, dry skin; fruity breath; Kussmaul respirations; signs of dehydration

3. **Differential**
   - Hypoxia
   - CNS (stroke, tumor, seizure, infection)
   - Thyroid
   - Shock
   - Diabetes
   - Toxicological
   - Acidosis or alkalosis
   - Diabetes
   - Environmental exposure
   - Psychiatric disorder
   - Sepsis

---

**Treatment Guidelines**

- **Airway TG, if indicated**
  - Blood glucose analysis
  - Cardiac monitor
  - 12-Lead ECG, if indicated
  - Establish IV/IO

  **Decision Flow**
  - **Blood glucose ≤ 60 or ≥ 350**
    - **Yes**
      - Exit to Diabetic TG
    - **No**
  - **Signs of shock/poor perfusion**
    - **Yes**
      - Exit to Hypotension/Shock TG
    - **No**
  - **Signs of OD/toxic exposure**
    - **Yes**
      - Exit to Overdose/Toxic Exposure TG
    - **No**
  - **Signs of stroke or seizure**
    - **Yes**
      - Exit to Seizure TG as indicated
    - **No**
  - **Signs of hypo/hyperthermia**
    - **Yes**
      - Exit to Hypo/Hyperthermia TG as indicated
    - **No**
  - **Arrhythmia/STEMI**
    - **Yes**
      - Exit to Appropriate Cardiac TG as indicated
    - **No**

**Notify receiving facility. Contact Base Hospital for medical direction**

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**Effective Jan. 2016**

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**Effective Jan. 2019**

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**Contra Costa County Emergency Medical Services**

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**Pediatric Treatment Guidelines**
**History**
- Situational crisis
- Psychiatric illness/medications
- Injury to self or threats to others
- Medical alert tag
- Substance abuse/overdose
- Diabetes

**Signs and Symptoms**
- Anxiety, agitation or confusion
- Affect change or hallucinations
- Delusional thoughts or bizarre behavior
- Combative or violent
- Expression of suicidal/homicidal thoughts

**Differential**
- Altered mental status
- Alcohol intoxication
- Toxin/substance abuse
- Medication effect/overdose
- Withdrawal symptoms
- Depression
- Bipolar (manic-depressive)
- Schizophrenia
- Anxiety disorders
- Hypoglycemia

---

**Aggressive or agitated, possible psychosis, possible danger to self, or others**

**For patients ≥ 12 years of age**

**Midazolam**

Use Pediatape and refer to dosing guide

**Consider restraints**

**Monitor restraints and PMS if indicated**

**Consider external cooling measures**

**Monitor and reassess**

**Establish IV**

**Blood glucose analysis**

**Cardiac monitor**

**Exit to appropriate TG, if indicated**

**Altered Mental Status TG**

**Overdose/Toxic Ingestion TG**

**Head Trauma TG**

Assume patient has medical cause of behavioral change

**Notify receiving facility.**

**Contact Base Hospital for medical direction**

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**Excited Delirium Syndrome**

Paranoia, disorientation, extremely aggressive or violent, hallucinations, tachycardia, increased strength, hyperthermia, and clearly a danger to self or others

**For patients ≥ 12 years of age**

**Midazolam**

Use Pediatape and refer to dosing guide

---

**Diabetic TG if indicated**

**Notify receiving facility.**

**Contact Base Hospital for medical direction**

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**Effective Jan. 2019**
Excited Delirium Syndrome:

This is a medical emergency. The condition is a combination of delirium, psychomotor agitation, anxiety, hallucinations, speech disturbances, disorientation, violent/bizarre behavior, insensitivity to pain, hyperthermia and increased strength. The condition is life-threatening and is often associated with use of physical control measures, including physical restraints, and tasers. Most commonly seen in male patients with a history of serious mental illness or drug abuse, particularly stimulant drugs such as cocaine, crack cocaine, methamphetamine, amphetamines, bath salts, or similar agents. Alcohol withdrawal or head injury may also contribute to the condition.

Pearls

- **Crew/responder safety is the main priority. See Policy 1008 – Managing Assaultive Behavior/Patient Restraint.**
- **Avoid using benzodiazepines for patients with alcohol intoxication.**
- **Limit IN administrations to ½ dose in each nare.**
- All patients who receive either physical restraint or chemical sedation must be continuously observed by EMS personnel. This includes direct visualization of the patient as well as cardiac and pulse oximetry monitoring.
- Consider all possible medical/trauma causes for behavior (e.g. hypoglycemia, overdose, substance abuse, hypoxia, seizure, head injury, etc.).
- Use caution when considering the use of Midazolam with postictal patients.
- Do not irritate the patient with a prolonged exam. Be thorough but quick.
- Do not overlook the possibility of associated domestic violence or child abuse.
- If patient suspected of excited delirium and suffers cardiac arrest, consider fluid bolus and sodium bicarbonate early.
- Do not position or transport any restrained patient in a way that negatively affects the patient’s respiratory or circulatory status (e.g. hog-tied or prone positions). Do not place backboards, splints or other devices on top of the patient.
- If restrained, the extremities that are restrained will have a circulation check at least every 15 minutes. The first of these checks should occur as soon after placement of the restraints as possible. This shall be documented in the EHR.
**Pediatric Brief Resolved Unexplained Event (BRUE)**

**History**
- Recent trauma, infection (e.g., fever, cough)
- GERD
- Congenital heart disease
- Seizures
- Medications

**Signs and Symptoms**
- Brief decrease/change in mentation
- Brief period of cyanosis or pallor
- Brief absence, decrease or irregular respirations
- Brief marked change in muscle tone
- Brief altered responsiveness

**Differential**
- GERD
- Pertussis
- Respiratory infection
- Seizure
- Infection
- Abuse

An infant ≤ 1 year who experienced an episode frightening to the observer, which is characterized by:
- Cyanosis or pallor
- Absent, decreased, or irregular breathing
- Choking or gagging
- Change in muscle tone
- Altered level of consciousness

**Pearls**
- BRUE was formally known as Apparent Life Threatening Event (ALTE).
- BRUE is formally diagnosed in the ED only when there is no explanation for a qualifying event after a physician conducts an appropriate history and physical examination.
- Always consider non-accidental trauma in any infant who presents with BRUE.
- Even with a normal physical examination at the time of EMS contact, patients that have experienced BRUE should be transported for further evaluation.
- It is important to document sleeping position as parent co-sleeping with child is associated with infant deaths.
Contra Costa County Emergency Medical Services

Pediatric Diabetic

**History**
- Past medical history
- Medications
- Recent blood glucose check
- Last meal

**Signs and Symptoms**
- Altered mental status
- Combative or irritable
- Diaphoresis
- Seizure
- Abdominal pain
- Nausea or vomiting
- Weakness
- Dehydration
- Deep or rapid breathing

**Differential**
- Alcohol or drug use
- Toxic ingestion
- Trauma or head injury
- Seizure
- Stroke
- Altered baseline mental status

---

**Flowchart**

1. **Altered Mental Status TG if indicated**

   - Suspected hypoglycemia or patient’s glucometer results read <60mg/dl
     - Blood glucose analysis
     - Cardiac monitor
     - 12-Lead ECG procedure if indicated
     - Establish IV/IO

   - Blood glucose ≤ 60mg/dl
     - Able to follow commands but symptomatic
       - Yes → **Consider Oral Glucose 1 tube (30g)**
       - No → **D-10 IV**
         - Use Pediatape and refer to dosing guide
         - No venous access
           - **Glucagon IM**
             - Use Pediatape and refer to dosing guide
             - Repeat in 15 minutes if needed
               - Consider IO access as a last resort
               - Improving?
                 - Yes → Notify receiving facility. Contact Base Hospital for medical direction
                 - No → D-10
               - Improving?
                 - Yes → Notify receiving facility. Contact Base Hospital for medical direction
                 - No → Normal Saline bolus IV
                   - Use Pediatape and refer to dosing guide
                   - Hypotension/ Shock TG
                     - Yes → Notify receiving facility. Contact Base Hospital for medical direction
                     - No → D-10

   - Blood glucose ≥ 350mg/dl
     - Normal Saline bolus IV
       - Use Pediatape and refer to dosing guide

---

**Pearls**
- Do not administer oral glucose to patients that are not able to swallow or protect their airway.
- Patients with prolonged hypoglycemia may not respond to Glucagon.

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Treatment Guideline P06
Page 1 of 1
Pediatric Hypotension/Shock

**History**
- Blood loss
- Vomiting
- Diarrhea
- Fever
- Infection

**Signs and Symptoms**
- Restlessness or confusion
- Weakness or dizziness
- Weak, rapid pulse
- Pale, cool, clammy skin signs
- Delayed capillary refill
- Hypotension
- Tarry stools

**Differential**
- Shock (hypovolemic, cardiogenic, septic, neurogenic, or anaphylaxis)
- Trauma
- Infection
- Dehydration
- Congenital heart disease
- Medication or Toxin

---

**Diabetic TG**
- If indicated

**IV/IO procedure**
- Cardiac monitor
- Blood glucose analysis
- **Consider** 12-Lead ECG
- **Airway TGs**
- If indicated

**Cardiac/Arrhythmia TG**
- If indicated

**History, exam and circumstances often suggest (type of shock)** WAS TRAUMA INVOLVED?

- **Yes**
  - Spinal motion restriction, *if indicated*
  - **CONTROL HEMORRHAGE** and wound care, *as indicated*
  - **Normal Saline bolus IV/IO**
  - Use Pediatape and refer to dosing guide
  - Repeat to age dependent goal SBP *Maximum 1L*  
  - Chest Decompression procedure *if indicated*

  **Exit to Trauma TG**
  - If indicated

- **No**
  - Consider hypovolemic (bleeding), neurogenic (spinal injury) and obstructive (pneumothorax) shock

  **Normal Saline bolus IV/IO**
  - Use Pediatape and refer to dosing guide
  - Repeat to age dependent goal SBP *Maximum 1L*

  **Exit to appropriate TG**

**Notify receiving facility. Contact Base Hospital for medical direction**

**MD**
- Normal Saline
- Contact Base Hospital Physician for additional order

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Effective Jan. 2019

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Contra Costa County Emergency Medical Services

Pediatric Treatment Guidelines
Pearls

- **Hypotension** is age dependent. This is not always reliable and should be interpreted in context with the patient’s typical BP, if known. Shock may be present with a seemingly normal blood pressure initially.

  Hypotension is defined as:
  - Neonate: < 60mmHg or weak pulses
  - Infant: < 70mmHg or weak pulses
  - 1-10 years: < 70mmHg + (age in years x2)
  - Over 10 years: < 90mmHg

- **Systemic BP goals** are defined as:
  - Neonate: > 60mmHg
  - Infant: > 70mmHg
  - 1-10 years: > 70mmHg + (age in years x2)
  - Over 10 years: > 90mmHg

- Common pediatric terms used to describe children are defined as:
  - Newly born are ≤ 24 hours old
  - Neonates are ≤ 28 days old
  - Infants are ≤ 1 year old

- Normal blood pressure, delayed capillary refill, diminished peripheral pulses, and tachycardia indicates compensated shock in children.

- Hypotension and delayed capillary refill > 4 seconds indicates impending circulatory failure.

- Systolic blood pressure in children may not drop until the patient is 25-30% volume depleted. This may occur through dehydration, blood loss, or an increase in vascular capacity (e.g. anaphylaxis).

- Decompensated shock (hypotension with capillary refill > 5 seconds) may present as PEA in children.

- Sinus tachycardia is the most common cardiac rhythm in encountered in children.

- SVT should be suspected in the heart rate is greater than 180 in children ages (1-8) or greater than 220 in infants.

- Hypoglycemia may be found in pediatric shock, especially in infants.

- Pediatric shock victims are at risk for hypothermia due to their increased body surface area, exposure, and rapid administration of IV/IO fluids.
**Contra Costa County Emergency Medical Services**

**Newly Born**

### History
- Due date and gestational age
- Multiple gestation (twins, etc.)
- Meconium
- Delivery difficulties
- Congenital disease
- Medications (maternal)
- Maternal risk factors (substance abuse, smoking)

### Signs and Symptoms
- Just born
- Uncut umbilical cord
- Respiratory distress
- Peripheral cyanosis or mottling (normal)
- Central cyanosis or mottling (abnormal)
- Altered level of responsiveness
- Bradycardia

### Differential
- Airway failure (secretions, respiratory drive)
- Infection
- Maternal medication effect
- Hypovolemia
- Hypoglycemia
- Congenital heart disease
- Hypothermia

---

**AT ANY TIME**

- **Return of spontaneous circulation**
  - Warm, dry, and stimulate
  - Clear airway if necessary
  - Provide warmth/dry infant
  - Clear airway if necessary
  - Monitor and reassess

**No**

- Warm, dry, and stimulate
- Clear airway if necessary

---

**Term gestation?**

- **Yes**
  - **Provide warmth/dry infant**
  - Clear airway if necessary
  - Monitor and reassess

- **No**
  - Warm, dry, and stimulate
  - Clear airway if necessary

---

**Heart rate > 100**

- Warm, dry, and stimulate
- Clear airway if necessary
- Monitor and reassess

**Heart rate < 100 or Labored breathing or persistent cyanosis**

- Supplemental oxygen
  - BVM ventilations
  - If repeating cycle, take correction action by changing BVM position or technique.
  - Maintain warmth
  - Cardiac monitor

**Heart rate < 60**

- Supplemental oxygen
  - BVM ventilations
  - If repeating cycle, take correction action by changing BVM position or technique.
  - Maintain warmth
  - Begin chest compressions 3:1 ratio
  - Cardiac monitor
  - IV/IO procedure
  - Epinephrine 1:10,000 IV/IO every 3-5 minutes as needed
  - Use Pediatape and refer to dosing guide

**Notify receiving facility.**

**Contact Base Hospital for medical direction**

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**Effective Jan. 2019**
PEARLS

- Most newborns requiring resuscitation will respond to ventilation/BVM, compressions, or Epinephrine. If not responding, consider hypovolemia, pneumothorax, or hypoglycemia (< 40mg/dl).
- Transport mother WITH infant whenever possible.
- Do not place hot packs directly on baby’s skin as it may cause severe burns.
- Common pediatric terms used to describe children are defined as:
  - Newly born are ≤ 24 hours old
  - Neonates are ≤ 28 days old
  - Infants are ≤ 1 year old
- Term gestation, strong cry/breathing and with good muscle tone generally will need no resuscitation.
- Most important vital signs in the newly born are respirations/respiratory effort and heart rate.
- Place baby skin-to-skin on mother.
- It is extremely important to keep an infant warm.
- Maternal sedation or narcotics will sedate an infant.
- Naloxone is no longer recommended for use in the newly born who may be sedated from maternal medications.
### History
- Ingestion or suspected ingestion of a potentially toxic substance
- Substance ingested, route and quantity
- Time of ingestion
- Reason (suicidal, accidental or criminal)
- Available medications in home
- Past medical history and medications

### Signs and Symptoms
- Mental status changes
- Hypo or hypertension
- Decreased respiratory rate
- Tachycardia or dysrhythmias
- Seizures
- S.L.U.D.G.E.

### Differential
- Tricyclic antidepressants (TCAs)
- Acetaminophen (Tylenol)
- Aspirin
- Depressants
- Stimulants
- Anticholinergics
- Cardiac medications
- Solvents, alcohols or cleaning agents
- Insecticides (organophosphates)

### California Poison Control Center
(800) 222-1222
Advisory ONLY

### Treatment Flowchart

1. **Adequate respirations (> 8) and oxygenation?**
   - Yes: **12-Lead ECG**
   - No: **Cardiac monitor**
2. **Blood glucose analysis**
   - Yes: Exit to Diabetic or Behavioral TGs as indicated
   - No: **Systolic BP < 90**
3. **Tricyclic Antidepressant OD**
   - Yes: Exit to Symptomatic Bradycardia TG as indicated
   - No: **Organophosphate OD**
4. **For patients > 22kg**
   - Naloxone IN
     - Use PEDIATAPE and refer to dosing guide
     - Naloxone is titrated to effect of adequate ventilation and oxygenation
     - NOT ADMINISTERED TO RESTORE CONSCIOUSNESS
5. **Atropine IV/IO**
   - Use PEDIATAPE and refer to dosing guide
   - Sodium Bicarb IV/IO
     - Use PEDIATAPE and refer to dosing guide
6. **Contact Base Hospital for orders**
7. **Notify receiving facility. Contact Base Hospital for medical direction**

### Pearl
- Do not rely on patient history of ingestion, especially in suicide attempts. Make sure the patient is still not carrying other medications or weapons. Bring bottles, contents, and emesis to ED.
**Pediatric Pain Control**

**History**
- Age
- Location and duration
- Severity (0 – 10 scale or Wong-Baker faces scale)
- Past medical history
- Medications
- Drug allergies

**Signs and Symptoms**
- Severity (pain scale)
- Quality (e.g. sharp, dull, or stabbing)
- Radiation
- Relation to movement or respiration
- Increased with palpation of area

**Differential**
- Per the specific TG
- Musculoskeletal
- Visceral (abdominal)
- Cardiac
- Pleural / respiratory
- Neurogenic
- Renal (colic)

**Assess pain severity**
Use combination of pain scale, circumstances, MOI, injury, or illness severity

**Moderate to severe pain**
- Assess and monitor respiratory status
- Monitor continuous EtCO₂
- Apply and monitor cardiac rhythm
- Consider, IV/IO
  - Fentanyl IV/IO/IM
    - Use Pediatape and refer to dosing guide
  - Fentanyl IN
    - Use Pediatape and refer to dosing guide
- Single dose only
  - Monitor and reassess every 5 minutes following administration

**Mild pain**
- Position of comfort
  - Apply cold pack, *if applicable*
  - Monitor and reassess

**Refer to contraindications and cautions**

**Notify receiving facility. Contact Base Hospital for medical direction**

**Fentanyl**
Contact Base Hospital for additional orders

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**Contra Costa County Emergency Medical Services**

**Treatment Guideline P10**

Page 1 of 2

Effective Jan. 2019
Pearls
• Use EXTREME CAUTION in administering opioids to patients less than 10kg.
• This treatment guideline applies to patients < 15 years of age and who can be measured on a PediaTape. If a patient is larger than a PediaTape, you may use the Adult Pain Control Treatment Guideline.
• Pain severity (0 – 10 scale or Wong-Baker faces scale) is a vital sign to be recorded before and after all BLS pain control measures and ALS pain medication delivery. Monitor blood pressure and respirations closely as pain control medications may cause hypotension or respiratory distress.
• Contraindications of Fentanyl include:
  - Closed head injury
  - Headache
  - Altered level of consciousness
  - Respiratory failure or worsening status
  - Hypotension
    - Neonate: < 60mmHg or weak pulses
    - Infant: < 70mmHg or weak pulses
    - 1-10 years: < 70mmHg + (age in years x2)
    - Over 10 years: <90mmHg

• At a minimum, vital signs should be obtained before medication administration, 10 minutes after administration, and before patient turnover.
• Have Naloxone available to reverse respiratory depression should it occur.
• Burn patients may require higher than usual opioid doses to achieve adequate pain control. IF A PATIENT HAS SUFFERED BURNS THAT REQUIRE TRANSPORT TO A BURN CENTER, THE PATIENT MAY REQUIRE MORE THAN THE MAXIMUM TOTAL DOSE OF FENTANYL TO ACHIEVE PAIN CONTROL. CONTACT THE BASE HOSPITAL FOR ADDITIONAL ORDERS.
**History**
- Time of onset
- Possibility of foreign body
- Past medical history
- Medications
- Fever/Illness
- Sick contacts
- History of trauma
- History/possibility of choking
- Ingestion/Overdose
- Congenital heart disease

**Signs and Symptoms**
- Wheezing/Stridor/Crackles/Rales
- Nasal flaring/Retractions/Grunting
- Increased heart rate
- AMS
- Anxiety
- Attention/Distractibility
- Cyanosis
- Poor feeding
- JVD/Frothy sputum
- Hypotension

**Differential**
- Asthma/Reactive Airway Disease
- Aspiration
- Foreign body
- Upper or lower airway infection
- Congenital heart disease
- Overdose/Toxic ingestion/CHF
- Anaphylaxis
- Trauma

---

**Airway patent, ventilation adequate, and oxygenation adequate?**

- Yes
  - Exit to Pediatric Airway TG
  - Cardiac monitor
  - Establish IV/IO, if indicated
  - EtCO₂ monitoring

- No
  - Allergic Reaction/Anaphylaxis?
    - Yes
      - Exit to Pediatric Allergic Reaction/Anaphylaxis TG
    - No
      - Monitor and reassess
      - Monitor for worsening signs and symptoms

---

**Pearls**
- All patients with respiratory symptoms must have continuous pulse oximetry and EtCO₂ measurement.
- Do not force a child into a position; allow them to assume a position of comfort.
- Bronchiolitis is a viral infection typically affecting infants which results in wheezing which may not respond to Albuterol.
- Croup typically affects children > 2 years of age. It is viral, possible fever, gradual onset, and without drooling.
- Epiglottitis typically affects children > 2 years of age. It is bacterial patients with fever, rapid onset, and possible who want to sit up to keep airway open and drooling is common. Airway manipulation may worsen condition.
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**History**
- Reported or witnessed seizure
- Previous seizure history
- Medical alert tag
- Seizure medications
- History of trauma
- History of diabetes
- History of pregnancy
- Time of seizure onset
- Document number of seizures
- Alcohol use, abuse, or abrupt cessation
- Fever

**Signs and Symptoms**
- Altered mental status
- Sleepiness
- Incontinence
- Observed seizure activity
- Evidence of trauma
- Unconscious
- Incontinence

**Differential**
- Head trauma
- Metabolic, hepatic or renal failure
- Tumor
- Hypoxia
- Electrolyte abnormality
- Drugs or medication non-compliance
- Infection or sepsis
- Alcohol withdrawal
- Eclampsia
- Stroke
- Hyperthermia
- Hypoglycemia

**Actively seizing?**
- **No**
  - Loosen any constrictive clothing and protect airway
  - Blood glucose analysis if GCS is < 15 OR baseline is not normal
  - Spinal immobilization procedure *if indicated*
  - Consider, IV
  - Cardiac monitor
  - If patient begins seizing in the presence of EMS and treatment is indicated, give *Midazolam IV/IM/IN*
  - Use Pediatape and refer to dosing guide
  - May repeat every 3 to 5 minutes for continued seizure activity
  - Max 5mg total

- **Yes**
  - Loosen any constrictive clothing and protect airway
  - If patient is seizing upon EMS arrival, give *Midazolam IM/IN*; do not wait to obtain IV or IO access.
  - Use Pediatape and refer to dosing guide
  - May repeat every 3 to 5 minutes for continued seizure activity
  - Max 5mg total
  - Establish IV/IO
  - Blood glucose analysis
  - Consider, Cardiac monitor
  - EtCO₂ monitoring
  - Spinal immobilization procedure *if indicated*

**Diabetic TG**
- *if indicated*

**If patient is seizing upon EMS arrival, give**
- *Midazolam IM/IN*; do not wait to obtain IV or IO access.
- Use Pediatape and refer to dosing guide
- May repeat every 3 to 5 minutes for continued seizure activity
- Max 5mg total

**Epileptic seizure?**
- **No**
  - Awake, alert normal mental status?
  - **Yes**
    - Monitor and reassess

- **No**
  - Monitor and reassess

**Status Epilepticus?**
- **Yes**
  - Notify receiving facility.
  - Contact Base Hospital for medical direction
  - MD
  - Midazolam
  - Contact Base Hospital Physician for additional order

- **No**
  - Contact Base Hospital Physician for medical direction
Pearls
• Simple febrile seizures are most common in ages 6 months to 5 years of age. They are, by definition, generalized seizures with no seizure history in the setting of any grade of fever, with an otherwise normal neurologic and physical exam. Any seizure confirmed to last for more than five (5) minutes should be treated with medication.
• Addressing the ABCs and verifying blood glucose is as important as stopping the seizure.
• Be prepared to assist ventilations, especially if Midazolam is used. Avoiding hypoxemia is extremely important.
• In an infant, a seizure may be the only evidence of a closed head injury.
• Status epilepticus is defined as two or more successive seizures without a period of consciousness or recovery. This is a true emergency requiring rapid airway control, treatment and transport.
• Assess for the possibility of occult trauma and substance abuse, overdose, or ingestion/toxins.
**Pediatric Vomiting and Diarrhea**

**History**
- Age
- Time of last meal
- Last emesis/bowel movement
- Improvement or worsening with food or activity
- Duration of problem
- Other sick contacts
- Past medical history
- Past surgical history
- Medications
- Menstrual history (Pregnancy)
- Travel history
- Bloody emesis/diarrhea

**Signs and Symptoms**
- Abdominal pain
- Character of pain (constant, intermittent, dull, sharp, etc.)
- Distension
- Constipation
- Diarrhea
- Anorexia
- Radiation

**Associated symptoms (helpful to localize source):**
- Fever, headache, blurred vision, weakness, malaise, myalgia, cough, dysuria, mental status changes, and rash

**Differential**
- CNS (increased pressure, headache, stroke, CNS lesions, trauma or hemorrhage, vestibular)
- MI
- Drugs (NSAIDs, antibiotics, narcotics, chemotherapy)
- GI or renal disorders
- Diabetic ketoacidosis
- Gynecologic disease (ovarian cyst, PID)
- Infections (pneumonia, influenza)
- Electrolyte abnormalities
- Food or toxin induced
- Medication or substance abuse
- Pregnancy
- Psychological

---

**Pearls**
- Heart rate: One of the first clinical signs of dehydration is almost always an increased heart rate. Tachycardia increases as dehydration becomes more severe, very unlikely to be significantly dehydrated if heart rate is close to normal.
- Beware of only vomiting (without diarrhea) in children. Pyloric stenosis, bowel obstruction, and CNS processes (bleeding, tumors, or increased CSF pressures) all often present with isolated vomiting.
- Ondansetron is not indicated for motion sickness.
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Contra Costa County Emergency Medical Services

Trauma Triage

ACTIVATION

Unmanageable airway or Traumatic arrest not meeting field determination

- No
- Yes

Measure vital signs and level of consciousness

- GCS ≤ 13
- Systolic blood pressure < 90mmHg
- Adult respiratory rate < 10 or > 29 or need for ventilatory support
- Infant (<1 year of age) respiratory rate < 20

Assess anatomy of injury

- All penetrating injuries to head, neck, torso, groin, pelvis, buttocks, and extremities above the 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 above the wrist or ankle
- Pelvic instability

Assess mechanism of injury and evidence of high-energy impact

- Adult fall > 20 feet
- Pediatric fall > 10 feet or 2-3 times height of child
- High risk auto crash with > 12 inches intrusion on patient side or > 18 inches at any site of passenger compartment
- Ejection (partial or complete)
- Death in same passenger compartment

- Yes
- No

Meets Destination / Call-in Criteria?

- Yes

Closest facility

Trauma Center transport with early notification

Trauma Center transport with early notification

Trauma Center transport with early notification

Call for destination decision

Treatment Guideline T01

Page 1 of 3
Risk Factor Advisory

Patients with either high energy or low energy mechanisms are more prone to serious injury if they have one or more of the following risk factors:

- Pregnancy over 20 weeks
- Communication barrier (e.g., age, language, psychiatric, or developmental issues)
- Age 55 or older
- Patient taking anticoagulants or with known bleeding disorder

<table>
<thead>
<tr>
<th>High energy mechanism</th>
<th>Low energy mechanism</th>
</tr>
</thead>
<tbody>
<tr>
<td>Motor vehicle crash</td>
<td>Low energy mechanisms should merit Base Hospital contact if symptoms, physical findings, or concern are encountered</td>
</tr>
<tr>
<td>- Estimated impact speed of &gt; 40mph</td>
<td></td>
</tr>
<tr>
<td>- Mechanical extrication required by fire department personnel</td>
<td></td>
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<tr>
<td>- Rollover with unrestrained occupant</td>
<td></td>
</tr>
<tr>
<td>Person struck by a vehicle at &lt; 20mph</td>
<td></td>
</tr>
<tr>
<td>Person ejected/fell from other object (e.g., motorcycle, horse, or ATV)</td>
<td>Examples include, but are not limited to ground level or short falls, blunt assault without a weapon (e.g., closed fist), low speed motor vehicle crash, or other blunt trauma (e.g., sports injury)</td>
</tr>
<tr>
<td>Blunt assault with weapon (e.g., pipe, bat, or golf club)</td>
<td></td>
</tr>
<tr>
<td>Falls &gt; 10 but &lt; 20 feet</td>
<td></td>
</tr>
</tbody>
</table>

This list is not all-inclusive and other high energy mechanisms encountered also merit Base Hospital contact

For situations not described above, consider Base Hospital contact if paramedic has concern that a serious injury may exist
Pearls

- Do not let alcohol confuse the clinical picture. Alcoholics may have unrecognized injuries, particularly head bleeds.
- A complete hands-on head-to-toe assessment is required for all trauma patients.
- Transport should be initiated within 10 minutes of ambulance arrival unless patient requires extrication.

Age Categories

- Adult Patient – Trauma patients 15 years of age and older.
- Pediatric Patients – Trauma patients under the age of 15 years.

Trauma Receiving Facilities

- Adult Trauma Centers – John Muir Medical Center – Walnut Creek is the designated trauma center for adults in Contra Costa County. In some circumstances, patients may be transported to other trauma receiving facilities. Alameda County Medical Center (Highland) and Eden Medical Center are trauma receiving facilities that, when they are the closest trauma receiving facility, may be appropriate for ground transport of trauma patients.
- Pediatric Trauma Centers – UCSF Benioff Children’s Hospital of Oakland (CHO) is the most appropriate destination for the majority of pediatric trauma patients.
  - John Muir Medical Center – Walnut Creek may be an appropriate trauma receiving facility for critically injured pediatric trauma patients who are near arrest or have a very prolonged transport time. UC Davis Medical Center is also a pediatric trauma receiving facility and may be utilized when helicopter transport is involved.

Receiving Facilities – Local hospitals that are not trauma receiving facilities are destinations for patients who are triaged by the Base Hospital at the time of report as not requiring trauma center care. A trauma receiving facility may also serve as the receiving facility when it is the patient’s facility of choice.

Low Energy Mechanism Trauma

Low energy mechanism trauma may reveal significant trauma. Examples include, but are not limited to ground level or short falls, blunt assault without a weapon (e.g. closed fist), low speed motor vehicle crash, or other blunt trauma (e.g. sports injury). Symptoms or concern may include:

- Symptoms in the presence of head injury such as headache, vomiting, loss of consciousness, repetitive questioning, abnormal, or combative behavior or new onset of confusion
- Pain level greater than 5/10 related to head, neck, or torso injury
- Any concerns due to hypotension, tachycardia, or tachypnea
- Systolic BP < 110mmHg in patients 65 years of age or older
- Torso injury with tenderness of abdomen, chest/ribs or back/flank
- Suspected hip dislocation or pelvis injury

Other Definitions

- Unmanageable Airway – A patient whose airway is unable to be adequately maintained with BLS or ALS maneuvers. Adult trauma patients are candidates for immediate redirection to the trauma center following airway stabilization at a non-trauma receiving facility.
- Traumatic Arrest – Patients who do not qualify for field determination of death but have or develop cardiopulmonary arrest should be transported to the closest Basic ED by ground ambulance.

Exceptions:

- Patients with penetrating trauma who arrest (pulseless, apneic, or pulseless with agonal respirations) after the arrival of transport personnel should be immediately transported to a trauma center if transport time is 20 minutes or less to that facility. If no Trauma Center is available within 20 minutes, patients should be transported to the closest basic emergency department.
- If a helicopter crew is present at the time of arrest (blunt or penetrating) and the air transport can be initiated immediately, use of helicopter to transport to a trauma center is appropriate.
Effective Jan. 2019

Contra Costa County Emergency Medical Services

Bites and Envenomations

History
- Type of bite or sting
- Description or photo of creature for identification, if safe to do so
- Time, location, size of bite or sting
- Previous reaction to bite or sting
- Domestic vs. wild
- Tetanus and Rabies risk
- Immunocompromised patient

Signs and Symptoms
- Rash, skin break, or wound
- Pain, soft tissue swelling, or redness
- Blood oozing from the bite wound
- Evidence of infection
- Shortness of breath or wheezing
- Allergic reaction, hives, or itching
- Hypotension or shock

Differential
- Animal bite
- Human bite
- Snake bite (poisonous)
- Spider bite (poisonous)
- Insect sting/bite (bee, wasp, ant, or tick)
- Infection risk
- Rabies risk
- Tetanus risk

Signs and Symptoms
- Rash, skin break, or wound
- Pain, soft tissue swelling, or redness
- Blood oozing from the bite wound
- Evidence of infection
- Shortness of breath or wheezing
- Allergic reaction, hives, or itching
- Hypotension or shock

If needed
California Poison Control
(800) 222-1222

General wound care
Consider, IV/IO

Allergic reaction/Anaphylaxis
No

Serious injury or hypotension
Yes

Hypotension/Shock TG
Trauma TG

Moderate/severe Pain
Yes

Appropriate pain control

Identification of animal, if possible

Spider bite
Bee/wasp sting

Snake bite

Dog / cat
Human bite

Immobilize injury
Elevate wound location to a neutral position, if able
Consider, applying cold pack(s)
Remove any constricting clothing/bands/jewelry

DO NOT apply COLD PACKS

Remove all jewelry from affected extremity
Mark margin of swelling/redness and time

Notify receiving facility.
Contact Base Hospital for medical direction

If indicated

Extremity trauma TG

Transport

No

Yes

Animal bites: Contact and document contact with Animal Control or Law Enforcement Officer
Pearls

- Human bites have higher infection rates than animal bites due to normally occurring mouth bacteria.
- Carnivore bites are much more likely to become infected and may have risk of Rabies exposure.
- Cat bites may progress to infection rapidly due to a specific bacteria (Pasteurella multocida).
- Poisonous snakes in our region are generally of the pit viper family: six rattlesnake species.
- If no pain or swelling is present, envenomation is unlikely. About 25% of snake bites are dry bites.
- Black Widow spider bites tend to be minimally painful initially, but over a few hours, muscular and severe abdominal pain may develop (black spider with a red hourglass on belly).
- Brown Recluse spider bites are minimally painful to painless. Little reaction is noted initially but tissue necrosis at the site of the bite develops over the next few days (brown spider with fiddle shape on back).
- Evidence of infection includes: swelling, redness, drainage, fever, and red streaks proximal to wound.
- Immunocompromised patients are at an increased risk for infection.
- Consider contacting the California Poison Control Center for identification (800) 222-1222.
Contra Costa County Emergency Medical Services

# Burns

## History
- Type of exposure (heat, gas or chemical)
- Inhalation injury
- Time of injury
- Other trauma
- Past medical history
- Medications

## Signs and Symptoms
- Burns, pain, or swelling
- Dizziness
- Loss of consciousness
- Hypotension/shock
- Airway compromise or distress could be presented as hoarseness or wheezing

## Differential
- Superficial – red and painful (do not include in TBSA)
- Partial thickness – blistering
- Full thickness – painless with charred or leathery skin
- Chemical injury
- Thermal injury
- Radiation injury
- Blast injury

## History

### History
- Type of exposure (heat, gas or chemical)
- Inhalation injury
- Time of injury
- Other trauma
- Past medical history
- Medications

### Signs and Symptoms
- Burns, pain, or swelling
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### Differential
- Superficial – red and painful (do not include in TBSA)
- Partial thickness – blistering
- Full thickness – painless with charred or leathery skin
- Chemical injury
- Thermal injury
- Radiation injury
- Blast injury

## Flowchart

1. **Assess burn injury severity**
   - Minor
     - < 20% TBSA partial or full thickness burns
     - No inhalation injury
     - GCS > 13
     - **E** Remove rings, bracelets, and constricting items
     - **P** Apply clean dressing to burn area
     - **P** Cardiac monitor
     - **P** Trauma Triage TG if indicated
     - **E** Pain Control TG if indicated
     - Transport to facility of choice. Consider transporting to Burn Center for burns to the face, hands, perineum, or feet and circumferential burns
     - Notify receiving facility. Contact Base Hospital for medical direction
   - Major
     - ≥ 20% TBSA partial or full thickness burns
     - Burns with suspected inhalation injury or high voltage electrical burns
     - **E** Remove rings, bracelets, and constricting items
     - **P** Apply clean dressing to burn area
     - **P** Maintain airway
     - **P** Consider, one 20g or larger IV in each AC
     - **P** Cardiac monitor
     - **P** EtCO₂ monitoring
     - **P** Trauma Triage TG if indicated
     - **P** Pain Control TG if indicated
     - Transport to appropriate facility

## Approved Burn Receiving Centers
- St. Francis – San Francisco
- Valley Med. Center – San Jose
- UC Davis – Sacramento

## Cardiac monitor
- Cardiac monitor
- EtCO₂ monitoring
- Maintain airway
- Consider, one 20g or larger IV in each AC
- Cardiac monitor
- EtCO₂ monitoring

## Transport to appropriate facility
- Burns with trauma to Trauma Center
- Burns only to Burn Center

## Treatment Guideline T03

**Effective Jan. 2019**

**Page 1 of 2**
Pearls

- Airway burns may lead to rapid compromise of the airway and can be identified by soot around the nares or mouth or visible burns or edematous mucosa in the mouth.
- Early intubation is required when the patient experiences significant inhalation injuries. If the patient requires advanced airway management that cannot be quickly achieved in the field, transport to the nearest facility for stabilization prior to transfer to the Burn Center. Do not wait for a helicopter if airway patency is a critical concern.
- Contact Burn Center prior to transport to confirm bed availability.
- For major burns, do not apply wet dressings, liquids or gels to burns unless it is to remove whatever caused the burn (i.e. dry chemical agent, etc.). Cooling large burns may lead to hypothermia.
- Burn patients are often trauma patients. If burns are evident in the presence of trauma, follow trauma triage guidelines and transport to trauma center if activation criteria is met. Do not transport a trauma patient with burns to a burn center.
- Circumferential burns to extremities are dangerous due to potential vascular compromise secondary to soft tissue swelling.
- Never administer IM pain medication into a burned area.

Rule of Nines

- Seldom will you find a complete isolated body part that is injured as described in the Rule of Nines. More likely, it will be portions of one area, portions of another, and an approximation will be needed.
- For the purpose of determining the extent of serious injury, differentiate the area with minimal (superficial) burn from those of partial or full thickness burns.
- When calculating TBSA of burns, include only partial and full thickness burns; do not include superficial burns in the calculation.
History
- Type and time of injury
- Mechanism (crush, penetrating, blunt, or amputation)
- Open vs. closed wound/fracture
- Past medical history
- Medications

Signs and Symptoms
- Evidence of trauma
- Pain, swelling, deformity, or bleeding
- Altered sensation or motor function
- Diminished pulse or capillary refill
- Decreased extremity temperature

Differential
- Abrasion
- Contusion
- Laceration
- Sprain
- Dislocation
- Fracture
- Amputation

Crush injury?

Early transport after release
Limit scene time to 10 minutes
- Secure airway and support respiratory rate
- Place splints and cold packs to stabilize fractures as necessary
- Control hemorrhaging
- Apply tourniquet for hemorrhage or shock

Exit to Airway TG if indicated

Notify receiving facility.
Contact Base Hospital for medical direction

Control hemorrhaging
Apply tourniquet for hemorrhage or shock
- Place splints and cold packs to stabilize fractures as necessary
- Establish IV/IO
- Cardiac monitor
- If SBP < 90 in adults
  Normal Saline bolus 500ml IV/IO
  Reassess patient for criteria above
  May repeat to a Maximum 1L as long as criteria above exists

- If poor perfusion or shock in peds
  Normal Saline bolus IV/IO
  Use PEDIATAPE and refer to dosing guide
  Repeat to age dependent goal SBP
  May repeat to a Maximum 1L as long as criteria above exists

- In the absence of head trauma, age-specific hypotension, poor perfusion or AMS
  Consider, Fentanyl for pain control

Exit to Pain Control TG if indicated

Yes

No

Tourniquet use should not be delayed until a patient is in shock or is clearly exsanguinating. It should be applied early and can be used safely without risk of patient injury. Do not wait; apply often and tighten if needed.

For suspected hyperkalemia:
- Peaked T-waves; or
- QRS > 0.12 seconds; or
- Loss of P-waves

Albuterol nebulizer 5mg in 6ml Normal Saline
Calcium Chloride 1gm over 60 seconds
20ml flush IV/IO prior to administering next med
Sodium Bicarbonate 1mEq/kg
Pearls

- For partial amputations, splint affected extremity in anatomic location and elevate extremity.
- For complete amputations, place amputated part in a dry container or bag and place on ice. Seal or tie off bag and place in second container or bag. DO NOT place amputated extremity directly on ice or in water. Elevate extremity and dress with dry gauze.
- Penetrating trauma to an extremity may hide significant vascular injury and hemorrhage. Early application of a tourniquet should be considered.
- In cases of clear-cut traumatic arrest, epinephrine is not indicated in PEA or asystole. Epinephrine will not correct arrest caused by a tension pneumothorax, cardiac tamponade, or hemorrhagic shock. If there is any doubt as to the cause of arrest, treat as a non-traumatic arrest.
- Hypotension is age dependent. This is not always reliable and should be interpreted in context with the patient’s typical BP, if known. Shock may be present with a seemingly normal blood pressure initially.
  - Neonate: < 60mmHg or weak pulses
  - Infant: < 70mmHg or weak pulses
  - 1-10 years: < 70mmHg + (age in years x2)
  - Over 10 years: <90mmHg
  - Over 65 years: <110mmHg
- If vigorous hemorrhage is not controlled with elevation and direct pressure on wound, apply a tourniquet. Tourniquets may be used in pediatric patients. Tourniquets may also be appropriate for hemorrhage control in multi-casualty incidents.
- Crush Injury Syndrome is caused by muscle crush injury and cell death. Most patients have an extensive area of involvement such as a large muscle mass in a lower extremity or the pelvis. May develop after one (1) hour in the presence of a severe crush, but usually requires at least four (4) hours of compression. Hypovolemia and hyperkalemia may occur, particularly in extended entrapments.
- Avoid hyperventilation. Maintain an EtCO₂ of 35 or greater, which may be unreliable if the patient was subject to multisystem trauma or poor perfusion.
- Hypotension usually indicates injury or shock and should be treated aggressively.
- An important item to monitor and document is a change in the level of consciousness by repeat examination.
- Do not overlook the possibility of associated domestic violence or abuse.
Contra Costa County Emergency Medical Services

Head Trauma

History
- Time of injury
- Mechanism (blunt vs. penetrating)
- Loss of consciousness
- Bleeding
- Past medical history
- Medications (anticoagulants)

Signs and Symptoms
- Evidence of trauma
- Pain, swelling, or bleeding
- AMS
- Unconscious
- Respiratory distress or failure
- Vomiting
- Seizure

Differential
- Skull fracture
- Spinal injury
- Abuse

History

- Time of injury
- Mechanism (blunt vs. penetrating)
- Loss of consciousness
- Bleeding
- Past medical history
- Medications (anticoagulants)

Signs and Symptoms
- Evidence of trauma
- Pain, swelling, or bleeding
- AMS
- Unconscious
- Respiratory distress or failure
- Vomiting
- Seizure

Differential
- Skull fracture
- Spinal injury
- Abuse

---

Early transport
Limit scene time to 10 minutes

- Spinal Motion Restriction
  - if indicated
- Secure airway
  - and support respiratory rate
- Elevate head 30 degrees unless contraindicated. Position patient on left side if needed for vomiting
- Control hemorrhaging
- Establish IV/IO
- Cardiac monitor
- EtCO₂ monitoring

If SBP < 90 in adults
Normal saline bolus 500ml IV/IO
Reassess patient for criteria above
May repeat to a Maximum 1L as long as criteria above exists

If poor perfusion or shock in ped
Normal saline bolus IV/IO
Use PEDIATAPE and refer to dosing guide
Repeat to age dependent goal SBP
May repeat to a Maximum 1L as long as criteria above exists

For Adults, Consider
Ondansetron 4mg IV/IO/IM/ODT
May repeat every 10 minutes to a Maximum 12mg for adults.

For ped patients ≥ 4 years, Consider
Ondansetron IV/IO/IM/ODT
Use PEDIATAPE and refer to dosing guide
May repeat x1 for ped > 40kg.

Notify receiving facility.
Contact Base Hospital for medical direction

Exit to Airway TG
if indicated
Pearls
• ALS procedures in the field do not significantly improve patient outcome in critical trauma patients.
• Basic airway management is preferred unless unable to effectively manage with BLS maneuvers. Utilize jaw thrust technique to open the airway.
• Intubation of head injury patients is best addressed at the hospital. Advanced Airways should not be used in traumatic arrest.
• In cases of clear-cut traumatic arrest, epinephrine is not indicated in PEA or asystole. Epinephrine will not correct arrest caused by a tension pneumothorax, cardiac tamponade, or hemorrhagic shock. If there is any doubt as to the cause of arrest, treat as a non-traumatic arrest.
• Hypotension is age dependent. This is not always reliable and should be interpreted in context with the patient’s typical BP, if known. Shock may be present with a seemingly normal blood pressure initially.
  ▪ Neonate: < 60mmHg or weak pulses
  ▪ Infant: < 70mmHg or weak pulses
  ▪ 1-10 years: < 70mmHg + (age in years x2)
  ▪ Over 10 years: <90mmHg
  ▪ Over 65 years: <110mmHg
• Avoid hyperventilation. Maintain an EtCO₂ of 35 or greater, which may be unreliable if the patient was subject to multisystem trauma or poor perfusion.
• In patients with a dilated pupil on one side or posturing, which indicates brainstem herniation, modest hyperventilation is appropriate. Keep EtCO₂ of 30 or greater.
• Scalp hemorrhage can be life threatening. Treat with direct pressure and pressure dressing.
• Increased intracranial pressure may cause hypertension and bradycardia.
• Hypotension usually indicates injury or shock unrelated to the head injury and should be treated aggressively.
• An important item to monitor and document is a change in the level of consciousness by repeat examination.
• Limit IV fluids unless the patient is hypotensive.
• Concussions are traumatic brain injuries involving any number of symptoms including confusion, LOC, vomiting, or headache. Any prolonged confusion or mental status abnormality which does not return to the patient’s baseline within 15 minutes of injury or any documented LOC should be evaluated by a physician immediately.
• Do not overlook the possibility of associated domestic violence or abuse.
Contra Costa County Emergency Medical Services
Multi-System Trauma

History
• Time of injury
• Mechanism (blunt vs. penetrating)
• Damage to structure or vehicle
• Location of patient in structure or vehicle
• Restraints or protective equipment use
• Past medical history
• Medications

Signs and Symptoms
• Evidence of trauma
• Pain, swelling, deformity, lesions, or bleeding
• AMS
• Unconscious
• Respiratory distress or failure
• Hypotension or shock
• Arrest

Differential
• Chest:
  • Tension pneumothorax
  • Flail chest
  • Pericardial tamponade
  • Open chest wound
  • Hemothorax
• Intra-abdominal bleeding
• Pelvis or femur fracture
• Spinal injury
• Head injury
• Hypothermia

---

**Early transport**
Limit scene time to 10 minutes

- Spinal Motion Restriction
  - *if indicated*
- Secure airway and support respiratory rate
- Place splints and cold packs to stabilize fractures as necessary
- Control hemorrhaging
- Establish IV/IO
- Cardiac monitor
- EtCO2 monitoring
- Needle Thoracostomy
  - *if indicated*
- If SBP < 90 in adults
  - Normal Saline bolus 500ml IV/IO
  - Reassess patient for criteria above
  - May repeat to a Maximum 1L as long as criteria above exists
- If poor perfusion or shock in peds
  - Normal Saline bolus IV/IO
  - Use PEDIATAPE and refer to dosing guide
  - Repeat to age dependent goal SBP
  - May repeat to a Maximum 1L as long as criteria above exists
- In the absence of head trauma, age-specific hypotension, poor perfusion or AMS
  - Consider Fentanyl for pain control

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Notify receiving facility.
Contact Base Hospital for medical direction

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Exit to Airway TG if indicated

Exit to Pain Control TG if indicated

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Treatment Guideline T06
Page 1 of 2

Effective Jan. 2019
Pears

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  - Over 65 years: <110mmHg
- Avoid hyperventilation. Maintain an EtCO$_2$ of 35 or greater, which may be unreliable if the patient was subject to multisystem trauma or poor perfusion.
- Hypotension usually indicates injury or shock and should be treated aggressively.
- An important item to monitor and document is a change in the level of consciousness by repeat examination.
- Do not overlook the possibility of associated domestic violence or abuse.
Heat Illness/Hyperthermia

**History**
- Exposure to increased temperatures, humidity, or extreme physical exertion
- Time and length of exposure
- Fatigue or muscle cramping
- Poor oral intake of fluids
- Past medical history
- Medications

**Signs and Symptoms**
- AMS
- Hot, dry, or sweaty skin
- Hypotension or shock
- Seizures
- Nausea

**Differential**
- Fever
- Dehydration
- Delirium tremens (DTs)
- Heat cramps
- Heat exhaustion
- Heat stroke

### Pearls
- Check an initial temperature and repeat every 15 minutes while actively cooling.
- Extremes of age are more prone to heat emergencies. Obtain and document the patient temperature and location taken.
- Salicylates and some recreational drugs may elevate body temperature.
- Sweating generally disappears as body temperature rises above 104°F.
- Intense shivering may occur as a patient is cooled.
- Seizures may occur with heat stroke; treat seizures per seizure treatment guideline.
- Increasing symptoms merit more aggressive cooling measures. With mild symptoms of heat exhaustion, movement to a cooler environment and fanning may suffice.

---

**Treatment**
- Remove from heat source to cool environment
- Remove tight clothing
- Active cooling measures
- Cardiac monitor
- Establish IV/IO
- Normal Saline bolus 500ml IV/IO
  - Reassess patient for criteria above
  - May repeat as long as criteria above exists
- If poor perfusion or shock in peds
  - Normal Saline bolus IV/IO
  - Use PEDIATAPE and refer to dosing guide
  - May repeat as long as criteria above exists

**Notify receiving facility.**
**Contact Base Hospital for medical direction.**
## Hypothermia

### History
- Age
- Exposure to decreased temperatures, but may occur in normal atmospheric temperatures
- Time and length of exposure
- Drug or alcohol use
- Infection or sepsis
- Past medical history
- Medications

### Signs and Symptoms
- AMS
- Cold or clammy skins
- Shivering
- Extremity pain or sensory abnormality
- Bradycardia
- Hypotension or shock

### Differential
- Sepsis
- Environmental exposure
- Hypoglycemia
- CNS dysfunction
- Stroke
- Head injury
- Spinal cord injury

### Signs and Symptoms
- AMS
- Cold or clammy skins
- Shivering
- Extremity pain or sensory abnormality
- Bradycardia
- Hypotension or shock

### Pearls
- Severe hypothermia may cause cardiac instability. Avoidance of excess stimuli is important in severe hypothermia as the heart is sensitive and interventions may induce arrhythmias. Necessary interventions should be done as gently as possible.
- Check for pulselessness for 30-45 seconds to avoid unnecessary chest compressions.
- Defer ACLS medications until patient is warmed.
- If V-Fib or pulseless V-Tach is present, shock x1, and defer further shocks.
- Extremes of age, malnutrition, alcohol, and other drug use are contributing factors to hypothermia.
- Patients with prolonged hypoglycemia often become hypothermic; blood glucose analysis is essential.
- If a temperature is unable to be measured, treat the patient based on the suspected temperature.
- Warm packs can be placed in the armpit and groin areas. Care should be taken not to place directly on skin.

### Plan

#### E
- Spinal motion restriction
  - if indicated
- Gently move to a warm environment
- Remove wet clothing and cover with warm dry sheets or blankets

#### P
- Secure airway and support respiratory rate
  - if indicated
- Cardiac monitor
- Establish IV/IO
- Blood glucose analysis

If SBP < 90 in adults
- Normal Saline bolus 500ml IV/IO
- Reassess patient for criteria above
- May repeat as long as criteria above exists

If poor perfusion or shock in peds
- Normal Saline bolus IV/IO
- Use PEDIATAPE and refer to dosing guide
- Repeat to age dependent goal SBP
- May repeat as long as criteria above exists

Notify receiving facility.
Contact Base Hospital for medical direction

### Exit to Diabetic TG
if indicated
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Clinical Indications:
1. Suspected cardiac patient or suspected stroke patient.
2. As required by treatment guidelines.

Procedure:
1. Prepare ECG monitor and connect patient cable with electrodes.
2. Enter the required patient information (e.g. patient name, age and gender) into the ECG monitor.
3. Expose chest and prep as necessary (e.g. shaving). Modesty of the patient should be respected.
4. Apply chest leads and extremity leads using the following landmarks:
   a. V1 – 4th intercostal space at right sternal border
   b. V2 – 4th intercostal space at left sternal border
   c. V3 – Directly between V2 and V4
   d. V4 – 5th intercostal space at midclavicular line
   e. V5 – Level with V4 at left anterior axillary line
   f. V6 – Level with V5 at left midaxillary line
5. Instruct the patient to remain still.
6. Acquire the 12-Lead ECG.
7. If the monitor detects signal noise (such as patient motion or a disconnected electrode), the 12-Lead acquisition may be interrupted until the noise is resolved.
8. Once acquired, transmit any 12-Lead ECG that indicates the patient is having a STEMI to the appropriate receiving STEMI Center.
9. Contact the receiving STEMI Center to notify them that a positive 12-Lead ECG has been sent.
10. Monitor the patient while continuing with the treatment protocol.
11. Download the cardiac monitor data as required by EMS policy and attach a copy of the 12-Lead ECG to the prehospital EHR.
12. Document the procedure, time, and results in the prehospital EHR.
Clinical Indications:
1. A patient who is unable to maintain their airway without assistance.

Procedure:
1. Position the patient to optimize airway opening and facilitate ventilations.
   a. Use the sniffing position with head extended (A) and neck flexed forward (B) unless there is a suspected spinal injury.
   b. Position with head/shoulders elevated; anterior ear should be at the same horizontal level as the sternal notch (C). This is especially advantageous in larger or morbidly obese patients.
2. Using a two-person technique is the preferred method to ventilate patients with a Bag-Valve-Mask (BVM).
   a. J – jaw thrust maneuver to open the airway.
   b. A – use a nasal or oral airway. Appropriately measure before placing airway adjunct.
   c. W – work together to ventilate the patient using a BVM. This should be done using two rescuers – one holding the mask to achieve an optimal seal and the other to deliver ventilations.
   d. S – slow and small ventilations to produce visible chest rise.
3. It is required that the airway be monitored continuously through waveform capnography (ALS providers) and pulse oximetry.

Notes:
1. The goal of airway management is to ensure adequate ventilation and oxygenation. Initial airway management should always begin with BLS maneuvers.
2. Avoid excessive ventilation. In non-arrest patients, ventilation rates should be:
   a. Adults – 10/minute
   b. Children – 20/minute
   c. Infants – 30/minute
**Clinical Indications:**

1. Patients meet clinical indications for oral intubation.

**Contraindications:**

1. Two attempts at intubation.
2. Age less than eight (8) or ETT size less than 6.5 mm.

**Procedure:**

1. Prepare, position, and oxygenate the patient with 100% oxygen.
2. Select the proper ET tube and remove stylette; test cuff and prepare suction.
3. Lubricate the distal end and cuff of the endotracheal tube (ETT) with a water-based lubricant and the distal 1/2 of the Bougie device. (Note: Failure to lubricate the Bougie and the ETT may result in being unable to pass the ETT).
4. Using the laryngoscope, visualize the vocal cords, if possible, using the BURP maneuver as needed.
5. Introduce the Bougie with the curved tip anteriorly and visualize the tip passing the vocal cords or above the arytenoids if the cords cannot be visualized.
6. Once inserted, gently advance the Bougie until you meet resistance; feel for the tracheal rings. If you do not meet resistance, you have a probable esophageal intubation and insertion should be reattempted or use a King Airway.
7. Withdraw the Bougie ONLY to a depth sufficient to allow loading of the ETT while maintaining proximal control of the Bougie.
8. Gently advance the Bougie and loaded ETT until you have feel resistance again, thereby assuring tracheal placement and minimizing the risk of accidental displacement of the Bougie.
9. While maintaining a firm grasp on the proximal Bougie, introduce the ETT over the Bougie passing the tube to its appropriate depth.
10. If you are unable to advance the ETT into the trachea and the Bougie and ETT are adequately lubricated, withdraw the ETT slightly and rotate the ETT 90 degrees COUNTER clockwise to turn the bevel of the ETT posteriorly. If this technique fails to facilitate passing of the ETT you may attempt direct laryngoscopy while advancing the ETT (this will require an assistant to maintain the position of the Bougie and, if so desired, advance the ETT).
11. Once the ETT is correctly placed, hold the ETT securely and remove the Bougie.
12. Confirm tracheal placement according to the intubation protocol, inflate the cuff with 3 – 10cc of air, auscultate for equal breath sounds, and reposition accordingly.
13. When final position is determined secure the ETT, reassess breath sounds, apply EtCO₂ monitoring, and record and monitor readings to assure continued tracheal intubation.
Clinical Indications:

1. Inability to adequately ventilate a patient with a Bag Valve Mask (BVM) and basic airway adjunct.
2. An unconscious patient without a gag reflex who is apneic or is demonstrating inadequate respiratory effort.

Procedure:

1. Using the Cormack Lehane difficult airway assessment tool to determine if the patient’s airway will be difficult to intubate. If it is determined to be difficult, use a King Airway.
2. Prepare, position, and oxygenate the patient with 100% Oxygen.
3. Select proper ET tube and stylette; have suction ready.
4. The use of a Bougie device is strongly encouraged with all ET intubation attempts.
5. Using laryngoscope, visualize vocal cords. (Use the BURP maneuver to assist).
6. Limit each intubation attempt to 30 seconds with BVM between attempts.
7. Visualize tube passing through vocal cords.
8. **Confirm and document tube placement using an EtCO2 monitoring.**
9. Inflate the cuff with 3 – 10cc of air; secure the tube using a commercial tube holder.
10. Auscultate for bilaterally equal breath sounds and absence of sounds over the epigastrium. If you are unsure of placement, remove tube and ventilate patient with a BVM.
11. Apply waveform capnography. After 3 ventilations, EtCO2 should be >10 or comparable to pre-intubation values. If < 10, check for adequate circulation, equipment, and ventilatory rate. If EtCO2 remains < 10 without physiologic explanation, remove the ETT and ventilate using an airway adjunct and BVM.
12. Consider using a King Airway if intubation efforts are unsuccessful.
13. Monitor EtCO2 and record readings on scene, en route to the hospital, and at the hospital.
14. Document ETT size, time, result (success) and placement location by the centimeter marks either at the patient’s teeth or lips in the EHR. Document all devices used to confirm initial tube placement. Also document positive or negative breath sounds before and after each movement of the patient.
15. **It is required that the airway be monitored continuously through waveform capnography (ALS providers) and pulse oximetry.**
Clinical Indications:

1. Sudden onset of respiratory distress often with coughing, wheezing, gagging, or stridor due to a foreign-body obstruction of the upper airway.

Procedure:

1. Assess the degree of foreign body obstruction.
   a. Do not interfere with a mild obstruction; allow the patient to clear their airway by coughing.
   b. In severe foreign-body obstructions, the patient may not be able to make a sound. The patient may clutch his/her neck demonstrating the universal choking sign.

2. For an infant, deliver 5 back blows (slaps) followed by 5 chest thrusts repeatedly until the object is expelled or the patient becomes unresponsive.

3. For a child, perform a subdiaphragmatic abdominal thrust (Heimlich Maneuver) until the object is expelled or the patient becomes unresponsive.

4. For adults, a combination of maneuvers may be required.
   a. First, subdiaphragmatic abdominal thrusts (Heimlich Maneuver) should be used in rapid sequence until the obstruction is relieved.
   b. If abdominal thrusts are ineffective, chest thrusts should be used. Chest thrusts should be used primarily in morbidly obese patients and in patients who are in the late stages of pregnancy.

5. If the patient becomes unresponsive, begin CPR immediately but look in the mouth before administering any ventilations. If a foreign-body is visible, remove it.

6. Do not perform blind finger sweeps in the mouth and posterior pharynx. This may push the object farther into the airway.

7. In unresponsive patients, Paramedics should visualize the posterior pharynx with a laryngoscope to potentially identify and remove the foreign-body using Magill forceps.

8. Document the methods used and result of these procedures in the EHR.
Clinical Indications:
1. EMT Optional – cardiac arrest patients only.
2. Inability to adequately ventilate a patient with a Bag Valve Mask (BVM) and basic airway adjunct.
3. An unconscious patient without a gag reflex who is apneic or is demonstrating inadequate respiratory effort.

Contraindications:
1. Gag reflex
2. Caustic ingestion
3. Known esophageal disease (e.g. cancer, varices or stricture)
4. Laryngectomy with stoma – if present, place ETT in stoma
5. Height less than 4 feet

Procedure:
1. Prepare, position and oxygenate the patient with 100% Oxygen.
2. Document the pre-intubation EtCO2 reading.
3. Select proper King Airway; have suction ready.
4. Lubricate the King Airway with water-based lubricant.
5. Grasp the patient’s tongue and jaw with your gloved hand and pull forward.
6. Using a laryngoscope to displace the tongue, gently insert the tube rotated laterally 45-90 degrees to the right so that the blue orientation line is touching the corner of the mouth. Once the tip is at the base of the tongue, rotate the tube back to midline. Insert the airway until the base of the connector is in line with the teeth and gums.
7. If resistance is encountered when ventilating immediately after placement, ventilate the patient while gently withdrawing the airway until the patient is easily ventilated.
8. Auscultate for breath sounds and sounds over the epigastrium and look for the chest to rise and fall.
9. The large pharyngeal balloon secures the device.
10. Confirm tube placement using EtCO2 and waveform capnography.
11. It is required that the airway be monitored continuously through waveform capnography (ALS providers) and pulse oximetry.
Clinical Indications:
1. Patient requiring intubation who has a mature stoma and does not have a replacement tracheostomy tube available.

Procedure:
1. Select the largest endotracheal tube (ETT) that will fit through the stoma without force; check the cuff and remove the stylette.
2. Pre-oxygenate the patient with 100% oxygen using a BVM.
3. Wear sterile gloves. It is not necessary to lubricate the ETT.
4. Suction if necessary.
5. Pass the ETT and inflate the cuff. The pharynx has been bypassed, so the ETT will protrude from the neck by several inches.
6. Hold the tube in place and attach the BVM.
7. While ventilating the patient, watch for equal rise and fall of the chest.
8. Secure the tube and ventilate with 100% oxygen.
10. Do not take longer than 30 seconds to perform this procedure.
11. Document ETT size, time, result (success) and placement location by the centimeter marks either at the stomal opening in the EHR. Document all devices used to confirm initial tube placement. Also document positive or negative breath sounds before and after each movement of the patient.
12. It is required that the airway be monitored continuously through waveform capnography (ALS providers) and pulse oximetry.
Airway: Tracheostomy Tube Replacement

Clinical Indications:
1. Presence of Tracheostomy site.
2. Urgent or emergent indication to change the tube, such as obstruction that will not clear with suction, dislodgement, or inability to oxygenate/ventilate the patient without other obvious explanation.

Procedure:
1. Have all airway equipment prepared for standard airway management, including equipment for endotracheal intubation.
2. Have an airway device (endotracheal tube or tracheostomy tube) of the same size as the tracheostomy tube currently in place as well as 0.5 size smaller available (e.g., if the patient has a #6.0 Shiley, then have a 6.0 and a 5.5 tube).
3. Lubricate the replacement tube(s) with water-based lubricant and check the cuff.
4. Remove the tracheostomy tube from mechanical ventilation device and use a bag-valve mask to pre-oxygenate the patient as much as possible.
5. Once all equipment is in place, remove the device securing the tracheostomy tube.
6. If applicable, deflate the cuff on the tube. If unable to aspirate air with a syringe, cut the balloon off to allow the cuff to deflate.
7. Remove the tracheostomy tube.
8. Insert the replacement tube. Confirm placement via auscultation of the lungs.
9. If there is any difficulty placing the tube, re-attempt procedure with the smaller tube.
10. If difficulty is still encountered, use standard airway procedures such as oral bag-valve mask or endotracheal intubation. More difficulty with tube changing can be anticipated for tracheostomy sites that are immature (i.e. less than two weeks old). Great caution should be exercised in attempts to change immature tracheotomy sites.
11. Document the procedure, confirmation, patient response, and any complications in the EHR.
Clinical Indications:
Each and every out-of-hospital cardiac arrest (OHCA) which results in the activation of the EMS System shall be managed using CPR-Highly Defined (CPR-HD). CPR-HD is the expected standard of care for cardiac arrest in Contra Costa County.

Purpose:
The purpose of CPR-HD is to provide a structured, standardized and choreographed approach to cardiac arrest management. The CPR-HD ‘Script’ is time driven and serves as the ‘CODE’ leader.

Principles:
1. Resuscitation is based on proper planning and organized execution. Procedures require space and patient access. Make room to work. Utilize a team focused approach assigning responders to predetermined tasks.
2. The unit first on scene shall establish and follow the CPR-HD Script. Efforts should be dispensed to ensure adequate timekeeping occurs throughout the resuscitation.
3. Cardiac arrest management efforts should be directed at high quality and continuous chest compressions with limited interruptions. Our goal is to provide two (2) minutes of straight continuous compressions with a less than ten (<10) second pause.
4. In cardiac arrest, drugs are of limited usefulness. High quality compressions and defibrillation are far more important.
5. Conduct resuscitation with goal of preserving cerebral function through meticulous attention to procedure.
6. Passive ventilation for the first three cycles (6 minutes) of CPR. After that time, the patient should be ventilated using a BLS airway and BVM at a rate of 6 ventilations/minute (1:10 seconds) with continuous CPR. Placement of an advanced airway should be deferred unless a provider is unable to ventilate the patient with a BLS airway and BVM.
7. Once transport is deemed appropriate and the patient has experienced a return of spontaneous circulation (ROSC) at any time throughout the resuscitation; transport to a STEMI receiving Center.
#### Field Procedure FP09

<table>
<thead>
<tr>
<th>Time (mins)</th>
<th>Provider #1 (paramedic)</th>
<th>Provider #2</th>
</tr>
</thead>
</table>
| 0-2 | Stopwatch/Full code  
Start high quality compressions | Apply pads  
Insert OPA with O₂ via NRB setup  
IV/IO supplies @1:45 charge defibrillator/AED |
| 2-4 | NRB  
Establish IV/IO access @3:45 charge defibrillator/AED | Compressions |
| 4-6 | Compressions | NRB @5:45 charge defibrillator/AED |
| 6-8 | Epinephrine  
Begin PPV + EtCO₂ @ 6/min  
Consider Hs and Ts (hx/rx)  
Amiodarone 300mg*  
@7:45 charge defibrillator/AED | Compressions |
| 8-10 | Compressions | PPV + EtCO₂ @ 6/min @9:45 charge defibrillator/AED |
| 10-12 | Epinephrine  
PPV + EtCO₂ @ 6/min  
Amiodarone 150mg*  
@11:45 charge defibrillator/AED | Compressions |
| 12-14 | Compressions | PPV + EtCO₂ @ 6/min @13:45 charge defibrillator/AED |

---

**Do NOT place advanced airway unless unable to ventilate effectively with BVM**

*Amiodarone is only indicated in shockable rhythms refractory to three (3) shocks

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***Early transport to a SRC is indicated under the following circumstances:***

- Witnessed arrest with suspicion of pulmonary embolism; or
- V-Fib arrest resistant to four (4) shocks (refractory V-Fib).
<table>
<thead>
<tr>
<th>Shockable rhythm? DEFIBRILLATION</th>
<th>14-16</th>
<th>Compressions</th>
</tr>
</thead>
<tbody>
<tr>
<td>PPV + EtCO₂ @ 6/min</td>
<td></td>
<td></td>
</tr>
<tr>
<td>@15:45 charge defibrillator/AED</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Compressions</td>
<td>16-18</td>
<td>PPV + EtCO₂ @ 6/min</td>
</tr>
<tr>
<td></td>
<td></td>
<td>@17:45 charge defibrillator/AED</td>
</tr>
<tr>
<td>Epinephrine</td>
<td>18-20</td>
<td>Compressions</td>
</tr>
<tr>
<td>PPV + EtCO₂ @ 6/min</td>
<td></td>
<td></td>
</tr>
<tr>
<td>@19:45 charge defibrillator/AED</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Compressions</td>
<td>20-22</td>
<td>PPV + EtCO₂ @ 6/min</td>
</tr>
<tr>
<td></td>
<td></td>
<td>@21:45 charge defibrillator/AED</td>
</tr>
<tr>
<td>Epinephrine</td>
<td>22-24</td>
<td>Compressions</td>
</tr>
<tr>
<td>PPV + EtCO₂ @ 6/min</td>
<td></td>
<td></td>
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<tr>
<td>@23:45 charge defibrillator/AED</td>
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<tr>
<td>Compressions</td>
<td>24-26</td>
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<td></td>
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<td>@25:45 charge defibrillator/AED</td>
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<tr>
<td>Epinephrine</td>
<td>26-28</td>
<td>Compressions</td>
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<tr>
<td>PPV + EtCO₂ @ 6/min</td>
<td></td>
<td></td>
</tr>
<tr>
<td>@27:45 charge defibrillator/AED</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Compressions</td>
<td>28-30</td>
<td>PPV + EtCO₂ @ 6/min</td>
</tr>
<tr>
<td></td>
<td></td>
<td>@29:45 charge defibrillator/AED</td>
</tr>
</tbody>
</table>

Termination of efforts:
If non-shockable rhythm persists for 30 minutes despite resuscitative efforts, consider discontinuation of CPR

- Naloxone for suspected OD only
- Sodium Bicarb or Calcium Chloride for renal failure or suspected hyperkalemia only

If indicated, contact the Base Hospital for order to terminate efforts
OPTIMAL CPR-HD MANAGEMENT

(If Fully Staffed)

First Arriving FMS Personnel
Should Assume These
Critical Positions First

Airway Two/Compression Two (A2/C2)

Airway One (A1)

Compression One (C1)

CPR Support Position

AED

Cardiac Monitor

Medication/Monitor One (M1)
Clinical Indications:
   1. Imminent delivery with crowning.

Procedure:
   1. Delivery should be controlled so as to allow a slow controlled delivery of the infant. This will prevent injury to the mother and infant.
   2. Support the infant’s head as needed.
   3. Check the neck for the umbilical cord. If it is present, slip it over the head. If unable to free the cord from the neck, double clamp the cord and cut between the clamps.
   4. Suction the airway with a bulb syringe.
   5. Grasping the head with hands over the ears, gently pull down to allow delivery of the anterior shoulder.
   6. Gently pull up on the head to allow delivery of the posterior shoulder.
   7. Slowly deliver the remainder of the infant.
   8. Clamp the cord 2 inches from the abdomen with 2 clamps and cut the cord between the clamps.
  10. The placenta will deliver spontaneously, usually within 5 minutes of the infant. Do not force the placenta to deliver.
  11. Massaging the fundus may aid in the delivery of the placenta and decrease bleeding by facilitating uterine contractions.
  12. Continue rapid transport to the hospital.
Clinical Indications:
1. CPAP is indicated in adult patients whom inadequate ventilation is suspected and who have adequate mental status and respiratory drive to allow CPAP to function. This could be as a result of pulmonary edema, pneumonia, asthma, COPD, etc.

Clinical Contraindications:
1. Decreased Mental Status.
2. Facial features or deformities that prevent an adequate mask seal.
3. Excessive respiratory secretions.

Procedure:
1. Ensure adequate oxygen supply to ventilation device.
2. Explain the procedure to the patient.
3. Consider placement of a nasopharyngeal airway.
4. Place the delivery mask over the mouth and nose. Oxygen should be flowing through the device at this point.
5. Secure the mask with provided straps starting with the lower straps until minimal air leak occurs.
6. If the Positive End Expiratory Pressure (PEEP) is adjustable on the CPAP device, adjust the PEEP beginning at 0 cmH2O of pressure and slowly titrate to achieve a positive pressure as follows:
   a. 5 – 10 cmH2O for pulmonary edema, near drowning, possible aspiration or pneumonia. A PEEP setting of 7.5 cm H2O is suitable for most patients.
   b. 3 – 5 cm H2O for COPD.
7. Evaluate the response of the patient assessing breath sounds, oxygen saturation, and general appearance.
8. Titrate oxygen levels to the patient’s response.
9. Encourage the patient to allow forced ventilation to occur. Observe closely for signs of complications. The patient must be breathing for optimal use of the CPAP device.
10. Document time and response in the EHR.
Clinical Indications:

1. Capnography shall be used when available with the use of all advanced airway procedures and as required by treatment guidelines.

Procedure:

1. Attach capnography sensor to the advanced airway or any other oxygen delivery device, including bag-valve mask and nasal cannula.
2. Note that EtCO2 level and waveform changes. Values shall be documented in the EHR.
3. The capnometer shall remain in place and be monitored throughout prehospital care and transport.
4. Any loss of EtCO2 detection or waveform may indicate an airway problem and should be immediately addressed and thoroughly documented.
5. Document the procedure and results in the EHR.

Notes:

1. EtCO2 readings may be unreliable if the patient is in shock or has poor perfusion.
2. Normal EtCO2 levels range from 35 – 45, but this may vary based on the patient’s underlying respiratory and metabolic status.
3. EtCO2 levels that rise from a normal baseline to or above 40 generally indicates hypoventilation is occurring.
4. Patient stimulation, use of a BVM, or use of Naloxone may be appropriate based on the situation.
Clinical Indications:

1. Patients with symptomatic bradycardia (< 60/minute) with signs and symptoms of inadequate cerebral or cardiac perfusion such as:
   a. Chest Pain
   b. Hypotension
   c. Acute onset of pulmonary edema
   d. Altered Mental Status
   e. Seizure

Procedure:

1. Attach cardiac monitor using standard four-lead placement.
2. Apply defibrillation/pacing pads to chest and back:
   a. One pad to left mid chest next to sternum.
   b. One pad to mid left posterior chest next to spine.
3. Select pacing option on monitor unit.
4. Adjust the heart rate to 60 BPM for an adult.
5. Note pacer spikes on ECG screen.
6. Slowly increase output until capture of electrical rhythm on the monitor.
7. If unable to capture while at maximum electrical output, stop pacing immediately.
8. If capture observed on monitor, check for corresponding pulse and assess vital signs.
9. Consider the use of sedation or analgesia if patient is uncomfortable.
10. Document the dysrhythmia and the response to external pacing with ECG strips in the EHR.
Clinical Indications:

1. Helmet interferes with airway management or spinal motion restriction.
2. Improper fit, allowing head to move within helmet.

Contraindications:

1. Airway and spinal motion restriction can be addressed without helmet removal.

Procedure:

1. High Impact Helmets (e.g. motorcycle, car racing) - Whether the helmet is a closed or open-faced style helmet, the helmet must always be removed while providing spinal precautions.
2. Low Impact Helmets with Shoulder Pads (e.g. football, ice hockey, etc.) - In those patients wearing a well-fitted helmet which conforms closely to the patient's head, it may be preferable to leave the helmet and shoulder pads in place after removing the face mask. If the helmet is removed, the shoulder pads must also be removed to maintain neutral spinal alignment.
3. Low Impact Helmets without Shoulder Pads (e.g. baseball, bicycle, rollerblade, etc.) - Whether the helmet is a closed or open faced style helmet, the helmet must always be removed while providing spinal precautions.
4. Assess and document PMS.
5. While gently removing the helmet, maintain stabilization of the cervical spine. If indicated, place the patient in spinal motion restriction.
6. Reassess and document PMS.
Clinical Indications:

1. Patients where rapid, regular IV access is unavailable with any of the following:
   a. Cardiac arrest
   b. When IV access is unsuccessful or, after evaluation of potential sites, it is determined that an IV attempt would not be successful in the setting of:
      i. Shock or evolving shock, regardless of the cause.
      ii. Impending arrest or unstable dysrhythmia.

Contraindications:

1. Fracture of the targeted bone.
2. IO within the past 48 hours in the targeted bone.
3. Infection at the insertion site.
4. Burns that disrupt actual bone integrity at the insertion site.
5. Inability to locate landmarks or excessive tissue over the insertion site.
6. Previous orthopedic procedure near the insertion site (e.g. prosthetic limb or joint).

Procedure:

1. Proximal humerus (preferred site in patients with perfusing rhythm)
2. Proximal tibia
3. Distal tibia (if proximal humerus or proximal tibia are unsuitable)

Procedure:

1. Locate the insertion site:
   a. The proximal humerus site is the greater tubercle, identifiable as a prominence on the humerus when the arm is rotated inward and the patient's hand is on the abdomen.
   b. The proximal tibia site is on the flat medial aspect of the tibia, 2 finger-breadths below the lower edge of the patella and medial to the tibial tuberosity.
   c. The distal tibia site is 2 finger-breadths above the most prominent aspect of the medial malleolus (inside aspect of ankle) in the midline of the shaft of the tibia.
2. Prep the selected site with chlorhexidine and allow to air dry.
3. Select and load the appropriate sized needle on the driver.
   a. For humeral access, a 45mm (yellow) needle is used except in patient adults less than 40kg.
   b. For proximal and distal tibial access, the amount of soft tissue should be gauged to determine if a 25mm (blue) or 45mm (yellow) needle is appropriate.

4. Introduce the IO needle through the skin without engaging the power driver:
   a. For humeral access, the direction of the needle should be perpendicular to the skin, directed at a downward angle of 45 degrees from the frontal plane, heading slightly downward toward the feet.
   b. For tibial sites, the direction of the needle should be at a 90 degree angle to the flat surfaces of the tibia.

5. Once the needle has touched the bone surface, assess to see if the black line on the needle is visible. If it is not visible, either a larger needle is needed, or in the case of the 45mm needle, the soft tissue is too thick to allow the use of that needle.

6. With firm pressure, insert needle using the power driver. In most cases, the hub should be flush or touching the skin. Verify that the needle is firmly seated in the bone; it should not wobble.

7. Remove the stylet and introduce Lidocaine if the patient is not in arrest.
   a. For adult patients not in arrest, 40mg of Lidocaine should be infused slowly over 1-2 minutes and allow 1 additional minute before flushing.
   b. For patients in arrest, Lidocaine is not necessary but may be needed if the patient regains consciousness.

8. Flush with 10ml Saline. In conscious patients, flush with 5ml Saline initially and repeat if necessary.

9. Attach stabilizer to skin.

10. Attach IV tubing to IO hub and begin infusion using pressure bag.

11. If painful, an additional 20mg of Lidocaine can be infused over 30 seconds, and after another minute, infusion should be restarted.

12. Monitor site for swelling or signs of infiltration and monitor pulses distal to area of placement.

13. Place wristband included with IO set on patient.
Clinical Indications:

1. Patients who are exhibiting signs of a tension pneumothorax and have at least one of the following signs:
   a. AMS
   b. Hypotension
   c. Increased pulse and respirations
   d. Absent breath sounds or hyperresonance to percussion on affected side
   e. Jugular vein distension
   f. Difficulty ventilating
   g. Tracheal shift
   h. In patients with penetrating trauma to the chest or upper back, or gunshot wound to the neck or torso who are in respiratory distress, a weak or absent radial pulse may be substituted for blood pressure measurement as listed above; signs of tension pneumothorax listed above may also be present.
   i. Patients in traumatic arrest with chest or abdominal trauma for whom resuscitation is indicated. These patients may require bilateral chest decompression even in the absence of the signs above.

Procedure:

1. Administer high flow oxygen.
2. Identify and prep the site:
   a. Locate the second intercostal space in the mid-clavicular line on the same side as the pneumothorax.
   b. Prepare the site with chlorhexidine and allow to air dry.
3. Insert a 14g catheter into the skin over the third rib and direct it just over the top of the rib (superior border) into the interspace.
4. Advance the catheter through the parietal pleura until a “pop” is felt and air or blood exits under pressure through the catheter, then advance catheter only to chest wall.
5. Remove the needle, leaving the plastic catheter in place.
6. Secure the catheter hub to the chest wall with an Asherman chest seal. The catheter should be stabilized within the flutter valve mechanism.
Clinical Indications:
1. Any child that can be measured with the Peditape.

Pediatric Assessment Triangle:

<table>
<thead>
<tr>
<th>Assessment</th>
<th>Abnormal</th>
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<tbody>
<tr>
<td>Appearance</td>
<td>Assess: Tone, Interactiveness, Consolability, Look/Gaze and Speech/Cry</td>
</tr>
<tr>
<td>Work of Breathing</td>
<td>Assess effort</td>
</tr>
<tr>
<td>Circulation</td>
<td>Assess skin color</td>
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Primary Assessment:

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<thead>
<tr>
<th>Assessment</th>
<th>Signs of Life-Threatening Condition</th>
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<tbody>
<tr>
<td>Airway</td>
<td>Complete or severe airway obstruction</td>
</tr>
<tr>
<td>Breathing</td>
<td>Apnea, slow respiratory rate, very fast respiratory rate or significant work of breathing</td>
</tr>
<tr>
<td>Circulation</td>
<td>Unexplained tachycardia, bradycardia, absence of detectable pulses, poor blood flow (increased capillary refill time, pallor, mottling or cyanosis) or hypotension</td>
</tr>
<tr>
<td>Disability</td>
<td>Decreased response or abnormal motor function (posturing) to pain or unresponsiveness</td>
</tr>
<tr>
<td>Exposure</td>
<td>Hypothermia, rash (petechiae/purpura) consistent with septic shock, significant bleeding or abdominal distention</td>
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Pediatric GCS:

<table>
<thead>
<tr>
<th>Pediatric GCS</th>
<th>Infant</th>
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<td></td>
<td>movements</td>
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<td>Localizes</td>
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<td></td>
<td>Withdraws to touch</td>
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<td>Flexion</td>
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<td></td>
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<tr>
<td>Verbal Response</td>
<td>Coos and babbles</td>
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<td>Oriented</td>
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<tr>
<td></td>
<td>Irritable cry</td>
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<td>Confused</td>
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<td>Cries to pain</td>
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Clinical Indications:
1. Suspicion of spinal or neurological injury

Procedure:
1. Have the patient extend both wrists and touch each finger to its thumb.
2. Have the patient flex each foot upward and down.
3. Ensure the patient has gross sensation in all extremities. Note any deficits.
4. Explain to the patient the actions that you are going to take when assessing the spine. Ask the patient to immediately report any pain verbally by answering questions with a verbal “yes” or “no” answer rather than shaking the head.
5. With the patient’s spine supported to limit movement, begin palpation at the base of the skull at the midline of the spine.
6. Palpate the vertebrae individually from the base of the skull to the bottom of the sacrum.
7. On palpation of each vertebral body, look for evidence of pain and ask the patient if they are experiencing pain. If evidence of pain along the spinal column is encountered, the patient should be immobilized.

Risk Assessment:
1. History of high-velocity blunt injury increases spinal injury risk.
2. Axial load injury to the head (e.g. diving) increases spinal injury risk.
3. Low-velocity injuries such as falls from a standing position or lower-velocity motor vehicle accidents have increased risk in patients 55 and older.
Clinical Indications:
1. Spinal motion restriction (SMR) as determined by spinal injury assessment.
   a. Blunt trauma – full SMR (C-collar and full-length vacuum splint):
      i. Major blunt trauma meeting trauma activation criteria
      ii. Presence of neurological deficit, priapism or suspected spinal shock
      iii. Obvious anatomic deformity of the spine
      iv. Significant tenderness on palpation of vertebral column
      v. Significant blunt trauma mechanism when a patient assessment is unreliable
   b. Blunt trauma – modified SMR (C-collar only):
      i. Blunt trauma not meeting above criteria but with pain complaints or concerns based on mechanism or patient risk
      ii. Examples of patients may include those ambulatory after self-extrication, low-velocity mechanisms and those with no neurologic findings.
   c. Penetrating trauma – full SMR:
      i. Neurologic deficit or an obvious deformity of the spine
      ii. Patients who have both penetrating and a significant blunt injury should be evaluated using blunt trauma criteria

Procedure:
1. Explain the procedure to the patient; assess and record extremity neuro status & distal pulses.
2. Place the patient in an appropriately sized C-collar while maintaining in-line stabilization of the cervical spine by a second provider.
3. If indicated, place the patient on a full-length vacuum splint.
4. Stabilize the patient with straps and head rolls or other similar device. Once the head is secured, the second provider may release manual in-line stabilization.
5. Assess and record extremity neuro status and distal pulses post-procedure. If worse, remove any immobilization devices and reassess.

Note:
1. SMR should reduce, rather than increase, patient discomfort. SMR that increases pain should be avoided. The cervical spine should never be moved if movement increases pain or in the presence of neurological deficits or neck spasms.
2. Suspected spinal injuries should be maintained in a neutral position; position will vary by patient.
3. Routine use of full spinal motion restriction should be reserved for patients with confirmatory physical findings or high suspicion of spinal injury.
4. AMS or presence of an entry/exit wound in proximity of spine are no longer indications for SMR.
Clinical Indications:
1. Taser darts incurred from law enforcement intervention that are impeding patient care or are causing profound discomfort for the patient may be removed.
2. Do NOT remove a taser dart that is located in the face, neck, or groin.

Procedure:
1. Assess the patient for any potential injury after the taser was deployed. Note that taser deployment will cause a patient to fall to the ground.
2. When safe to do so, verify that all wires of the taser dart have been disconnected from the weapon.
3. Place one hand on the patient in the area where the taser dart is embedded and stabilize the skin surrounding the puncture site between two fingers. Keep your hand away from the taser dart.
4. With your other hand, in one fluid motion, pull the taser dart straight out from the puncture site.
5. Immediately dispose of the taser dart in an approved sharps container.
6. Apply direct pressure for bleeding and apply a sterile dressing to the wound.

Note:
1. Patients who have had taser darts removed shall not be medically cleared by prehospital personnel.
2. The following must be documented in the EHR:
   a. The patient’s presenting behavior or signs/symptoms which lead to law enforcement to tase the patient.
   b. Time of taser dart removal.
   c. Anatomic location of taser dart.
   d. Whether or not the taser dart was intact following removal.
Clinical Indications:
1. Life threatening extremity hemorrhage that can not be controlled by other means.
2. May be appropriate for use to control hemorrhage in multi-casualty incidents.

Contraindications:
1. Non-extremity hemorrhage.
2. Hemorrhage that can be controlled with pressure or dressings.

Procedure:
1. Place tourniquet proximal to wound.
2. Tighten until hemorrhage stops or distal pulses in affected extremity disappear.
3. Secure the tourniquet and mark the time of application on extremity.
4. Note the time of tourniquet application in the electronic medical record and communicate this to the receiving facility.
5. Dress wounds as necessary.
6. If one tourniquet is not sufficient or not functional to control hemorrhage, consider the application of a second tourniquet more proximal to the first.
Clinical Indications:

1. Clinically stable patient with narrow complex tachycardia. Do not attempt this procedure on a patient with serious signs or symptoms, which include: Hypotension; acutely altered mental status; signs of shock/poor perfusion; chest pain with evidence of ischemia (e.g. STEMI, T-wave inversions, or depressions); and acute CHF.

Procedure:

1. Place the patient on a cardiac monitor; ensure continuous ECG monitoring throughout procedure.
2. If not already completed, establish intravenous access.
3. Describe the procedure to the patient.
4. Place and position the patient on the gurney so that the patient is sitting in a semi-recumbent (45°) position.
5. Have the patient inhale and hold his/her breath while bearing down as if to have a bowel movement, or have the patient blow into a 10ml syringe while pinching their nose closed. Instruct the patient to continue bearing down or blowing into the syringe until told to stop; time the event for 15 seconds.
6. Immediately lie the patient supine and elevate the patient’s legs to 45° for 15 seconds.
7. Lower the patient’s legs such that the patient is in a supine position and reassess the cardiac rhythm after 45 seconds.
8. Continue to monitor the heart rhythm during the procedure. Stop the procedure if the patient becomes confused, the heart rate drops below 100 or asystole occurs.
9. If the patient remains in a narrow complex tachycardia, repeat the procedure one time.
10. Document the initial and all subsequent ECG rhythms and any dysrhythmia in the prehospital care record.
Clinical Indications:

1. Any patient where intravenous access is indicated (significant trauma, emergent, or potentially emergent medical condition) for fluid or medication therapy.

Procedure:

1. Saline locks may be used as an alternative to an IV tubing and IV fluid in every treatment guideline at the discretion of the ALS provider.
2. Paramedics can use intraosseous access where threat to life exists as provided for in the Intraosseous procedure.
3. Use the largest catheter necessary based upon the patient’s condition and size of veins.
4. Select the most appropriate site:
   b. Antecubital – Preferred site for patients in shock, cardiac arrest, who will receive Adenosine, or when a peripheral site is not available.
   c. Intraosseous (IO) – Preferred site for critical patients where IV access was unsuccessful or are in cardiac arrest.
   d. External Jugular (EJ) – Unstable patients who need emergent IV medications or fluids AND no peripheral site is available AND IO access is not appropriate (e.g. very alert patient).
5. Inspect the IV solution for expiration date, cloudiness, discoloration, leaks, or the presence of particles.
6. Connect IV tubing to the solution in a sterile manner. Fill the drip chamber half full and flush the tubing, thus bleeding all air bubbles from the line.
7. Place a tourniquet around the patient’s extremity to restrict venous flow only.
8. Prep the skin with chlorhexidine and allow to air dry.
9. Insert the needle with the bevel up into the skin in a steady, deliberate motion until a blood flashback is visualized in the catheter.
10. Advance the catheter into the vein. Never reinsert the needle through the catheter. Dispose of the needle into a sharps container without recapping.
11. Remove the tourniquet and connect the IV tubing or saline lock.
12. Open the IV to assure free flow of the fluid and then adjust the flow rate as clinically indicated.
Energy Selection
Physio-Control LifePak 12 and LifePak 15

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Note: Cardioversion in pediatric patients requires a Base Hospital order.
### Energy Selection
**Physio-Control LifePak 12 and LifePak 15**

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Always document weight in kg

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<td>40kg</td>
<td>40 kg</td>
<td>90 lbs</td>
</tr>
<tr>
<td>45kg</td>
<td>45 kg</td>
<td>101 lbs</td>
</tr>
</tbody>
</table>
**Indication: SVT**
Concentration = 3 mg/ml

<table>
<thead>
<tr>
<th>COLOR</th>
<th>Doses (mg)</th>
<th>Give (ml)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gray</td>
<td>0.45 mg</td>
<td>1&lt;sup&gt;st&lt;/sup&gt; 0.15 ml</td>
</tr>
<tr>
<td></td>
<td>0.9 mg</td>
<td>2&lt;sup&gt;nd&lt;/sup&gt; 0.3 ml</td>
</tr>
<tr>
<td>Pink</td>
<td>0.66 mg</td>
<td>1&lt;sup&gt;st&lt;/sup&gt; 0.22 ml</td>
</tr>
<tr>
<td></td>
<td>1.35 mg</td>
<td>2&lt;sup&gt;nd&lt;/sup&gt; 0.45 ml</td>
</tr>
<tr>
<td>Red</td>
<td>0.9 mg</td>
<td>1&lt;sup&gt;st&lt;/sup&gt; 0.3 ml</td>
</tr>
<tr>
<td></td>
<td>1.8 mg</td>
<td>2&lt;sup&gt;nd&lt;/sup&gt; 0.6 ml</td>
</tr>
<tr>
<td>Purple</td>
<td>1 mg</td>
<td>1&lt;sup&gt;st&lt;/sup&gt; 0.33 ml</td>
</tr>
<tr>
<td></td>
<td>2 mg</td>
<td>2&lt;sup&gt;nd&lt;/sup&gt; 0.67 ml</td>
</tr>
<tr>
<td>Yellow</td>
<td>1.35 mg</td>
<td>1&lt;sup&gt;st&lt;/sup&gt; 0.45 ml</td>
</tr>
<tr>
<td></td>
<td>2.7 mg</td>
<td>2&lt;sup&gt;nd&lt;/sup&gt; 0.9 ml</td>
</tr>
<tr>
<td>White</td>
<td>1.7 mg</td>
<td>1&lt;sup&gt;st&lt;/sup&gt; 0.6 ml</td>
</tr>
<tr>
<td></td>
<td>3.4 mg</td>
<td>2&lt;sup&gt;nd&lt;/sup&gt; 1.2 ml</td>
</tr>
<tr>
<td>Blue</td>
<td>2.1 mg</td>
<td>1&lt;sup&gt;st&lt;/sup&gt; 0.7 ml</td>
</tr>
<tr>
<td></td>
<td>4.2 mg</td>
<td>2&lt;sup&gt;nd&lt;/sup&gt; 1.4 ml</td>
</tr>
<tr>
<td>Orange</td>
<td>2.7 mg</td>
<td>1&lt;sup&gt;st&lt;/sup&gt; 0.9 ml</td>
</tr>
<tr>
<td></td>
<td>5.4 mg</td>
<td>2&lt;sup&gt;nd&lt;/sup&gt; 1.8 ml</td>
</tr>
<tr>
<td>Green</td>
<td>3.3 mg</td>
<td>1&lt;sup&gt;st&lt;/sup&gt; 1.1 ml</td>
</tr>
<tr>
<td></td>
<td>6.6 mg</td>
<td>2&lt;sup&gt;nd&lt;/sup&gt; 2.2 ml</td>
</tr>
<tr>
<td>40kg</td>
<td>4 mg</td>
<td>1&lt;sup&gt;st&lt;/sup&gt; 1.3 ml</td>
</tr>
<tr>
<td></td>
<td>8 mg</td>
<td>2&lt;sup&gt;nd&lt;/sup&gt; 2.7 ml</td>
</tr>
<tr>
<td>45kg</td>
<td>4.5 mg</td>
<td>1&lt;sup&gt;st&lt;/sup&gt; 1.5 ml</td>
</tr>
<tr>
<td></td>
<td>9 mg</td>
<td>2&lt;sup&gt;nd&lt;/sup&gt; 3 ml</td>
</tr>
</tbody>
</table>

Note: Immediately follow with a rapid 10-20ml NS bolus.
**Indication: V-Fib**  
Concentration = 50 mg/ml

<table>
<thead>
<tr>
<th>COLOR</th>
<th>Doses (mg)</th>
<th>Give (ml)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gray</td>
<td>Not given</td>
<td></td>
</tr>
<tr>
<td>Pink</td>
<td>35 mg</td>
<td>0.7 ml</td>
</tr>
<tr>
<td>Red</td>
<td>45 mg</td>
<td>0.9 ml</td>
</tr>
<tr>
<td>Purple</td>
<td>50 mg</td>
<td>1 ml</td>
</tr>
<tr>
<td>Yellow</td>
<td>65 mg</td>
<td>1.3 ml</td>
</tr>
<tr>
<td>White</td>
<td>80 mg</td>
<td>1.6 ml</td>
</tr>
<tr>
<td>Blue</td>
<td>100 mg</td>
<td>2 ml</td>
</tr>
<tr>
<td>Orange</td>
<td>130 mg</td>
<td>2.6 ml</td>
</tr>
<tr>
<td>Green</td>
<td>170 mg</td>
<td>3.4 ml</td>
</tr>
<tr>
<td>40kg</td>
<td>200 mg</td>
<td>4 ml</td>
</tr>
<tr>
<td>45kg</td>
<td>225 mg</td>
<td>4.5 ml</td>
</tr>
</tbody>
</table>
**Indication: Symptomatic Bradycardia/Overdose**

*Concentration = 0.1 mg/ml*

*Minimum Dose = 0.1 mg*

*Maximum Dose – 0.5 mg*

<table>
<thead>
<tr>
<th>COLOR</th>
<th>Doses (mg)</th>
<th>Give (ml)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gray</td>
<td>0.1 mg</td>
<td>1 ml</td>
</tr>
<tr>
<td>Pink</td>
<td>0.13 mg</td>
<td>1.3 ml</td>
</tr>
<tr>
<td>Red</td>
<td>0.17 mg</td>
<td>1.7 ml</td>
</tr>
<tr>
<td>Purple</td>
<td>0.2 mg</td>
<td>2 ml</td>
</tr>
<tr>
<td>Yellow</td>
<td>0.25 mg</td>
<td>2.5 ml</td>
</tr>
<tr>
<td>White</td>
<td>0.35 mg</td>
<td>3.5 ml</td>
</tr>
<tr>
<td>Blue</td>
<td>0.42 mg</td>
<td>4.2 ml</td>
</tr>
<tr>
<td>Orange</td>
<td>0.5 mg</td>
<td>5 ml</td>
</tr>
<tr>
<td>Green</td>
<td>0.5 mg</td>
<td>5 ml</td>
</tr>
<tr>
<td>40kg</td>
<td>0.5 mg</td>
<td>5 ml</td>
</tr>
<tr>
<td>45kg</td>
<td>0.5 mg</td>
<td>5 ml</td>
</tr>
</tbody>
</table>

Note: Ensure adequate ventilation before considering Atropine. **NOT** indicated for asystole.
Indication: Hypoglycemia  
Concentration = 0.1 g/ml

<table>
<thead>
<tr>
<th>COLOR</th>
<th>Doses (mg)</th>
<th>Give (ml)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gray</td>
<td>2 g</td>
<td>20 ml</td>
</tr>
<tr>
<td>Pink</td>
<td>3.5 g</td>
<td>35 ml</td>
</tr>
<tr>
<td>Red</td>
<td>4.5 g</td>
<td>45 ml</td>
</tr>
<tr>
<td>Purple</td>
<td>5.5 g</td>
<td>55 ml</td>
</tr>
<tr>
<td>Yellow</td>
<td>6.5 g</td>
<td>65 ml</td>
</tr>
<tr>
<td>White</td>
<td>8.5 g</td>
<td>85 ml</td>
</tr>
<tr>
<td>Blue</td>
<td>10 g</td>
<td>100 ml*</td>
</tr>
<tr>
<td>Orange</td>
<td>10 g</td>
<td>100 ml*</td>
</tr>
<tr>
<td>Green</td>
<td>10 g</td>
<td>100 ml*</td>
</tr>
</tbody>
</table>

For 40kg and 45kg, use 10 g and 100 ml*

Note: *A repeat dose equal to the initial dose and be required based on repeat BGL.
**Indication: Allergic Reaction**

**Concentration = 50 mg/ml**

<table>
<thead>
<tr>
<th>COLOR</th>
<th>Doses (mg)</th>
<th>Give (ml)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gray</td>
<td>5 mg</td>
<td>0.1 ml</td>
</tr>
<tr>
<td>Pink</td>
<td>6.5 mg</td>
<td>0.13 ml</td>
</tr>
<tr>
<td>Red</td>
<td>8.5 mg</td>
<td>0.17 ml</td>
</tr>
<tr>
<td>Purple</td>
<td>10 mg</td>
<td>0.2 ml</td>
</tr>
<tr>
<td>Yellow</td>
<td>12.5 mg</td>
<td>0.25 ml</td>
</tr>
<tr>
<td>White</td>
<td>17.5 mg</td>
<td>0.35 ml</td>
</tr>
<tr>
<td>Blue</td>
<td>20 mg</td>
<td>0.4 ml</td>
</tr>
<tr>
<td>Orange</td>
<td>27 mg</td>
<td>0.5 ml</td>
</tr>
<tr>
<td>Green</td>
<td>36 mg</td>
<td>0.7 ml</td>
</tr>
<tr>
<td>40kg</td>
<td>40 mg</td>
<td>0.8 ml</td>
</tr>
<tr>
<td>45kg</td>
<td>45 mg</td>
<td>0.9 ml</td>
</tr>
</tbody>
</table>

Note: Utilize Epinephrine 1: 1,000 IM first if patient is in anaphylaxis. Consider giving one-half dose Diphenhydramine if patient has taken or been given full dose within one hour.
**Indication: Anaphylaxis and Severe Asthma**

*NEVER GIVE EPINEPHRINE 1:1,000 VIA IV ROUTE*

Concentration = 1 mg/ml  
Maximum Dose = 0.3 mg IM

<table>
<thead>
<tr>
<th>COLOR</th>
<th>Doses (mg)</th>
<th>Give (ml)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gray</td>
<td>0.04 mg</td>
<td>0.04 ml</td>
</tr>
<tr>
<td>Pink</td>
<td>0.06 mg</td>
<td>0.06 ml</td>
</tr>
<tr>
<td>Red</td>
<td>0.08 mg</td>
<td>0.08 ml</td>
</tr>
<tr>
<td>Purple</td>
<td>0.1 mg</td>
<td>0.1 ml</td>
</tr>
<tr>
<td>Yellow</td>
<td>0.13 mg</td>
<td>0.13 ml</td>
</tr>
<tr>
<td>White</td>
<td>0.17 mg</td>
<td>0.17 ml</td>
</tr>
<tr>
<td>Blue</td>
<td>0.21 mg</td>
<td>0.21 ml</td>
</tr>
<tr>
<td>Orange</td>
<td>0.27 mg</td>
<td>0.27 ml</td>
</tr>
<tr>
<td>Green</td>
<td>0.3 mg</td>
<td>0.3 ml</td>
</tr>
<tr>
<td>40kg</td>
<td>0.3 mg</td>
<td>0.3 ml</td>
</tr>
<tr>
<td>45kg</td>
<td>0.3 mg</td>
<td>0.3 ml</td>
</tr>
</tbody>
</table>

Note: Subcutaneous administration of Epinephrine 1:1,000 is no longer authorized.
**Indication: Cardiac Arrest**

Concentration = 0.1 mg/ml

<table>
<thead>
<tr>
<th>COLOR</th>
<th>Doses (mg)</th>
<th>Give (ml)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gray</td>
<td>0.04 mg</td>
<td>0.4 ml**</td>
</tr>
<tr>
<td>Pink</td>
<td>0.06 mg</td>
<td>0.6 ml**</td>
</tr>
<tr>
<td>Red</td>
<td>0.08 mg</td>
<td>0.8 ml**</td>
</tr>
<tr>
<td>Purple</td>
<td>0.1 mg</td>
<td>1 ml</td>
</tr>
<tr>
<td>Yellow</td>
<td>0.13 mg</td>
<td>1.3 ml</td>
</tr>
<tr>
<td>White</td>
<td>0.17 mg</td>
<td>1.7 ml</td>
</tr>
<tr>
<td>Blue</td>
<td>0.21 mg</td>
<td>2.1 ml</td>
</tr>
<tr>
<td>Orange</td>
<td>0.27 mg</td>
<td>2.7 ml</td>
</tr>
<tr>
<td>Green</td>
<td>0.33 mg</td>
<td>3.3 ml</td>
</tr>
<tr>
<td>40kg</td>
<td>0.4 mg</td>
<td>4 ml</td>
</tr>
<tr>
<td>45kg</td>
<td>0.45 mg</td>
<td>4.5 ml</td>
</tr>
</tbody>
</table>

Note: Epinephrine 1:10,000 is also used in anaphylactic shock if IM treatment is ineffective.

** In anaphylactic shock:
- Patients under 10kg receive smaller increments (same as single dose for cardiac arrest.
- For patients ≥ 10kg, administer in 0.1mg increments (1ml).
Indication: Pain Management  
Concentration = 50 mcg/ml  
Single dose only – Repeat doses require Base Hospital order

<table>
<thead>
<tr>
<th>COLOR</th>
<th>Doses (mg)</th>
<th>Give (ml)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gray</td>
<td>Not given</td>
<td></td>
</tr>
<tr>
<td>Pink</td>
<td>6 mcg</td>
<td>0.12 ml</td>
</tr>
<tr>
<td>Red</td>
<td>8 mcg</td>
<td>0.16 ml</td>
</tr>
<tr>
<td>Purple</td>
<td>10 mcg</td>
<td>0.2 ml</td>
</tr>
<tr>
<td>Yellow</td>
<td>12.5 mcg</td>
<td>0.25 ml</td>
</tr>
<tr>
<td>White</td>
<td>15 mcg</td>
<td>0.3 ml</td>
</tr>
<tr>
<td>Blue</td>
<td>20 mcg</td>
<td>0.4 ml</td>
</tr>
<tr>
<td>Orange</td>
<td>25 mcg</td>
<td>0.5 ml</td>
</tr>
<tr>
<td>Green</td>
<td>35 mcg</td>
<td>0.7 ml*</td>
</tr>
<tr>
<td>40kg</td>
<td>40 mcg</td>
<td>0.8 ml*</td>
</tr>
<tr>
<td>50kg</td>
<td>45 mcg</td>
<td>0.9 ml*</td>
</tr>
</tbody>
</table>

Note: *Doses greater than 25mcg can be titrated to effect beginning with 25mcg increments.
Indication: Pain Management  
Concentration = 50 mcg/ml  
Single dose only – Repeat doses require Base Hospital order

<table>
<thead>
<tr>
<th>COLOR</th>
<th>Doses (mg)</th>
<th>Give (ml)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gray</td>
<td>Not given</td>
<td></td>
</tr>
<tr>
<td>Pink</td>
<td>9 mcg</td>
<td>0.18 ml</td>
</tr>
<tr>
<td>Red</td>
<td>12 mcg</td>
<td>0.24 ml</td>
</tr>
<tr>
<td>Purple</td>
<td>15 mcg</td>
<td>0.3 ml</td>
</tr>
<tr>
<td>Yellow</td>
<td>20 mcg</td>
<td>0.4 ml</td>
</tr>
<tr>
<td>White</td>
<td>25 mcg</td>
<td>0.5 ml</td>
</tr>
<tr>
<td>Blue</td>
<td>30 mcg</td>
<td>0.6 ml*</td>
</tr>
<tr>
<td>Orange</td>
<td>40 mcg</td>
<td>0.8 ml*</td>
</tr>
<tr>
<td>Green</td>
<td>50 mcg</td>
<td>1 ml*</td>
</tr>
<tr>
<td>40kg</td>
<td>60 mcg</td>
<td>1.2 ml*</td>
</tr>
<tr>
<td>50kg</td>
<td>70 mcg</td>
<td>1.4 ml*</td>
</tr>
</tbody>
</table>

Note: *Doses greater than 25mcg (0.5ml) can be titrated to effect beginning with 25mcg increments.
**Indication: Shock/Hypotension**

*Maximum single bolus = 500ml*

<table>
<thead>
<tr>
<th>COLOR</th>
<th>Give (ml)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gray</td>
<td>80 ml</td>
</tr>
<tr>
<td>Pink</td>
<td>130 ml</td>
</tr>
<tr>
<td>Red</td>
<td>170 ml</td>
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<tr>
<td>Purple</td>
<td>210 ml</td>
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<tr>
<td>Yellow</td>
<td>260 ml</td>
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<tr>
<td>White</td>
<td>340 ml</td>
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<tr>
<td>Blue</td>
<td>420 ml</td>
</tr>
<tr>
<td>Orange</td>
<td>500 ml</td>
</tr>
<tr>
<td>Green</td>
<td>500 ml</td>
</tr>
<tr>
<td>40kg</td>
<td>500 ml</td>
</tr>
<tr>
<td>45kg</td>
<td>500 ml</td>
</tr>
</tbody>
</table>
Indication: Hypoglycemia  
Concentration = 1 mg/ml

<table>
<thead>
<tr>
<th>COLOR</th>
<th>Doses (mg)</th>
<th>Give (ml)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gray</td>
<td>0.5 mg</td>
<td>0.5 ml</td>
</tr>
<tr>
<td>Pink</td>
<td>0.5 mg</td>
<td>0.5 ml</td>
</tr>
<tr>
<td>Red</td>
<td>0.5 mg</td>
<td>0.5 ml</td>
</tr>
<tr>
<td>Purple</td>
<td>0.5 mg</td>
<td>0.5 ml</td>
</tr>
<tr>
<td>Yellow</td>
<td>0.5 mg</td>
<td>0.5 ml</td>
</tr>
<tr>
<td>White</td>
<td>0.5 mg</td>
<td>0.5 ml</td>
</tr>
<tr>
<td>Blue</td>
<td>0.5 mg</td>
<td>0.5 ml</td>
</tr>
<tr>
<td>Orange</td>
<td>1 mg</td>
<td>1 ml</td>
</tr>
<tr>
<td>Green</td>
<td>1 mg</td>
<td>1 ml</td>
</tr>
<tr>
<td>40kg</td>
<td>1 mg</td>
<td>1 ml</td>
</tr>
<tr>
<td>50kg</td>
<td>1 mg</td>
<td>1 ml</td>
</tr>
</tbody>
</table>
**Indication: Pain Management for Placement of IO**
(Not for patients in cardiac arrest)
Concentration = 2% (100mg/5ml)

<table>
<thead>
<tr>
<th>COLOR</th>
<th>Doses (mg)</th>
<th>Give (ml)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gray</td>
<td>Not given</td>
<td></td>
</tr>
<tr>
<td>Pink</td>
<td>3 mg</td>
<td>0.15 ml</td>
</tr>
<tr>
<td>Red</td>
<td>4 mg</td>
<td>0.2 ml</td>
</tr>
<tr>
<td>Purple</td>
<td>5 mg</td>
<td>0.25 ml</td>
</tr>
<tr>
<td>Yellow</td>
<td>7 mg</td>
<td>0.35 ml</td>
</tr>
<tr>
<td>White</td>
<td>9 mg</td>
<td>0.45 ml</td>
</tr>
<tr>
<td>Blue</td>
<td>10 mg</td>
<td>0.5 ml</td>
</tr>
<tr>
<td>Orange</td>
<td>14 mg</td>
<td>0.7 ml</td>
</tr>
<tr>
<td>Green</td>
<td>16 mg</td>
<td>0.8 ml</td>
</tr>
<tr>
<td>40kg</td>
<td>20 mg</td>
<td>1 ml</td>
</tr>
<tr>
<td>50kg</td>
<td>20 mg</td>
<td>1 ml</td>
</tr>
</tbody>
</table>
**Indication:** Seizure/Behavioral/Sedation for Cardioversion/Sedation for Advanced Airway  
Concentration = 5 mg/ml  
Single dose only – Repeat doses require Base Hospital order

<table>
<thead>
<tr>
<th>COLOR</th>
<th>Doses (mg)</th>
<th>Give (ml)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gray</td>
<td>0.5 mg</td>
<td>0.1 ml</td>
</tr>
<tr>
<td>Pink</td>
<td>0.75 mg</td>
<td>0.15 ml</td>
</tr>
<tr>
<td>Red</td>
<td>0.85 mg</td>
<td>0.17 ml</td>
</tr>
<tr>
<td>Purple</td>
<td>1 mg</td>
<td>0.2 ml</td>
</tr>
<tr>
<td>Yellow</td>
<td>1.25 mg</td>
<td>0.25 ml</td>
</tr>
<tr>
<td>White</td>
<td>1.75 mg</td>
<td>0.35 ml</td>
</tr>
<tr>
<td>Blue</td>
<td>2 mg</td>
<td>0.4 ml</td>
</tr>
<tr>
<td>Orange</td>
<td>2.75 mg</td>
<td>0.55 ml</td>
</tr>
<tr>
<td>Green</td>
<td>3.25 mg</td>
<td>0.65 ml</td>
</tr>
<tr>
<td>40kg</td>
<td>4 mg</td>
<td>0.8 ml</td>
</tr>
<tr>
<td>50kg</td>
<td>4.5 mg</td>
<td>0.9 ml</td>
</tr>
<tr>
<td>≥ 60kg</td>
<td>5 mg</td>
<td>1 ml</td>
</tr>
</tbody>
</table>

Note: Titrate dosage in 0.5 – 1mg increments to desired effect (seizure cessation) or 5mg maximum dose.
Indication: Respiratory Depression
Concentration = 1 mg/ml
Maximum single dose = 2mg

<table>
<thead>
<tr>
<th>COLOR</th>
<th>Doses (mg)</th>
<th>Give (ml)</th>
</tr>
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<tbody>
<tr>
<td>Gray</td>
<td>0.4 mg</td>
<td>0.4 ml</td>
</tr>
<tr>
<td>Pink</td>
<td>0.7 mg</td>
<td>0.7 ml</td>
</tr>
<tr>
<td>Red</td>
<td>0.9 mg</td>
<td>0.9 ml</td>
</tr>
<tr>
<td>Purple</td>
<td>1 mg</td>
<td>1 ml</td>
</tr>
<tr>
<td>Yellow</td>
<td>1.3 mg</td>
<td>1.3 ml</td>
</tr>
<tr>
<td>White</td>
<td>1.7 mg</td>
<td>1.7 ml</td>
</tr>
<tr>
<td>Blue</td>
<td>2 mg</td>
<td>2 ml</td>
</tr>
<tr>
<td>Orange</td>
<td>2 mg</td>
<td>2 ml</td>
</tr>
<tr>
<td>Green</td>
<td>2 mg</td>
<td>2 ml</td>
</tr>
<tr>
<td>40kg</td>
<td>2 mg</td>
<td>2 ml</td>
</tr>
<tr>
<td>50kg</td>
<td>2 mg</td>
<td>2 ml</td>
</tr>
</tbody>
</table>

Note: Naloxone is available in multiple concentrations. This chart is intended for a 1mg/ml concentration.
**Indication: Nausea/Vomiting**
Concentration = 4mg tablet
Maximum single dose = 4mg

<table>
<thead>
<tr>
<th>COLOR</th>
<th>Doses (mg)</th>
<th>Give (ml)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gray</td>
<td>Not indicated</td>
<td>Not indicated</td>
</tr>
<tr>
<td>Pink</td>
<td>Not indicated</td>
<td>Not indicated</td>
</tr>
<tr>
<td>Red</td>
<td>Not indicated</td>
<td>Not indicated</td>
</tr>
<tr>
<td>Purple</td>
<td>Not indicated</td>
<td>Not indicated</td>
</tr>
<tr>
<td>Yellow</td>
<td>Not indicated</td>
<td>Not indicated</td>
</tr>
<tr>
<td>White</td>
<td>4 mg</td>
<td>1 tablet</td>
</tr>
<tr>
<td>Blue</td>
<td>4 mg</td>
<td>1 tablet</td>
</tr>
<tr>
<td>Orange</td>
<td>4 mg</td>
<td>1 tablet</td>
</tr>
<tr>
<td>Green</td>
<td>4 mg</td>
<td>1 tablet</td>
</tr>
<tr>
<td>40kg</td>
<td>4 mg</td>
<td>1 tablet</td>
</tr>
<tr>
<td>50kg</td>
<td>4 mg</td>
<td>1 tablet</td>
</tr>
</tbody>
</table>

Note: Ondansetron is not indicated for motion sickness.
Indication: Nausea/vomiting
Concentration = 2 mg/ml
Maximum single dose = 4 mg

<table>
<thead>
<tr>
<th>COLOR</th>
<th>Doses (mg)</th>
<th>Give (ml)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gray</td>
<td>Not indicated</td>
<td>Not indicated</td>
</tr>
<tr>
<td>Pink</td>
<td>Not indicated</td>
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<tr>
<td>Red</td>
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<td>Not indicated</td>
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<tr>
<td>Purple</td>
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<td>Not indicated</td>
</tr>
<tr>
<td>Yellow</td>
<td>Not indicated</td>
<td>Not indicated</td>
</tr>
<tr>
<td>White</td>
<td>1 mg</td>
<td>0.5 ml</td>
</tr>
<tr>
<td>Blue</td>
<td>2 mg</td>
<td>1 ml</td>
</tr>
<tr>
<td>Orange</td>
<td>2 mg</td>
<td>1 ml</td>
</tr>
<tr>
<td>Green</td>
<td>3 mg</td>
<td>1.5 ml</td>
</tr>
<tr>
<td>40kg</td>
<td>4 mg</td>
<td>2 ml</td>
</tr>
<tr>
<td>50kg</td>
<td>4 mg</td>
<td>2 ml</td>
</tr>
</tbody>
</table>

Note: Ondansetron is not indicated for motion sickness. May be repeated x1 for patients ≥ 40kg.
<table>
<thead>
<tr>
<th>ABBREVIATION</th>
<th>DEFINITION</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;</td>
<td>Is greater than</td>
</tr>
<tr>
<td>&lt;</td>
<td>Is less than</td>
</tr>
<tr>
<td>≥</td>
<td>Is greater than or equal to</td>
</tr>
<tr>
<td>≤</td>
<td>Is less than or equal to</td>
</tr>
<tr>
<td>ACLS</td>
<td>Advanced Cardiopulmonary Life Support</td>
</tr>
<tr>
<td>AED</td>
<td>Automated External Defibrillator</td>
</tr>
<tr>
<td>ALS</td>
<td>Advanced Life Support</td>
</tr>
<tr>
<td>AMA</td>
<td>Against Medical Advice</td>
</tr>
<tr>
<td>AMI</td>
<td>Acute Myocardial Infarction</td>
</tr>
<tr>
<td>AMS</td>
<td>Altered Mental Status</td>
</tr>
<tr>
<td>APS</td>
<td>Adult Protective Services</td>
</tr>
<tr>
<td>BHP</td>
<td>Base Hospital Physician</td>
</tr>
<tr>
<td>BLS</td>
<td>Basic Life Support</td>
</tr>
<tr>
<td>BP</td>
<td>Blood Pressure</td>
</tr>
<tr>
<td>BPM</td>
<td>Beats Per Minute</td>
</tr>
<tr>
<td>BSA</td>
<td>Body Surface Area</td>
</tr>
<tr>
<td>BSI</td>
<td>Body Substance Isolation</td>
</tr>
<tr>
<td>BVM</td>
<td>Bag Valve Mask</td>
</tr>
<tr>
<td>CAB</td>
<td>Circulation, Airway, Breathing</td>
</tr>
<tr>
<td>CAD</td>
<td>Computer Aided Dispatch</td>
</tr>
<tr>
<td>CHF</td>
<td>Congestive Heart Failure</td>
</tr>
<tr>
<td>CHO</td>
<td>UCSF Benioff Children’s Hospital of Oakland</td>
</tr>
<tr>
<td>CHP</td>
<td>California Highway Patrol</td>
</tr>
<tr>
<td>COPD</td>
<td>Chronic Obstructive Pulmonary Disease</td>
</tr>
<tr>
<td>CPAP</td>
<td>Continuous Positive Airway Pressure</td>
</tr>
<tr>
<td>CPR</td>
<td>Cardiopulmonary Resuscitation</td>
</tr>
<tr>
<td>CPS</td>
<td>Child Protective Services</td>
</tr>
<tr>
<td>CT</td>
<td>Computed Tomography</td>
</tr>
<tr>
<td>CVA</td>
<td>Cerebral Vascular Accident</td>
</tr>
<tr>
<td>DNR</td>
<td>Do Not Resuscitate</td>
</tr>
</tbody>
</table>
### Approved Abbreviations

<table>
<thead>
<tr>
<th>ABBREVIATION</th>
<th>DEFINITION</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECG</td>
<td>Electrocardiogram</td>
</tr>
<tr>
<td>ED</td>
<td>Emergency Department</td>
</tr>
<tr>
<td>EHR</td>
<td>Electronic Health Record</td>
</tr>
<tr>
<td>EMS</td>
<td>Emergency Medical Services</td>
</tr>
<tr>
<td>EMT</td>
<td>Emergency Medical Technician</td>
</tr>
<tr>
<td>EMTALA</td>
<td>Emergency Medical Treatment and Active Labor Act</td>
</tr>
<tr>
<td>EOA</td>
<td>Exclusive Operating Area</td>
</tr>
<tr>
<td>ETA</td>
<td>Estimated Time of Arrival</td>
</tr>
<tr>
<td>EtCO₂</td>
<td>End Tidal Carbon Dioxide</td>
</tr>
<tr>
<td>ETT</td>
<td>Endotracheal Tube</td>
</tr>
<tr>
<td>GCS</td>
<td>Glasgow Coma Score</td>
</tr>
<tr>
<td>H₂O</td>
<td>Water</td>
</tr>
<tr>
<td>HIPAA</td>
<td>Health Insurance Portability and Accountability Act</td>
</tr>
<tr>
<td>HR</td>
<td>Heart Rate (as depicted on an ECG) – not to be confused with pulse rate</td>
</tr>
<tr>
<td>IC</td>
<td>Incident Commander</td>
</tr>
<tr>
<td>ICS</td>
<td>Incident Command System</td>
</tr>
<tr>
<td>IFT</td>
<td>Inter-facility Transfer</td>
</tr>
<tr>
<td>IM</td>
<td>Intramuscular</td>
</tr>
<tr>
<td>IN</td>
<td>Intranasal</td>
</tr>
<tr>
<td>IO</td>
<td>Intraosseous</td>
</tr>
<tr>
<td>IV</td>
<td>Intravenous</td>
</tr>
<tr>
<td>IVP</td>
<td>Intravenous Piggyback</td>
</tr>
<tr>
<td>LOC</td>
<td>Level of Consciousness</td>
</tr>
<tr>
<td>MCI</td>
<td>Multi Casualty Incident</td>
</tr>
<tr>
<td>MHOAC</td>
<td>Medical/Health Operational Area Coordinator</td>
</tr>
<tr>
<td>MOI</td>
<td>Mechanism of injury</td>
</tr>
<tr>
<td>NIMS</td>
<td>National Incident Management System</td>
</tr>
<tr>
<td>NREMT</td>
<td>National Registry of Emergency Medical Technicians</td>
</tr>
<tr>
<td>NS</td>
<td>Normal Saline</td>
</tr>
<tr>
<td>NTG</td>
<td>Nitroglycerin</td>
</tr>
<tr>
<td>ABBREVIATION</td>
<td>DEFINITION</td>
</tr>
<tr>
<td>--------------</td>
<td>------------</td>
</tr>
<tr>
<td>PALS</td>
<td>Pediatric Advanced Life Support</td>
</tr>
<tr>
<td>PMS</td>
<td>Pulse, motor, and sensation</td>
</tr>
<tr>
<td>PO</td>
<td>Periorally</td>
</tr>
<tr>
<td>PPE</td>
<td>Personal Protective Equipment</td>
</tr>
<tr>
<td>PPV</td>
<td>Positive Pressure Ventilation</td>
</tr>
<tr>
<td>PR</td>
<td>Pulse rate (manually obtained) – not to be confused with heart rate</td>
</tr>
<tr>
<td>PSAP</td>
<td>Primary Service Answering Point (9-1-1)</td>
</tr>
<tr>
<td>QA</td>
<td>Quality Assurance</td>
</tr>
<tr>
<td>QI</td>
<td>Quality Improvement</td>
</tr>
<tr>
<td>RIVP</td>
<td>Rapid Intravenous Push</td>
</tr>
<tr>
<td>RN</td>
<td>Registered Nurse</td>
</tr>
<tr>
<td>ROSC</td>
<td>Return of Spontaneous Circulation</td>
</tr>
<tr>
<td>RR</td>
<td>Respiratory Rate</td>
</tr>
<tr>
<td>SBP</td>
<td>Systolic Blood Pressure</td>
</tr>
<tr>
<td>SEMS</td>
<td>Standardized Emergency Management System</td>
</tr>
<tr>
<td>SIDS</td>
<td>Sudden Infant Death Syndrome</td>
</tr>
<tr>
<td>SIVP</td>
<td>Slow Intravenous Push</td>
</tr>
<tr>
<td>SL</td>
<td>Sublingual</td>
</tr>
<tr>
<td>SOB</td>
<td>Shortness of Breath</td>
</tr>
<tr>
<td>SpO₂</td>
<td>Pulse Oximeter Oxygen Concentration</td>
</tr>
<tr>
<td>SC</td>
<td>Subcutaneous</td>
</tr>
<tr>
<td>SRC</td>
<td>STEMI Receiving Center</td>
</tr>
<tr>
<td>STEMI</td>
<td>ST-Segment Elevation Myocardial Infarction</td>
</tr>
<tr>
<td>TKO</td>
<td>To Keep Open</td>
</tr>
<tr>
<td>V-Fib</td>
<td>Ventricular Fibrillation</td>
</tr>
<tr>
<td>V-Tach</td>
<td>Ventricular Tachycardia</td>
</tr>
<tr>
<td>Drug</td>
<td>Indication</td>
</tr>
<tr>
<td>-----------------------</td>
<td>-----------------------------</td>
</tr>
<tr>
<td><strong>Adenosine</strong></td>
<td>Narrow complex tachycardia</td>
</tr>
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<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Albuterol</strong></td>
<td>Bronchospasm</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Crush injury - hyperkalemia</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Amiodarone</strong></td>
<td>V-Fib</td>
</tr>
<tr>
<td></td>
<td>Pulseless V-Tach refractory</td>
</tr>
<tr>
<td></td>
<td>to three (3) shocks</td>
</tr>
<tr>
<td></td>
<td>Symptomatic stable V-Tach</td>
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<tr>
<td></td>
<td></td>
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<tr>
<td><strong>Aspirin</strong></td>
<td>Chest pain – suspected</td>
</tr>
<tr>
<td></td>
<td>cardiac or STEMI</td>
</tr>
<tr>
<td><strong>Atropine</strong></td>
<td>Symptomatic bradycardia</td>
</tr>
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<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Organophosphate overdose</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Drug</td>
<td>Indication</td>
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<td>-----------------------------------</td>
</tr>
<tr>
<td>Atropine</td>
<td>Organophosphate overdose</td>
</tr>
<tr>
<td>Calcium Chloride</td>
<td>Hydrofluoric acid exposure</td>
</tr>
<tr>
<td>Dextrose 10%</td>
<td>Hypoglycemia</td>
</tr>
<tr>
<td>Diphenhydramine</td>
<td>Allergic reaction</td>
</tr>
<tr>
<td></td>
<td>Dystonic reaction</td>
</tr>
<tr>
<td>Cardiac arrest</td>
<td>1mg IV/IO every 3-5 minutes</td>
</tr>
<tr>
<td>Epi 1:10,000</td>
<td>Cardiac arrest/Bradycardia</td>
</tr>
<tr>
<td></td>
<td>Anaphylactic shock</td>
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<tr>
<td>Drug</td>
<td>Indication</td>
</tr>
<tr>
<td>------</td>
<td>-----------</td>
</tr>
<tr>
<td>Epi 1:1,000</td>
<td>Anaphylactic shock</td>
</tr>
<tr>
<td></td>
<td>Asthma/COPD or Pediatric respiratory distress</td>
</tr>
<tr>
<td>EpiPen EpiPen Jr.</td>
<td>Allergic reaction/Anaphylaxis</td>
</tr>
<tr>
<td>Fentanyl</td>
<td>Pain control</td>
</tr>
<tr>
<td>Glucagon</td>
<td>Hypoglycemia</td>
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<tr>
<td>Lidocaine</td>
<td>IO anesthetic</td>
</tr>
<tr>
<td>Midazolam</td>
<td>Seizure</td>
</tr>
<tr>
<td>Drug</td>
<td>Indication</td>
</tr>
<tr>
<td>--------</td>
<td>---------------------------------</td>
</tr>
</tbody>
</table>
| Midazolam | Behavioral emergency            | Initial - 5mg IM/IN or 1-3mg IV in 1mg increments  
May repeat to a max of 5mg  
For excited delirium  
Initial – 5mg IM/IN  
May repeat to a max of 10mg  
For patients ≥ 12 years of age only. Refer to pediatric dosing guide | Use caution in patients over 60 years of age.  
Observe respiratory status after administration.  
For pediatric patients, repeat orders require Base Hospital orders. |
|       | Sedation for pacing or cardioversion | 1mg IV/IO  
Titrate in 1-2mg increments to a max of 5mg | Refer to pediatric dosing guide | |
|       | Sedation of patient with an advanced airway | 2-5mg IV/IO  
May repeat to a max of 5mg | Refer to pediatric dosing guide | |
| Naloxone | Respiratory depression or apnea  | 2mg IN or 1-2mg IV/IM  
Refer to pediatric dosing guide | Abrupt withdrawal symptoms and combative behavior may occur.  
IN administration preferred unless patient is in shock or has copious secretions/blood in nares. Shorter duration of action than that of narcotics. Titrate to effect of normal respirations; it is not necessary to fully wake the patient. | |
| Naloxone | Overdose                        | 1 preload syringe  
Refer to pediatric dosing guide | See Naloxone  
See Naloxone | |
<table>
<thead>
<tr>
<th>Drug</th>
<th>Indication</th>
<th>Dosing</th>
<th>Cautions</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nitroglycerin</td>
<td>Chest pain</td>
<td>0.4mg SL</td>
<td>Do not administer if STEMI is detected. Can cause hypotension and headache. Do not administer if systolic BP &lt; 90mmHg or heart rate &lt; 50. Do not administer if patient has taken Viagra, Levitra, Staxyn, or Stendra within past 24 hours or Cialis if taken within 36 past hours.</td>
<td>Perform 12-Lead ECG prior to administration.</td>
</tr>
<tr>
<td></td>
<td>Pulmonary edema</td>
<td>0.4mg SL if systolic BP &gt; 90mmHg</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.8mg SL if systolic BP &gt; 150mmHg</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>May repeat appropriate dose every 5 minutes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ondansetron</td>
<td>Vomiting or severe nausea</td>
<td>4mg IV/IO/IM/ODT</td>
<td>Administer IV/IO dose over 1 minute as rapid administration may cause syncope.</td>
<td>None</td>
</tr>
<tr>
<td>Sodium Bicarbonate</td>
<td>Tricyclic antidepressant overdose</td>
<td>1mEq/kg IV/IO</td>
<td>Can precipitate with or inactivate other drugs.</td>
<td>Use only if life-threatening or in the presence of hemodynamically significant dysrhythmias.</td>
</tr>
<tr>
<td></td>
<td>Crush injury</td>
<td></td>
<td></td>
<td>Administer 20ml flush IV/IO when delivering in conjunction Calcium Chloride.</td>
</tr>
<tr>
<td></td>
<td>Hyperkalemia</td>
<td>50mEq IV/IO</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>