
Field Treatment Guideline

Updates For 2022
<table>
<thead>
<tr>
<th>Field Treatment Guideline</th>
<th>2022 Summary of Updates</th>
<th>Reason for change/evidence/other notes</th>
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</thead>
</table>
| **AC05 - Symptomatic Bradycardia** | 1. Change name to "Bradycardia"  
2. Increase initial dose of Atropine to 1mg  
3. Add hypotension/shock arm with push dose epi  
4. Add definition of unstable | *Cleaned and clarified algorithm*  
*Consistent with 2020 AHA guidelines* |
| **AC06 - Narrow Tachycardia** | 1. Change name to "Tachycardia" | |
| **AC07 - Wide Tachycardia** | 1. Combined both Tachycardia FTGs into one.  
2. Add definition of Unstable  
3. Add immediate synchronized cardioversion for unstable patients | |
| **AC08 - Chest Pain and STEMI** | 1. Update history, s/s and dx  
2. Add NTG in STEMI when indicated  
3. Remove base contact for additional fentanyl  
4. Add NTG contraindications  
5. Add indications for fluid administration  
6. Clarified STEMI definition to >= 2mm ST elevation in anterior and/or lateral leads | *Cleaned and clarified algorithm*  
*The concern about NTG causing hypotension in the setting of an inferior wall MI was not seen in two large retrospective studies. [Links to articles below]*  
*Safety and Effectiveness of Field NTG in Patients with Suspected STEMI*  
*Intranasal delivery may be inconsistent or not immediately effective in uncooperative patients.*  
*Updated history, s/s and dx*

| **Adult Medical** | | |
| **A06a - Post-Partum Hemorrhage** | 1. New FTG for FPI 2022 | |
| **A09 - Dyspnea** | 1. Changed CPAP to be within EMT Scope | To be current with EMT Scope of practice |
| **A14 - Pain Control** | 1. Changed delivery language in Ketamine box to: "Draw in a tuberculin syringe and dilute dose in 10 ml or 100 ml NS for infusion over 2 minutes" | Ask from the field personnel for clarification on administration |

| **Pediatric Medical** | | |
| **P04 - Pediatric Behavioral** | 1. Add "Suggested Agitation Categories" Levels  
2. Add "Caution" direction for reassessment prior to sedation administration  
3. Removed IV route for Midazolam administration | *Clinical Care and restraint of Agitated or Combative Patients by Emergency Medical Services Providers*  
*Intranasal delivery may be inconsistent or not immediately effective in uncooperative patients.*  
*Updated history, s/s and dx* |

| **Trauma** | | |
| **T04 - Extremity Trauma** | 1. Include exit to T09 - Major Hemorrhage control  
2. Remove references to tourniquet or hemostatic gauze | *Moved Major Hemorrhage to new FTG - T09*  
*Updated FTG to include reference for exclusion of STEMI* |
| **T06 - Multi System Trauma** | 1. Include exit to T09 - Major Hemorrhage control  
2. Remove references to tourniquet or hemostatic gauze | *Moved Major Hemorrhage to new FTG - T09*  
*Updated FTG to include reference for exclusion of STEMI* |
| **T09 - Major Hemorrhage Control** | 1. New FTG for FPI 2022 | |

| **Field Procedure** | | |
| **FP11 - CPAP** | 1. Changed CPAP to be within EMT Scope | To be current with EMT Scope of practice |
| **FP13 - External Pacing** | 1. Changed indication to be inline with Unstable definition in AC05 - Bradycardia | Consistent with 2020 AHA guidelines |
| **FP30 - TXA Administration** | 1. New FP for 2022 | *Effects of Tranexamic Acid on Death, Vascular Occlusive Events, and Blood Transfusion in Trauma Patients with Significant Hemorrhage - Crash-2 Trial* |
| **FP31 - Synchronized Cardioversion** | 1. New FP for 2022 | Response to FP missing in manual. |

| **Drug Reference** | | |
| All Added convention for all EMT approved medications to include yellow E along with green background | *Updates to FTGs required an update in this reference* |
| Added Atropine indication for unstable bradycardia back into reference. Changed to 1 mg IV/IO. | |
| Added to Ketamine: "Draw in a tuberculin syringe and dilute dose in 10 ml or 100 ml NS for infusion over 2 minutes.1. Changed CPAP to be within EMT Scope" | |
| 1. Update NTG to remove exclusion of STEMI  
2. Add TKA | |
Bradycardia

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

**Signs and Symptoms**
- Heart rate < 60 with:
  - Chest pain
  - Respiratory distress/acute CHF
  - Hypotension or shock
  - Altered mental status
  - Dizziness/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. 1st, 2nd or 3rd)
- Overdose
- Hypothyroidism

**Unstable due to Bradycardia**
- Hypotension/shock often with signs of poor perfusion
- Altered mental status
- Chest pain highly suggestive of ACS:
  - Severe crushing chest pain
  - Pale/diaphoretic
  - With or without evidence of ischemia on EKG (STEMI, T-wave inversion/depression)

**Flowchart**
- Cardiac monitor
- 12-Lead ECG
- EtCO₂ monitoring

Is the patient stable?
- Stable
- Unstable due to Bradycardia

**Transcutaneous Pacing**
- Establish IV/IO, do not delay pacing for the unstable patient

Consider **Atropine 1mg IV/IO**
- while waiting for TCP
- May repeat every 3 – 5 minutes as needed
- Should not be used in wide-complex rhythms or in 2nd or 3rd heart blocks
  - Maximum 3mg

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

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

**Normal Saline bolus 500ml IV/IO**, may repeat as needed
- **Maximum 1L**

Consider **Push Dose Epi 10mcg (1 ml) IV/IO**
- Every 3 minutes, titrate to a BP > 90

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

**Observe and monitor**

**Effective Jan. 2022**
Pearls

- Worsening bradycardia in ROSC may indicate signs of impending rearrest.
- Instability due to bradycardia is typically seen with heart rates < 35 bpm. Prehospital treatment is directed toward the unstable patient, 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 2° or 3° heart block.
- For patients who are not in 2° or 3° 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 2° or 3° heart blocks will not have a response to Atropine because the heart rates are not based on vagal tone. An increase in ventricular arrhythmias may occur.
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 palpations/heart racing
- Syncope/near syncope

**Signs and Symptoms**
- Hypotension
- Palpitations, 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**
- Dysrhythmia
- Sick sinus syndrome
- Myocardial infarction
- Electrolyte imbalance
- Exertion, pain, or emotional stress
- Fever/sepsis
- Hypoxia
- Hypovolemia or anemia
- Drug effect/overdose (see History)
- Hyperthyroidism
- Pulmonary embolus

**Unstable due to Tachycardia**
- HR typically >150
- Hypotension/shock often with signs of poor perfusion
- Altered mental status
- Chest pain highly suggestive of ACS:
  - Severe crushing chest pain
  - Pale/diaphoretic
  - With or without evidence of ischemia on EKG (STEMI, T-wave inversion/depression)

**Immediate Synchronized Cardioversion**
- Narrow Regular: 100J, 150J, 200J...
- Narrow Irregular: 150J, 200J, 300J...
- Wide Regular: 150J, 200J, 300J...
- Wide Irregular: Defibrillate 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

**Notify receiving facility.
Contact Base Hospital for medical direction, as needed.**
Pearls

- 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.
- If at any point the patient becomes unstable, move to the unstable arm of the algorithm.
- For ASYMPTOMATIC patients (or those with only minimal symptom, 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.
- 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.
- 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 AFib with left or right bundle, etc, synchronize cardioversion at 360J is more likely to yield first shock conversion.
- 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.
- Search for underlying cause of tachycardia such as fever, sepsis, dehydration, hypovolemia, 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 tachycardia patients.
Chest Pain: Suspected Cardiac or STEMI

### History
- Age
- Medications
- Past medical history (e.g. MI, angina, diabetes, CAD, HTN, hyperlipidemia)
- 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
- Chest pain
- Shortness of breath
- Pale, cool, diaphoretic
- Nausea, vomiting
- Hypotension or shock
- Possible bradycardia
- Syncope

#### Atypical presentations for elderly patients
- Epigastric pain
- Generalized weakness

### Differential
- Acute coronary syndrome (MI, unstable angina)
- Pulmonary embolus
- Aortic dissection
- Pericarditis
- Pneumothorax
- Pneumonia
- Tamponade

### Signs and Symptoms
- Chest pain
- Shortness of breath
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#### Atypical presentations for elderly patients
- Epigastric pain
- Generalized weakness

### Treatment

#### Aspirin 324mg PO

Establish IV/IO

<table>
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<tr>
<th>Condition</th>
<th>Action</th>
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<tr>
<td>If initial SBP &gt; 90</td>
<td>Nitroglycerin 0.4mg sublingual May repeat every 5 minutes as needed. Maximum 3 doses.</td>
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<tr>
<td>Use caution and consider base contact if HR &gt;120 prior to administration. Do not administer if patient has taken erectile dysfunction drugs (e.g. Viagra, Levitra) within the last 24 hours or (e.g. Cialis) within 36 hours.</td>
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<td>If SBP &lt;90 or drops &gt;30 from baseline after NTG</td>
<td>Withhold further NTG administration and Normal Saline bolus 500ml IV/IO May repeat as needed Maximum 1L</td>
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Consider Fentanyl 25 – 200mcg IV titrated in 25 – 50mcg increments for pain relief if SBP > 90

### Diagram

- Primary assessment indicates chest pain or signs/symptoms consistent with cardiac ischemia
- Cardiac monitor
  - Titrate O2 administration to min needed to maintain goal of 94%-99% SPO2
  - 12-Lead ECG
- No
- Yes
  - STEMI?
    - Immediate transmission of 12 lead to STEMI receiving facility
    - Make STEMI ALERT notification to STEMI receiving facility

### Definition of STEMI
- > 1mm ST segment elevation in inferior, or
- > 2mm ST segment elevation in anterior or lateral leads, in 2 or more contiguous leads (See 12-Lead Procedure)

### 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

### Notes
- Notify receiving facility. Contact Base Hospital for medical direction, as needed.

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**Effective Jan. 2022**

**Contra Costa County Emergency Medical Services**

**Chest Pain: Suspected Cardiac or STEMI**

**Treatment Guideline AC08**

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PEARLS

• 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.
**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

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**Assess patient’s level of Agitation**

**Mild**
Anxious/agitated but cooperative
- Not aggressive (verbally or physically)
- Has the potential to be easily provoked or triggered

**Moderate**
Verbally confrontational
Uncooperative
- Easily provoked or triggered
- Threatening physical posture (clenched jaw, fists)
- Not physically combative
- Disruptive without danger

**Severe**
Overtly confrontational
Physically combative (fighting, spitting, biting)
- Has little control
- Not easily directed
- Not able to be deescalated

**Excited Delirium**
Extremely aggressive or violent
- Poses immediate and grave danger to self or providers and exhibits the following:
  - Possibly confused or incoherent
  - Unable to maintain attention
  - Significantly increased strength
  - Impervious to pain or fatigue
  - Diaphoresis
  - Hot/flushed skin
  - Tachycardia

**Midazolam**
- 5mg IM
- May repeat 2.5mg every 5 minutes to effect **Maximum 10mg**

**Midazolam**
- 1-3mg IV in 1mg increments
  - Age ≥ 65 years of age: 1mg IV/IM
  - May repeat every 5 minutes to effect
  - **Maximum 5mg**

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**Exit to appropriate TG, if indicated**

- Gulfstream
- Altered Mental Status TG
- Diabetic TG
- Overdose/Toxic Ingestion TG
- Head Trauma TG

Assume patient has medical cause of behavioral change

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**Consider restraints**
- Monitor restraints and PMS **if indicated**
- If patient is hot to touch or suspected hyperthermia, initiate cooling measures
- Monitor and reassess
- Blood glucose analysis
- Consider IV
- Cardiac monitor

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

**MD**
- Contact Base Hospital Physician for additional order
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.
- Use least restrictive method needed to manage patient and to ensure safety.
- Use caution when administering Midazolam for postictal patients or patients with alcohol intoxication. Apply waveform capnography and frequently assess for depressed respirations and level of consciousness.
- 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.).
- 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.
History
- Bleeding < 24 hours after delivery
- Out of hospital delivery
- Quantity and duration of bleeding
- Placenta delivery

Signs and Symptoms
- Bleeding
- Dizziness/syncope
- Weakness/dyspnea
- Confusion/ALOC
- Hypotension or other signs of shock

Differential
- Trauma (vaginal or cervical laceration)
- Uterine atony
- Retained tissue/placenta
- Coagulopathy

Primary assessment indicates post-partum (within last 24 hours) ongoing hemorrhage or hemodynamic instability

- Supplemental oxygen as required
- Visualize for and manage bleeding from external laceration
  - Initiate gentle fundal massage to encourage delivery of placenta. If placenta delivered, massage until uterus is firm.
  - Encourage breast feeding
- Establish IV/IO
- Cardiac Monitor

Normal Saline 500ml - 1000ml bolus to maintain SBP > 90

Estimated blood loss >500ml
And initial SBP < 90?

- No
- Yes

Yes

- Consider TXA 1gm in 100ml IV/IO over 10 minutes

No

Notify receiving facility.
Contact Base Hospital for medical direction, as needed.
Causes of Post-Partum Hemorrhage

- The Four T's of Post-Partum Hemorrhage (PPH) include:
  - Tone – (70% of PPH incidents) is uterine atony which occurs when the uterus fails to contract after delivery of the baby. Contraction of the uterine muscles helps deliver the placenta, and compresses blood vessels to prevent hemorrhage.
  - Trauma (20% of PPH incidents), which includes:
    Lacerations of the cervix, vagina or perineum;
  - Tissue (10% of PPH incidents), which includes:
    Retained products, placenta, membranes or clots; or
    An abnormal placenta
  - Thrombin (less than 1% of PPH incidents), which is caused by issues with coagulation.

Pearls

PPH is the leading cause of maternal mortality in the world.

Primary Post-partum hemorrhage is excessive bleeding within the first 24 hours of birth. It is defined as either:

- The loss of more than 500 ml of blood following vaginal birth;
  - Minor: 500 ml to 1 liter
  - Major: More than 1 liter
- The loss of more than 1 liter of blood following a caesarean section; or
- Enough blood loss to cause the mother's condition to deteriorate.

Clinical signs of shock may not manifest until considerable blood loss has occurred. Recognition is critical.

Secondary PPH is defined as a loss of more than 500 ml of blood between 24 hours postpartum and 6 weeks postpartum

Fundal massage is the most important intervention for primary post-partum hemorrhage. It helps contract the uterus and encourage delivery of the placenta.

Breast feeding helps release the hormone, Oxytocin, which also helps contract the uterus.
Contra Costa County Emergency Medical Services

Shortness of Breath

**History**
- Asthma; COPD – chronic bronchitis and emphysema
- Home treatment (e.g. oxygen or nebulizer)
- Medications (e.g. Theophylline, steroids, inhalers, digoxin, lasix, Viagra, Sildenafil, levitra, vardenafil, cialis, or tadalafil)
- Toxic exposure or smoke inhalation
- Cardiac History including MI

**Signs and Symptoms**
- Shortness of breath
- Increased respiratory rate and effort
- Diminished or abnormal lung sounds
- Tachycardia
- Purse lip breathing
- Use of accessory muscles
- Peripherally edema or diaphoresis
- Pink, frothy sputum

**Differential**
- Asthma
- COPD
- Congestive Heart Failure
- Myocardial Infarction
- Aspiration
- Pneumonia
- Pulmonary embolus
- Hyperventilation
- Inhaled toxin

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**Routine Care**
- Apply Oxygen maintain goal SpO2 93 to 95%  
- Airway support  
- Lung Sounds  
- Cardiac monitor  
- 12-Lead ECG  
- EtCO2 monitoring  
- Consider IV/IO

**PERI-ARREST OR SEVERE DISTRESS?**  
**Consider administering Epinephrine 1:1,000 0.3mg IM**

**P**
- Albuterol nebulizer 5mg  
- Repeat as needed  
- Consider CPAP

**E**
- Improving?  
  - No  
    - If no improvement, consider Epinephrine 1:1,000 0.3mg IM (Use 0.15mg for patients > 50 years of age)
  - Yes  
    - Notifying receiving facility.  
      - Contact Base Hospital for medical direction, as needed

**Airway Obstructed?**
- Yes  
  - Exit to A02 - Adult Airway TG
- No  
  - Allergic Reaction/Anaphylaxis?
    - Yes  
      - Exit to A04 – Allergic Reaction/Anaphylaxis TG
    - No  
      - Ventilation Adequate? Oxygenation Adequate?
        - No  
          - Lung Sounds  
            - Rales, pedal edema, hx of heart disease
        - Yes  
          - Wyeeses, Hx of Asthma/COPD

**Ventilation Adequate? Oxygenation Adequate?**
- No  
  - BP > 90  
    - Nitroglycerin 0.4mg sublingual  
      - If systolic BP > 150, double Nitroglycerin to 0.8mg sublingual  
      - Repeat every 5 minutes as needed  
    - Improving?  
      - Yes  
        - Consider CPAP  
      - No  
        - Hypotension/Shock
          - BP < 90
            - Hypotensive  
              - Systolic < 90
                - Remove CPAP
                - Consider A12 Hypotension/Shock TG
            - No  
              - Notify receiving facility.  
                - Contact Base Hospital for medical direction, as needed
        - Improving?
          - Yes  
            - Consider CPAP
          - No  
            - Exit to A02 - Adult Airway TG
Pearls

- If a patient is in CHF AND the 12 lead indicates STEMI, treat with nitroglycerine as on this treatment guideline. Nitro is withheld if the patient has a STEMI and CHF symptoms are not present.
- 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:
  1) Patients with a history of coronary artery disease, MI, stents, CHF, cardiac surgery; OR
  2) 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.
- 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.
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

- Position of comfort
- Apply cold pack if applicable
- Monitor and reassess
- Consider IV/IO procedure
- Assess and monitor respiratory status
- Monitor continuous EtCO2
- Apply and monitor cardiac rhythm

Moderate to severe pain

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

Acetaminophen 1g IV/IO infusion over 15 minutes (single dose only)
Monitor and reassess every 5 minutes following administration

Ketamine IV/IO
500mg/10ml = 50mg/ml

- Weight
- Dose
- Volume
- 50-69 kg
  - 15mg
  - 0.3 ml
- 70-89 kg
  - 20mg
  - 0.4 ml
- 90+
  - 30mg
  - 0.6 ml

Draw in a tuberculin syringe and dilute dose in 10 ml or 100 ml NS for infusion over 2 minutes

- Single dose only
- Monitor and reassess every 5 minutes following administration

Consider for longer acting relief
Acetaminophen 1g IV/IO infusion over 15 minutes (single dose only)
Monitor and reassess every 5 minutes following administration

Notify receiving facility.
Contact Base Hospital for medical direction as needed

Fentanyl or Ketamine
Contact Base Hospital for additional order

DO NOT ADMINISTER FENTANYL AND KETAMINE TO THE SAME PATIENT.
**Pearls**

**DO NOT ADMINISTER FENTANYL AND KETAMINE TO THE SAME PATIENT.**

- 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 patients who have a tolerance to opioids, non-narcotic therapies may be appropriate until evaluation at the receiving facility.

- Acetaminophen may be administered once in addition to Fentanyl or Ketamine for patients with severe pain.

- Do not administer Acetaminophen to patients with severe liver impairment or active liver disease.

- Contraindications of Fentanyl and Ketamine include:
  - Closed head injury
  - Hypotension (BP < 90)
  - Altered level of consciousness
  - Respiratory failure/worsening status
  - Headache
  - Childbirth/suspected active labor

- 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 OR KETAMINE TO ACHIEVE PAIN CONTROL. CONTACT THE BASE HOSPITAL FOR ADDITIONAL ORDERS.
**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

**Assess patient’s level of Agitation**

**Mild**
- Anxious/agitated but cooperative
- Not aggressive (verbally or physically)
- Has the potential to be easily provoked or triggered

**Moderate**
- Verbally confrontational
- Uncooperative
- Easily provoked or triggered
- Threatening physical posture (clenched jaw, fists)
- Not physically combative
- Disruptive without danger

**Severe**
- Overtly confrontational
- Physically combative (fighting, spitting, biting)
- Has little control
- Not easily directed
- Not able to be deescalated

**Excited Delirium**
- Extremely aggressive or violent
- Poses immediate and grave danger to self or providers and exhibits the following:
  - Possibly confused or incoherent
  - Unable to maintain attention
  - Significantly increased strength
  - Impervious to pain or fatigue
  - Diaphoresis
  - Hot.flushed skin
  - Tachycardia
  ** Patients are often found in a protracted physical struggle requiring physical restraint by multiple providers.

**Approach patient with caution and begin verbal de-escalation. Exhaust de-escalation techniques prior to consideration of physical restraints. Provide continuous reassessment of situation to ensure patient and provider safety.**

**Consider**
- restraints
- Monitor restraints and PMS
- if indicated
- If patient is hot to touch or suspected hyperthermia, initiate cooling measures
- Monitor and reassess
- Blood glucose analysis
- Consider IV
- Cardiac monitor

**Exit to appropriate TG, if indicated**
- Altered Mental Status TG
- Diabetic 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, as needed.

**MD**
- Contact Base Hospital Physician for additional order
Pearls

- Crew/responder safety is the main priority. See Policy 1008 – Managing Assaultive Behavior/Patient Restraint.
- Use least restrictive method needed to manage patient and to ensure safety.
- Use caution when administering Midazolam for postictal patients or patients with alcohol intoxication. Apply waveform capnography and frequently assess for depressed respirations and level of consciousness.
- 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.).
- 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.

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.
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

History

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 pain control

Notify receiving facility.
Contact Base Hospital for medical direction, as needed.

Differential

Control hemorrhaging
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 pain control

Albuterol nebulizer 5mg in 6ml Normal Saline

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 pushing next med
Sodium Bicarbonate 1mEq/kg

Early transport after release
Limit scene time to 10 minutes for critical patients

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 and hemostatic gauze may also be appropriate for hemorrhage control in multi-casualty incidents.
- Consider the use of hemostatic gauze to pack the wound. More than hemostatic agent may be needed. Secure hemostatic gauze in place with a compression bandage.
- 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
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

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**Early transport**
Limit scene time to 10 minutes for critical patients

**Spinal Motion Restriction**
if indicated

- Secure airway and support respiratory rate
- Place splints and cold packs to stabilize fractures as necessary
- Control hemorrhage
  - Do not delay transport
- 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**

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

Multi-System Trauma

Pears
- 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.
- 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.
**Major Hemorrhage Control**

**History**
- Quantity and duration of bleeding
- Meds (anticoagulants)
- Recent trauma
- Pregnant or menstruating
- Recent surgery

**Signs and Symptoms**
- Visible external bleeding
- Melena
- Rectal bleeding
- Hematuria
- Vaginal bleeding
- Dizziness/syncope
- Weakness/dyspnea
- Confusion/ALOC
- Hypotension or other signs of shock

**Differential**
- Trauma
- Coagulopathy
- GI bleed
- Urinary tract pathology
- Vaginal bleeding (all causes)

---

**Cardiac monitor**

**Establish IV/IO**

**Normal Saline bolus 1L IV/IO**
May repeat to maintain SBP >90

For poor perfusion or shock in ped:
**Normal Saline bolus IV/IO**
Use PEDIATAPE and refer to dosing guide
Repeat to age dependent goal SBP

**Consider Hemostatic Gauze (FP28)** for junctional injury not amenable to tourniquet

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**Tranexamic Acid**

**Indications (all three must be met)**
1) Age ≥ 15
2) Blunt/penetrating trauma and injury within 3 hours or postpartum hemorrhage
3) SBP < 90 due to uncontrolled hemorrhage

**Contraindications**
1) Isolated head injury (blunt or penetrating)
2) Cervical cord injury with motor deficit
3) Traumatic arrest (with > 5 minutes CPR without ROSC)
4) Isolated drowning or hanging victims

---

**Secure airway and support respiratory rate**

If indicated

**Apply direct pressure/pressure dressing to injury**

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**Hemorrhage controlled?**

**No**

**Yes**

**Extremity Injury?**

**Yes**

**Apply tourniquet(s) (FP21)**

**No**

**Consider Hemostatic Gauze (FP28)** for junctional injury not amenable to tourniquet

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**Cardiac monitor**

**Establish IV/IO**

**Normal Saline bolus 1L IV/IO**
May repeat to maintain SBP >90

For poor perfusion or shock in ped:
**Normal Saline bolus IV/IO**
Use PEDIATAPE and refer to dosing guide
Repeat to age dependent goal SBP

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**Notify receiving facility. Contact Base Hospital for medical direction, as needed.**

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**Effective Jan. 2022**
Pearls

- Scene time for major trauma patients should be limited to < 10 minutes whenever possible.
- Transport should NOT be delayed to administer fluids or TXA. Administer these during transport if time permits.
- Hypotension indicates stage 3 hypovolemic shock and at least 1500 cc of blood loss.
- Tachycardia (if not due to other causes) is a hallmark of stage 2 hypovolemic shock. Providers should anticipate progression, resuscitate with crystalloid fluids and prepare to administer TXA should hypotension occur.
- Pressure dressing indications include limb, torso and head wounds with significant bleeding. Can also be applied as an adjunct to hemostatic agent.
- Tourniquet indications include life threatening hemorrhage to limbs and amputations/mangled limb with multiple locations of bleeding. If hemorrhage is not controlled with one tourniquet, a second can be applied more proximally.
- Wound packing locations include limbs, neck, shoulder hips and groin. (DO NOT USE TO PACK ABDOMEN, CHEST OR SKULL)
- Early communication to advise the receiving hospital of the use of TXA is critical.
- Make sure to label the medication on the IV bag.
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:
Unstable patients requiring pacing due to bradycardia may include:
- Hypotension/shock often with signs of poor perfusion
- Altered mental status
- Chest pain highly suggestive of ACS:
  - Severe crushing chest pain
- Pale/diaphoretic
  - With or without evidence of ischemia on EKG (STEMI, T-wave inversion/depression)

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) Adults, age ≥ 15 years old, and;
2) Any sustained blunt or penetrating trauma within 3 hours of injury and systolic blood pressure < 90 mmHg at scene, during transport, or upon arrival to appropriate hospital due to suspected hemorrhagic shock, or;
3) Post-partum hemorrhage with > 500 ml blood loss and systolic blood pressure < 90 mmHg in the first 24-hours following delivery.

Contraindications:
1) Less than 15 y/o
2) Traumatic injury occurred > 3 hours ago
3) Isolated head injury (blunt or penetrating)
4) Cervical cord injury with motor deficit
5) Traumatic arrest with > 5-minute CPR without ROSC
6) Isolated drowning or hanging victims

Procedure:
MUST BE ADMINISTERED WITHIN 3 HOURS OF INJURY

- Mix 1gm of TXA in 100ml of Normal Saline. Apply medication label.
- Administer 1gm IV/IO over 10 minutes (No IV push)
- Monitor the patient while continuing the treatment protocol
- Contact receiving hospital to notify them TXA has been initiated
- Place TXA wristband on patient and indicate time of administration on the wristband.
- Document the procedure, time and results in the Prehospital electronic health record.

Adverse Reaction/Side Effects:
Hypotension with rapid IV injection, giddiness, nausea, vomiting, blurred vision

Treatment and Field Procedure Guidelines:
M06a, T09
Clinical Indications:
1) Unstable patient with a tachydysrhythmia (rapid atrial fibrillation, supraventricular tachycardia, ventricular tachycardia)
2) Patient is not pulseless (the pulseless patient requires unsynchronized cardioversion, i.e., defibrillation)

Procedure:
1) Completely expose the chest. Remove medication patches, if present.
2) Properly attach the patient to the monitor/defibrillator. Pads should be placed at least 10 cm from a PPM/AICD.
3) Consider the use of pain or sedating medications.
4) Set energy selection to the appropriate setting.
5) Set monitor/defibrillator to synchronized cardioversion mode.
6) Make certain all personnel are clear of patient.
7) Press and hold the shock button to cardiovert. Stay clear of the patient until you are certain the energy has been delivered. NOTE: It may take the monitor/defibrillator several cardiac cycles to "synchronize", so there may a delay between activating the cardioversion and the actual delivery of energy.
8) Observe patient response and perform immediate unsynchronized cardioversion/defibrillation if the patient's rhythm converts to pulseless ventricular tachycardia/ventricular fibrillation.
9) If the patient's condition is unchanged, repeat with escalating energy settings, as above. Repeat until maximum setting or until efforts succeed.
10) Consider base consultation if cardioversion is unsuccessful after 3 attempts.

Adverse Reaction/Side Effects:
Pain and irritation to the electrode site, dislodgment of a clot, other abnormal heart rhythms.

Treatment and Field Procedure Guidelines:
AC06, PC06
<table>
<thead>
<tr>
<th>Drug</th>
<th>Indication</th>
<th>Dosing</th>
<th>Cautions</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acetaminophen</td>
<td>Moderate to severe pain</td>
<td>1 gm over 15 minutes for patients greater than 50 kg</td>
<td>Active liver disease, history of transplant, patients currently taking Acetaminophen containing products such as cold/cough medicine, percocet or vicodin</td>
<td>Should not be directly administered into IV site. Set up as piggyback. Not for use in patients with chest pain of cardiac origin.</td>
</tr>
<tr>
<td>Adenosine</td>
<td>Narrow complex tachycardia</td>
<td>Initial – 6mg rapid IV Repeat – 12mg rapid IV Follow each dose with 20ml NS rapid IV Refer to pediatric dosing guide</td>
<td>May cause transient heart block or asystole. Use caution when patient is taking carmbamazepine, dipyramidole, or methylxanthines. Do not administer if patient is experiencing acute asthma exacerbation.</td>
<td>Side effects include: chest pressure/pain, palpitations, hypotension, dyspnea, or feeling of impending doom.</td>
</tr>
<tr>
<td>Albuterol</td>
<td>Bronchospasm</td>
<td>5mg nebulized Repeat as needed 5mg nebulized Repeat as needed</td>
<td>Use caution in patients taking MAOIs (antidepressants Nardil and Parnate)</td>
<td>None</td>
</tr>
<tr>
<td></td>
<td>Crush injury - hyperkalemia</td>
<td>5mg nebulized continuously</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Amiodarone</td>
<td>V-Fib Pulseless V-Tach</td>
<td>Initial – 300mg IV/IO Repeat – 150mg IV/IO if rhythm persists Refer to pediatric dosing guide</td>
<td>In patients with pulses, may cause hypotension. Do not administer if patient is hypotensive. Do not use filter needle.</td>
<td>When creating infusion, careful mixing is needed to avoid foaming of medication.</td>
</tr>
<tr>
<td></td>
<td>Symptomatic stable V-Tach</td>
<td>Initial – 150mg IV/IO drip over 10 minutes Repeat – 150mg IV/IO if needed</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Drug</td>
<td>Indication</td>
<td>Dosing</td>
<td>Cautions</td>
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<td>--------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Aspirin</td>
<td>Chest pain – suspected cardiac or STEMI</td>
<td>324mg PO</td>
<td>Contraindicated in aspirin or salicylate allergy.</td>
<td>Blood thinner use is not a contraindication.</td>
</tr>
<tr>
<td>Calcium Chloride</td>
<td>Unstable bradycardia</td>
<td>Initial – 1mg IV/IO Repeat every 3-5 minutes to a max of 3mg</td>
<td>Doses less than 0.5mg can cause paradoxical bradycardia.</td>
<td>Can dilate pupils, aggravate glaucoma, cause urinary retention, confusion, and dysrhythmias including V-Tach and V-Fib. Increases myocardial oxygen consumption. Bradycardia in children is primarily related to respiratory issues – assure adequate ventilation first.</td>
</tr>
<tr>
<td></td>
<td>Organophosphate overdose</td>
<td>Initial – 1-2mg IV/IO Repeat every 3-5 minutes until relief of symptoms is achieved</td>
<td>Refer to pediatric dosing guide</td>
<td></td>
</tr>
<tr>
<td>Calcium Chloride</td>
<td>Hydrofluoric acid exposure</td>
<td>500mg IV/IO for tetany or cardiac arrest</td>
<td>Use cautiously or not at all in patients on digitalis. Avoid extravasation. Rapid administration can cause dysrhythmias or arrest.</td>
<td>Administer 20ml flush IV/IO when delivering in conjunction with Sodium Bicarbonate.</td>
</tr>
<tr>
<td>Calcium Chloride</td>
<td>Crush injury</td>
<td>1g IV/IO over 60 seconds</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Calcium Chloride</td>
<td>Suspected hyperkalemia</td>
<td>Initial - 100ml IV Repeat – 150ml if glucose remains ≤ 60mg/dl</td>
<td>Can cause tissue necrosis if IV is infiltrated</td>
<td>Recheck blood glucose after administration.</td>
</tr>
<tr>
<td>Dextrose 10%</td>
<td>Hypoglycemia</td>
<td>Refer to pediatric dosing guide</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diphenhydramine</td>
<td>Allergic reaction</td>
<td>50mg IV/IO/IM</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>Diphenhydramine</td>
<td>Dystonic reaction</td>
<td>25-50mg IV/IO or 50mg IM</td>
<td></td>
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</tr>
<tr>
<td>Drug</td>
<td>Indication</td>
<td>Dosing</td>
<td>Cautions</td>
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</tr>
<tr>
<td>Epi 1:100,000</td>
<td>Adult post resuscitation (ROSC) with systolic BP &lt; 90mmHg</td>
<td>10mcg (1 ml) IV/IO every 3 minutes to a systolic BP &gt; 90 mmHg</td>
<td>Use caution when mixing to make the correct concentration of EPI (1:100,000). Dose should be provided by drawing up only what will be administered to prevent possible overdosing.</td>
<td>With Base contact, Push Dose EPI can be administered in patients with hypotension (systolic BP &lt; 90mmHg) in Sepsis after fluid administration. LP15 Monitor should be set to cycle BP every 3 minutes.</td>
</tr>
<tr>
<td>Epi 1:10,000</td>
<td>Cardiac arrest</td>
<td>1mg IV/IO every 3-5 minutes</td>
<td>May cause serious dysrhythmias or exacerbate angina.</td>
<td>Alpha and beta sympathomimetic.</td>
</tr>
<tr>
<td></td>
<td>Cardiac arrest/Bradycardia</td>
<td>Refer to pediatric dosing guide</td>
<td></td>
<td>Use ½ dose for patients: • with history of CAD; or • &gt; 50 years of age</td>
</tr>
<tr>
<td></td>
<td>Anaphylactic shock</td>
<td>0.1mg slow IV/IO increments titrated to effect to a max of 0.5mg</td>
<td>In adult anaphylactic patients, should be used if patient is hypotensive or no improvement after Epi 1:1,000 IM dose. In pediatric anaphylactic patients, should only be administered if Epi 1:1,000 IM dose is ineffective.</td>
<td></td>
</tr>
<tr>
<td>Epi 1:1,000</td>
<td>Anaphylactic shock</td>
<td>0.3mg IM</td>
<td>Never administer IV/IO.</td>
<td>Use ½ dose for patients: • with history of CAD; or • &gt; 50 years of age</td>
</tr>
<tr>
<td></td>
<td>Refer to pediatric dosing guide</td>
<td></td>
<td>Use with caution in asthma patients with a history of hypertension or coronary artery disease. May cause serious dysrhythmias or exacerbate angina.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Asthma/COPD or Pediatric respiratory distress</td>
<td>0.3mg IM</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Refer to pediatric dosing guide</td>
<td></td>
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</tr>
<tr>
<td>EpiPen</td>
<td>Allergic reaction/Anaphylaxis</td>
<td>1 auto-injector</td>
<td>See Epinephrine 1:1,000 and Epinephrine 1:10,000</td>
<td>See Epinephrine 1:1,000 and Epinephrine 1:10,000</td>
</tr>
<tr>
<td>EpiPen Jr.</td>
<td></td>
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</tr>
<tr>
<td>Drug</td>
<td>Indication</td>
<td>Dosing</td>
<td>Cautions</td>
<td>Comments</td>
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</tr>
<tr>
<td>Fentanyl</td>
<td>Pain control</td>
<td>Initial - 25-50mcg IV/IO or 50-100mcg IM or 100mcg IN</td>
<td>Can cause hypotension or respiratory depression.</td>
<td>Recheck vital signs between each dose. Hypotension is more common in patients with low cardiac output or volume depletion. Respiratory depression is reversible with naloxone. Additional IV/IO doses can be administered every 5 minutes. IM and IN doses can be repeated once in 15 minutes.</td>
</tr>
<tr>
<td>Glucagon</td>
<td>Hypoglycemia</td>
<td>1mg IM</td>
<td>None</td>
<td>Effect may be delayed 15-20 minutes</td>
</tr>
<tr>
<td>Ketamine</td>
<td>Mild to Moderate Pain</td>
<td>50-69 kg – 15mg IV 70-89 kg – 20 mg IV ≥ 90 kg – 30 mg IV</td>
<td>Contraindicated in patients with multisystem trauma, ALOC and pregnancy, chest pain of cardiac origin</td>
<td>Draw in a tuberculin syringe and dilute dose in 10 ml or 100 ml NS for infusion over 2 minutes</td>
</tr>
<tr>
<td>Lidocaine</td>
<td>IO anesthetic</td>
<td>Initial – 40mg IO Repeat dose – 20mg if painful</td>
<td>None</td>
<td>Effect may be delayed 15-20 minutes</td>
</tr>
<tr>
<td>Midazolam</td>
<td>Seizure</td>
<td>10mg IM (preferred) 10mg IN (5mg each nare) 6-8 mg IV/IO (if established) May repeat to a max of 10mg</td>
<td>Use caution in patients over 60 years of age.</td>
<td>Observe respiratory status after administration.</td>
</tr>
<tr>
<td>Drug</td>
<td>Indication</td>
<td>Dosing</td>
<td>Cautions</td>
<td>Comments</td>
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<tr>
<td>Naloxone</td>
<td>Respiratory depression or apnea</td>
<td>2mg IN or 1-2mg IV/IM</td>
<td>Abrupt withdrawal symptoms and combative behavior may occur.</td>
<td>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.</td>
</tr>
<tr>
<td>Naloxone</td>
<td>Overdose</td>
<td>1 preload syringe</td>
<td>See Naloxone</td>
<td>See Naloxone</td>
</tr>
<tr>
<td>Midazolam</td>
<td>Behavioral emergency</td>
<td>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</td>
<td>For patients ≥ 12 years of age only. Refer to pediatric dosing guide Use caution in patients over 60 years of age.</td>
<td>Observe respiratory status after administration. For pediatric patients, repeat orders require Base Hospital orders.</td>
</tr>
<tr>
<td>Midazolam</td>
<td>Sedation for pacing or cardioversion</td>
<td>1mg IV/IO</td>
<td>Refer to pediatric dosing guide</td>
<td></td>
</tr>
<tr>
<td>Midazolam</td>
<td>Sedation of patient with an advanced airway</td>
<td>2-5mg IV/IO</td>
<td>Refer to pediatric dosing guide</td>
<td></td>
</tr>
<tr>
<td>Drug</td>
<td>Indication</td>
<td>Dosing</td>
<td>Cautions</td>
<td>Comments</td>
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<tr>
<td>Nitroglycerin</td>
<td>Chest pain</td>
<td>0.4mg SL</td>
<td>Can cause hypotension and headache. Do not administer if systolic BP &lt; 90mmHg.</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>Do not administer if patient has taken Viagra, Levitra, within past 24 hours or Cialis if taken within 36 past hours</td>
<td>Use caution and consider base contact if HR &gt;120.</td>
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<td>0.8mg SL if systolic BP &gt; 150mmHg</td>
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<td>May repeat appropriate dose every 5 minutes</td>
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<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></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>Tricyclic antidepressant overdose</td>
<td></td>
<td></td>
<td>Administer 20ml flush IV/IO when delivering in conjunction Calcium Chloride.</td>
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<tr>
<td></td>
<td>Crush injury</td>
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<tr>
<td></td>
<td>Hyperkalemia</td>
<td>50mEq IV/IO</td>
<td></td>
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<tr>
<td>Tranexamic Acid (TXA)</td>
<td>Blunt or penetrating injury within 3 hours,</td>
<td>1gm in 100ml IV/IO over 10 minutes</td>
<td>Do not administer to:</td>
<td>Do not delay transport to administer TXA.</td>
</tr>
<tr>
<td></td>
<td>OR Postpartum hemorrhage with &gt; 500 ml blood</td>
<td></td>
<td>• Patient &lt; 15 years old</td>
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<td></td>
<td>loss, AND SBP &lt; 90 due to uncontrolled</td>
<td></td>
<td>• Isolated head injury</td>
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<tr>
<td></td>
<td>hemorrhage</td>
<td></td>
<td>• Cervical cord injury with motor deficit</td>
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<td>• Traumatic arrest &gt; 5 min, CPR without ROSC</td>
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<td>• Isolated drowning</td>
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<td></td>
<td></td>
<td></td>
<td>• Hanging victims</td>
<td></td>
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</tbody>
</table>