CONTRA COSTA
HEALTH

777 Arnold Drive, Suite 110 | Martinez, CA 94553 | Phone: (925) 608-5454 | Fax: (925) 228-2492
cchealth.org

MEMORANDUM

25-MEMO-004

TO:	EMS Service Providers, EMS Prehospital Personnel, and Local Area Hospitals
FROM:	Senai Kidane, MD, EMS Medical Director
DATE:	May 28, 2025
SUBJECT:	**Public Comment Period Open: CCCEMSA 2026 Field Treatment Guidelines Proposed Changes**

The Contra Costa County Emergency Medical Services Agency ("CCCEMSA") has opened a public comment period and requests your feedback for the following:

CCCEMSA 2026 Field Treatment Guidelines Proposed Changes

All feedback must be submitted using the online public comment form link or QR code located below no later than June 11, 2025, at 5:00 p.m. This memo and attached documentation will be published to the CCCEMSA website at the website link below, and on the Contra Costa County EMS mobile application, "XCCEMS".

Website Link: https://www.cchealth.org/about-contra-costa-health/divisions/ems/ems-policies-and-treatment-guidelines/public-comment

Online Public Comment Form Link: https://forms.office.com/g/Dha3msnBdE

Public Comment Form QR Code:

Attachments

1. 2026 FTG Proposed Changes Packet

Field Treatment Guideline	2026 Summary of Updates	Reason for change/evidence/other notes
General		
	No Changes	
Adult Cardiac		
	No Changes	
Adult Medical		
A06a Post-Partum Hemorrhage	Changed dose to 2gm slow IV/IO push over 1 minute	Dosing now compliant with Tactical Combat Casualty Care. Dose to remain consistent in both medical and traumatic applications.
A07 Diabetic Emergency	**<u>Added:</u>** Intranasal (IN) Glucagon when venous access is not available. Intramuscular (IM) is still an option. FTG updated to say " Glucagon 1mg IM or IN. May repeat in 15 minutes	The addition of IN as a route for administration of glucagon was added to provide an alternative route to IM when IV dextrose is not feasible. Research shows that IN and IM delivery options are comparable in efficacy and response time to improve BGL levels for hypoglycemia. IN may provide an easier route and elimiates the needle-based delivery for hypoglycemia managment.
A18 Suspected Stroke	**<u>Added</u>**: Directive for direct transport to John Muir Walnut Creek (Comprehensive Stroke Receiving Center) when stroke is suspected and patient is unresponsive following a complaint of a sudden severe headache. **<u>Changed:</u>** Decision box that said "Still suspect stroke?" to Sudden onset unsteady gait, dizziness, vision changes, or other neuro changes?	Timely intervention is critical for acute subarachnoid hemorrhage (SAH), which requires neurocritical care and neurosurgical services found only at a comprehensive stroke center. A sudden, severe headache followed by loss of consciousness is highly suggestive of SAH and should prompt direct transport. About 20% of strokes present without the classic signs identified by the Cincinnati Stroke Screen (CSS). Posterior strokes, in particular, may involve sudden changes in vision, balance, or gait. The updated protocol now highlights
Pediatric Cardiac		
	No changes	
Pediatric Medical		
	No changes	
Trauma		
T03 Burns	Added EMT treatment box under Minor Burns to reflect 20CRW (20minutes of cold running water) and application of clean dressing to burned area. Added EMT treatment box under Major Burns to reflect application of a clean, dry dressing. Add Paramedic treatment box to under Major Burns for the Cyanokit. Added mode of transport verbiage to orange Transport Facility box.	20CRW is compliant with ABA guidelines. Specific dressing additions are reminders to avoid hypothermia in larger burns. Cyanokit administration approved by Dr.Kidane for 2026 roll out. Mode of transport reminder due to increased inappropriate helo utilization and crew confusion around utilizing ground transport to burn center destinations.
T09 Major Hemorrhage Control	Changed TXA dose to 2gm slow IV/IO push over 1 minute. Added non-compressible sites (trunk and/or head) to yelow TXA box. Removed head injury contraindication from yellow TXA box.	Changed to reflect updated FP 30 TXA

Field Procedures		
FP 15 Intraosseous Access	Total re-write. Added distal femur as a pediatric site.	Condensed site locations and instructions into chart-like format for easier reference. Changed images to more accurately reflect site locations. Distal femur widely recognized and utilized as a successful site.
FP 28 Hemostatic Dressing Application	Added definitions and examples of "junctional areas' under clinicial indications	Improved clarity.
FP 30 TXA	Condensed clinical indications and added "non-compressible sites" with examples. Removed head injury as a contraindication. Changed dose to 2gm slow IV/IO push over 1 minute.	Improved clarity. Trials have found no significant increase in adverse events for head trauma patients. Dosing now compliant with Tactical Combat Casualty Care recommendations.
Drug Reference		
TXA	Changed dose to 2gm slow IV/IO push over 1 minute	Dosing now compliant with Tactical Combat Casualty Care.
Cyanokit (Hydroxocobalamin)	Added drug information	New to our FTG

Post-Partum Hemorrhage Control

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

E	Supplemental **Oxygen** as required
E	Visualize for and manage bleeding from external laceration
E	• Initiate gentle fundal massage to encourage delivery of placenta. If placenta delivered, massage until uterus is firm. • Encourage breast feeding
P	Establish IV/IO
P	Cardiac Monitor
P	**Normal Saline 500ml - 1000ml bolus** to maintain SBP > 90 Maximum 1L

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

Yes → | P | Consider **TXA 2gm slow IV/IO** push over 1 minute | → Notify receiving facility.

No → Notify receiving facility.

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

CONTRA COSTA HEALTH EMERGENCY MEDICAL SERVICES
Effective Jan. 2026

Post-Partum Hemorrhage Control

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

- Post-partum hemorrhage 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.

Diabetic Emergency

History
- Past medical history
- Medications
- Recent blood glucose check
- Last oral intake
- Type I or Type II diabetic

Signs and Symptoms
- Altered mental status
- Combative or irritable
- Diaphoresis
- Seizure
- Weakness
- Dehydration
- Polyuria
- Polydypsia

DKA Signs and Symptoms
- Abdominal pain
- Weakness, fatigue
- Fruity smelling breath
- Altered mental status
- Shortness of breath
- Nausea or vomiting
- Dry mucous membranes/ extreme dehydration

Differential
- Alcohol or drug use
- Toxic ingestion
- Trauma or head injury
- Seizure
- Sepsis/Infection
- Renal failure
- Other metabolic abnormality
- Stroke
- Altered baseline mental status

E — Blood glucose (BGL) analysis

P — *Consider Cardiac Monitor*

BGL ≤ 60mg/dl or ≥ 350mg/dl?

BGL ≤ 60mg/dl

Able to follow commands?

- Yes → E — *Consider **Oral Glucose 30g***
- No → P — Establish IV/IO
  - **D-10 100ml IV**
  - No venous access **Glucagon 1mg IM or IN** **May repeat in 15 minutes**
  - *Consider IO access as a last resort*

Returns to baseline?

- Yes → P — Recommend transport or conduct Refusal if indicated
- No → P — If blood glucose ≤ 60mg/dl **D-10 150ml IV**

Improving?

- Yes → Notify receiving facility.
- No → BH — Base Hospital for additional order **D-10**

BGL ≥ 350mg/dl with signs and symptoms of DKA?

- No → P — *Consider IV/IO*; *Consider **Normal Saline bolus 500-1000ml IV***
- Yes → P — Establish IV/IO; **Normal Saline bolus 500-1000ml IV**

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

Adult Medical Treatment Guidelines

Treatment Guideline A07

CONTRA COSTA HEALTH EMERGENCY MEDICAL SERVICES

Effective Jan. 2026

Diabetic Emergency

- Do not administer oral glucose to patients that are not able to swallow or protect their airway.
- Recheck BGL after each D-10 or Glucagon administration.
- Hypoglycemic patients who have experienced a seizure should be transported to the hospital irrespective of their mental status and therapeutic response.
- For patients refusing transport to a hospital after treatment of hypoglycemia, non-transport should only be considered when the following are true:
  - Repeat glucose measurement is greater than 80 mg/dL.
  - The patient is not taking oral diabetic medication to control blood sugar (excluding Metformin). There is risk of recurrent hypoglycemia that can be delayed for hours and requires close monitoring even after a prehospital blood glucose level of greater than 60mg/dl has been achieved.
  - The patient returns to normal mental status, with no focal neurologic signs/symptoms after receiving glucose/ dextrose.
  - The patient can promptly obtain and will eat a carbohydrate meal.
  - The parent or legal guardian refuses transport, and EMS providers agree transport not indicated.
  - A reliable adult will be staying with the patient.
  - No significant co-morbid symptoms exist, like chest pain, shortness of breath, seizures, intoxication.
  - A clear cause of hypoglycemia is identifiable (e.g., missed meal).

Types of Insulin and Brand Names	
Rapid Acting	**Intermediate and Long Acting**
Lisipro (Humalog)	NPH
Aspart (NovoLog)	Insulin glargine (Lantus, Basaglar, Toujoe)
Glulisine (Apidra)	Insulin (Levemir)
	Insulin degludec (Tresiba)

Adult Medical Treatment Guidelines

Pearls

- 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 pursuing the more aggressive course of performing IO access to give faster acting D10 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.

Contra Costa County Emergency Medical Services

Suspected Stroke

History
- Previous stroke or TIA
- Associated diseases (diabetes, hypertension, CAD, hypocholesteremia)
- Atrial fibrillation
- Medications (blood thinners)

Signs and Symptoms - Sudden Onset
- Acute altered mental status
- One-sided weakness or paralysis
- Blindness or other new visual symptoms
- Aphasia or dysarthria
- Vertigo/dizziness
- Vomiting
- Sudden severe headache
- Seizure
- Unsteady gait

Differential
- Seizure
- Todd's paralysis
- Hypoglycemia
- Sepsis/Infection
- Stroke
  - Thrombotic or embolic (~85%)
  - Hemorrhagic (~15%)
- Trauma

Designated Stroke Receiving Centers

John Muir – Concord
John Muir – Walnut Creek
Kaiser – Antioch
Kaiser – Richmond
Kaiser – Walnut Creek
San Ramon Regional

Approved Out of County Stroke Receiving Centers

Eden – Castro Valley
Highland Hospital - Oakland
Kaiser – Oakland
Kaiser – Vallejo
Marin Health – San Rafael
ABMC – Summit – Oakland
SHC – Valley Care
Sutter Solano - Vallejo

E | Blood glucose analysis → *If indicated, exit to Diabetic Emergency TG*

Unresponsive preceded by a sudden onset of a severe headache? Consider catastrophic hemorrhagic CVA

- Yes → P | **INITIATE TRANSPORT to the Comprehensive Stroke Receiving Center - John Muir Walnut Creek**
  Make STROKE ALERT notification to Stroke Receiving Center
  → Establish IV 20g or larger IV
- No → E | Perform Cincinnati Stroke Screen

CINCINNATI STROKE SCREEN

- Negative/ Inconslusive → Sudden onset unsteady gait, dizziness, vision changes, or other neuro changes?
  - Yes → Last Known Well Time is ≤ 24 hours?
  - No → Notify receiving facility. Contact Base Hospital for medical direction, as needed
- Positive → Last Known Well Time is ≤ 24 hours?

Last Known Well Time is ≤ 24 hours?

- Yes → P | Make STROKE ALERT notification to Stroke Receiving Center
  Transport to appropriate Stroke Receiving Center
  → P | Establish IV 20g or larger IV AC preferred Avoid distal sites
- No → P | *Consider IV*

P | Cardiac monitor
Consider 12-Lead ECG if monitor suggests dysrhythmia

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

Adult Medical Treatment Guidelines

CONTRA COSTA HEALTH EMERGENCY MEDICAL SERVICES

Effective Jan. 2026

Suspected Stroke

Stroke Destination and Stroke Alert

A sudden onset of symptoms is the hallmark of a neurovascular event or stroke. A patient with a complaint of a sudden and severe headache followed by unresponsiveness needs immediate intervention at a comprehensive stroke receiving center. All other suspected stroke patients should be transported to the closest appropriate primary stroke receiving center when the Cincinnati Stoke Screen is positive or when other signs and symptoms indicate a stroke.

Notify the stroke receiving center of a **Stroke Alert** when the Last Known Well Time (LKWT) is ≤24 hours from patient contact. Include the following:

- Last Known Well Time as a clock time not as a duration
- Cincinnati Stroke Screen findings
- Vital signs
- Blood glucose result
- Known anticoagulant prescription
- ETA

Whenever possible, bring a family member or guardian with the patient or collect contact information to assure rapid definitive treatment upon arrival at the stroke center.

Assessment Matrices

Cincinnati Stroke Screen	
Finding	**Interpretation**
Facial Droop	Normal: Symmetrical smile or face **Abnormal: Asymmetry**
Arm Weakness	Normal: Both arms move symmetrically **Abnormal: Asymmetrical arm movement**
Speech Abnormality	Normal: Correct words; no slurring **Abnormal: Slurred or incorrect words**

LAMS Assessment		
Finding	**Scoring**	**Interpretation**
Facial Droop	Absent - 0 points Present - 1 point	Normal: Symmetrical smile or face **Abnormal: Asymmetry**
Arm Weakness	Absent - 0 points Drifts - 1 point Falls rapidly - 2 points	Normal: Both arms move symmetrically **Abnormal: Asymmetrical arm movement** **Falls rapidly: some or no effort**
Grip	Normal - 0 points Weak - 1 point No grip - 2 points	Normal: Equal grip in both hands **Weak: Unequal grip in one hand** **No grip: no muscle strength or contraction**
A LAMS score of ≥ 4 indicates a high likelihood of a LVO stroke		

Pearls

- Last Known Well Time (LKWT) is the time the patient was last witnessed to be at their baseline. Be precise in gathering this, and report it as an actual time (e.g. 13:45 NOT “about 45 minutes ago”).
- The time the patient is found with their stroke symptoms (Time of Discovery) is often different than and should be distinguished from the LKWT.
- Hypoglycemia can present as a LOCALIZED neurologic deficit, especially in the elderly.
- Because the patient may need to receive thrombolytic therapy, avoid multiple IV attempts.
- A 35° head position is preferred for transport.
- 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)
  - Heparin
  - Fondaparinux (Arixtra)
  - Enaoxaparin (Lovenox)
  - Dabigatran (Pradaxa)
  - Rivaroxaban (Xarelto)
  - Apixaban (Eliquis)

Burns

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

Signs and Symptoms
- Inhalation injury: Respiratory distress or horse voice with soot in mouth/throat or nose
- ALOC or unconsciousness suggest CO/CN poisoning

Differential
- Superficial – red and painful (do <u>not</u> include in Total Body Surface Area)
- Partial thickness – blistering
- Full thickness – painless with charred or leathery skin
- Chemical injury
- Thermal injury
- Radiation injury
- Blast injury

Approved
<u>Burn Receiving Centers</u>
Valley Med. Center – San Jose
UC Davis – Sacramento

Adults Only
St. Francis – San Francisco

E	Maintain airway
E	Consider high flow Oxygen via NRB for suspected CO/CN toxicity
E	Remove rings, bracelets, and constricting items
P	*Consider IV/IO (Consider one ≥ 20g IV in each AC)*
P	Cardiac monitor
P	$EtCO_2$ monitoring

Assess burn injury severity

<u>Minor Burns</u>
- < 20% TBSA partial or full thickness burns
- GCS > 13
- No inhalation injury

E	Apply cool running water over the burn for 20 minutes
E	Apply clean dry dressing to burn area

<u>Transport to facility of choice</u>
Consider transporting to Burn Center for burns to the face, hands, perineum, feet, or circumferential burns

If indicated, exit to appropriate TG
- *Exit to Trauma Triage TG*
- Exit to Adult Pain Control
- Exit to Pediatric Pain Control

<u>Major Burns</u>
- ≥ 20% TBSA partial or full thickness burns
- High voltage electrical burns
- Burns with suspected inhalation injury

E	Apply clean dry dressing to burn area
P	Administer fluids • ≤ 5 year old – 125 ml • 6-12 year old – 250 ml • ≥ 13 year old – 500 ml
P	*If patient is unconscious with suspected cyanide poisoning, **administer Cyanokit (Hydroxocobalamin) 5gm IV infusion over 15 minutes***

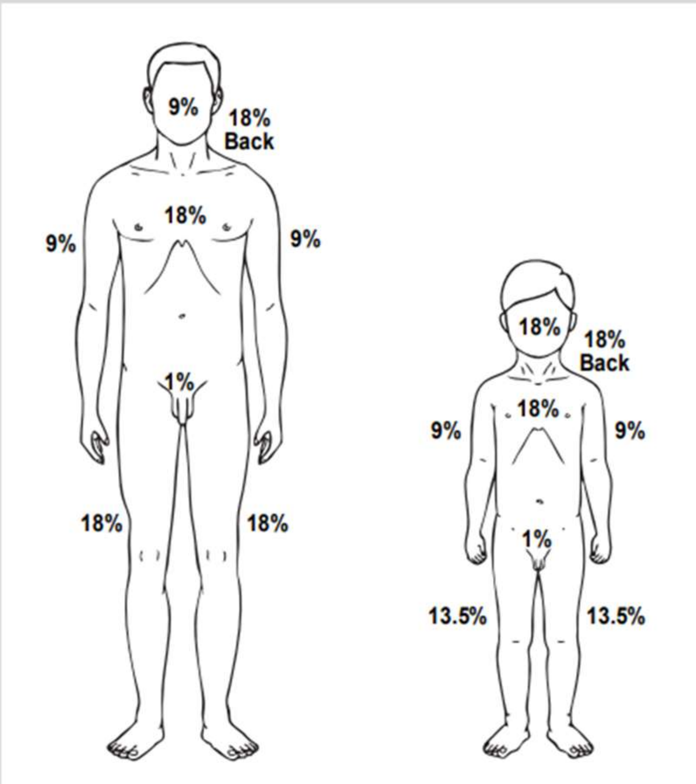
<u>Transport to appropriate facility</u>
- Burns with major trauma to Trauma Center
- Inhalation with potentially unstable airway to closest receiving facility
- All others consider direct transport to a Burn Center by ground, unless extenuating circumstances exist

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

CONTRA COSTA HEALTH
EMERGENCY MEDICAL SERVICES

Effective Jan. 2026

Burns



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.

Burn Assessment Terminology	
Approved Terminology	Former Terminology
Superficial	1st degree
Partial thickness	2nd degree
Full thickness	3rd degree
Burn assessment should be documented and reported using only approved terminology	

- 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.
- 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.
- Never administer IM pain medication into a burned area.

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.
- Circumferential burns to extremities are dangerous due to potential vascular compromise secondary to soft tissue swelling.

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)

Age Dependent SBP for Signs of Shock
- Neonate: < 60mmHg or weak pulses
- Infant: < 70mmHg or weak pulses
- 1-10 years: < 70mmHg + (age in years x2)
- Over 10 years: <90mmHg

E
If indicated, secure airway and support respiratory rate
Apply direct pressure/pressure dressing to injury

↓

Hemorrhage controlled?
- Yes → go to Cardiac monitor (right column)
- No → **Extremity Injury?**
  - Yes → **E** Apply tourniquet(s) (FP21) → Cardiac monitor (right column)
  - No →

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

P
Cardiac monitor

Establish IV/IO

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

If poor perfusion or shock in Pediatrics
(Refer to age dependent chart)
Normal Saline bolus IV/IO
Use PEDIATAPE and refer to dosing guide
May repeat to age dependent goal SBP

*Consider **TXA 2gm slow IV/IO***
Push over 1 minute

→ Notify receiving facility

P (right column)
Cardiac monitor

Establish IV/IO

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

If poor perfusion or shock in Pediatrics
(Refer to age dependent chart)
Normal Saline bolus IV/IO
Use PEDIATAPE and refer to dosing guide
May repeat to age dependent goal SBP

↓

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

Tranexamic Acid (TXA)

Indications
1) Age ≥ 15, and;
2) SBP < 90 due to uncontrolled hemorrhage, and;
3) Blunt/penetrating trauma to non-compressible sites (trunk and/or head) within 3 hours
4) Postpartum hemorrhage > 500ml within 24 hours s/p delivery

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

Major Hemorrhage Control

- Scene time for major trauma patients should be limited to < 10 minutes whenever possible.
- In patients older than 65 years old, an SBP in the low 100 range may constitute relative hypotension. Be proactive about fluid replacement.
- Transport should NOT be delayed to administer fluids or TXA. Administer these during transport if time permits.
- Wound packing locations include neck, shoulder, hips, and groin. **Do not pack abdomen, chest, skull, or any injuries to the eyes or airway.**
- Early communication to advise the receiving hospital of the use of TXA is critical.
- Make sure to label the medication on the IV bag.

Pearls

- 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 limbs, torso, and head wounds with significant bleeding. Dressings 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.

Intraosseous Access

Applies to:
P Paramedic

Any prehospital fluids or medications approved for IV use may also be given through IO access.

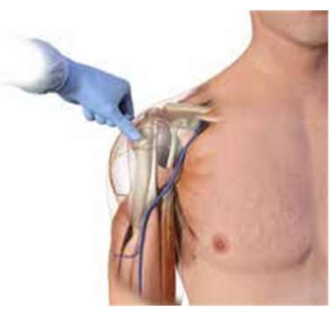
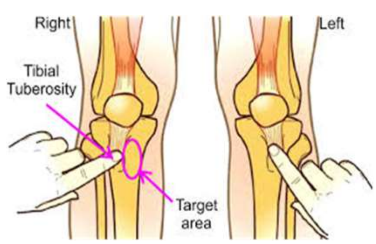
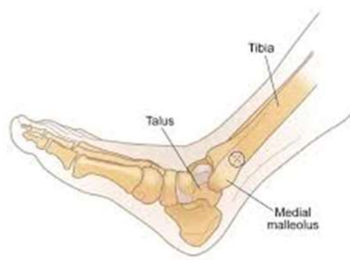
Clinical Indications:

1. Any critically ill or injured patient where rapid IV access cannot be established

Contraindications:

1. Infection at area of insertion
2. Fracture of the targeted bone
3. IO within the past 48 hours in the targeted bone
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)

Site Locations and Specifics:

Proximal Humerus	Proximal Tibia	Distal Fibula	Distal Femur (≤6 yo)
			
• Rotate arm inward and place the patient's hand on the abdomen • Identify the greater tubercle as the main prominence on the humerus	• 2 finger widths below the lower edge of the patella, and medial to the tibial tuberosity	• 2 finger widths above the most prominent aspect of the medial malleolus in the midline shaft	• 1-2 finger widths above the upper edge of the patella and medial to the midline
45º insertion towards the feet	90º angle insertion	90º angle insertion	90º angle insertion
25mm needle	25mm needle	25mm needle	15mm needle
45mm needle if ≥ 40kg	45mm needle if ≥ 40kg or if excessive soft tissue	45mm needle if ≥ 40kg or if excessive soft tissue	25mm needle

Intraosseous Access

Procedure:

1. Locate the insertion site as directed above.
2. Prep the selected site with chlorhexidine and allow to air dry.
3. Load the appropriate sized needle on the driver.
4. Without engaging the power driver, push the needle through the skin until the tip rests against the bone. The 5mm black mark on the needle must be visible. If not visible, the soft tissue is too thick to allow use of that needle.
5. Squeeze the trigger by applying gentle steady pressure. In most cases, the hub should be flush or touching the skin. Verify the needle is firmly seated in the bone; it should not wobble.
6. Remove the stylet and introduce Lidocaine if the patient is conscious.
   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.
7. Flush with 10ml Saline. If conscious, flush with 5ml Saline initially, repeat if necessary.
8. Attach stabilizer to skin.
9. Attach IV tubing to IO hub and begin infusion using pressure bag.
10. If painful, an additional 20mg of Lidocaine can be infused over 30 seconds, and after another minute, infusion should be restarted.
11. Monitor site for signs of infiltration as well as pulses distal to area of placement.
12. Complete the included wristband and place on the patient.

Hemostatic Dressing Application

	Applies to:
E	EMT

Clinical Indication:

- Bleeding in junctional areas not amenable to tourniquet.
  - Junctional areas are where the limbs connect to the torso (i.e. base of the neck, shoulders, axilla, hips, groin)

Contraindications:

- Abdominal wounds
- Chest wounds
- Injuries to the eye or airway
- Injuries to the head/skull

Procedure:

1. Expose the injury by opening or cutting away the patient's clothing.
2. If possible, remove excess blood from the wound while preserving any clots that may have formed.
3. Locate the source of the most active bleeding.
4. Remove the hemostatic dressing from its sterile package and pack it tightly into the wound directly over the site of the most active bleeding (more than one dressing may be required to achieve hemorrhage control).
5. Apply direct pressure quickly with enough force to stop the bleeding, holding direct pressure for a minimum of 3 minutes.
6. Reassess for bleeding control
7. More dressing may be packed into the wound as necessary to stop any continued bleeding.
8. Secure the hemostatic dressing in place with compression bandage or roller gauze.

Treatment and Field Procedure Guidelines:

1. T09

Tranexamic Acid

Applies to:	
P	Paramedic

Clinical Indications:

1) Adults, age ≥ 15 years old, and;
2) Systolic blood pressure <90 mmhg due to suspected hemorrhagic shock, and;
3) Any sustained blunt or penetrating trauma to non-compressible sites (trunk and/or head) within 3 hour of injury, or;
4) Post-partum hemorrhage with > 500 ml blood loss in the first 24hrs following delivery.

Contraindications:

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

Procedure:

MUST BE ADMINISTERED WITHIN 3 HOURS OF INJURY

- Administer 2gm slow IV/IO push over 1 minute
- 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:

A06a, T09

Drug Reference

Drug	Indication	Dosing	Cautions	Comments
Acetaminophen	Moderate to severe pain	1 gm over 15 minutes for patients greater than 50 kg	Active liver disease, history of transplant, patients currently taking Acetaminophen containing products such as cold/cough medicine, percocet or vicodin	Should not be directly administered into IV site. Set up as piggyback. Not for use in patients with chest pain of cardiac origin.
Adenosine	Narrow complex tachycardia	Initial – 6mg rapid IV Repeat – 12mg rapid IV Follow each dose with 20ml NS rapid IV Refer to pediatric dosing guide	May cause transient heart block or asystole. Use caution when patient is taking carbmabazepine, dipyramidole, or methylxanthines. Do not administer if patient is experiencing acute asthma exacerbation.	Side effects include: chest pressure/pain, palpitations, hypotension, dyspnea, or feeling of impending doom.
Albuterol	Bronchospasm	5mg nebulized Repeat as needed 5mg nebulized Repeat as needed	Use caution in patients taking MAOIs (antidepressants Nardil and Parnate)	None
	Crush injury - hyperkalemia	5mg nebulized continuously to 20mg		
Amiodarone	V-Fib Pulseless V-Tach	Initial – 300mg IV/IO Repeat – 150mg IV/IO if rhythm persists Refer to pediatric dosing guide	In patients with pulses, may cause hypotension. Do not administer if patient is hypotensive. Do not use filter needle.	When creating infusion, careful mixing is needed to avoid foaming of medication.
	Symptomatic stable V-Tach	Initial – 150mg IV/IO drip over 10 minutes Repeat – 150mg IV/IO if needed		

Drug	Indication	Dosing	Cautions	Comments
Aspirin E	Chest pain – suspected cardiac or STEMI	**324mg PO**	Contraindicated in aspirin or salicylate allergy.	Blood thinner use is not a contraindication.
Atropine	Unstable bradycardia	Initial – 1mg IV/IO Repeat every 3-5 minutes to a max of 3mg Refer to pediatric dosing guide	Doses less than 0.5mg can cause paradoxical bradycardia.	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.
	Organophosphate overdose	Initial – 1-2mg IV/IO Repeat every 3-5 minutes until relief of symptoms is achieved Refer to pediatric dosing guide		
Calcium Chloride	Hydrofluoric acid exposure	500mg IV/IO for tetany	Use cautiously or not at all in patients on digitalis. Avoid extravasation. Rapid administration can cause dysrhythmias or arrest.	Administer 20ml flush IV/IO when delivering in conjunction with Sodium Bicarbonate.
	Suspected severe hyperkalemia A08, A13, T04	1g IV/IO over 2-3 minutes		
Cyanokit (Hydroxo-colbalamin)	Smoke inhalation burn	5gm IV infusion over 15 minutes	May cause substantial increases in blood pressure and acute renal failure	Monitor blood pressure during therapy
Dextrose 10%	Hypoglycemia	Initial - 100ml IV Repeat – 150ml if glucose remains ≤ 60mg/dl Refer to pediatric dosing guide	Can cause tissue necrosis if IV is infiltrated	Recheck blood glucose after administration.
Diphenhydramine	Allergic reaction	50mg IV/IO/IM Refer to pediatric dosing guide	None	None
	Dystonic reaction	50mg IV/IO/IM		

Drug Reference

Drug	Indication	Dosing	Cautions	Comments
Epi 0.01 mg/ml Push Dose Epi	Adult post resuscitation (ROSC) with systolic BP < 90mmHg	10mcg (1 ml) IV/IO every 3 minutes to a systolic BP > 90 mmHg	Use caution when mixing to make the correct concentration of EPI 0.01mg/ml. Dose should be provided by drawing up only what will be administered to prevent possible overdosing.	In Sepsis, consider base contact for Push Dose Epi in patients with severe hypotension, refractory to fluid bolus. LP15 Monitor should be set to cycle BP every 3 minutes.
Epi 0.1 mg/ml	Cardiac arrest	1mg IV/IO every 3-5 minutes	May cause serious dysrhythmias or exacerbate angina. In adult anaphylactic patients, should be used if patient is hypotensive or no improvement after Epi 1mg/ml IM dose. In pediatric anaphylactic patients, should only be administered if Epi 1mg/ml IM dose is ineffective.	Alpha and beta sympathomimetic. Use ½ dose for patients: • with history of CAD; or • > 50 years of age
	Cardiac arrest/ Bradycardia	Refer to pediatric dosing guide		
	Anaphylactic shock	0.1mg slow IV/IO increments titrated to effect to a max of 0.5mg		
		Refer to pediatric dosing guide		
Epi 1 mg/ml	Anaphylactic shock	0.3mg IM	Never administer IV/IO. Use with caution in asthma patients with a history of hypertension or coronary artery disease. May cause serious dysrhythmias or exacerbate angina.	Use ½ dose for patients: • with history of CAD; or • > 50 years of age
		Refer to pediatric dosing guide		
	Asthma/COPD or Pediatric respiratory distress	0.3mg IM		
		Refer to pediatric dosing guide		
EpiPen EpiPen Jr. E	Allergic reaction/ Anaphylaxis	1 auto-injector	See Epinephrine 1 mg/ml and Epinephrine 0.1 mg/ml	See Epinephrine 1 mg/ml and Epinephrine 0.1 mg/ml
		1 auto-injector		

Drug Reference

Drug	Indication	Dosing	Cautions	Comments
Fentanyl	Pain control	Initial - 25-50mcg IV/IO or 50-100mcg IM or 100mcg IN (50mcg each nare) May repeat to max of 200mcg Refer to pediatric dosing guide	Can cause hypotension or respiratory depression.	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.
Glucagon	Hypoglycemia	1mg IM or IN Refer to pediatric dosing guide	None	Effect may be delayed 15-20 minutes
Ketamine	Moderate to severe pain	50-69 kg – 15mg IV 70-89 kg – 20 mg IV ≥ 90 kg – 30 mg IV	Contraindicated in patients with multisystem trauma, ALOC and pregnancy, chest pain of cardiac origin	Draw in a tuberculin syringe and dilute dose in 10 ml or 100 ml NS for infusion over 5 minutes
Lidocaine	IO anesthetic	Initial – 40mg IO Repeat dose – 20mg if painful Refer to pediatric dosing guide	None	Effect may be delayed 15-20 minutes
Midazolam	Seizure	10mg IM (preferred) 10mg IN (5mg each nare) 6-8 mg IV/IO (if established) May repeat to a max of 10mg Refer to pediatric dosing guide	Use caution in patients over 60 years of age.	Observe respiratory status after administration.

Drug	Indication	Dosing	Cautions	Comments
Midazolam	Behavioral emergency	Initial - 5mg IM *or* 1-3mg IV in 1mg increments May repeat to a max of 5mg For excited delirium Initial – 10mg IM 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 administration 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	2-4mg 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 E	Overdose	Preload delivery only	See Naloxone	See Naloxone

Drug Reference

Drug	Indication	Dosing	Cautions	Comments
Nitroglycerin	Chest pain	0.4mg SL May repeat to a max of 3 doses	Can cause hypotension and headache. Do not administer if systolic BP < 90mmHg. Do not administer if patient has taken Viagra, Levitra, within past 24 hours or Cialis if taken within 36 past hours. Use caution and consider base contact if HR >120.	Perform 12-Lead ECG prior to administration.
	Pulmonary edema	0.4mg SL if systolic BP > 90mmHg 0.8mg SL if systolic BP > 150mmHg May repeat appropriate dose every 5 minutes		
Ondansetron	Vomiting or severe nausea	4mg IV/IO/IM/ODT May repeat after 15 minutes Refer to pediatric dosing guide	Administer IV/IO dose over 1 minute as rapid administration may cause syncope.	None
Sodium Bicarbonate	Tricyclic antidepressant overdose Crush injury Hyperkalemia	50mEq IV/IO	Can precipitate with or inactivate other drugs.	Use only if life-threatening or in the presence of hemodynamically significant dysrhythmias. Administer 20ml flush IV/IO when delivering in conjunction Calcium Chloride.
Tranexamic Acid (TXA)	Blunt or penetrating injury within 3 hours, **OR** Postpartum hemorrhage with > 500 ml blood loss, **AND** SBP < 90 due to <u>uncontrolled</u> hemorrhage	2gm slow IV/IO over 1 minute	Do not administer to: • Patient < 15 years old • Cervical cord injury with motor deficit • Traumatic arrest > 5 min, CPR without ROSC • Isolated drowning • Hanging victims	Do not delay transport to administer TXA.