Blood Administration

History	Signs and Symptoms	Differential

• Traumatic Injury
  • Penetrating
  • Blunt
• Surgical History
• Medical History
  • Medications
  • Previous Transfusions
• Duration of Injury
	• Active Bleeding
	  • Visible
	  • Internal
	• S/S Hemorrhagic Shock
	• Blood in Urine, Emesis or Stool
	• Increased Lactate Level
	• Decreased or Low Hemoglobin
		• Hemorrhagic Shock
		• Penetrating Injury
		• Blunt Injury
		• Open Surgical Wound
		• Dialysis Shunt Injury
		• Dehydration

Universal Patient Guideline

Initial Assessment and Treatment

1. (B) Assure Scene safety. Primary Survey/Control Severe Traumatic Bleeding per guideline
2. Baseline Vitals including
   - Temperature
   - Lactate Level, if available
   - H&H Level
3. Complete inclusion criteria and confirmation procedure
4. FAST Exam
4. Normal Saline IV on a blood y with QinFlow Warmer.
   - If able two primary access sites are preferable
     - 2 IVS or an IV and IO

Inclusion Criteria 12 and older (Should have 2 or more of the following)

1. Hemodynamically Unstable
   - HR > 120
   - Systolic B/P 90 mmHg or less
2. Penetrating Injury and/or Blunt Trauma with significant injury
3. Positive FAST (If available)
4. Lactate > 4
4. Hemoglobin < 6.0 (Intended as a guideline for medical patients)

Note if criteria is not met, and feel the need is there, contact the on call EMS Physician

Administration

1. Confirm patent administration site if any question exists utilize a new site
   - Record baseline vitals, including TEMP
   - (2) EMS personnel confirm the correct blood product, blood type, RH Factor, Titer and expiration date
   - Complete and sign the HCESD 48 Blood Tag
2. Place flat thermometer on patient's forehead
3. Administer
   - Whole Blood (LTOWB O+ <256) **1 unit** IV/IO via blood Y.
     - Flow through blood warmer to completion and/or hemodynamic stability. Repeat PRN x 1
     - If bleeding is controlled, IE Tourniquet is applied, bleeding is stopped. Administer back to normotensive levels
   - Low Titer A Liquid Plasma and O- PRBCs given in pairs to permissive hypotension hemodynamic stability.
     - In the event LTOWB is not available
     - Plasma may be given on its own, PRN
4. If only one IV line can be established, medications can be pushed via the Blood Y.
   - Stop the Blood Flow
   - Flush with 10cc NS
   - Push the Medication
   - Flush with 10cc NS
   - Re-Start Blood Flow

Blood Administration

Note Well & Treatment Options

1. Consistently watch for transfusion reaction. If any reaction is suspected, stop transfusion
   - For Minor Reactions, Treat PRN and attempt to continue the transfusion
   - Change Out IV Lines and Utilize BCS or NS
   - Bag all blood products to be returned to the blood bank
   - For an Allergic Reaction goto Guideline M-2 PRN
2. Full report to the receiving level 1 or designated medical center about blood transfusion
3. If any question exists contact the on call EMS Physician
4. Do not delay transport to initiate blood products. Start enroute to the receiving facility
5. Treat Medical Based patients via Guideline M-9 and OB via Guideline M-16

Blunt Traumatic Injury

History	Signs and Symptoms	Differential
• Mechanism of Injury • Damage to Vehicle • Speed of Vehicle • Restraints • Helmet or No Helmet • Type of Object Struck With • Height of Fall • Medical History	• Pain • Swelling and/or Deformity • Altered Mental Status • S/S of Shock • S/S Pneumo or Tension Pneumo • Traumatic Arrest	• Hemorrhagic Shock • Pneumothorax • Intra-Abdominal bleeding • Long Bone Fx • Pelvic Fx • Spinal Injury • Head Injury

Universal Patient Guideline

Initial Assesment

1. (B) Assure Scene Safety/Rapid Trauma Assessment
    - Hemodynamic Stability
    - Early Transport Decision
2. (B) Baseline Vitals including (If able)
    - Temperature
    - Lactate
    - H&H
    - FAST Exam

Treatment (Situational Awareness of surroundings and assure scene safety)

1. (A) C-Spine PRN, see T-1 for reference
2. (B) Keep patient warm and prevent hypothermia
3. (P) Needle decompression PRN
    - (S) Finger thoracotomy PRN
4. (B) Pelvic Binder PRN
5. Normal Saline **250 cc** IV fluid bolus. Repeat up to 1 liter. Utilize warmed fluids PRN. Titrate to maintain blood pressure of 90-100/systolic (100-110/systolic for suspected TBI). *Note blood products are the fluid of choice
    - If able two primary access sites are preferable
        - 2 IVS or an IV and IO
6. Blood Products PRN see T-2 for reference
7. Pain Control PRN see M-18 for reference

Medication Options

Ondansetron **8mg** IV/IM/PO for nausea & vomiting. Repeat PRN q 5 min x 1 (IM (P) only)

Calcium Chloride **1g** IV for patients receiving blood products

- Do not give in the same line as blood
- Flush line with 10-20ml of NS after bolus

TXA **2g** IV Slow push or put in 50ml NS and run WO for

- Severe Blunt trauma and/or TBI with indication of shock and/or need for blood transfusion
- Give prior to Blood Products

Note Well & Treatment Options

1. Rapid and best means of transport to an appropriate level trauma center PRN
2. Do not delay transport, perform procedures enroute unless airway control is needed
3. Use caution and work with law enforcement to preserve evidence if this is a crime scene
4. In the event of sexual assault, contact the receiving facility for availability of SANE exam

Penetrating Traumatic Injury

History	Signs and Symptoms	Differential
• Mechanism of Injury • Number of Shots Heard • Type of Weapon or Object • Time of Injury • Duration of Injury • Medical History	• Open Wound or Wounds • Altered Mental Status • S/S of Shock • S/S Pneumo or Tension Pneumo • Traumatic Arrest	• Hemorrhagic Shock • Pneumothorax • Active Bleeding • Internal Bleeding • Long Bone Fxs • Spinal Injury • Head Trauma

Universal Patient Guideline

Initial Assessment

1. (B) Assure Scene safety/Rapid Trauma Assessment
    - Hemodynamic Stability
    - Early Transport Decision
2. (B) Baseline Vitals including (as available)
    - Temperature
    - Lactate Level
    - H&H Level
    - FAST/EFAST Exam

Treatment (Situational Awareness of surroundings and assure scene safety)

1. Rapidly control severe bleeding via the best way
    - **Mild** Apply direct pressure and secure in place. Monitor for changes
    - **Moderate** Direct pressure in combination with a pressure dressing or tourniquet. Monitor for change
    - **Severe** Immediately apply commercial tourniquet if anatomically able. More than one may be needed, especially on lower extremities
    - **Junctional** If able pack wound with hemostatic gauze, hold direct pressure for 3 minutes and apply pressure dressing and/or utilize a Junctional Tourniquet

** Note, Severely hypovolemic patients may not be actively bleeding*

2. (B) Keep patient warm and prevent hypothermia
3. (B) Occlusive dressing/chest seal PRN (P) Needle Decompression PRN
    - (S) Finger thoracotomy PRN
4. Normal Saline **250ml** IV fluid bolus. Repeat up to 1 liter. Utilize warmed fluids PRN. Titrate to maintain blood pressure of 90-100/systolic or 100-110/systolic for suspected TBI. *Note blood products are the fluid of choice
    - If able two primary access sites are preferable
        - 2 IVS or an IV and IO
5. Blood Products PRN see T-2 for reference
6. Pain Control PRN see M-18 for reference

Medication Options

Ondansetron **8mg** IV/IM/PO for nausea & vomiting. Repeat PRN q 5 min x 1 (IM (P) only)
Cefazolin 2g IV for Amputations and/or contaminated wounds (3g if patient >120kg)
Clindamycin 900mg IV for Amputations and/or contaminated wounds, with a PCN or Cephalosporin allergy
Calcium Chloride **1g** IV for patients in hemorrhagic shock, receiving blood products

- Do not give in the same line as blood
- Flush line with 10-20ml of NS after bolus

TXA **2g** IV Slow push or put in 50ml NS and run WO, if the patient will need blood products and/or TBI

- Give prior to blood products

Note Well & Treatment Options

1. Rapid and best means of transport to an appropriate level trauma center PRN
2. Do not delay transport, perform procedures enroute unless airway control is needed
3. Use caution and work with law enforcement to preserve evidence if this is a crime scene
4. In the event of sexual assault, contact the receiving facility for availability of SANE exam
5. Do not remove a tourniquet once in place

Traumatic Cardiac Arrest

History	Signs and Symptoms	Differential

• Traumatic Injury
• Mechanism of Injury
  • Penetrating
  • Blunt
• Medical History
• Duration of Down Time
	• Pulesless and Apenic
	• Active Bleeding
	• S/S of Internal Bleeding
	• S/S Tension Pneumothorax
	• Rapid and Narrow PEA
		• Penetrating Injury
		• Blunt Injury
		• Cardiac Arrest
		• Hemorrhagic Shock

Universal Patient Guideline

Immediate Treatment and Assessment

1. (P) Evaluate injuries, presenting rhythm and down time to determine patient viability
2. (F) Chest compressions in 2 minute uninterrupted cycles
3. (B) Control bleeding via tourniquet, JETT or combat gauze
   - Non-bleeding wounds with potential for bleeding upon return of volume and circulation should be controlled
4. (B) Apply Pelvic Binder PRN
5. (P) Bilateral chest decompressions PRN. If there is any question go ahead with the procedure
   - (S) Bilateral finger thoracotomy
6. Blood Products IV to replace volume, utilize QinFlow if able
7. Normal Saline **250ml** IV fluid bolus up to 1 liter. Use after blood or if no blood is available
8. Manage airway at credentialed level. Attach end tidal CO2
9. Epinephrine **1:10**,000 **1mg** IV. Repeat q 6min PRN to a max of 4mg
10. Calcium Chloride **1g** IV for penetrating trauma arrest x 1
11. Work Hs and Ts to rule out other causes of arrest, see Guideline C-1 PRN
12. Ultrasound as avaialble
    - FAST
    - EFAST

Transport Decision

1. Blunt Trauma- Initiate care and transport to closest Trauma Center
2. Penetrating Trauma- Initiate care
   - Transport Time < 20 Minutes by Air or Ground go to Level 1 Center
   - Transport Time > 20 minutes by Air or Ground go to the closest trauma center

ROSC should goto a level I by Ground or Air

Note well and Treatment Options

1. Correcting traumatic causes like tension pneumothorax, hypovolemia, and bleeding control are PRIORITY
2. This guideline is not intended to work obvious traumatic deaths
3. Once all rapid causes have been assessed and arrest guidelines are working, if IV access could not be obtained, look again for IV access with CPR in progress to maximize administration of blood products and/or fluid boluses
5. Again, minimize scene time. Do most interventions enroute. Imminent surgical care is needed

Abdominal Pain

History
- History of Present Illness
- Past Medical History
- Past Surgical History
- Medications
- Last Meal Intake
- Last BM and/or Emesis
- Menstrual History
- Estimated Duration

Signs and Symptoms
- Pain (OPQRST)
- Nausea and/or Vomiting
- Constipation
- Diarrhea
- Pregnant
- Blood in Urine, Emesis or Stool
- Pulsating Mass
- Fever

Differential
- AAA
- Cardiac Event
- GI Bleed
- Ectopic Pregnancy
- Food Poisoning
- Hypoxia
- GI or Renal Disorders
- Infection
- Psychological Causes

Cardiac Suspicion
- Epighastric Pain
- EKG Changes
- Cardaic History
- SOB

GO TO Guideline C-6 for high suspicion of a Cardiac Event

Universal Patient Guideline

Assessment
1. (P) 12 lead EKG for Cardiac Markers
2. (P) H & H and Lactate if available
3. Abdominal Pain should include Differential Diagnosis for the following
    1. Abdominal Aortic Aneurysm (AAA)
    2. Pancreatitis
    3. Ectopic Pregnancy
    4. GI Bleed
4. (P) Abdominal Ultrasound, if available

Treatment
1. Normal Saline/BCS **250cc** IV Fluid Bolus may repeat up to 1 liter. Utilize warmed fluids PRN
2. Consider Blood Products for medically suspected hemorrhagic shock

Medication Options
Ondansetron **8mg** IV/IM/PO for nausea & vomiting. Repeat PRN q 5 min x 1 (IM (P) only)
Droperidol **1.25mg** IV/IM. Repeat PRN q 10 min at **0.625mg**
- Secondary to Ondansetron, unless actively vomiting
- Intractable Vomiting

Ofirmev **1g** IV over 10 minutes
- Mild-moderate pain
- Fever >100, infuse over 10 minutes
- Reduce to **15mg/kg** if < 50kg

Fentanyl **1mcg/kg** IV moderate-severe pain (100mcg max dose). Repeat PRN q 5 min x1. (Consider 2mcg/kg for IN)

Note Well & Treatment Options
1. For epigastric pain, unexplained abdominal pain, SOB, cardiac history or other cardiac markers, utilize the 12 lead EKG and treat appropriately PRN
2. Utilize fluid boluses for dehydration and/or hypotension. Repeat PRN. Use caution in the elderly population and CHF. Always consider warmed IV fluids
3. If a AAA is suspected, maintain B/P at 90/systolic. Transfer to vascular surgery capable center
4. Confirm receiving facility has 24/7 Gastrointestinal Coverage
5. TXA is not indicated for any GI suspected bleeds

Medical Hypovolemia

History	Signs and Symptoms	Differential
• Previous Medical History • Medications (Look for anticoagulants) • Blood Loss • Fluid Loss • Environmental Exposure	• Altered Mental Status • Hypotension • Tachycardia • Cold, Clammy Skin • Black Tarry Stools • Coffee Ground Emesis	• GI Bleed • Vaginal Bleed • Vomiting • Diarrhea • Infection • Cardiac Causes • CNS Causes • Non Traumatic Hypovolemia

Universal Patient Guideline

Assessment

1. Assess for shock
   - Type
   - Level of Shock
   - Causes
2. Signs of Hypo-Perfusion:
   - Tachycardia
   - AMS
   - Mottled and / or cold extremities
   - Hypotension
3. (B) Point of Care
   - Blood Glucose Level
   - Lactate Level
   - H&H Level
   - FAST

Treatment

1. Normal Saline **1 liter** IV. Repeat PRN up to 2 liters reassessing for signs of pulmonary edema. Goal is SBP of > 90 and signs of adequate perfusion
2. Low Titer O+ Whole Blood **1 unit** IV for hypovolemia with known or suspected bleeding

Blood Therapy Guidelines (For any questions or concerns contact the online EMS Physician)

1. Suspected or Active GI or Vaginal Bleed
2. Signs of Active Bleeding
   - Tachycardia
   - Hypotension
   - Altered Mental Status
   - Lactate Level > 2.0
   - Hemoglobin <7.0

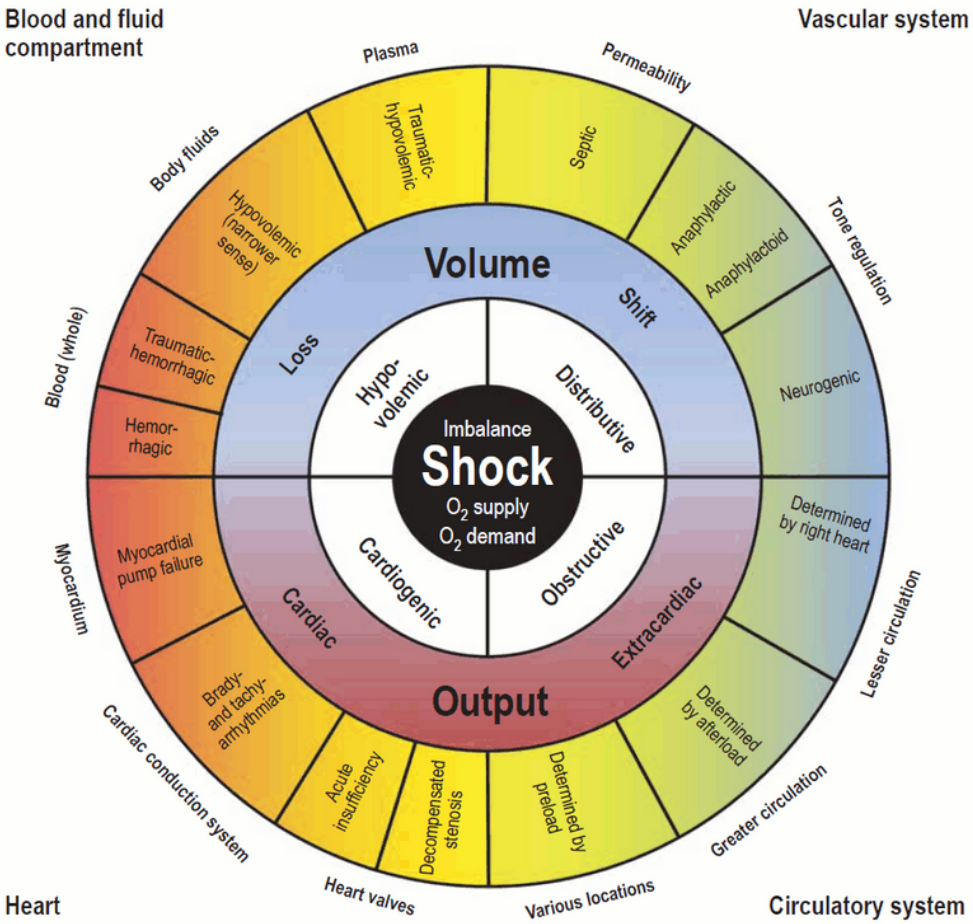
Medication Options

Ondansetron **8mg** IV/IM/PO for nausea & vomiting. Repeat PRN x 1 q 5 min (IM (**P**) only)
Norepinephrine (16mcg/ml) **0.5ml** push dose pressor. Repeat PRN x 2 Q 1-2 min (Follow with Norepi Infusion)
Norepinehprine (16mcg/ml) **8mcg/min** IV (30ml/hour). Titrate PRN by 4mcg/min q 5 min to a B/P of 90-100/Systolic
Liquid A Plasma **1 unit** May be given in place of or in addition to LTOWB
PRBCs O- **1 unit** May be given in place of or in addition to LTOWB

Note Well & Treatment Options

1. Use caution with fluid boluses in the elderly
2. Treat hypovolemia based shock. Refer to the appropriate guideline PRN for other shock causes
3. Push dose pressors can be given with fluid bolus. Maintenance infusion should be established post fluid bolus
4. TXA is not indicated for any GI suspected bleeds

Medical Hypovolemia



	RR	HR	BP	SKIN	TEMP	URINE	OTHER S&S
ANAPHYLACTIC Severe allergic reaction.	↑↓	↑	↓	Flushed Swollen Itchy	NO CHANGE	↓	Urticaria, Pruritus, Decreased LOC, Bronchoconstriction
CARDIOGENIC Failing pumping ability of the heart.	↑	↑	↓	Pale Cool Clammy	NO CHANGE	↓	Chest Discomfort, Syncope, JVD, Pulmonary Edema, Orthopnea
HYPOVOLEMIC Reduced circulating blood volume.	↑	↑	↓	Pale Cool Clammy	NO CHANGE	↓	Anxiety, Thirst, Syncope, Weakness, Confusion, Dizziness, Syncope, Weak Pulse
OBSTRUCTIVE Physical obstruction of great vessels or the heart.	↑	↑	↓	Extremities: Pale Cool	↓	↓	Muffled Heart Sounds, JVD, Decreased LOC, Signs of Poor Perfusion
NEUROGENIC Severe central nervous system damage.	↑	↓	↓	Warm Flushed Dry	↑ OR ↓	No Bladder Control	Paralysis Distal to Injury Site, Priaprism
SEPTIC Extreme immune system response to an infection.	↑	↑	↓	Flushed then Pale & Cool	≥38°C OR <36°C	↑	Bounding Pulse, Altered LOC

Obstetrical Emergencies

History	Signs and Symptoms	Differential
• Due Date • Past Medical History • Pre-Natal Care • Medications (Look for Htn Meds) • Gravida/Para	• Vaginal Bleeding • Hypotension • Hypertension • Severe Head Ache • Seizures • Edema (Hands and Face)	• Pre-Eclampsia/Eclampsia • Placenta Previa • Placenta Abruptio • Spontaneous Abortion • Substance Abuse

Universal Patient Guideline

Assessment

1. Obtain full OB history
2. Evaluate for hemorrhage
    - (B) Obtain Lactate and H&H if able
3. Evaluate for S/S of Pre-Eclampsia/Eclampsia
4. Determine delivery status

Treatment

1. If delivery is not imminent, transport in left lateral recumbent position
2. If delivery is imminent, go to Guideline M-15
3. Midazolam **5mg** IM if actively seizing, do not delay care for IV access
4. Normal Saline **250ml** IV Fluid Bolus may repeat up to 1 liter. Utilize warmed fluids PRN
5. Blood Products PRN for severe bleeding. Consult the on call EMS Physician
6. TXA **2g** IV Slow push or put in 50ml NS and run WO for confirmed bleeding time < 3 hours

Medication Options

Ondansetron **8mg** IV/IM/PO for nausea & vomiting. Repeat PRN q 5 min x 1 (IM (P) only)
Dextrose 10% (0.1g/ml) **125ml IV** for BS < 60mg/dl. Repeat PRN x 1 q 5 min
Cardene **5mg/hr** (50ml/hr) IV for systolic > 200 and/or diastolic > 110

- Increase by 2.5mg/hr (25ml) q 10min PRN to a max dose of 15mg/hr (150ml)
- Target is 10-15% reduction in SBP

Midazolam **2.5mg** IV for seizure control and/or mild sedation

- 5mg IM Repeat PRN x 2 q5min
- Repeat PRN x 2 q 5min

Mag-Sulfate **4g** (100ml D5W) IV over 10 min for known or witnessed seizure activity

- Post midazolam for active seizures

Note Well & Treatment Options

1. Mother is the priority patient until child birth
2. Go to child birth Guideline M-15 PRN
3. If patient arrests, go to Guideline C-1 (Pregnancy Section)
4. If actively seizing give midazolam prior to Mag-Sulfate

Trauma

History	Signs and Symptoms	Differential
• Previous Medical History • Medications • Toxic Exposures • Traumatic Event • Duration of Event • Suspected Abuse • Mechanism of Injury	• Tachycardia • Obvious Injury • Hemorrhage • S/S of Hemorrhagic Shock • Burns • Altered Mental Status • Respiratory Distress • Pain	• Fracture • Burns • Blunt Trauma • Penetrating Trauma • Head Injury • Drowning/Near Drowning • Suspected Abuse • Toxic Exposure

Utilize Handtevy System for all dosing and admixtures (*Notate color you are working from*)

Initial Assessment and Care

1. Evaluate S/S, MOI and injuries. Make an early transport decision. Go to Guideline S-23P
2. (B) C-Spine immobilization PRN and titrated to age, IE car seat or half/full Hartwell splint
3. (B) Keep patient warm and prevent hypothermia
4. (B) Baseline temperature
5. LTOWB is the fluid of choice.
    - Normal Saline **20ml/kg** fluid bolus for hypotension Utilize warm fluids PRN

5. (P) IO access PRN

Hemorrhage

1. (B) Apply direct pressure to control bleeding.
2. (B) If unable to control bleeding
    - Tourniquet to control extremity bleeds
    - If unable to apply a tourniquet, utilize hemostatic gauze and direct pressure

3. (B) Transport to appropriate medical facility by ground or air PRN
4. Consider Blood Products PRN. Go to Guideline T-2
5. Pain management per medication options

Burns

1. (P) Prepare for advanced airway management PRN. Go to Guideline P-4
2. (B) Stop burning process and wrap in clean dry burn sheet.
3. (B) Keep patient warm and prevent hypothermia.
4. Pain management per medication options below.
5. (B) Transport to burn center by ground or air PRN

Fractures

1. (B) Splint as found with best device. Attempt to reach position of comfort
2. Pain management per medication options
3. For open fractures, utlilize antibiotics per medication options
3. (B) Transport to appropriate medical facility by ground or air PRN

Drowning / Near Drowning

1. (B) If age appropriate, utilize CPAP PRN
1. (P) Prepare for advanced airway management PRN. Go to Guideline P-4
2. Always transport near-drowning/submersion injury patients
3. Remove wet clothing and work to prevent hypothermia
4. Consider traumatic cause and c-spine immobilize

Trauma

Mild to Moderate Pain 0-4

Acetaminophen **15mg/kg** PO
- <10y/o max dose is 500mg
- >10y/o max dose is 1g

Ofirmev **15mg/kg** IV fever > 100 and/or mild pain (1-4), if unable to give PO
- Patient >1y/o
- Maximum dose is 1g

Moderate to Severe > 5

Fentanyl Pain >4
- **0.5mcg/kg** IV. Repeat PRN x1 q 5min
- **1.5mcg/kg** IM/IN. Repeat PRN x 1 q 5min
- Max initial dose 100mcg and max total dose 200mcg

Ketamine
- **0.2mg/kg** (50ml of NS) Primary pain medication or pain refractory to Fentanyl. Max dose 20mg. May also give IM or IN. (>3 years of age)

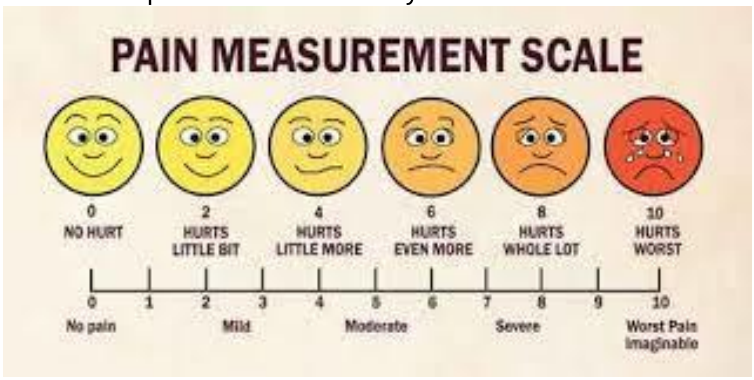
Medication Options

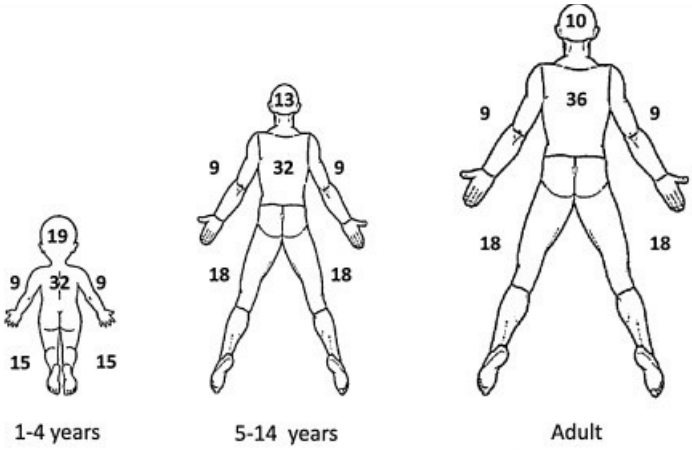
Ondansetron for nausea and/or vomiting
- **0.1mg/kg** IV/IM. Max dose is 4mg. Repeat PRN x 1 q 5min
- **4mg** PO dose may be used if >40kg x 1

Ceftriaxone **50mg/kg** (50ml of NS) IV infused over 10 min for open log bone fractures. Max dose is 2g

Note Well and Treatment Options

1. As with all pediatric patients, good airway management and oxygenation are essential
2. Pediatric trauma patients compensate well and crash fast. Look for early signs & symptoms of shock
3. Do not delay transport for IV antibiotics, give enroute to pediatric trauma facility





Blood Products

Clinical Indications
- Penetrating Trauma
- Blunt Trauma
- Hemorrhagic Shock
  - Traumatic
  - Medical

Clinical Contraindications
- Known transfusion reaction
- Religious reasons
- Does not meet transfusion criteria

Usage Key

P	Paramedic
S	Supervisor
AP	AP Paramedic

Class: Biological

Actions: Improves blood volume and pressure with the ability to carry oxygen. Hemostatic properties to control bleeding

Pregnancy Category: None

Dosage Adult:
- 1 unit Low Titer O+ Whole Blood for all indications
- 1 unit of A Liquid Plasma for Angioedema reaction
- 1 unit of A Liquid Plasma PRN for active bleeding in addition to or if no LTOWB is available
- 1 unit of O PRBCs in pairs with A Liquid Plasma if LTOWB is not available

Dosage Pediatric:
- Low Titer O+ Whole Blood at 10ml/kg to hemodynamic stability, followed by 100ml/hr (MD Approval)
- Liquid A Plasma and O- PRBCs at 10ml/kg to hemodynamic stability, followed by 100ml/hr

Side Effects:
- Transfusion Reaction similar to allergic reaction but may also have chills
- Fever
- Pain at the injection site
- Low back pain
- Vomiting
- Hemoglobinuria

Note Well:
- Must be stored in temperature controlled environment
- Must be maintained in the approved cooler
- Use filterted blood Y tubing for administration
- Blood products must be verified by 2 crew members prior to administration
- IV access should be 20g or larger if possibe
- Efficient documentation and transfer of all product related forms
- If transfusion reaction develops, replace all lines, save blood products and tubing to be returned to blood bank
- NS or Plasma Lyte-A should be the primary IV solutions when giving blood
- If possible utilize a 2nd line for medications. If the blood line needs to be used:
  - Stop the blood infusion
  - Flush with 20cc of NSS
  - Give Medications
  - Flush with 20cc of NSS
  - Restart blood infusion
- Utilize QinFLow warmer with all blood administration

Supplied:
1. LTOWB
2. Liquid A Plasma
3. O- PRBCs

Calcium Chloride

Clinical Indications
- Cardiac Arrest with Renal Disease
- Calcium Channel Blocker Overdose
- HyperKalemia
  - Crush Injury
  - Cardiac Arrhythmias
  - Medical Causes

Clinical Contraindications
- Known Hypersensitivity

Usage Key

P	Paramedic
S	Supervisor
AP	AP Paramedic

Class: Electrolyte

Actions: Improves myocardial contractility, may enhance ventricular automaticity. Stabilizes cardiac membranes

Onset: Rapid Onset
Duration: 30 minutes-2 hours
Half Life: Unknown

Pregnancy Category: C

IV Fluid Compatibility:
- Normal Saline
- Dextrose 5%

Dosage Adult:
- 1g IV for cardaic arrest with known renal disease
- 1g (*100ml of D5W*) IV over 10 minutes for symptomatic calcium channel blocker OD
- 1g IV slow for confirmed or suspected medical HyperKalemia (*DO NOT give with Sodium Bicarbonate*)
- 1g IV slow for crush injury > 4 hours (*DO NOT give with Sodium Bicarbonate*)
- 1g IV slow for trauma indications
  - Hemorrhagic Shock
  - Penetrating traumatic cardiac arrest
  - Give post 1 unit of blood products and flush with 10cc NS post bolus

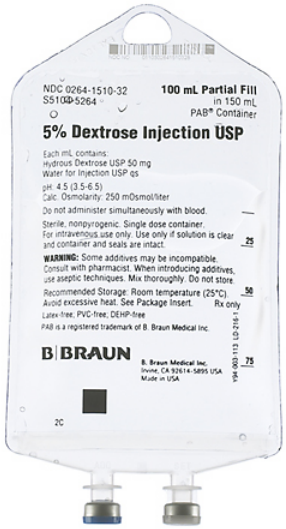
Dosage Pediatric:
- 20mg/kg (50ml of NS) IV infuse over 10 minutes for sympotmatic calcium channel blocker OD. Max dose is 1g

Side Effects:
- Hypotension
- Flushing
- Warm Feeling
- Cardiac Arrhythmias

Note Well:
- DO NOT mix or administer with sodium bicarbonate it will create a precipitate
- Rapid push may cause bradycardia
- Infusions over 10 minutes on a secondary IV set
- Consider placing in 50ml NS for slow IV push
- Infiltration may cause tissue necrosis
- If PlasmaLyte or Normosol is hanging, flush with 10ml of NSS post administration
- Utilize the Handtevy system for pediatric dosages

Supplied:
- 1g Pre-Filled Syringe

Calcium Chloride



Place 1g Calcium Chloride + 100ml Dextrose 5% = 10mg/ml

Typical dose: 1g infused over 10 min on a secondary set

Drug Incompatibility:
1. Ampicillin
2. **ceFAZolin**
3. cefTAZIDime
4. cefitriAXONE
5. ceFUROxime
7. Dobutamine
8. **Magnesium Sulfate**
9. Potassium phosphate
10. Propofol
11. **Sodium Bicarbonate**

IV Fluid Combatibility
1. Dextrose 5%
2. Normal Saline

IV Fluid Incombatibility
1. Normosol
2. Plasmalyte

Tranexamic Acid (TXA)

Clinical Indications
- Blood Transfusion
- Hemorrhagic Shock
  - Trauma
  - OB
- Traumatic Brain Injury

Clinical Contraindications
- Known Drug Allergy
- GI Bleed
- Injury > 3 hours
- OB Bleeding > 3 hours
- Hemorrhagic Stroke
- Non-Traumatic Head Bleed

Usage Key

S	Supervisor
AP	AP Paramedic

Class: Hemostatic Agent

Actions: Inhibits activation of plasaminogen, thereby preventing the conversion of plasminogen to plasmin

Onset: Unknown
Duration: 7-8 hours
Half Life: 2 hours

Pregnancy Category: B

IV Compatibility:
- Normal Saline

Dosage Adult:
- 2g IV in 50ml NS and run WO
- 2g in 20ml syringe slow IV push

There are no pediatric indications for this medication

Side Effects:
- Thromboembolism
- Seizures
- Nausea
- Vomiting
- Hypotension

Note Well:
- Give prior to Blood Products
  - Do not give blood through the same line without flushing first
- Do not give if bleeding time is unknown or can not be confirmed < 3 hours

Supplied:
- 1g 10ml Vial

Tranexamic Acid (TXA)

Place 2g in 50ml NS = 40mg/ml
Place 2g in 20ml Syringe

Typical dose: 2g IV infuse on a secondary IV set
2g in 20ml syringe slow IV

Drug Incompatibility:
1. **Blood**

IV Fluid Combatibility
1. Normal Saline