# Pediatric; Hypotension / Shock



## **History**

- Blood loss
- \* Fluid loss
- Vomiting
- Diarrhea
- \* Fever
- Infection

## **Signs and Symptoms**

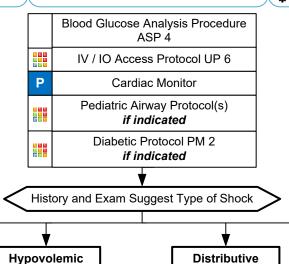
- Restlessness, confusion, weakness
- \* Dizziness
- \* Tachycardia
- \* Hypotension (Late sign)
- Pale, cool, clammy skin
- Delayed capillary refill
- Dark-tarry stools

#### **Differential**

Shock

Hypovolemic Cardiogenic Septic Neurogenic Anaphylactic

- \* Trauma
- \* Infection
- Dehydration
- Congenital heart disease
- Medication or Toxin



Age Specific Blood Pressure indicating possible shock

Age 0 – 28 days: SBP < 60 Ages ≥ 1 month: SBP < 70 Age 1 – 9: SBP < 70 + (2*x* Age)

Ages 10 – 64: SBP < 90 Ages ≥ 65: SBP < 110

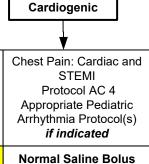
> All ages Shock Index: HR > SBP

> > Obstructive

Chest Decompression-

Needle Procedure WTP 1

if indicated



5 – 10 mL / kg IV / IO

Titrate to age appropriate

SBP ≥ 70 + (2 x Age)

Maximum 10 mL / kg

Pediatric Allergy
Protocol PM 1
if indicated

Suspected Sepsis Protocol UP 15
if indicated

Multiple Trauma Protocol TB 6
if indicated

Normal Saline Bolus 20 mL/kg IV / IO Titrate to age appropriate SBP ≥ 70 + (2 x Age) Maximum 60 mL / kg

Consider

Push-Dose Vasopressor Agent

Α

Norepinephrine 0.1 – 2.0 mcg/kg/ min IV / IO

Titrate to age appropriate SBP ≥ 70 + (2 x Age)

Notify Destination or Contact Medical Control



## Pediatric; Hypotension / Shock



\*\* Refer to Length Based Medication Tape for Medication Doses IF pediatric patients weight is unknown \*\*

#### Push-Dose Vasopressor Agent - Procedure

- 1. Indications
  - a. Peri-intubation hypotension
  - b. Post-arrest (post-ROSC) hypotension
  - c. Hypotension requiring initiation of vasopressor drip prior to drip setup
  - d. Unstable bradycardia (as a supplement to other therapy)
- 2. Instructions
  - a. Draw up 1mL of 1:10,000 epinephrine
  - b. Waste 1mL of saline from a 10mL saline flush
  - c. Add the 1mL of epinephrine to the remaining 9mL of saline
    - . This yields epinephrine in a concentration of 10mcg/mL
  - d. Place a medication added label on this syringe to identify it as a vasopressor
  - e. Administer 1mcg/kg (0.1mL/kg) every 2 minutes as needed to achieve desired blood pressure or heart rate and/or max 10mcg (1mL)

## Norepinephrine (Levophed) Drip Rates

For the following chart, add 4mg norepinephrine to 250mL NS or D5W. Use 60 gtts/mL IV Set

Desired Dose (mcg/min)	4 mcg/min	8 mcg/min	12 mcg/min	16 mcg/min	20 mcg/mi	24 mcg/min	28 mcg/min	30 mcg/min
Drip Rate	15	30	45	60	75	90	105	113
(drops/min)	gtts/min	gtts/min	gtts/min	gtts/min	gtts/min	gtts/min	gtts/min	gtts/min

#### **Pearls**

- \* Recommended Exam: Mental Status, Skin, Heart, Lungs, Abdomen, Back, Extremities, Neuro
- \* Consider all possible causes of shock and treat per appropriate protocol. Majority of decompensation in pediatrics is airway related.
- \* Decreasing heart rate and hypotension occur late in children and are signs of imminent cardiac arrest.
- \* Shock may be present with a normal blood pressure initially.
- \* Shock often is present with normal vital signs and may develop insidiously. Tachycardia may be the only manifestation.
- \* Consider all possible causes of shock and treat per appropriate protocol.
- \* Hypovolemic Shock;

Hemorrhage, trauma, GI bleeding, or pregnancy-related bleeding.

#### **Tranexamic Acid (TXA):**

Agencies utilizing TXA must submit letters from the their receiving trauma centers for approval by the OEMS Medical Director.

Receiving trauma centers must agree to continue TXA therapy with repeat dosing.

TXA is NOT indicated and should NOT be administered where trauma occurred > 3 hours prior to EMS arrival.

#### \* Cardiogenic Shock:

Heart failure: MI, Cardiomyopathy, Myocardial contusion, Ruptured ventricle/ septum/ valve/ toxins.

#### \* Distributive Shock:

Septic/ Anaphylactic/ Neurogenic/ Toxic

Hallmark is warm, dry, pink skin with normal capillary refill time and typically alert.

### \* Obstructive Shock:

Pericardial tamponade. Pulmonary embolus. Tension pneumothorax.

Signs may include hypotension with distended neck veins, tachycardia, unilateral decreased breath sounds or muffled heart sounds.

#### \* Acute Adrenal Insufficiency or Congenital Adrenal Hyperplasia:

Body cannot produce enough steroids (glucocorticoids/ mineralocorticoids.)

May have primary or secondary adrenal disease, congenital adrenal hyperplasia, or more commonly have stopped a steroid like prednisone. Injury or illness may precipitate.

Usually hypotensive with nausea, vomiting, dehydration and/ or abdominal pain.

If suspected, Paramedic should give Methylprednisolone 125 mg IM / IV / IO or Dexamethasone 10 mg IM / IV / IO. Use steroid agent specific to your drug list.

May administer prescribed steroid carried by patient IM / IV / IO. Patient may have Hydrocortisone (Cortef or Solu-Cortef). Dose: < 1y.o. give 25 mg, 1-12 y.o. give 50 mg, and > 12 y.o. give 100 mg or dose specified by patient's physician.