SHOCK and FLUID THERAPY

ALL PROVIDERS / EMT

- **Focused history and physical exam**
  - Blood glucose, oxygen saturation and temperature assessment
  - Consider shock in patients with one or more the following:
    - Vital signs: HR >100, SBP of <90mmHg for adults, SBP <70 + (age in years x 2) mmHg for children, or RR >20 BPM
    - Skin signs: cold clammy skin, febrile, or delayed capillary refill
    - Mental status: altered, lethargic, or irritable (esp. in infants).
- Evaluate for the source including distributive (e.g. infection, anaphylaxis), hypovolemic (e.g. hemorrhagic, vomiting/diarrhea, heat exposure), neurologic (i.e. spinal injury), or cardiogenic
- Continuous cardiac, ETCO2, and pulse oximetry monitoring, when available
- Obtain a 12 Lead EKG when available
- **Treatment Plan**
  - Address the underlying cause of the shock, if possible
  - Administer 10-15 lpm of oxygen to keep oxygen saturations between 90-94%.
  - Ensure patient warmth, resuscitate with warm IV fluids, when available
  - Pregnancy >20 weeks gestation - Transport in partial left lateral decubitus position. Place wedge-shaped cushion or multiple pillows under patient’s right hip and shoulders to elevate R side 45 degrees
  - Pediatric lowest acceptable systolic blood pressures are birth to 1 month = 60mmHg, 1 month to 1 year = 70mmHg, 1 year to 10 years is = 70mmHg + (age x 2) and over 10 years = 90mmHg.
ADULT

ADULT AEMT

- Vascular access per IV/IO Access Guideline
  - Insert 2 large bore IVs

- Traumatic Shock – Permissive Hypotension
  - If SBP >80-90:
    - No IV fluid bolus
    - Place saline locks on IVs or run at TKO rate
  - If SBP <80-90:
    - Give fluid bolus 500mL at a time, reassess and repeat as needed to:
      - Maintain SBP to 80-90 mmHg WITHOUT a CLOSED HEAD INJURY.
      - Maintain SBP to 110-120 mmHg WITH a CLOSED HEAD INJURY.
  - Once minimum blood pressures have been achieved the patient should have a saline lock and no further fluid boluses should be administered until the BP falls below the limits.

- Non-Traumatic Shock – Give IV fluid bolus 500 ml at a time, reassess and repeat up to a maximum of 2 liters as required for reversal of signs of shock
  - Call OLMC if the patient remains hypotensive after 2 liters has been administered

- Cardiogenic Shock - In patients with CHF, pulmonary edema, and cardiogenic shock, IV fluids should be withheld, to avoid worsening shock
  - Apply high-flow oxygen
  - Rapidly transport to hospital

- Kidney Failure (i.e. dialysis patients) - Give 500mL fluid boluses up to a maximum of 1 liter and reassess for reversal of the signs of shock
  - Call OLMC if the patient remains hypotensive after 20 ml/kg has been administered

ADULT PARAMEDIC

- Epinephrine (1 mg/ml/1:1000) 2–10 mcg/min IV/IO infusion for hypoperfusion.
  - Titrate to maintain a SBP >100 mmHg

OR

- Norepinephrine initial dose: 0.5 – 1 mcg/minute titrated to maintain a SBP > 100 mmHg. For patients in refractory shock: 8-30 mcg/minute

PEDIATRIC (<15 years of Age)

NOTE: Pediatric weight based dosing should not exceed Adult dosing.

PEDIATRIC AEMT

- Vascular access and fluid per IV/IO Access Guideline
  - Insert 2 large bore IVs

- Traumatic Shock – Give fluid bolus of NS 20 mL/kg at a time, reassess and repeat up to a maximum of 60 mL/kg total. Reassess for reversal of the signs of shock
  - If the patient remains hypotensive after 60mL/kg of NS call OLMC

- Non-Traumatic Shock - Provide 20mL/kg boluses up to a maximum of 60mL/kg and reassess for reversal of the signs of shock
  - If the patient remains hypotensive after 60mL/kg of NS call OLMC

- Cardiogenic Shock - In patients with CHF, pulmonary edema, and cardiogenic shock, IV fluids should be withheld, to avoid worsening shock
  - Apply high-flow oxygen
  - Rapidly transport to the hospital

- Kidney Failure (i.e. dialysis patients) - Give 10 mL/kg fluid boluses up to a maximum of 20mL/kg and reassess for reversal of the signs of shock
  - Call OLMC if the patient remains hypotensive after 20 ml/kg has been administered

PEDIATRIC PARAMEDIC

- Epinephrine (1 mg/ml/1:1000) 0.1–1 mcg/kg/min IV/IO infusion for hypoperfusion.
  - Titrate to maintain a SBP >70 + (age in years x 2) mmHg

OR

- Norepinephrine initial dose: 0.05 - 0.1 mcg/kg/min, titrate to max of 2 mcg/kg/min to maintain SBP >70 + (age in years x 2) mmHg