SHOCK, SEPSIS, & 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 of 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 of shock including distributive (e.g. infection, anaphylaxis), hypovolemic (e.g. hemorrhagic, vomiting/diarrhea, heat exposure), neurologic (i.e. spinal injury), or cardiogenic
- ❑ **Sepsis Alert** – Contact the hospital and initiate a Sepsis Alert if:
  - Suspected or documented Infection AND EITHER
  - Two or more of the following criteria are met:
    - Temp >100.4 °F (38°C) or <96.8°F (36°C)
    - RR >20 BPM
    - Heart Rate >90 bpm

  OR
  - Signs of hypoperfusion – SBP <90mmHg or MAP <65mmHg or ETCO2 <25
- ❑ Continuous cardiac, ETCO2, and pulse oximetry monitoring, when available
- ❑ Obtain a 12 Lead EKG when available
- ❑ **Treatment Plan**
  - Address the underlying cause of shock, if possible
  - Administer oxygen as needed 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 30-45 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

AEMT

- ❑ Vascular access
  - Insert 2 large bore IVs
- ❑ **Traumatic Shock – Permissive Hypotension**
  - If SBP >80-90 (intact radial pulse):
    - 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.

PEDIATRIC (<15 years of Age)

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

AEMT

- ❑ Vascular access
  - Insert 2 large bore IVs
- ❑ **Traumatic Shock** – Give fluid bolus of NS 20 mL/kg at a time (max 1L) reassess and repeat up to a maximum of 60 mL/kg total (Max 2L); Reassess for reversal of the signs of shock
  - ✆ If the patient remains hypotensive after 60mL/kg (max 2L) of NS call OLMC
- ❑ **Non- Traumatic Shock** - Provide 20mL/kg (max 1 L) boluses up to a maximum of 60mL/kg (max 2L) and reassess for reversal of the signs of shock
  - ✆ If the patient remains hypotensive after 60mL/kg (max 2L) of NS call OLMC

        - 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 unless the BP falls below the limits.
- ❑ **Non-Traumatic Shock** – Give IV NS 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
    - 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

PARAMEDIC

FOR USE ONLY IN NON-TRAUMATIC SHOCK

- ❑ **Push Dose Epinephrine 10mcg** as needed to maintain a SBP >100 mmHg after fluid bolus
- ❑ **Epinephrine 2–10 mcg/min** IV/IO infusion for hypoperfusion. Titrate to maintain a SBP >100 mmHg
- ❑ **Norepinephrine** initial dose: **0.05 – 1 mcg/kg/min** IV/IO for hypoperfusion. Titrate to maintain a SBP > 100 mmHg. For patients in refractory shock: 8-30 mcg/minute
- ❑ **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(max 500mL) up to a maximum of 20mL/kg (max 1L) and reassess for reversal of the signs of shock
- ✆ Call OLMC if the patient remains hypotensive after 20 ml/kg has been administered

PARAMEDIC

FOR USE ONLY IN NON-TRAUMATIC SHOCK

- ✆ **Epinephrine 0.1–1 mcg/kg/min** IV/IO infusion for hypoperfusion. Titrate to maintain a SBP >70 + (age in years x 2) mmHg
- ✆ **Push Dose Epinephrine (dose per appendix)** as needed to maintain a SBP>70 + (age in years x 2) mmHg after fluid bolus
- ✆ **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