

## HYPOPERFUSION / SHOCK

Shock, or hypoperfusion, is decreased effective circulation causing inadequate delivery of oxygen to tissues. Signs of early (compensated) shock include tachycardia, poor skin color, cool/dry skin, and delayed capillary refill. Systolic blood pressure is normal in early shock. In late (decompensated) shock, perfusion is profoundly affected. Signs include low blood pressure, tachypnea, cool/clammy skin, agitation, and altered mental status.

- A. Perform **Initial Treatment / Universal Patient Care Protocol** and follow the proper protocol for medical management based on clinical presentation.
- B. Categories of Shock:
  - 1. Hypovolemic
  - 2. Distributive
  - 3. Cardiogenic
- C. Determine most likely cause of shock:
  - 1. Hypovolemic (loss of fluid) is **most common**. Usually from bleeding or vomiting and diarrhea.
  - 2. Distributive (loss of vascular tone) is usually from sepsis (infection). Other causes include anaphylaxis, toxic chemicals, or spinal cord injury.
  - 3. Cardiogenic (heart pump failure) - most common cause in adults is acute MI or CHF. Is rare in children.
- D. If hypovolemic shock is suspected (most common):
  - 1. Monitor vital signs, ECG, and pulse oximeter.
  - 2. Expedite transport.
  - 3. As soon as possible, and without delaying transport, establish two (2) IV lines of normal saline with as large a catheter as possible up to a 14 gauge.
  - 4. If systolic blood pressure < 90 or patient has other signs and symptoms of shock such as tachycardia, delayed capillary refill, cool/clammy skin, or altered mental status, then administer 20 ml/kg normal saline IV up to a maximum of 2 liters and reassess.

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5. If on reassessment blood pressure is still  $< 90$  or other signs and symptoms of shock are still present, then contact **Medical Command** and reconsider causes.



E. If still felt to be hypovolemic shock:

1. Repeat 20 ml/kg normal saline IV **per order of Medical Command**.



2. Continue treatment **per MCP orders**.

F. If blood pressure is  $> 90$  systolic and patient has no other signs or symptoms of shock, administer 100 ml/hour normal saline IV and continue to monitor patient.

G. If distributive shock is suspected:

1. If anaphylaxis or allergic reaction, refer to **Allergic Reaction / Anaphylaxis Protocol 4501**.

2. Initial treatment same as hypovolemic shock above.

3. If hypotension (BP  $< 90$  systolic) and other signs and symptoms of shock persist after administration of second 20 ml/kg normal saline bolus, then:

a. Reassess that shock is distributive and not from untreated hypovolemia.

b. **Contact Medical Command** and consider **Dopamine** IV drip infusion at 5 micrograms/kg/minute **per MCP order**.

c. Titrate **Dopamine** drip at 5 - 20 micrograms/kg per minute in an effort to improve perfusion **per MCP order**.



H. If cardiogenic shock is suspected:

1. Immediate transport.

2. Establish IV normal saline and administer fluid bolus of 250 ml assessing for signs of fluid overload.

3. Reassess appearance, vital signs, and signs and symptoms of shock.

4. If there is no rhythm disturbance and patient remains poorly perfused after the initial fluid bolus:

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- a. Contact Medical Command and consider repeat 250 ml fluid bolus or **Dopamine** IV drip infusion at 5 micrograms/kg/minute **per MCP order**.
- b. Titrate **Dopamine** drip at 5 - 20 micrograms/kg per minute in an effort to improve perfusion **per MCP order**.



**Note:** Patients with distributive shock from infection may also have hypovolemia from vomiting, diarrhea, and poor fluid intake.