

“Remember – there is nothing hard about life.

What makes life hard is how we approach each situation we are asked to confront.

As we face life’s challenges the QUALITY, not the quantity, of our response determines whether or not we succeed or fail.”

Emergency

Care and Transportation of the Sick and Injured



Section 5: Trauma

23: Shock

Cognitive and Affective Objectives

5-1.9 List signs and symptoms of shock (hypoperfusion).

5-1.10 State the steps in the emergency medical care of a patient with signs and symptoms of shock (hypoperfusion).

5-1.11 Explain the sense of urgency to transport patients who are bleeding and show signs of shock (hypoperfusion).

Psychomotor Objectives

- 5-1.16 Demonstrate the care of the patient exhibiting signs and symptoms or shock (hypoperfusion).
- 5-1.17 Demonstrate completing a prehospital care report for the patient with bleeding and/or shock (hypoperfusion).

Shock

- State of collapse and failure of the cardiovascular system
- Leads to inadequate circulation
- Without adequate blood flow, cells cannot get rid of metabolic wastes
- The result of hypoperfusion to cells that causes the organ, then organ systems, to fail

Perfusion

- The cardiovascular system's circulation of blood and oxygen to all the cells in different tissues and organs of the body

Perfusion Triangle

Heart

(Pump Function)

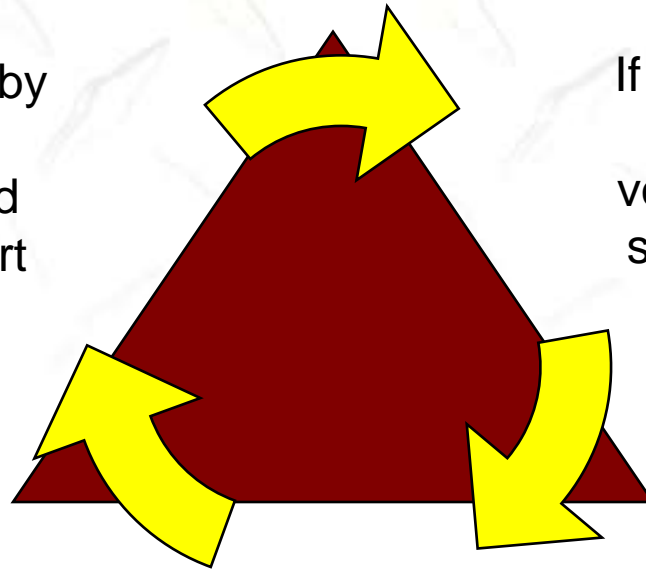
Damage to the heart by disease or injury.

It cannot move blood adequately to support perfusion.

Blood Vessels

(Container Function)

If all the vessels dilate at once, the normal amount of blood volume is not enough to fill the system and provide adequate perfusion to the body.



Blood

(Content Function)

If blood or plasma is lost, the volume in the container is not enough to support the perfusion needs of the body.

Perfusion Triangle

Heart (Pump Function)

Damage to the heart by disease or injury decreases the ability of the heart to properly function as a pump. Therefore, it cannot move enough blood through the body to support perfusion.

Blood Vessels (Container Function)

If all the blood vessels dilate at once, the normal amount of blood volume is not enough to fill the system and provide adequate perfusion to the body.

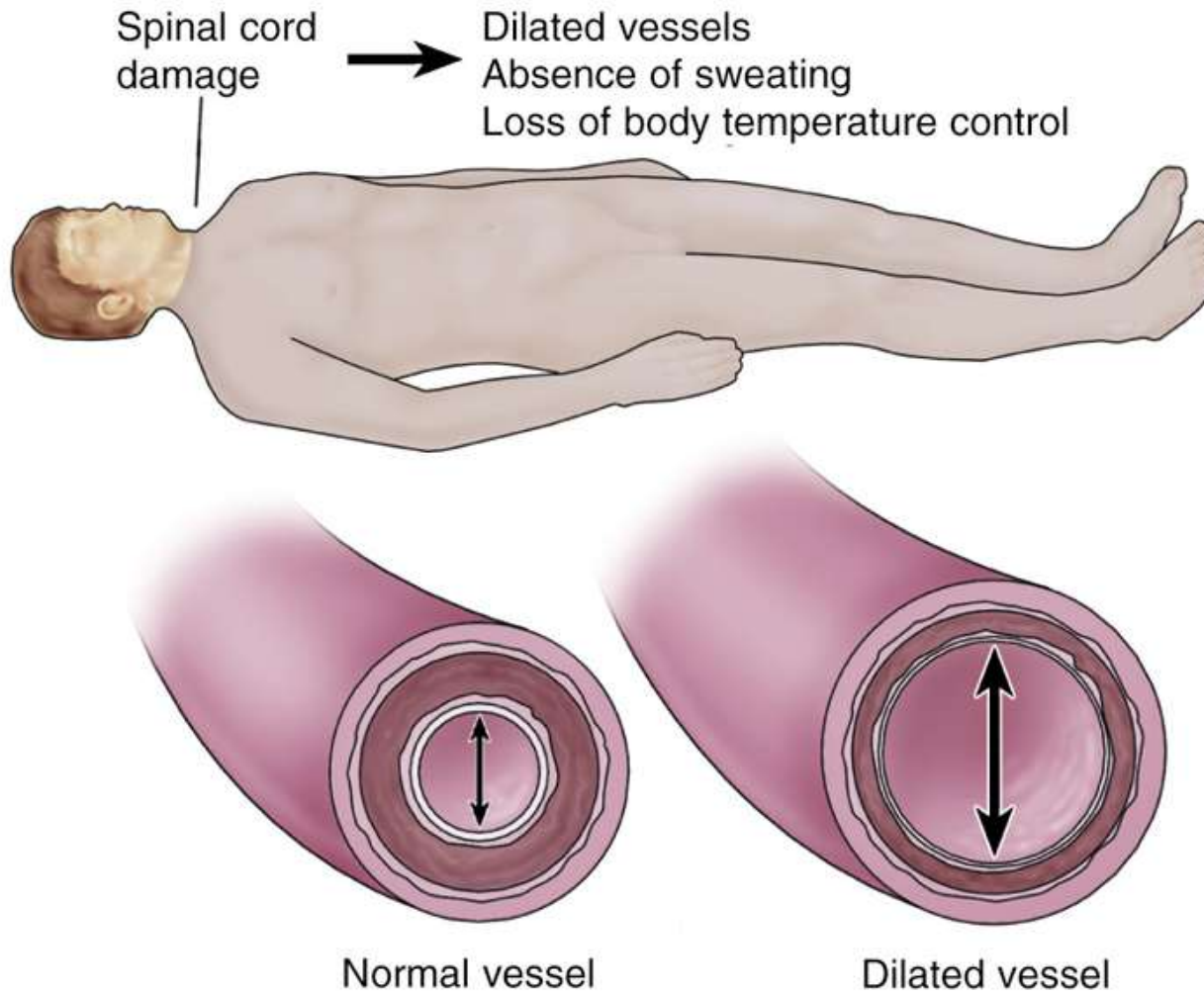
Blood (Content Function)

If enough blood or plasma is lost, the volume of fluid in the container is not enough to support the perfusion needs of the body.

Capillary Sphincters

- Regulate the blood flow through the capillary beds.
- Sphincters are under the control of the automatic nervous system.
- Regulation of blood flow is determined by cellular need.

Perfusion and Neurogenic Shock



Cardiovascular Causes of Shock (1 of 4)

- Pump failure (cardiogenic shock)
 - Inadequate function of the heart or pump failure
 - Causes a backup of blood into the lungs
 - Results in pulmonary edema
 - Pulmonary edema leads to impaired ventilation





Cardiovascular Causes of Shock (2 of 4)

- Poor vessel function (neurogenic shock)
 - Damage to the cervical spine may affect control of the size and muscular tone of blood vessels.
 - The vascular system increases.
 - Blood in the body cannot fill the enlarged system.
 - Neurogenic shock occurs.

Cardiovascular Causes of Shock (3 of 4)

- Content failure (hypovolemic shock)
 - Results from fluid or blood loss
 - Blood is lost through external and internal bleeding.
 - Severe thermal burns cause plasma loss.
 - Dehydration aggravates shock.

Cardiovascular Causes of Shock (4 of 4)

- Combined vessel and content failure
 - Some patients with severe bacterial infections, toxins, or infected tissues contract septic shock.
 - Toxins damage vessel walls, causing leaking and impairing ability to contract.
 - Leads to dilation of vessels and loss of plasma, causing shock

Noncardiovascular Causes of Shock (1 of 3)

- **Respiratory insufficiency**
 - Patient with a severe chest injury or airway obstruction may be unable to breathe adequate amounts of oxygen.
 - Insufficient oxygen in the blood will produce shock.

Noncardiovascular Causes of Shock (2 of 3)

- Anaphylactic shock
 - Occurs when a person reacts violently to a substance.
 - Four categories of common causes:
 - Injections
 - Stings
 - Ingestion
 - Inhalation

Noncardiovascular Causes of Shock (3 of 3)

- Psychogenic shock
 - Caused by sudden reaction of the nervous system that produces a temporary, generalized vascular dilation
 - Commonly referred to as fainting or syncope
 - Can be brought on by serious causes: irregular heartbeat, brain aneurysm
 - Can be brought on by fear, bad news, unpleasant sights

Progression of Shock

- *Compensated shock*
 - When the body compensates for blood loss
- *Decompensated shock*
 - The late stage of shock when blood pressure is falling
- *Irreversible shock*
 - The terminal stage

Compensated Shock

- Agitation
- Anxiety
- Restlessness
- Feeling of impending doom
- Altered mental status
- Weak pulse
- Clammy skin
- Pallor
- Shallow, rapid breathing
- Shortness of breath
- Nausea or vomiting
- Delayed capillary refill
- Marked thirst

Decompensated Shock

- Falling blood pressure (<90 mm Hg in an adult)
- Labored, irregular breathing
- Ashen, mottled, cyanotic skin
- Thready or absent pulse
- Dull eyes, dilated pupils
- Poor urinary output

Irreversible Shock

- This is the terminal stage of shock.
- A transfusion of any type will not be enough to save a patient's life.

When to Expect Shock

- Multiple severe fractures
- Abdominal or chest injuries
- Spinal injuries
- Severe infection
- Major heart attack
- Anaphylaxis
- Head Injury

You are the Provider

- You and your partner respond to an MVC involving two cars. En route you follow BSI.
- You arrive to a 25-year-old man.
- Law enforcement informs you that the other car left the scene. Patient was restrained and is sitting outside car. He is pale.
- The airbag has deployed and the steering wheel has some damage.

Scene Size-up

- In addition to BSI, what are some considerations at the scene?
- What is the mechanism of injury?

You are the Provider**(continued)**

- You approach the patient and introduce yourself. He appears visibly upset but lets you take his vital signs.
 - Pulse: 115 beats/min
 - Respirations: 26 breaths/min
 - Blood pressure: 110 mm Hg
- He has a laceration on his knee where it hit the dashboard.

Initial Assessment

- Describe the steps of your initial assessment and findings:
 - General impression
 - Airway
 - Breathing
 - Circulation
 - Transport decision

You are the Provider

(continued)

- Spinal immobilization needed.
- Pallor is a sign of shock.
- He is “A” on the AVPU scale.
- Airway is open.
- Breathing is rapid.
- Inspect and palpate chest for DCAP-BTLS.
- Observe for accessory muscle use.

You are the Provider**(continued)**

- Patient has rapid pulse.
- Clammy skin.
- Knee laceration
- Priority transport

Focused History and Physical Exam

- Would you perform a rapid physical exam or focused physical exam?
- What is your reasoning?

Detailed Physical Exam

- If time permits, perform en route to the hospital.

Ongoing Assessment

- Perform reassessment.
- Take vital signs every 5 minutes.

You are the Provider**(continued)**

- You reassess the patient in the ambulance and he has a pulse of 122 beats/min, respirations of 30 breaths/min, and a blood pressure of 106/68 mm Hg.
- What do his vital sign changes indicate?

Emergency Medical Care (1 of 3)

- Make certain patient has open airway.
- Keep patient supine.
- Control external bleeding.



The Decision Making Process



Beliefs

About yourself and Others

Your values – Your character

The systems by which you
attach value to the circumstances
and people with whom you interact
What you consider important...

Thoughts

The information you obtain
will guide your course of action in
response to the issues and
circumstances you are facing

Behavior / Action

A direct result of your thoughts
and belief – Will my conclusions
result in a constructive outcome?

Emergency Medical Care (2 of 3)

- Splint any broken bones or joint injuries.
- Always provide oxygen.
- Place blankets under and over patient.



Emergency Medical Care (3 of 3)

- If there are no broken bones, elevate the legs 6" to 12".
- Do not give the patient anything by mouth.



Pneumatic Antishock Garment

- Some localities allow EMTs to apply a pneumatic antishock garment (PASG) for some patients in decompensated shock.
- Know your local protocol regarding their usage.

Treating Cardiogenic Shock

- Patient may breathe better in a sitting or semi-sitting position.
- Administer high-flow oxygen.
- Assist ventilations as necessary.
- Have suction nearby in case the patient vomits.
- Transport promptly.

Treating Neurogenic Shock

- Maintain airway and assist breathing as needed.
- Keep patient warm.
- Transport promptly.

Treating Hypovolemic Shock

- Control obvious bleeding.
- Splint any bone or joint injuries.
- If no fractures, raise legs 6" to 12".
- Secure and maintain airway.
- Give oxygen as soon as you suspect shock.
- Transport rapidly.

Treating Septic Shock

- Transport as promptly as possible while giving all general support available.
- Give high-flow oxygen during transport.
- Use blankets to conserve body heat.

Treating Respiratory Insufficiency

- **Secure and support the airway.**
- **Clear airway of any obstructions.**
- **Ventilate if needed with a BVM device.**
- **Administer oxygen.**
- **Transport promptly.**

Treating Anaphylactic Shock

- Administer epinephrine.
- Provide prompt transport.
- Provide all possible support.
 - Oxygen
 - Ventilatory assistance

Treating Psychogenic Shock

- It is usually self-resolving.
- Assess patient for injuries from fall.
- If patient has difficulties after regaining consciousness, suspect another problem.

Anaphylactic	8. Life-threatening allergic reaction
Cardiogenic	9. Inadequate heart function Disease of muscle tissue Impaired electrical system Disease or injury
Hypovolemic	10. Loss of blood or fluid
Respiratory Insufficienc	11. Severe chest injury Airway obstruction
Neurogenic	12. Damaged cervical spine, which causes widespread blood vessel dilation
Psychogenic (fainting)	13. Temporary, generalized vascular dilation Anxiety, bad news, sight of injury or blood
Septic	14. Severe bacterial infection

Respiratory Insufficiency	A	Life-threatening allergic reaction
Septic	B	Inadequate heart function - Disease of muscle tissue - Impaired electrical system Disease or injury
Psychogenic	C	Loss of blood or fluid
Neurogenic	D	Severe chest injury - Airway obstruction
Anaphylactic	E	Damaged cervical spine, which causes widespread blood vessel dilation
Hypovolemic	F	Temporary, generalized vascular dilation Anxiety, bad news, sight of injury or blood
Cardiogenic	G	Severe bacterial infection