SHOCK

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Critical Care Nursing

Semester 7

Week 6

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Outline

- **Introduction**
- **Etiology**
- **Pathophysiology**
- **Risk factors**
- **Types of shock**
- **Stages of shock**
- **Clinical presentations of shock**
- **Principle of managements**
- **correction of underlying causes**

Objectives

- Discuss the etiology, pathophysiology, clinical
- presentation, patient needs, and principles of
- management of patients in shock.
- Identify stages of shock

Introduction

- Shock is the inability of the circulatory system to deliver enough blood to meet the oxygen and metabolic requirements of body tissues.

Etiology, Risk Factors, and Pathophysiology

This clinical syndrome may result from:

- Ineffective pumping of the heart (cardiogenic shock)
- Insufficient volume of circulating blood (hypovolemic shock)
- or massive vasodilation of the vascular bed causing maldistribution of blood (distributive shock).

Etiology:

- The ineffective delivery of oxygen to the tissues leads to cellular dysfunction, rapidly progressing to organ failure, and finally to total body system failure.

Risk factor

- The cause of the initial onset of the shock syndrome may be from any number of underlying problems, including heart problems, fluid loss, and trauma.

Pathophysiology

The body responds in the same way, differences between cardiogenic, hypovolemic, and distributive shock are obvious to the clinician only after the initial assessment has provided key information about the patient's acute illness.

Given the history, the clinician can classify shock into one of three major pathologic groups and proceed to further determine the patient's needs with the help of diagnostic testing.

Because interventions for patient management are directed at the cause, it is essential for the underlying pathophysiology to be clearly understood.

Cardiogenic Shock

1. The heart is unable to pump enough blood to meet the oxygen and metabolic needs of the body.

2. Pump failure (coronary and non coronary causes)

3. The heart ceases to function effectively as a pump, resulting in decreases in stroke volume and cardiac output.

4. This leads to a decrease in blood pressure and tissue perfusion.

5. The inadequate emptying of the ventricle increases left atrial pressure, which then increases pulmonary venous pressure.

Hypovolemic Shock

- Hypovolemic shock occurs when there is inadequate volume in the vascular space.

This volume depletion may be caused by blood loss, either internal or external, or by the vascular fluid volume shifting out of the vascular space into other body fluid spaces

- The pathophysiology of hypovolemic shock is related directly to decreased circulating blood volume

Hypovolemic Shock

When an insufficient amount of blood is circulating, the venous blood returning to the heart is insufficient.

As a result, right and left ventricular filling pressures are insufficient, decreasing stroke volume and cardiac output. As in cardiogenic shock, when cardiac output is decreased, BP is low and tissue perfusion is poor.

Distributive Shock

Distributive shock is characterized by an abnormal placement or distribution of vascular volume, occurring in three situations: (1) sepsis, (2) neurologic damage, and (3) anaphylaxis. In each of these situations, the pumping function of the heart and the total blood volume are normal, but the blood is not appropriately distributed throughout the vascular bed.

In the field or emergency department setting, anaphylaxis and neurogenic shock are also common and typically result from allergic reactions and trauma-related spinal cord injury

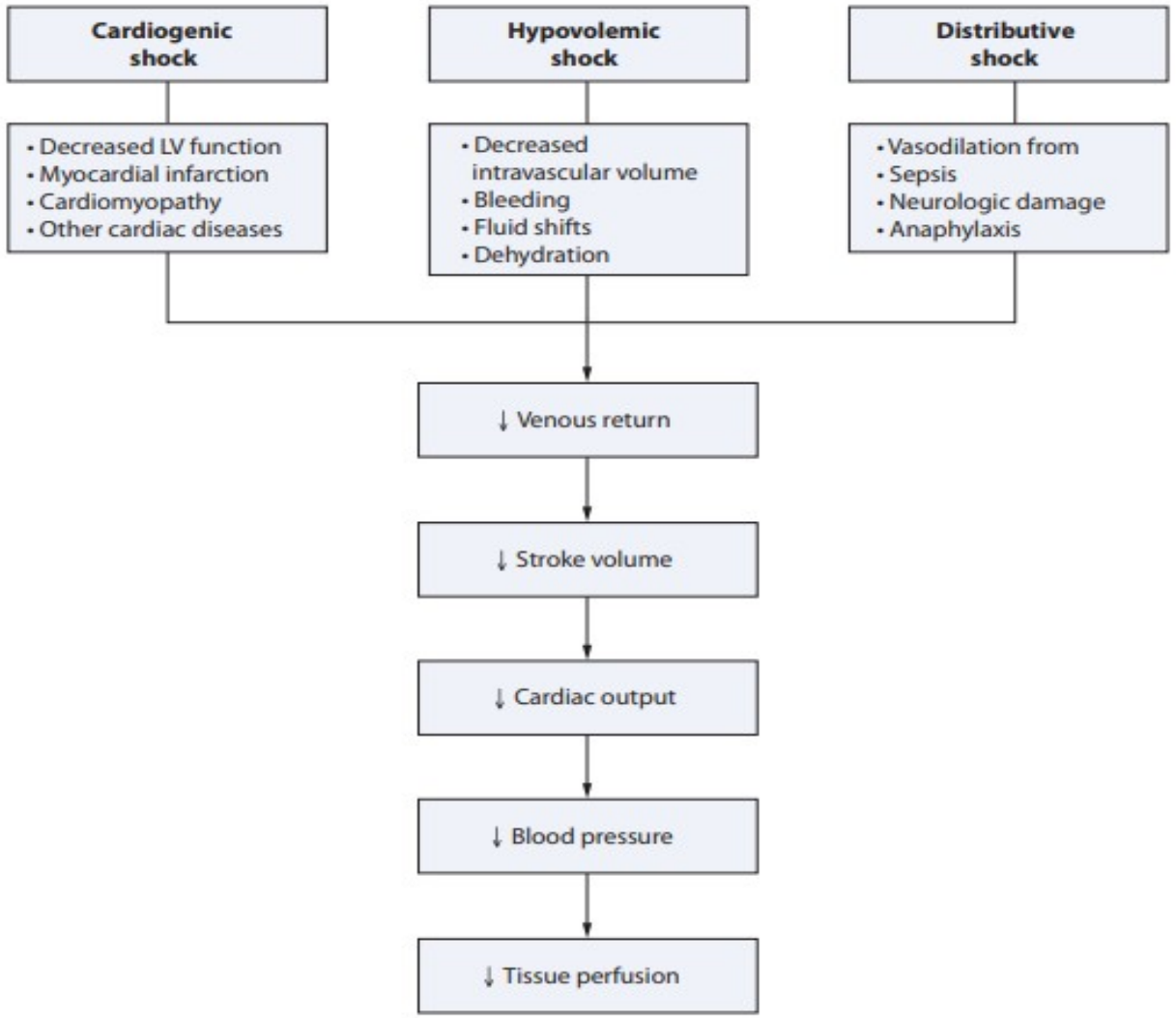
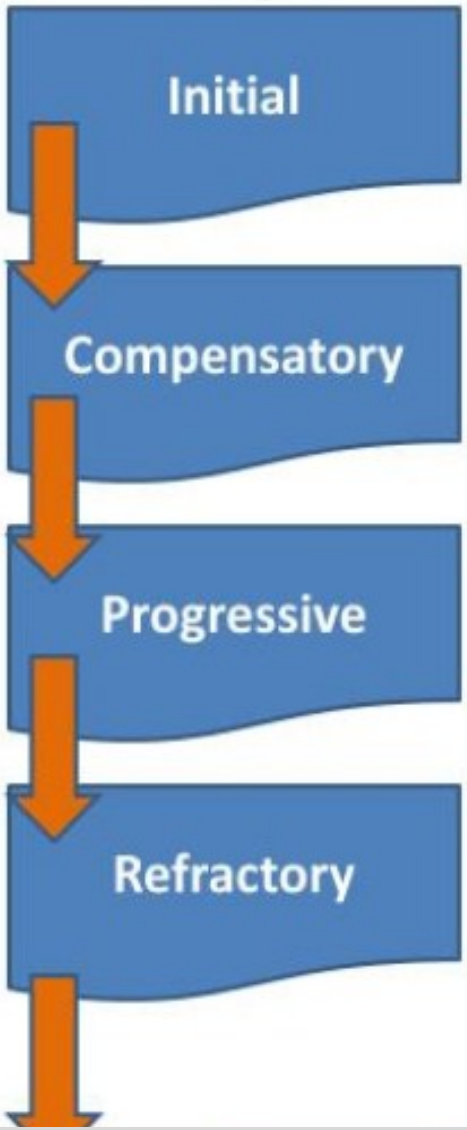


Figure 9-15. Pathophysiology of shock.

Stages of shock

- Stages of Shock Regardless of underlying etiology, all three types of shock (cardiogenic, hypovolemic, distributive) activate the sympathetic nervous system, which in turn initiates neural, hormonal, and chemical compensatory mechanisms in an attempt to improve tissue perfusion.

Progression of Shock (Stages)



No visible changes in client parameters, changes are now occurring on the cellular level only

Body is mounting measures to increase cardiac output to restore tissue perfusion and oxygenation.

Compensatory mechanisms begin to fail

IRREVERSIBLE;
TOTAL BODY FAILURE

Clinical Presentation

Initial stage: No visible signs and symptoms evident

Compensatory stage:

Consciousness: Restless, agitated, confused

Blood pressure: Normal or slightly low

Heart rate: Increased

Respiratory rate: Increased (> 20 breaths/min)

Skin: Cool, clammy, may be cyanotic

Peripheral pulses: Weak

Urine output: scant and Concentrated

Clinical Presentation

Progressive stage:

Consciousness: Unresponsive to verbal stimuli

Blood pressure: Inadequate (< 90 mm Hg systolic)

Heart rate: Increased (> 90 beats/min)

Respiratory rate: Increased, shallow

Skin: Cold, cyanotic

Peripheral pulses: Weak and thready, may be absent

Urine output: Scant (< 20 mL/h) and concentrated

Bowel sounds: Absent

Principles of Management for Shock

The basic goals of therapy for all forms of shock, include the need to correct the underlying cause of shock, improvement of oxygenation, and restoration of adequate tissue perfusion.

Correction of the Underlying Cause of Shock

Cardiogenic: Remove coronary obstruction or correct tamponade, if present, and support ventricular contractility to increase cardiac output.

Hypovolemic: Identify source and stop bleeding if possible; correct fluid shunting or third spacing with electrolyte management.

Distributive –Anaphylactic: Intubate for oxygenation and treat the underlying allergic reaction using antidote or steroid therapy.

Correction of the Underlying Cause of Shock

Improve Oxygenation

- Assess for patent airway and intubate if necessary.
- Administer oxygen at 100% or as necessary until Pao2 is adequate

Restore Adequate Tissue Perfusion

- Administer fluid volume expanders in large rapid boluses. Type and cross-match for blood type and administer blood as necessary for hypovolemic shock.
- Initiate vasoactive drug therapy

Reference

- *AACN Essentials of Critical Care Nursing, 4e* Eds. Suzanne M. Burns, and Sarah A. Delgado. McGraw Hill, 2019, https://apn.mhmedical.com/content.aspx?bookid=3184&sectionid=265336356.