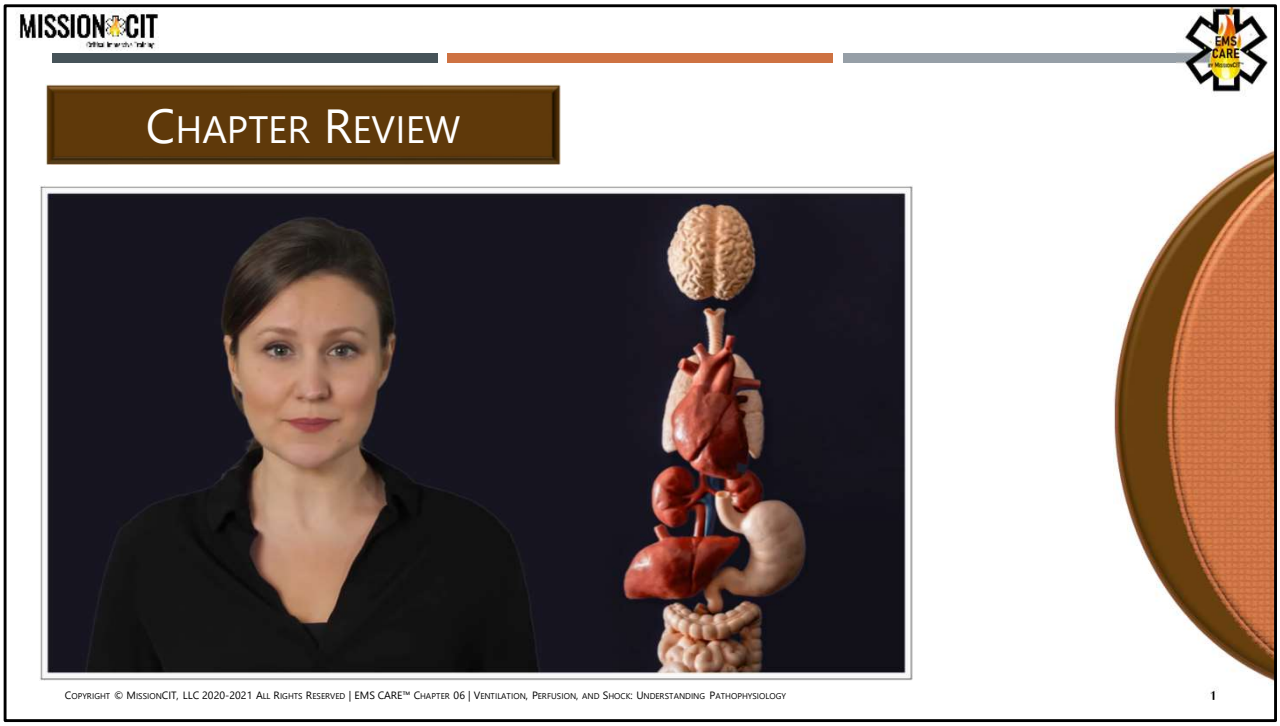
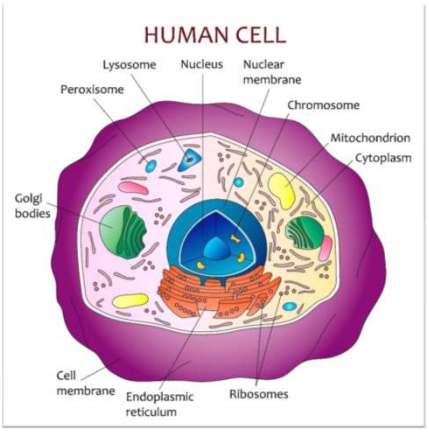


Thank you, Justin. And now it's time to review the entire chapter on Ventilation, Perfusion, and Shock: Understanding Pathophysiology. After this review session will be a test to evaluate your knowledge. You will need a score of 75% or higher to earn credit for this chapter. So, please review carefully. And don't hesitate to go back and view again any of the previous lessons so you are ready!

MISSION CIT

Lesson 1 – The Cell

- Pathophysiology – Study of how disease processes affect the functioning of the body
- Cell discovery – Robert Hooke 1665
- Parts of the cell:
  - ✓ Cell Membrane
  - ✓ Nucleus
  - ✓ Cytoplasm
- Cells require correct balance of water
- Cells get energy from glucose – Cellular respiration
- Diseases alter permeability of cell membrane



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2

In the first lesson, we started with an introduction to Pathophysiology which is the study of how disease processes affect the functioning of the body. Then we talked about the cell, their discovery, and their structure. To recollect, cells are the structural, functional, and biological units of all living beings. They are constantly carrying out thousands of chemical reactions needed to keep the cell, and your body as a whole, alive and healthy. These chemical reactions are often linked together in chains or pathways. All of the chemical reactions that take place inside of a cell are collectively

called the cell's metabolism.

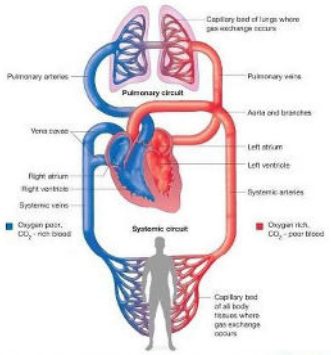
The term "cells" was first coined in 1665 by a British scientist Robert Hooke, then further investigated by Anton Van Leeuwenhoek and later by Robert Brown in 1883. There are hundreds of different types of cells in the human body, which vary in shape and size. All cells have three main parts: the cell membrane, the nucleus, and, between the two, the cytoplasm.

Cells generally require the correct balance of water to help maintain shape and structure. Most of the cells, get energy from glucose in a process called cellular respiration. A glucose molecule is broken down gradually, in many small steps, which is captured by the cell in the form of ATP. Then we discussed aerobic respiration which uses oxygen and anaerobic respiration is independent of oxygen. Finally, we discussed that diseases often alter the permeability of the cell membrane.

MISSION CIT

LESSON 2 – CARDIOPULMONARY SYSTEM

- Includes the heart, blood vessels and blood, trachea, bronchi and lungs
- Vital functions:
  - ✓ Bringing oxygen into the body
  - ✓ Distributing oxygen to the cells
  - ✓ Removing waste products from cells
- Respiratory system includes airways, lungs, and blood vessels



A schematic of the circulatory system illustrating the **pulmonary circulation** picking up oxygen from the lungs and the **systemic circulation** delivering oxygen to the body.

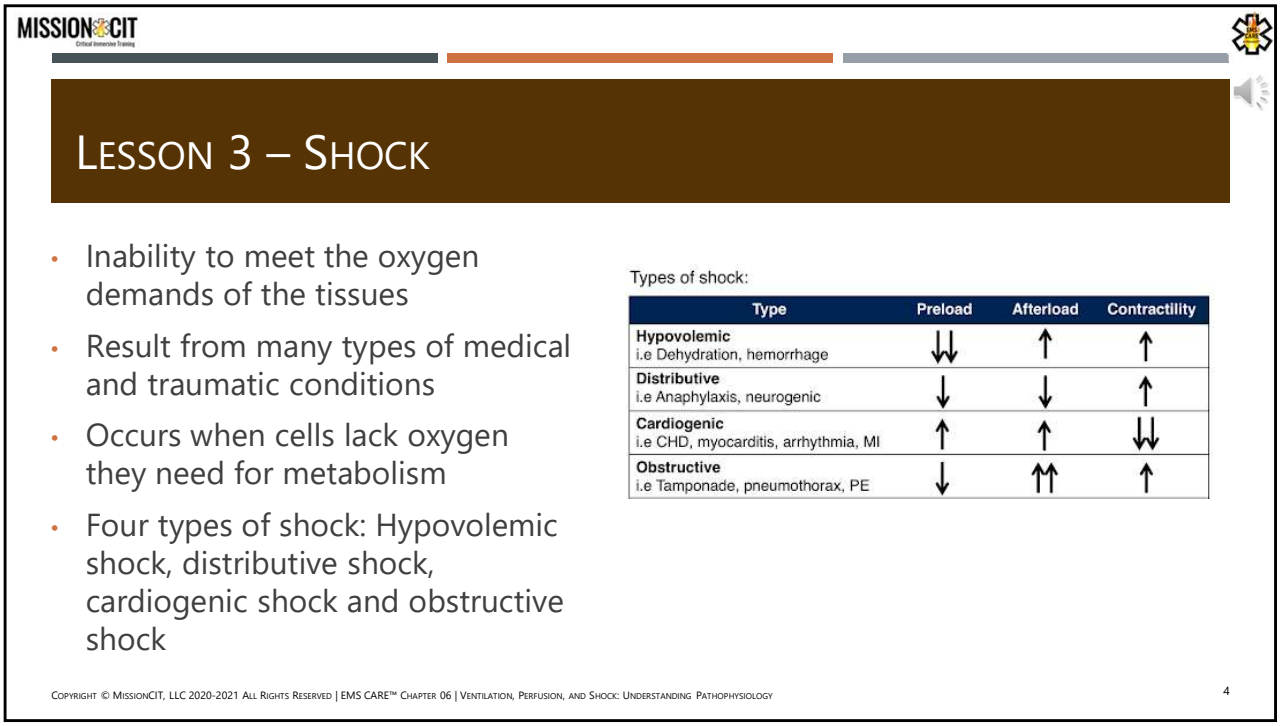
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In the next lesson, we talked about the Cardiopulmonary System. The cardiopulmonary system includes the heart, blood vessels, and blood, trachea, bronchi, and lungs. These interdependent systems are responsible for picking up and carrying oxygen to the cells of the body and transporting and discarding carbon dioxide. The primary purposes of the cardiopulmonary system are to deliver oxygen to metabolically active tissues and to remove carbon dioxide and metabolites.

The Cardiopulmonary System is where the respiratory and cardiovascular systems work together to do three vital functions:

- First, bringing oxygen into the body.
- Next, distributing oxygen to the cells.
- And then, removing waste products from the cells.

The respiratory system is the network of organs and tissues that help you breathe. It includes your airways, lungs, and blood vessels. Briefly discussing each of these, airways are pipes that carry oxygen-rich air to the alveoli in your lungs. The lungs are the center of the respiratory system. And finally, blood vessels are the components of the circulatory system that transport blood throughout the human body. We also discussed airway obstruction which is a blockage of respiration in the airway. And how any event impacting the function of the medulla oblongata can affect minute volume. In addition, air or blood accumulating in the chest called the pleural space also compromises respiration.



We now talk briefly about shock in the third lesson. Shock is the inability to meet the oxygen demands of the tissues. It may result from many types of medical and traumatic conditions.

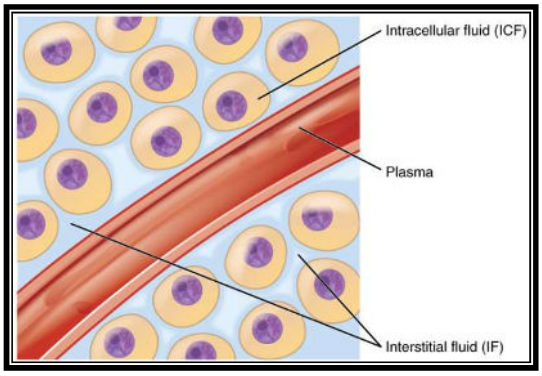
Shock occurs when cells lack the oxygen they need for metabolism. There are four major types of shock, namely, Hypovolemic Shock, Distributive Shock, Cardiogenic shock, and Obstructive shock. Compensated Shock occurs when a patient is still interacting normally and has a normal BP, look for prevalent signs in the

patient before treating them.

Next, we will discuss the last lesson in this topic.

Lesson 4 – Pathophysiology of Other Systems

- Fluid balance is critical to health
- Three fluid compartments: Intracellular fluid compartment, interstitial fluid, and plasma
- Nervous system
- Endocrine system
- Digestive system
- Immune system



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In this lesson, we first discussed how fluid balance is critical to health. Body fluids can be discussed in terms of their specific fluid compartment, and in the human body plan, three major fluid compartments are functionally interconnected. These are the intracellular fluid compartment, interstitial fluid, and plasma. Fluid balance in the body may be disrupted in several ways. Then we saw the nervous system, endocrine system, digestive system, and immune system.

A short recap of each of these systems:

- The nervous system transmits signals between the brain and the rest of the body.
- The endocrine system is a system of glands that make hormones.
- The digestive system involves organs that turn food into energy and eliminate waste.
- And finally, the immune system defends our body against invaders, such as viruses, bacteria, and foreign bodies.

Then we saw the dysfunction of each of these systems. Nervous System Dysfunction may arise as a result of trauma. Endocrine System Dysfunction occurs when hormone levels are too high or too low. Digestive Dysfunction impacts hydration levels and nutrient transfer and finally, Hypersensitivity reactions occur when the normally protective immune system responds abnormally, potentially harming the body. With this, we've come to the end of the chapter reviews. The quiz is coming up next. Good testing.