

## CHAPTER OVERVIEW

### Section 8: Basic Physiology

## Learning Objectives

After completing this lesson, you will be able to:

- Explain the basic functional and structural organization of the human body.
- Describe homeostasis.
- Explain the role of the four types of tissues in the human body.
- Explain the role of physiological chemicals in normal body functions.

## In this section...

Topics include:

[8.1: Introduction to Basic Physiology](#)

[8.2: Homeostasis](#)

[8.3: Organs and Organ Systems](#)

[8.4: Tissues](#)

[8.5: Cells](#)

[8.6: Chemicals](#)

## Section 8: Key Points

## What We've Covered

This section made the following main points:

- In most cases, toxic substances exert their harmful effects directly on specific cells or biochemicals within the affected organ (specific toxic effects).
- Homeostasis is the ability of the body to maintain relative stability and function despite drastic changes in the external environment or one portion of the body. The primary components of homeostasis include:
  - Stimulus — a change in the environment.
  - Receptor — the site within the body that detects or receives the stimulus.
  - Control center — the operational point at which the signals are received, analyzed, and an appropriate response is determined.
  - Effector — the body site where a response is generated.
  - Feedback mechanisms — methods by which the body regulates the response
- The basic structure and functional organization of the human body is:  
Chemicals → Cells → Tissues → Organs → Organ Systems → Organism
- The human body consists of eleven organ systems.
- Tissues in organs are precisely arranged to work in harmony to perform organ functions.
- There are four types of tissues in the body:
  1. Epithelial tissue protects, absorbs, and secretes substances, and detects sensations.
  2. Connective tissue provides support and holds body tissues together.
  3. Muscle tissue has the ability to contract.

4. Nerve tissue conducts electrical impulses and conveys information from one area of the body to another.
- The cell is the smallest component of the body that can perform all of the basic life functions.
  - Cell components that are most susceptible to cellular damage include the cell membrane, nucleus, ribosomes, peroxisomes, lysosomes, and mitochondria.
  - The three categories of physiological chemicals normally functioning in the body are:
    1. Elements — made up of only one atom (examples include hydrogen and oxygen).
    2. Inorganic compounds — simple molecules made up of one or two different elements (examples include water and carbon dioxide).
    3. Organic compounds — contain covalently-bonded carbon and hydrogen and often other elements (examples include DNA, RNA, ATP, and proteins).

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