

## CHAPTER SUMMARY

- 1.1 Anatomy and Physiology Compared 2**
- Anatomy is the study of structure and form of the human body, while physiology is the study of function of these parts.
- 1.1a Anatomy: Details of Form 2**
- Anatomy may be subdivided into microscopic anatomy (anatomic study of materials using the microscope) and gross anatomy (the study of structures visible to the unaided eye).
- 1.1b Physiology: Details of Function 3**
- Physiologists may examine the function of specific body systems (e.g., cardiovascular physiology) and may focus on problems or pathologies of such systems (pathophysiology).
- 1.2 Anatomy and Physiology Integrated 3**
- Form and function are interrelated. Anatomists cannot gain a full appreciation of anatomic form without first understanding the structure's function. Likewise, physiologists cannot fully appreciate body functions without learning about the structure's form.
  - It is easiest to learn anatomy and physiology by integrating the two disciplines, rather than trying to separate the study of form from the study of function.
- 1.3 The Body's Levels of Organization 6**
- Scientists group the body's components into an organizational hierarchy of form and function.
- 1.3a Characteristics That Describe Living Things 6**
- All living organisms exhibit several common properties: organization, metabolism, growth and development, responsiveness, adaptation, and reproduction.
- 1.3b The View from Simplest to Most Complex 6**
- Anatomic structure is organized in an increasingly complex series of levels: the chemical level, cellular level, tissue level, organ level, organ system level, and the organismal level.
- 1.3c Introduction to Organ Systems 7**
- The human body contains 11 organ systems: integumentary, skeletal, muscular, nervous, endocrine, cardiovascular, lymphatic, respiratory, urinary, digestive, and reproductive.
- 1.4 The Language of Anatomy and Physiology 11**
- Clear, exact terminology accurately describes body structures and helps us identify and locate them.
- 1.4a Anatomic Position 11**
- The anatomic position is used as a standard reference point for the human body.
- 1.4b Sections and Planes 12**
- Three planes section the body and help describe relationships among the parts of the three-dimensional human body: the coronal

plane, the transverse plane, and the midsagittal plane.

#### 1.4c Anatomic Directions 13

- Specific directional terms indicate body structure locations.

#### 1.4d Regional Anatomy 13

- Specific anatomic terms identify body regions.

#### 1.4e Body Cavities and Membranes 14

- Body cavities are spaces that enclose organs and organ systems.
- The posterior aspect of the body contains the cranial cavity and the vertebral canal.
- The ventral cavity is subdivided into a thoracic cavity (which is partitioned into pleural cavities, mediastinum, and pericardial cavity) and an abdominopelvic cavity (which is partitioned into an abdominal cavity and a pelvic cavity).
- The ventral cavity is lined by thin serous membranes. A parietal layer lines the internal body wall surface, and a visceral layer covers the organs.

#### 1.4f Abdominopelvic Regions and Quadrants 17

- Regions and quadrants are two aids for describing locations of the abdominopelvic viscera.
- There are nine abdominopelvic regions and four abdominopelvic quadrants.

### 1.5 Homeostasis: Keeping Internal Conditions Stable 18

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- Homeostasis refers to the body's ability to maintain a relatively stable internal environment, even in the face of changing internal or external environmental factors.

#### 1.5a Components of Homeostatic Systems 18

- The three components are the receptor (detects a stimulus), control center (interprets input from the receptor and initiates changes through the effector), and effector (the structure that brings about a change to the stimulus).

#### 1.5b Homeostatic Systems Regulated by Negative Feedback 19

- Negative feedback mechanisms or loops are initiated by a stimulus, and the end result is to inhibit or slow down the stimulus. Most feedback mechanisms in the human body work by negative feedback.

#### 1.5c Homeostatic Systems Regulated by Positive Feedback 22

- Positive feedback mechanisms are initiated by a stimulus, and they maintain or increase the activity of the original stimulus.

### 1.6 Homeostasis, Health, and Disease 23

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- An understanding of the concept of homeostasis is essential when understanding the structure and function of a normal, healthy body, the mechanisms of disease, and how the body reacts to pharmaceutical agents.



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## CHALLENGE YOURSELF

Do You Know the Basics?

- \_\_\_1. Examining the superficial anatomic markings and internal body structures as they relate to the covering skin is called
  1. regional anatomy.
  2. surface anatomy.
  3. pathologic anatomy.
  4. comparative anatomy.
  
- \_\_\_2. The level of organization is composed of two or more tissue types that work together to perform a common function.
  1. cellular
  2. molecular
  3. organ
  4. organismal
  
- \_\_\_3. The term refers to the sum of all chemical reactions in the body.
  1. metabolism
  2. responsiveness
  3. stimulus
  4. reproduction
  
- \_\_\_4. A midsagittal plane separates the body into
  1. anterior and posterior portions.
  2. superior and inferior portions.
  3. right and left halves.
  4. unequal right and left portions.
  
- \_\_\_5. The term used to describe an appendage structure that is closest to its point of attachment to the trunk is
  1. distal.
  2. lateral.
  3. superior.
  4. proximal.