Mader's Understanding Human Anatomy & Physiology 10th edition Longenbaker Solutions Manual

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1 Organization of the Body

Chapter Summary

Chapter one serves as a basic introduction to the study of anatomy and physiology. Anatomy is the study of the structure of the body parts while physiology is the study of the function of these parts. The levels of organization in the body are discussed. These levels progress from atoms to molecules, macromolecules, organelles, cells, tissues, organs, organ systems, and, finally, the human organism. The human body is in the anatomical position when standing erect, arms at the sides, and face, palms, and toes forward. In anatomical position, various terms can be used to describe the location of body parts and organs. These terms are explained, as are terms used to describe body sectioning, body regions, and major cavities in the body. The major functions of the organ systems are also summarized, and the concept of homeostasis is explained. Homeostasis is the relative constancy of the internal environment, which can be seen at the cellular level and the systems level (consisting of blood and tissue fluid). All the body systems contribute to homeostasis. The chapter ends with a discussion of disease, which is when the body does not properly function due to the failure of homeostasis.

Chapter Outline

1.1 The Human Body
- A. The Body's Organization Levels

1.2 Anatomical Terms
- A. Directional Terms
- B. Regions of the Body
- C. Planes and Sections of the Body

1.3 Body Cavities and Membranes
- A. Posterior (Dorsal) Cavity
- B. Anterior (Ventral) Cavity
  - 1. Thoracic Cavity
  - 2. Abdominopelvic Cavity

1.4 Organ Systems
- A. Support, Movement, and Protection
- B. Integration and Coordination
- C. Maintenance of the Body
- D. Reproduction and Development

1.5 Homeostasis
- A. Negative Feedback
  - 1. Mechanical Example
  - 2. Human Examples for Negative Feedback
- B. Positive Feedback
- C. Homeostasis and Body Systems
- D. Disease

Suggested Student Activities

1. Identify organs on a dissectible mannequin and match them to their organ system and its functions.
2. Practice using anatomical terms and demonstrate their proper usage on a mannequin or a fellow student.
3. Show images of tissue cut at various planes (cross section of the leg, cross section of the neck, midsagittal MRI image) and discuss planes and sections of the body.
4. With the help of the instructor discuss how various common diseases affect homeostasis.
5. Discuss how the household thermostat and negative feedback work alike.
6. Identify body cavities and body cavity regions on a dissectible mannequin and list the organs found within each cavity and region.

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7. Have students take their pulse every minute for 5 minutes. Discuss slight changes in pulse and use this as an example to describe homeostasis in regulation of heartbeat. (Heart rate should increase or decrease slightly and return to resting.)

Answers to Learning Outcome Questions

1. c
2. f
3. g
4. a
5. d
6. c
7. e
8. b
9. a
10. d
11. g
12. f
13. d
14. c
15. e
16. a
17. d
18. b
19. g
20. c
21. d
22. e
23. f
24. a
25. b
26. anatomy
27. organ
28. midsagittal or median
29. homeostasis
30. negative feedback

Answers to Medical Terminology Reinforcement Exercise

1. above
2. beneath
3. stomach
4. abdomen
5. head
6. chest
7. sides
8. eye
9. back
10. study
11. a. chest
12. a. lower back
13. blood
14. d. kidneys
15. a. faster than normal

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