

Study Guide *for* **The Human Body in Health and Illness**

Fifth Edition

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*To my students at the University of the Incarnate Word for the millions
of questions you have answered over the years and, most important,
for your warmth, affection, and friendship.
I have learned so much from you.*

Barbara Herlihy

Preface

Questions, questions, and more questions! The *Study Guide for The Human Body in Health and Illness* is designed to help you learn the basic concepts of anatomy and physiology through relentless questioning. Each chapter in the *Study Guide* corresponds to a chapter in the textbook. Some questions are easy and require simple recall; other exercises are more difficult and are designed to help you synthesize and integrate basic concepts. A strategy that I have found very helpful is to ask the same question in several different ways. This requires you to view the content from several different perspectives and encourages you to think critically and to integrate many seemingly unrelated facts. This *Study Guide* will make you work.

It is recommended that you work through all the exercises in every chapter. Working in groups reduces stress, encourages learning, and makes the learning process more enjoyable. More important, student-to-student interaction encourages active learning.

Organization

The *Study Guide* chapters are divided into three parts: **Part I, Mastering the Basics**, contains matching, ordering, labeling, diagram reading, similars and dissimilars, and coloring exercises for each content area in the corresponding textbook chapter, helping you learn basic anatomy and physiology knowledge; **Part II, Putting It All Together**, contains multiple-choice practice quizzes and case studies that integrate the chapter content; and **Part III, Challenge Yourself!**, contains grouping exercises and word puzzles.

Throughout the *Study Guide*, there is a concerted effort to use the medical terminology that was introduced in the textbook and will certainly be used in clinical situations. For instance, words such as *diagnosis*, *hypokalemia*, and *hyperglycemia* are used

frequently and require mastery. As in the textbook, *pathophysiology* is used when it serves to explain the normal anatomy and physiology.

Throughout the *Study Guide*, page references from the textbook are provided to assist you in answering the questions. A complete Answer Key has been provided for your instructor.

PART I: MASTERING THE BASICS

Matching

You are asked to match the words or terms in one column with descriptive terms in a second column.

Ordering

The ordering exercises ask you to arrange a series of events or structures in the correct order. For instance, one exercise is ordering the structures through which blood flows from the right atrium through the heart to the aorta. Other ordering exercises include the sequence of events at the neuromuscular junction, the flow of urine from the kidney through the urethra, and the flow of blood from the finger to the toe.

Labeling and Coloring

Many of the illustrations that appear in the textbook are reproduced in the *Study Guide*. You will need to label the figure and, in some instances, color a particular part of it. Coloring helps to focus your attention on a particularly important anatomic structure. For example, color the right side of the heart blue, indicating unoxygenated blood, and the left side red, indicating oxygenated blood.

Read the Diagram

These exercises ask you to interpret illustrations from the textbook to promote understanding of a particular function or process.

Similar and Dissimilar

Four words are listed; you are asked to identify the word that is least related to the other three words.

PART II: PUTTING IT ALL TOGETHER

Multiple-Choice Questions

Each chapter contains multiple-choice questions. In addition, a simple case study and a series of related multiple-choice questions appear at the end of each chapter.

PART III: CHALLENGE YOURSELF!

Groups and Puzzles

Part III includes Groups and Puzzles. The grouping exercise asks you to integrate information by grouping together related topics and excluding unrelated topics. The puzzles, while entertaining, are integrative and instructive. You are asked to eliminate anatomical terms until you discover the answer. A hint appears in the title.

Acknowledgments

As with the text, the creation and publication of this *Study Guide* involved the combined efforts of many people. I want to thank the staff of Elsevier Science for their efforts; they are talented, beyond competent, and just plain nice. I especially want to thank Catherine Jackson, Rhoda Bontrager, Nisha Selvaraj, Kellie White, and Joe Gramlich for their encouragement, persistence, patience, sense of humor, and close attention to detail.

Many thanks to my family—Jerry, Kellie, Joe, and Kristan—for enduring another edition. The same goes to the pet population, which faithfully camped out around my cluttered writing table. And to my grandchildren—not quite so understanding—who just wanted me to play with them.

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Introduction to the Human Body

1

Answer Key: Textbook page references are provided as a guide for answering these questions. A complete answer key was provided for your instructor.

OBJECTIVES

1. Define the terms *anatomy* and *physiology*.
2. List the levels of organization of the human body.
3. Describe the 12 major organ systems.
4. Define homeostasis.
5. Describe the anatomical position.
6. List common terms used for relative positions of the body.
7. Describe the three major planes of the body.
8. List anatomical terms for regions of the body.
9. Describe the major cavities of the body.

6. _____ Word describing the lowering of the blood glucose level to normal after eating a meal
7. _____ Example: the heart has four chambers
8. _____ Example: heart muscle contracts forcefully and pumps blood into the blood vessels
9. _____ Example: a damaged heart muscle pumps an insufficient quantity of blood
10. _____ The femur, located in the thigh, is the largest bone in the body.

Part I: Mastering the Basics

MATCHING

General Terms

Directions: Match the following terms to the most appropriate definition by writing the correct letter in the space provided. Some terms may be used more than once. See text, pp. 1, 6.

- | | |
|----------------|--------------------|
| A. physiology | C. pathophysiology |
| B. homeostasis | D. anatomy |
1. _____ Branch of science that studies the structure of the body
 2. _____ Branch of science that describes how the body functions
 3. _____ Branch of science that describes the consequences of improper function of the body (as in disease)
 4. _____ Word from the Greek meaning "to dissect"
 5. _____ Word describing, for example, body temperature remaining at 37° C (98.6° F), despite the fact that the person is swimming in water that is 22° C (72° F)

Anatomical Terms

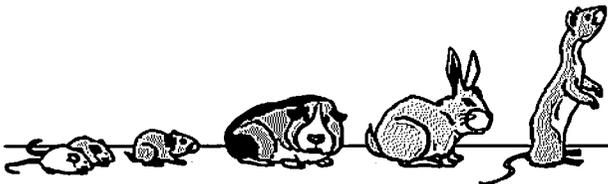
Directions: Match the following terms to the most appropriate definition by writing the correct letter in the space provided. Some terms may be used more than once. See text, pp. 6-7.

- | | |
|----------------|------------------------|
| A. superior | G. anterior |
| B. medial | H. anatomical position |
| C. distal | I. lateral |
| D. inferior | J. posterior |
| E. proximal | K. deep |
| F. superficial | L. peripheral |
1. _____ The body is standing erect, with the face forward, the arms at the side, and the toes and the palms of the hands directed forward.
 2. _____ Part that is above another part or is closer to the head; opposite of *inferior*
 3. _____ Toward the front (the belly surface); another word is *ventral*
 4. _____ Toward the back surface; another word is *dorsal*
 5. _____ Part that is located below another part or is closer to the feet; opposite of *superior*

6. _____ Toward the midline of the body; opposite of *lateral*
7. _____ Structure that is nearer the trunk or main part of the body; opposite of *distal*
8. _____ Part that is located on or near the surface of the body; opposite of *deep*
9. _____ Part that is located away from the center; opposite of *central*
10. _____ Away from the midline of the body; opposite of *medial*
11. _____ Position of the blood vessels relative to the heart (central location)
12. _____ Opposite of *superficial*
13. _____ Opposite of *proximal*
14. _____ The fingers are _____ to the wrist.
15. _____ The elbow is _____ to the wrist.
16. _____ The abdomen is _____ to the chest.
17. _____ The head is _____ to the shoulders.
18. _____ The mouth is _____ to the nose.

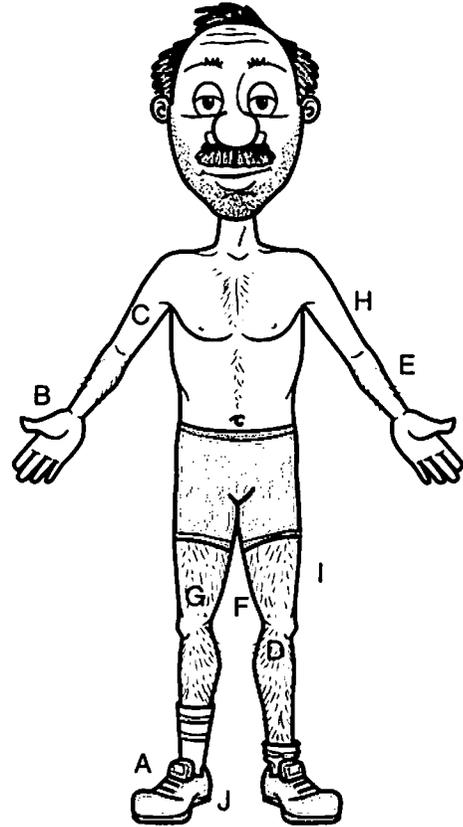
BODY TOON

Hint: The Type of Thinking You Need to Study Anatomy and Physiology



READ THE DIAGRAM

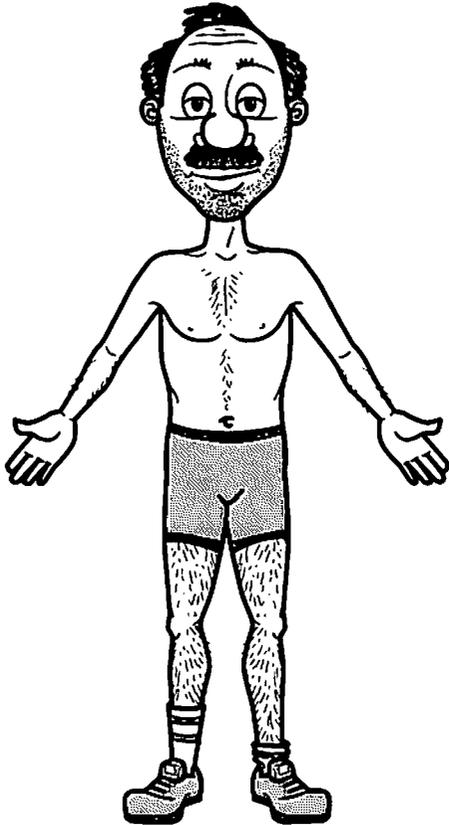
Directions: Referring to the diagram, fill in the spaces with the correct letters. Not all letters are used—(L) is left; (R) is right. See text, pp. 6-7.



1. _____ Point that is distal to the (L) elbow and proximal to the wrist
2. _____ Point that is proximal to the (R) elbow
3. _____ Point that is immediately distal to the (L) patella
4. _____ Point that is immediately proximal to the (R) patella
5. _____ Point that indicates the lateral aspect of the (R) foot
6. _____ Point that is distal to the (L) hip and proximal to the knee
7. _____ Point that indicates the medial aspect of the right foot
8. _____ Point that is distal to the (L) axillary area and proximal to the antecubital area

Answer: critical thinking

Xs, Ys, Zs, AND CIRCLES



1. Encircle the following areas: cervical, oral, umbilical.
2. Place a string of Xs along the sternal area.
3. Place Ys in the antecubital spaces.
4. Place a string of Zs along the brachial areas.
5. Draw an arrow to the left inguinal area.
6. Place a W on the right patellar area.
7. Place a D on both deltoid areas.
8. Place an A on the medial right thigh.
9. Place a B on a point distal to the left patella and proximal to the left ankle.
10. Place a C on a point proximal to the left elbow.
11. Draw a straight line to create a sagittal plane.
12. Draw a wavy line, creating a transverse plane.

MATCHING

Regional Body Terms

Directions: Match the following terms to the most appropriate definition by writing the correct letter in the space provided. See text, pp. 8-9.

- | | |
|----------------|--------------|
| A. digital | L. oral |
| B. axillary | M. occipital |
| C. buccal | N. pubic |
| D. cervical | O. patellar |
| E. lumbar | P. pedal |
| F. deltoid | Q. popliteal |
| G. scapular | R. femoral |
| H. umbilical | S. brachial |
| I. antecubital | T. sternal |
| J. gluteal | U. flank |
| K. inguinal | |

1. _____ Neck region
2. _____ Groin region
3. _____ Navel, or "belly button" area
4. _____ Armpit
5. _____ Kneecap area
6. _____ Between the cheek and gum
7. _____ Pertaining to the mouth
8. _____ Pertaining to the back (posterior) of the head
9. _____ Lower back area, extending from the chest to the hips
10. _____ Where you sit; the buttocks area
11. _____ Front aspect of the elbow area
12. _____ Area behind the knee
13. _____ Shoulder area
14. _____ Breastbone area
15. _____ Genital area
16. _____ Referring to the arm
17. _____ Referring to fingers and toes
18. _____ Foot area
19. _____ Shoulder blade area

20. _____ Area on the sides between the lower ribs and hip
21. _____ Thigh region

MATCHING

Cavities of the Body

Directions: Match the following terms to the most appropriate definition by writing the correct letter in the space provided. Some terms may be used more than once. See text, pp. 9-11.

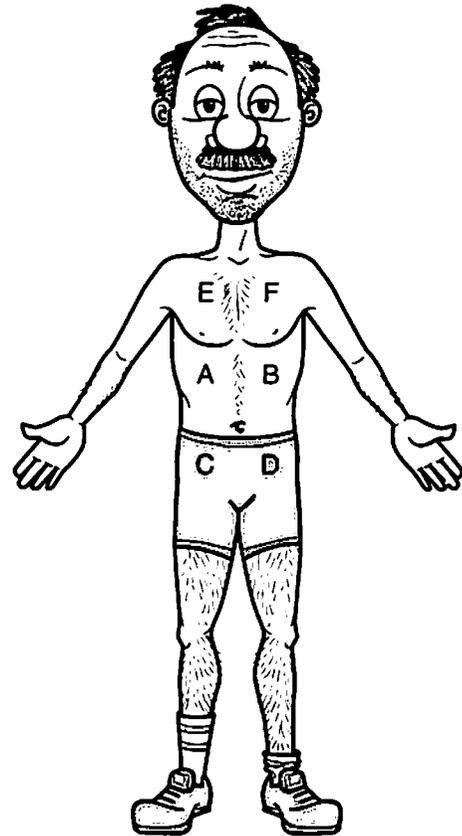
- | | |
|---------------------|--------------------------|
| A. dorsal cavity | E. ventral cavity |
| B. cranial cavity | F. abdominopelvic cavity |
| C. vertebral cavity | G. pleural cavity |
| D. thoracic cavity | |

1. _____ Cavity that is located in the skull and contains the brain
2. _____ Cavity that extends from the cranial cavity; contains the spinal cord
3. _____ Also called the *spinal canal*
4. _____ Cavity that is located in the front of the body; contains the thoracic cavity and the abdominopelvic cavity
5. _____ Cavity that is divided into quadrants
6. _____ Cavity that is located toward the back of the body; contains the cranial cavity and the vertebral cavity
7. _____ Upper ventral cavity that is surrounded by ribs; largely filled with the lungs
8. _____ Lower ventral cavity that is separated from the thoracic cavity by the diaphragm
9. _____ Part of the ventral cavity that contains the mediastinum
10. _____ Part of the thoracic cavity that contains the lungs
11. _____ Ventral cavity that is inferior to the thoracic cavity
12. _____ Ventral cavity that contains the liver, stomach, spleen, and intestines
13. _____ Cavity that contains the brain and spinal cord

14. _____ Cavity that contains the heart and lungs
15. _____ Cavity that is described in quadrants (RUQ, LUQ, RLQ, LLQ)
16. _____ Cavity that is described as regions (nine)

READ THE DIAGRAM

Directions: Indicate the letter on the diagram that is described below—(L) is left; (R) is right. Not all letters are used. Some letters may be used more than once.



1. _____ The point that is inferior to the diaphragm and located in the left lower quadrant (LLQ)
2. _____ The point over the left pleural cavity
3. _____ The point that is in both the right upper quadrant (RUQ) and hypochondriac region (R)
4. _____ The point on the right side of the body that is superior to the umbilicus and inferior to the diaphragm

- 5. _____ The point of pain for acute appendicitis—right lower quadrant (RLQ)
- 6. _____ The point on the left side of the body that does not “fall into” a quadrant
- 7. _____ The point that is inferior to the RUQ
- 8. _____ The point that is superior to the RLQ

- 11. thoracic sagittal frontal transverse
- 12. ventral cranial spinal vertebral

SIMILARS AND DISSIMILARS

Directions: Circle the word in each group that is least similar to the others. Indicate the similarity of the three words on the line below each question.

- 1. stomach ovary sagittal heart

- 2. heart thoracic ventral pleural

- 3. superior anterior pleural deep

- 4. lungs dorsal thoracic pelvic

- 5. RUQ cranial umbilical left inguinal

- 6. LLQ left hypochondriac RLQ thoracic

- 7. umbilical epigastric right inguinal cranial

- 8. urinary reproductive stomach nervous

- 9. ventral diaphragm dorsal abdominopelvic

- 10. lumbar gluteal sternal scapular

Part II: Putting It All Together

MULTIPLE CHOICE

Directions: Choose the correct answer.

- 1. The heart and blood vessels work together to pump blood throughout the body. What is the word that describes the heart and blood vessels?
 - a. tissue
 - b. molecule
 - c. organ
 - d. organ system
- 2. The inguinal region
 - a. is in the thoracic cavity.
 - b. houses the heart.
 - c. refers to the groin.
 - d. is superior to the umbilical region.
- 3. The sternum (breastbone) is
 - a. inferior to the umbilicus.
 - b. deep to the lungs.
 - c. superficial to the heart.
 - d. posterior to the heart.
- 4. Which word describes the route of administration of a drug given by mouth?
 - a. cranial
 - b. inguinal
 - c. oral
 - d. antecubital
- 5. The appendix is located in the RLQ of which cavity?
 - a. dorsal
 - b. cranial
 - c. abdominopelvic
 - d. spinal
- 6. The liver is located in the RUQ and the appendix is located in the RLQ. Which of the following describes the position of the liver relative to the appendix?
 - a. distal
 - b. superior
 - c. anterior
 - d. deep

7. Which region of the abdomen surrounds the navel (belly button)?
 - a. epigastric region
 - b. popliteal area
 - c. umbilical region
 - d. right iliac region
8. Which of the following regions is included within the RUQ?
 - a. umbilical
 - b. hypogastric
 - c. right iliac
 - d. right hypochondriac
9. Which of the following describes the division of the body by a transverse plane?
 - a. a front and a back
 - b. a left and a right
 - c. a top and a bottom
 - d. an inside and an outside
10. Which of the following describes the division of the body by a coronal plane?
 - a. a front and a back
 - b. a top and a bottom
 - c. a left and a right
 - d. an inside and an outside
11. Which of the following describes the division of the body by a sagittal plane?
 - a. a front and a back
 - b. a left and a right
 - c. a top and a bottom
 - d. an inside and an outside
12. Which of the following divides the body into a front and a back?
 - a. the frontal plane
 - b. the sagittal plane
 - c. a cross section
 - d. transverse plane
13. Which of the following describes the position of the wrist relative to the elbow?
 - a. proximal
 - b. superior
 - c. dorsal
 - d. distal
14. Which of the following describes the position of the antecubital space relative to the carpal region?
 - a. proximal
 - b. medial
 - c. distal
 - d. deep
15. Which of the following describes the position of the wrist relative to the fingers?
 - a. proximal
 - b. inferior
 - c. ventral
 - d. distal
16. The mediastinum is contained within which cavity?
 - a. dorsal
 - b. abdominal
 - c. pelvic
 - d. thoracic

Part III: Challenge Yourself!

GROUPS AND PUZZLE

1. Which group is incorrect?
 - a. planes: transverse, sagittal, frontal
 - b. ventral cavities: thoracic, abdominopelvic, spinal
 - c. cavities: dorsal, ventral
 - d. organs: heart, stomach, lungs
2. Which group is incorrect?
 - a. cavities: dorsal, ventral
 - b. ventral cavities: thoracic, abdominopelvic, pleural
 - c. organ systems: circulatory, digestive, respiratory, immune
 - d. organs: heart, stomach, lungs, mediastinum
3. Which group is incorrect?
 - a. planes: transverse, sagittal, frontal
 - b. cavities: dorsal, ventral
 - c. dorsal cavities: thoracic, abdominopelvic
 - d. organ systems: skeletal, digestive, respiratory, immune

Student Name _____

PUZZLE

Hint: Navel-Gazing Territory

Directions: Perform the following functions on the Sequence of Words that follows. When all the functions have been performed, you are left with a word or words related to the hint. Record your answer in the space provided.

Functions: Remove the following:

1. Four quadrants
2. Word for the groin area
3. Words (three) that refer to parts of the upper extremities
4. Words (four) that refer to parts of the lower extremities
5. Cavities (three) of the ventral cavity
6. Cavities (two) of the dorsal cavity
7. Word for the lower back region
8. Membranes (two) that have a visceral and parietal layer
9. Planes of the body (three)

Sequence of Words

CORONALBRACHIALCRANIALINGUINALLU
 MBARABDOMINOPELVICTHORACICPERIT
 ONEUMTRANSVERSEPATELLARRUQDIG
 ITALFEMORALPLEURALUQRLQUMBILI
 CALREGIONPEDALANTECUBITALSAG
 ITTALSPINALLLQPLEURALPOPLITEAL

Answer: _____