# Chapter 2
# Body Structure

## Chapter Contents



## Media Library

### Student DVD-ROM

- Twelve different interactive learning games
- Flash card generator
- Audio Glossary
- Professional Profile video—Medical Care
  - Family and General Practitioner
  - Physician Assistant
  - Medical Assistants
- Terminology Translator

### Companion Website

- Multiple Choice, True/False, and Fill-in-the-Blank practice questions
- Labeling exercises
- Case study
- Additional Professional Profile information
- *New York Times* link for research into specific pathologies
- Web Destination activities
- Audio Glossary
- Link to VangoNotes
- Link to drug updates

### IRDVD

- Animations
  - 3D interactive animation of cardiovascular system
  - 3D interactive animation of lymphatic system
  - 3D interactive animation of respiratory system
  - 3D interactive animation of digestive system
  - 3D interactive animation of urinary system

- 3D interactive animation of female reproductive system
- 3D interactive animation of male reproductive system
- 3D interactive animation of endocrine system
- 3D interactive animation of nervous system
- 3D interactive animation of eye
- 3D interactive animation of ear
- Drag and drop labeling activity
  - Body cavities
  - Directional terms
- Digital library of all figures from text chapter, labeled and unlabeled
- Test bank with 200 objective questions per chapter plus two short answer questions
- 20 classroom response questions
- PowerPoint presentation for classroom or online utilization

## OBJECTIVE 1

**Recognize the combining forms introduced in this chapter.**

Text page: 20; PowerPoint slides: 3–4

### LECTURE NOTES

| | |
|---|---|
| abdomin/o | abdomen |
| adip/o | fat |
| anter/o | front |
| brachi/o | arm |
| caud/o | tail |
| cephal/o | head |
| cervic/o | neck |
| chondr/o | cartilage |
| crani/o | skull |
| crur/o | leg |
| cyt/o | cell |
| dist/o | away from |
| dors/o | back of body |
| epitheli/o | epithelium |
| glute/o | buttock |
| hist/o | tissue |
| infer/o | below |
| later/o | side |
| medi/o | middle |
| muscul/o | muscle |
| neur/o | nerve |
| organ/o | organ |
| oste/o | bone |
| pelv/o | pelvis |
| peritone/o | peritoneum |
| pleur/o | pleura |
| poster/o | back |
| proxim/o | near to |
| pub/o | genital region |
| somat/o | body |
| spin/o | spine |
| super/o | above |
| system/o | system |
| thorac/o | chest |
| ventr/o | belly |
| vertebr/o | vertebra |
| viscer/o | internal organ |

### TEACHING STRATEGIES

- Encourage students to add new combining forms to their flash cards.

**Medical Terminology Bee**

- Create PowerPoint flash cards of new combining forms and suffixes presented in this chapter; have all students stand and then define word part; if student is correct he/she remains standing, if student is wrong he/she sits down; continue until only one student is standing.

### LEARNING ACTIVITIES

**Worksheet 2A**

- New Combining Form Handout

**Quiz 2A**

- May be used as a worksheet

**Text**

- Practice Exercises

**Student DVD-ROM**

- Learning games
- Make flash cards

**CW**

- Practice questions

### ASSESSMENTS

**Quiz 2A—**New Word Parts Quiz
**Quiz 2E—**Word Building Quiz
**Test Bank—**Fill-in-the-Blank questions

# OBJECTIVE 2

**Correctly spell and pronounce medical terms and anatomical structures relating to body structure.**

## LECTURE NOTES

Pronunciation for medical terms in this chapter can be found:

- In parentheses following key terms
- In the Audio Glossary on Student DVD-ROM
- In the Audio Glossary at Companion Website

## TEACHING STRATEGIES

Emphasize to students:

- Importance of correctly spelling terms.
- How sounding out terms can assist in learning how to spell terms.

Say each new term in class and have students repeat it.

### Pop Questions

- Use Clicker questions as either a pretest or posttest quiz to gauge student comprehension of spelling strategies.

## LEARNING ACTIVITIES

### Worksheet 2B

- Medical Term Analysis

### Terminology Checklist

- Can be used to practice pronunciation using the Audio Glossary as a reference

### Text

- Practice Exercises

### Flash cards

- Look at definition and write out/pronounce terms

### Student DVD-ROM

- Audio Glossary
- Spelling Challenge game
- Crossword and Word Search puzzles

## ASSESSMENTS

**Quiz 2B—**Spelling Quiz
Suggested terms:

1. cytoplasm
2. epithelium
3. anatomical
4. coronal
5. sagittal
6. brachial
7. crural
8. gluteal
9. dorsum
10. abdominopelvic
11. diaphragm
12. mediastinum
13. peritoneum
14. pleura
15. pericardial
16. viscera
17. otorhinolaryngology
18. ophthalmology
19. epigastric
20. hypochondriac

**Test Bank—**questions

## OBJECTIVE 3

**Discuss the organization of the body in terms of cells, tissues, organs, and systems.**

Text pages: 21–22; PowerPoint slides: 5–6

### LECTURE NOTES

- Components arranged in hierarchical manner; parts from lower level come together to form next higher level:
  - **cells**–come together to form tissues
  - **tissues**–come together to form organs
  - **organs**–come together to form systems
  - **systems**–come together to form whole body
- Refer to System Illustrated figure

### TEACHING STRATEGIES

#### Visual Aids

- Use anatomical charts to illustrate different levels of organization, particularly from organ to system to whole body.

#### Pop Questions

- Use Clicker questions as either a pretest or posttest quiz to gauge student comprehension during lecture.

### LEARNING ACTIVITIES

#### Worksheet 2C

- Chapter Review

#### Text

- Labeling exercise 2.A
- Practice Exercises

#### Student DVD-ROM

- Learning games

#### CW

- Labeling exercise
- Practice questions

### ASSESSMENTS

**Quiz 2G—**Chapter Review
**Test Bank—**questions

## OBJECTIVE 4

**Describe the common features of all cells.**

Text page: 22; PowerPoint slides: 7–10

### LECTURE NOTES

- Fundamental unit of all living things; smallest structure of body that has all properties of being alive:
  - responds to stimuli
  - engages in metabolic activities
  - reproduces itself
- Tissues and organs in body are composed of cells
- Individual cells perform functions for body such as reproduction, hormone secretion, energy production, and excretion
- Special cells carry out specific functions, such as contraction by muscle cells and electrical impulse transmission by nerve cells
- Study of cells and their functions is called **cytology**

### TEACHING STRATEGIES

#### Visual Aids

- Use full-size anatomical charts and models to illustrate different types of cells and their organelles.

#### Pop Questions

- Use Clicker questions as either a pretest or posttest quiz to gauge student comprehension during lecture.

- No matter difference in shape and function, all cells have:
  - **nucleus**–outermost boundary of cell
  - **cytoplasm**–watery internal environment of cell
  - **cell membrane**–contains DNA
- See ■ Figure 2.1

## Learning Activities

**Worksheet 2C**
- Chapter Review

**Text**
- Practice Exercises

**Student DVD-ROM**
- Learning games

**CW**
- Practice questions

## Assessments

**Quiz 2G—**Chapter Review
**Test bank—**questions

# Objective 5

**Define the four types of tissues.**

Text pages: 23–24; PowerPoint slides: 11–19

## Lecture Notes

### Histology

- Study of tissue
- Tissue formed when like cells grouped together and function together to perform specific activity
- Body has four types of tissue: **muscle tissue**, **epithelial tissue**, **connective tissue**, and **nervous tissue**

### Muscle Tissue

- Produces movement through contraction, or shortening in length
- Composed of individual muscle cells called **muscle fibers** (see ■ Figure 2.2)
- Three basic types of muscles: **skeletal muscle** (attached to bone), **smooth muscle** (in internal organs such as intestines, uterus, and blood vessels), and **cardiac muscle** (only in heart)

### Epithelial Tissue

- Also called **epithelium**
- Found throughout body
- Composed of close-packed cells that form covering for and lining of body structures
- Examples: top layer of skin and lining of stomach (see ■ Figure 2.2)
- May be specialized to absorb substances (such as nutrients from intestines), secrete substances (such as sweat glands), or excrete wastes (such as kidney tubules)

### Connective Tissue

- Supporting and protecting tissue
- Performs many different functions depending on location
- Appears in many different forms so that each is able to perform task required at that location

## Teaching Strategies

**Visual Aids**
- Use full-size anatomical charts to illustrate unique characteristics of each tissue type.

**Pop Questions**
- Use Clicker questions as either a pretest or posttest quiz to gauge student comprehension during lecture.

## Learning Activities

**Worksheet 2C**
- Chapter Review

**Text**
- Practice Exercises

**Student DVD-ROM**
- Learning games

**CW**
- Practice questions

## Assessments

**Quiz 2G—**Chapter Review
**Test Bank—**questions

- Examples: **bone** (structural support for whole body); **cartilage** (shock absorber in joints); t**endons** (connects skeletal muscles to bones); a **dipose** (protective padding) (see ■ Figure 2.2)

### Nervous Tissue

- Composed of cells called **neurons** (see ■ Figure 2.2)
- Forms **brain**, **spinal cord**, and network of **nerves** throughout entire body
- Allows for conduction of electrical impulses to send information between brain and rest of body

## OBJECTIVE 6

**List the major organs found in the twelve organ systems.**

Text pages: 25–29; PowerPoint slides: 20–50

## LECTURE NOTES

### Organs

- Composed of several different types of tissue that work as a unit to perform special functions
- Example: Stomach contains smooth muscle tissue, nervous tissue, and epithelial tissue that allow it to contract to mix food with digestive juices

### Systems

- Composed of several organs working in coordinated manner to perform complex function or functions
- Example: stomach plus other digestive system organs—oral cavity, esophagus, liver, pancreas, small intestines, and colon—work together to ingest, digest, and absorb our food

**TABLE 2.1 Organ Systems of the Human Body**

| *System* | *Structures* | *Functions* | *Medical Specialty* |
|---|---|---|---|
| Integumentary | • skin<br>• hair<br>• nails<br>• sweat glands<br>• sebaceous glands | protective two-way barrier, aids in temperature regulation | dermatology |
| Musculoskeletal (MS) | • bones<br>• joints<br>• muscles | supports and protects body; forms blood cells; stores minerals; muscles produce movement | orthopedics<br>orthopedic surgery |
| Cardiovascular (CV) | • heart<br>• arteries<br>• veins | pumps blood throughout entire body | cardiology |

## TEACHING STRATEGIES

- At beginning of lesson, name each body system and see how many organs class can correctly identify for each.
- Conduct class discussion in order to rank body systems by importance.

#### IRDVD

See PowerPoint presentation on the Instructor's Resource DVD for 3D animations for the following systems:

- cardiovascular
- lymphatic
- respiratory
- digestive
- urinary
- female reproductive
- male reproductive
- endocrine
- nervous
- eye
- ear

#### Pop Questions

- Use Clicker questions as either a pretest or posttest quiz to gauge student comprehension during lecture.

## LEARNING ACTIVITIES

- Assign each student an organ from one body system and have each prepare one-page report.

#### Worksheet 2C

- Chapter Review

#### Text

- Practice Exercises

| | | | |
|---|---|---|---|
| Blood (Hematic System) | • plasma<br>• erythrocytes<br>• leukocytes<br>• platelets | transports oxygen, protects against pathogens, and controls bleeding | hematology |
| Lymphatic | • lymph nodes<br>• lymphatic vessels<br>• spleen<br>• thymus gland<br>• tonsils | protects body from disease and invasion from pathogens | immunology |
| Respiratory | • nasal cavity<br>• pharynx<br>• larynx<br>• trachea<br>• bronchial tubes<br>• lungs | obtains oxygen and removes carbon dioxide from body | otorhinolaryngology (ENT)<br>pulmonology<br>thoracic surgery |
| Digestive or Gastrointestinal (GI) | • oral cavity<br>• pharynx<br>• esophagus<br>• stomach<br>• small intestine<br>• colon<br>• liver<br>• gallbladder<br>• pancreas<br>• salivary glands | ingests, digests, and absorbs nutrients for body | gastroenterology<br>proctology |
| Urinary | • kidneys<br>• ureters<br>• urinary bladder<br>• urethra | filters waste products out of blood and removes them from body | nephrology<br>urology |
| Female reproductive | • ovary<br>• fallopian tubes<br>• uterus<br>• vagina<br>• vulva<br>• breasts | produces eggs for reproduction and provides place for growing baby | gynecology (GYN)<br>obstetrics (OB) |
| Male reproductive | • testes<br>• epididymis<br>• vas deferens<br>• penis<br>• seminal vesicles<br>• prostate gland<br>• bulbourethral gland | produces sperm for reproduction | urology |
| Endocrine | • pituitary gland<br>• pineal gland<br>• thyroid gland<br>• parathyroid glands<br>• thymus gland<br>• adrenal glands<br>• pancreas<br>• ovaries<br>• testes | regulates metabolic activities of body | endocrinology |
| Nervous | • brain<br>• spinal cord<br>• nerves | receives sensory information and coordinates body's response | neurology<br>neurosurgery |
| Special senses: Eye and Ear | • eye (vision)<br>• ear (hearing and balance) | vision<br>hearing and balance | ophthalmology<br>otorhinolaryngology (ENT) |

**Student DVD-ROM**
- Learning games

**CW**
- Practice questions

## ASSESSMENTS

**Quiz 2G—**Chapter Review
**Test Bank—**questions

## OBJECTIVE 7

**Describe the anatomical position.**

Text page: 29; PowerPoint slides: 50–52

### LECTURE NOTES

- Used when describing positions and relationships of structure in human body
- Body in anatomical position is standing erect with arms at side of body, palms of hands facing forward, and eyes looking straight ahead; legs are parallel with feet and toes pointing forward (see ■ Figure 2-3)
- For descriptive purposes, assumption is always that person is in anatomical position even if body or parts of body are in any other position

### TEACHING STRATEGIES

**Visual Aids**

- Use several anatomical charts or diagrams from other sources to illustrate how anatomical position is universally used.
- Have students stand and mimic features of anatomical position as you describe them.

**Pop Questions**

- Use Clicker questions as either a pretest or posttest quiz to gauge student comprehension during lecture.

### LEARNING ACTIVITIES

**Worksheet 2C**

- Chapter Review

**Text**

- Practice Exercises

**Student DVD-ROM**

- Learning games

**CW**

- Practice questions

### ASSESSMENTS

**Quiz 2G—**Chapter Review
**Test Bank—**questions

## OBJECTIVE 8

**Define the body planes.**

Text pages: 30–31; PowerPoint slides: 53–58

### LECTURE NOTES

- Terminology for body planes used to assist medical personnel in describing body and its parts
- To understand body planes, imagine cuts slicing through body at various angles; imaginary slicing allows us to use more specific language when describing parts of body
- Body planes, illustrated in ■ Figure 2.4, include the following:
  1. **Sagittal plane**; vertical plane; also called **median plane**; runs lengthwise from front to back; divides body or any of its parts into right and left portions; right and left sides do not have to be equal; cut along sagittal plane yields **sagittal section** view of inside of body

### TEACHING STRATEGIES

**Visual Aids**

- Use full-size anatomical chart to illustrate direction of each plane.
- Have students pair up and draw imaginary lines on each other to envision what internal structures would be revealed by a slice along each plane.

**Pop Questions**

- Use Clicker questions as either a pretest or posttest quiz to gauge student comprehension during lecture.

2. **Frontal plane:** vertical plane; also called **coronal plane;** runs lengthwise from side to side; divides body into front and back portions; cut along frontal plane yields **frontal** or **coronal section** view of inside of body
3. **Transverse plane:** horizontal plane; also called **horizontal plane;** divides body or its parts into upper and lower portions; cut along transverse plane yields **transverse section** view of inside of body

- **Longitudinal section**—view produced by lengthwise slice along long axis of structure
- **Cross-section**—view produced by slice perpendicular to long axis of structure

## Learning Activities

**Worksheet 2C**
- Chapter Review

**Quiz 2C**
- May be used as a worksheet

**Text**
- Labeling Exercises 2.B1
- Practice Exercises

**Student DVD-ROM**
- Learning games

**CW**
- Practice questions

## Assessments

**Quiz 2C—**Labeling quiz
**Quiz 2G—**Chapter Review quiz
**Test Bank—**questions

# Objective 9

**Identify regions of the body.**

Text pages: 31–32; PowerPoint slides: 59–61

## Lecture Notes

Body is divided into large regions that can easily be identified externally:

- **Cephalic region**—entire head
- **Cervical region**—neck
- **Trunk**—torso
- **Thoracic region**—chest
- **Abdominal region**
- **Pelvic region**
- **Pubic region**—genital region
- **Dorsum**—back
- **Vertebral region**
- **Gluteal region**—buttocks
- **Upper extremities or brachial region**—arms
- **Lower extremities or crural regions**—legs
- See ■ Figure 2.5 to locate each region on body

## Teaching Strategies

**Visual Aids**
- Use full-size anatomical chart to illustrate different regions.

**Pop Questions**
- Use Clicker questions as either a pretest or posttest quiz to gauge student comprehension during lecture.

## Learning Activities

**Worksheet 2B**
- Medical Term Analysis

**Worksheet 2C**
- Chapter Review

**Quiz 2D**
- May be used as worksheet

**Text**
- Labeling Exercise 2.B2
- Practice Exercises

**Student DVD-ROM**
- Learning games

**CW**
- Practice questions

## Assessments

**Quiz 2D—**Labeling quiz
**Quiz 2G—**Chapter Review quiz
**Test Bank—**questions

# Objective 10

**Define directional and positional terms.**

Text pages: 33–36; PowerPoint slides: 75–82

## Lecture Notes

- Assist medical personnel in discussing position or location of patient's complaint
- Also help describe one process, organ, or system as it relates to another
- Table 2.4 presents commonly used terms for describing position of body or its parts
- Listed in pairs that have opposite meanings: for example, superior versus inferior, anterior versus posterior, medial versus lateral, proximal versus distal, superficial versus deep, and supine versus prone
- Illustrated in ■ Figure 2.7

**TABLE 2.4 Terms Describing Body Positions**

| *Term* | *Definition* |
|---|---|
| **superior** or **cephalic** | More toward head, or above another structure<br>*Example:* The adrenal glands are superior to the kidneys. |
| **inferior** or **caudal** | More toward feet or tail, or below another structure<br>*Example:* The intestine is inferior to the heart. |
| **anterior** or **ventral** | More toward front or belly-side of body<br>*Example:* The navel is located on the anterior surface of the body. |
| **posterior** or **dorsal** | More toward back or spinal cord side of body<br>*Example:* The posterior wall of the right kidney was excised. |
| **medial** | Refers to middle or near middle of body or structure<br>*Example:* The heart is medially located in the chest cavity. |
| **lateral** | Refers to side<br>*Example:* The ovaries are located lateral to the uterus. |
| **apex** | Tip or summit of organ<br>*Example:* We hear the heart beat by listening over the apex of the heart. |
| **base** | Bottom or lower part of organ<br>*Example:* On the X-ray, a fracture was noted at the base of the skull. |
| **proximal** | Located nearer to the point of attachment to body<br>*Example:* In the anatomical position, the elbow is proximal to the hand. |
| **distal** | Located farther away from point of attachment to body<br>*Example:* The hand is distal to the elbow. |
| **superficial** | More toward surface of body<br>*Example:* The cut was superficial. |

## Teaching Strategies

- After all directional terms have been covered, stand in front of class and make hand motions to indicate each directional term; instruct students write down each term as you make motion; repeat and speed up.
- Select various body parts and have students determine directional relationship of two parts.

### IRDVD

- See PowerPoint presentation on the Instructor's Resource DVD for a drag-and-drop anatomy activity for directional terms; display on screen and have students discuss and place labels during class.

### Pop Questions

- Use Clicker questions as either a pretest or posttest quiz to gauge student comprehension during lecture.

## Learning Activities

### Worksheet 2B

- Medical Term Analysis

### Worksheet 2C

- Chapter Review

### Text

- Practice Exercises

### Student DVD-ROM

- Learning games

### CW

- Practice questions
- Labeling exercise

## Assessments

**Quiz 2G—**Chapter Review
**Test Bank—**questions

| | |
|---|---|
| **deep** | Further away from surface of body<br>*Example:* An incision into an abdominal organ is a deep incision. |
| **supine** | Body lying horizontally and facing upward (see ■ Figure 2.8A)<br>*Example:* The patient is in the supine position for abdominal surgery. |
| **prone** | Body lying horizontally and facing downward (see ■ Figure 2.8B)<br>*Example:* The patient is placed in the prone position for spinal surgery. |

## OBJECTIVE 11

**List the body cavities and their contents.**

Text pages: 31–33; PowerPoint slides: 62–69

### LECTURE NOTES

- Body is not solid structure; has many open spaces or cavities
- Cavities are part of normal body structure and are illustrated in ■ Figure 2.6
- Can divide body into four major cavities—two dorsal cavities and two ventral cavities
- Dorsal cavities include **cranial cavity** (contains brain) and **spinal cavity** (contains spinal cord)
- Ventral cavities include **thoracic cavity** and **abdominopelvic cavity**
- Thoracic cavity contains two lungs and central region between them called **mediastinum**; heart, aorta, esophagus, trachea, and thymus gland located in mediastinum
- **Diaphragm**—physical wall between thoracic cavity and abdominopelvic cavity; muscle used for breathing
- Abdominopelvic cavity generally subdivided into superior **abdominal cavity** and inferior **pelvic cavity**; organs of digestive, excretory, and reproductive systems located in these cavities; organs within ventral cavities referred to as **viscera**
- Table 2.2 describes body cavities and their major organs
- Cavities lined by, and viscera encased in, two-layer membrane called **pleura** in thoracic cavity and **peritoneum** in abdominopelvic cavity
- Outer layer that lines cavities called **parietal layer** (i.e., **parietal pleura** and **parietal peritoneum**), and inner layer that encases viscera called **visceral layer** (i.e., **visceral pleura** and **visceral peritoneum**)
- Within thoracic cavity, pleura is subdivided, forming **pleural cavity** (contains lungs) and **pericardial cavity** (contains heart)

### TEACHING STRATEGIES

- Name an organ and have students identify which cavity it is located in.

#### IRDVD

- See PowerPoint presentation on the Instructor's Resource DVD for a drag and drop anatomy activity for body cavities; display on screen and have students discuss and place labels during class.

#### Pop Questions

- Use Clicker questions as either a pretest or posttest quiz to gauge student comprehension during lecture.

### LEARNING ACTIVITIES

#### Worksheet 2C

- Chapter Review

#### Text

- Practice Exercises

#### Student DVD-ROM

- Learning games

#### CW

- Labeling exercise
- Practice questions

### ASSESSMENTS

**Test Bank**—questions

**TABLE 2.2 Body Cavities and their Major Organs**

| *Cavity* | *Major Organs* |
|---|---|
| Dorsal cavities | |
| Cranial cavity | Brain |
| Spinal cavity | Spinal cord |
| Ventral cavities | |
| Thoracic cavity | Pleural cavity: lungs<br>Pericardial cavity: heart<br>Mediastinum: heart, esophagus, trachea, thymus gland, aorta |
| Abdominopelvic cavity | |
| Abdominal cavity | Stomach, spleen, liver, gallbladder, pancreas, and portions of the small intestines and colon |
| Pelvic cavity | Urinary bladder, ureters, urethra, and portions of the small intestines and colon<br>*Female:* uterus, ovaries, fallopian tubes, vagina<br>*Male:* prostate gland, seminal vesicles, portion of the vas deferens |

# OBJECTIVE 12

**Locate and describe the nine anatomical and four clinical divisions of the abdomen.**

Text pages: 33–34; PowerPoint slides: 70–74

## LECTURE NOTES

- Abdominopelvic cavity usually subdivided into regions so different areas can be precisely referred to
- Two different methods of subdividing cavity are used: anatomical divisions and clinical divisions
- Table 2.3 describes methods for dividing abdominopelvic cavity

**TABLE 2.3 Methods of Subdividing Abdominopelvic Cavity**

**Anatomical Divisions of the Abdomen**

- **Right hypochondriac:** Right lateral region of upper row beneath lower ribs
- **Epigastric:** Middle area of upper row above stomach
- **Left hypochondriac:** Left lateral region of upper row beneath lower ribs
- **Right lumbar:** Right lateral region of middle row at waist
- **Umbilical:** Central area over navel
- **Left lumbar:** Left lateral region of middle row at waist
- **Right iliac:** Right lateral region of lower row at groin
- **Hypogastric:** Middle region of lower row beneath navel
- **Left iliac:** Left lateral region of lower row at groin

## TEACHING STRATEGIES

- Name organ and have students determine in which body cavity it is located for both methods of dividing the abdominopelvic cavity.

**Pop Questions**

- Use Clicker questions as either a pretest or posttest quiz to gauge student comprehension during lecture.

## LEARNING ACTIVITIES

**Text**

- Practice Exercises

**Student DVD-ROM**

- Learning games

**CW**

- Practice questions

## ASSESSMENTS

**Quiz 2G—**Chapter Review
**Test Bank—**questions

**Clinical Divisions of the Abdomen**

- **Right upper quadrant (RUQ):** Contains majority of liver, gallbladder, small portion of pancreas, right kidney, small intestines, and colon
- **Right lower quadrant (RLQ):** Contains small intestines and colon, right ovary and fallopian tube, appendix, and right ureter
- **Left upper quadrant (LUQ):** Contains small portion of liver, spleen, stomach, majority of pancreas, left kidney, small intestines, and colon
- **Left lower quadrant (LLQ):** Contains small intestines and colon, left ovary and fallopian tube, and left ureter
- **Midline organs:** uterus, bladder, prostate gland

# OBJECTIVE 13

**Build body organization medical terms from word parts.**

Text pages: 36–37; PowerPoint slides: 83–86

## LECTURE NOTES

| Combining Form | Suffix | Medical Term | Definition |
|---|---|---|---|
| abdomin/o | -al | abdominal | pertaining to abdomen |
| anter/o | -ior | anterior | pertaining to front |
| brachi/o | -al | brachial | pertaining to arm |
| caud/o | -al | caudal | pertaining to tail |
| cephal/o | -ic | cephalic | pertaining to head |
| cervic/o | -al | cervical | pertaining to neck |
| crani/o | -al | cranial | pertaining to skull |
| crur/o | -al | crural | pertaining to leg |
| dist/o | -al | distal | pertaining to away |
| dors/o | -al | dorsal | pertaining to spinal cord |
| epitheli/o | -al | epithelial | pertaining to epithelium |
| glute/o | -al | gluteal | pertaining to buttocks |
| infer/o | -ior | inferior | pertaining to below |
| later/o | -al | lateral | pertaining to side |
| medi/o | -al | medial | pertaining to middle |
| muscul/o | -ar | muscular | pertaining to muscles |
| neur/o | -al | neural | pertaining to nerves |
| organ/o | -ic | organic | pertaining to organs |
| pelv/o | -ic | pelvic | pertaining to pelvis |
| peritone/o | -al | peritoneal | pertaining to peritoneum |
| pleur/o | -al | pleural | pertaining to pleura |
| poster/o | -ior | posterior | pertaining to back |
| proxim/o | -al | proximal | pertaining to near |
| pub/o | -ic | pubic | pertaining to genital region |
| somat/o | -ic | somatic | pertaining to body |
| spin/o | -al | spinal | pertaining to spine |
| super/o | -ior | superior | pertaining to above |
| system/o | -ic | systemic | pertaining to systems |
| thorac/o | -ic | thoracic | pertaining to chest |
| ventr/o | -al | ventral | pertaining to belly side |
| vertebr/o | -al | vertebral | pertaining to vertebrae |
| viscer/o | -al | visceral | pertaining to internal organs |

## TEACHING STRATEGIES

- Reinforce how many body structure terms can be constructed from word parts.
- Read aloud body structure terms made up of word parts; have students identify parts and define terms, either aloud or individually on paper.
- Write sentences on the board using common words; have students substitute correct medical terms.

### Pop Questions

- Use Clicker questions as either a pretest or posttest quiz to gauge student comprehension during lecture.

## LEARNING ACTIVITIES

### Worksheet 2B

- Medical Term Analysis

### Quiz 2A

- May be used as a worksheet

### Text

- Practice Exercises
- Terminology Checklist

### Student DVD-ROM

- Learning games
- Flash cards

### CW

- Practice questions

## ASSESSMENTS

**Quiz 2E—**Word Building quiz
**Test Bank—**questions

# OBJECTIVE 14

**Interpret abbreviations associated with body organization.**

Text page: 37; PowerPoint slides: 87–88

## LECTURE NOTES

| | |
|---|---|
| AP | anteroposterior |
| CV | cardiovascular |
| ENT | ear, nose, and throat |
| GI | gastrointestinal |
| GU | genitourinary |
| GYN | gynecology |
| lat | lateral |
| LE | lower extremity |
| LLQ | left lower quadrant |
| LUQ | left upper quadrant |
| MS | musculoskeletal |
| OB | obstetrics |
| PA | posteroanterior |
| RLQ | right lower quadrant |
| RUQ | right upper quadrant |
| UE | upper extremity |

## TEACHING STRATEGIES

- Emphasize importance of learning abbreviations and their full meanings; point out how some abbreviations, such as CV, GYN, UE, and LE are typically used rather than the full terms.
- Encourage students to add abbreviations to their flash cards.

### Memory Game

- Have students assist in creating memory game to play in class.

### Pop Questions

- Use Clicker questions as either a pretest or posttest quiz to gauge student comprehension during lecture.

## LEARNING ACTIVITIES

**Worksheet 2C**

- Chapter Review

**Quiz 2F**

- May be used as a worksheet

### Text

- Practice Exercises

### Student DVD-ROM

- Learning games
- Flash cards

### CW

- Practice questions

## ASSESSMENTS

**Quiz 2F—**Abbreviations Quiz
**Quiz 2G—**Chapter Review
**Test Bank—**questions

# Worksheet 2A

## New Combining Form Handout

**Directions: For each combining form below, write out its meaning and then locate a new term from the chapter that uses the combining form.**

| Combining Forms | Meaning | Chapter Term | Meaning |
|---|---|---|---|
| **1.** abdomin/o | | | |
| **2.** adip/o | | | |
| **3.** anter/o | | | |
| **4.** brachi/o | | | |
| **5.** caud/o | | | |
| **6.** cephal/o | | | |
| **7.** cervic/o | | | |
| **8.** chondr/o | | | |
| **9.** crani/o | | | |
| **10.** crur/o | | | |
| **11.** cyt/o | | | |
| **12.** dist/o | | | |
| **13.** dors/o | | | |
| **14.** epitheli/o | | | |
| **15.** glute/o | | | |
| **16.** hist/o | | | |
| **17.** infer/o | | | |
| **18.** later/o | | | |
| **19.** medi/o | | | |
| **20.** muscul/o | | | |
| **21.** neur/o | | | |
| **22.** organ/o | | | |

(*Continued*)

| Combining Forms | Meaning | Chapter Term | Meaning |
|---|---|---|---|
| **23.** oste/o | _____ | _____ | _____ |
| **24.** pelv/o | _____ | _____ | _____ |
| **25.** peritone/o | _____ | _____ | _____ |
| **26.** pleur/o | _____ | _____ | _____ |
| **27.** poster/o | _____ | _____ | _____ |
| **28.** proxim/o | _____ | _____ | _____ |
| **29.** pub/o | _____ | _____ | _____ |
| **30.** somat/o | _____ | _____ | _____ |
| **31.** spin/o | _____ | _____ | _____ |
| **32.** super/o | _____ | _____ | _____ |
| **33.** system/o | _____ | _____ | _____ |
| **34.** thorac/o | _____ | _____ | _____ |
| **35.** ventr/o | _____ | _____ | _____ |
| **36.** vertebr/o | _____ | _____ | _____ |
| **37.** viscer/o | _____ | _____ | _____ |

# Worksheet 2B

## Medical Term Analysis

**Directions: Below are terms built from word parts used in this chapter that are not analyzed in the Word Building Table. Many are built from word parts you have learned in previous chapters. Analyze each term presented below and list and define the word parts used to build each term.**

| Medical Term | Word Part Analysis |
|---|---|
| **1.** cytology | |
| **2.** cytoplasm | |
| **3.** cardiac | |
| **4.** adipose | |
| **5.** abdominopelvic | |
| **6.** pericardial | |
| **7.** hypochondriac | |
| **8.** epigastric | |
| **9.** dermatology | |
| **10.** hematology | |
| **11.** otorhinolaryngology | |

(*Continued*)

| Medical Term | Word Part Analysis |
| --- | --- |
| **12.** gastroenterology | |
| **13.** nephrology | |
| **14.** gynecology | |
| **15.** urology | |
| **16.** neurology | |
| **17.** ophthalmology | |
| **18.** pulmonology | |
| **19.** immunology | |
| **20.** cardiology | |

# Worksheet 2C

## Chapter Review

### Body Structure

1. The hierarchical arrangement of the body from cells to whole body is: cell, _____, _____, _____, whole body.
2. All cells have the following: _____, _____, _____.
3. _____ tissue is designed to contract.
4. Adipose is a type of _____ tissue.
5. Nervous tissue is composed of cells called _____.
6. The _____ position is used to describe the positions and relationships of structures.
7. The _____ divides the thoracic cavity from the abdominopelvic cavity.
8. The pleural cavity contains the _____.
9. _____ tissue is composed of close-packed cells to from a covering.
10. _____ is the study of tissues.

### Organs, Systems, and Medical Specialties

**Directions: For each set of organs below, give the system they belong to and the medical specialty associated with that system.**

| Organs | System | Medical Specialty |
|---|---|---|
| 1. skin, hair, nails | _____ | _____ |
| 2. heart, blood vessels | _____ | _____ |
| 3. lymph nodes, spleen | _____ | _____ |
| 4. lungs, trachea | _____ | _____ |
| 5. stomach, esophagus | _____ | _____ |
| 6. kidneys, bladder | _____ | _____ |
| 7. ovaries, uterus | _____ | _____ |
| 8. testes, penis | _____ | _____ |
| 9. thyroid, pituitary | _____ | _____ |
| 10. brain, nerves | _____ | _____ |

(*Continued*)

## Matching

| | | | |
|---|---|---|---|
| _____ | **1.** sagittal plane | **a.** | divides body into upper and lower portions |
| _____ | **2.** gluteal region | **b.** | top or summit of an organ |
| _____ | **3.** viscera | **c.** | buttocks |
| _____ | **4.** peritoneum | **d.** | central region of thoracic cavity |
| _____ | **5.** longitudinal section | **e.** | arm |
| _____ | **6.** thoracic region | **f.** | a ventral cavity |
| _____ | **7.** spinal cavity | **g.** | neck |
| _____ | **8.** apex | **h.** | also the medial plane |
| _____ | **9.** transverse plane | **i.** | opposite direction from dorsal |
| _____ | **10.** pubic region | **j.** | membrane sac in abdominopelvic cavity |
| _____ | **11.** inferior | **k.** | lying face up |
| _____ | **12.** cervical region | **l.** | chest |
| _____ | **13.** brachial region | **m.** | slice along long axis of structure |
| _____ | **14.** anterior | **n.** | toward the belly side of the body |
| _____ | **15.** frontal plane | **o.** | a dorsal cavity |
| _____ | **16.** supine | **p.** | torso |
| _____ | **17.** deep | **q.** | slice perpendicular to long axis of structure |
| _____ | **18.** thoracic cavity | **r.** | same direction as caudal |
| _____ | **19.** crural region | **s.** | head |
| _____ | **20.** mediastinum | **t.** | genital region |
| _____ | **21.** ventral | **u.** | further away from surface of body |
| _____ | **22.** cross-section | **v.** | divides body into front and back portions |
| _____ | **23.** trunk | **w.** | toward the side |
| _____ | **24.** lateral | **x.** | internal organs |
| _____ | **25.** cephalic region | **y.** | leg |

Name _____ Date _____ Score _____

# Quiz 2A

## New Word Parts Quiz

**Directions: Define the combining form in the spaces provided.**

1. adip/o _____
2. brachi/o _____
3. caud/o _____
4. cephal/o _____
5. chondr/o _____
6. crani/o _____
7. cyt/o _____
8. dist/o _____
9. dors/o _____
10. glute/o _____
11. hist/o _____
12. infer/o _____
13. later/o _____
14. medi/o _____
15. neur/o _____
16. oste/o _____
17. pleur/o _____
18. poster/o _____
19. proxim/o _____
20. pub/o _____
21. somat/o _____
22. thorac/o _____
23. ventr/o _____
24. viscer/o _____
25. anter/o _____

Name _____ Date _____ Score _____

# Quiz 2B

## Spelling Quiz

Directions: Write each term as your instructor pronounces it.

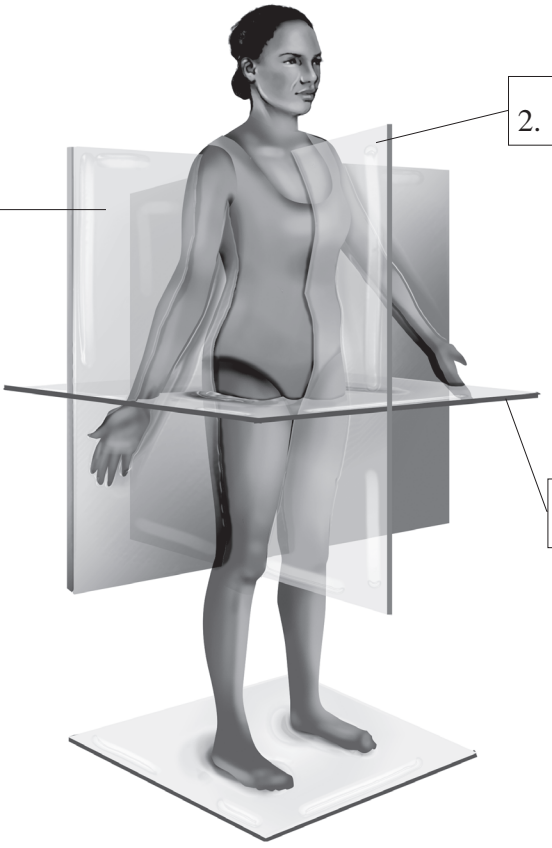
1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____
11. _____
12. _____
13. _____
14. _____
15. _____
16. _____
17. _____
18. _____
19. _____
20. _____

Name _____ Date _____ Score _____

# Quiz 2C

## Labeling Diagram

**Directions: Label the planes of the body.**



1. _____

2. _____

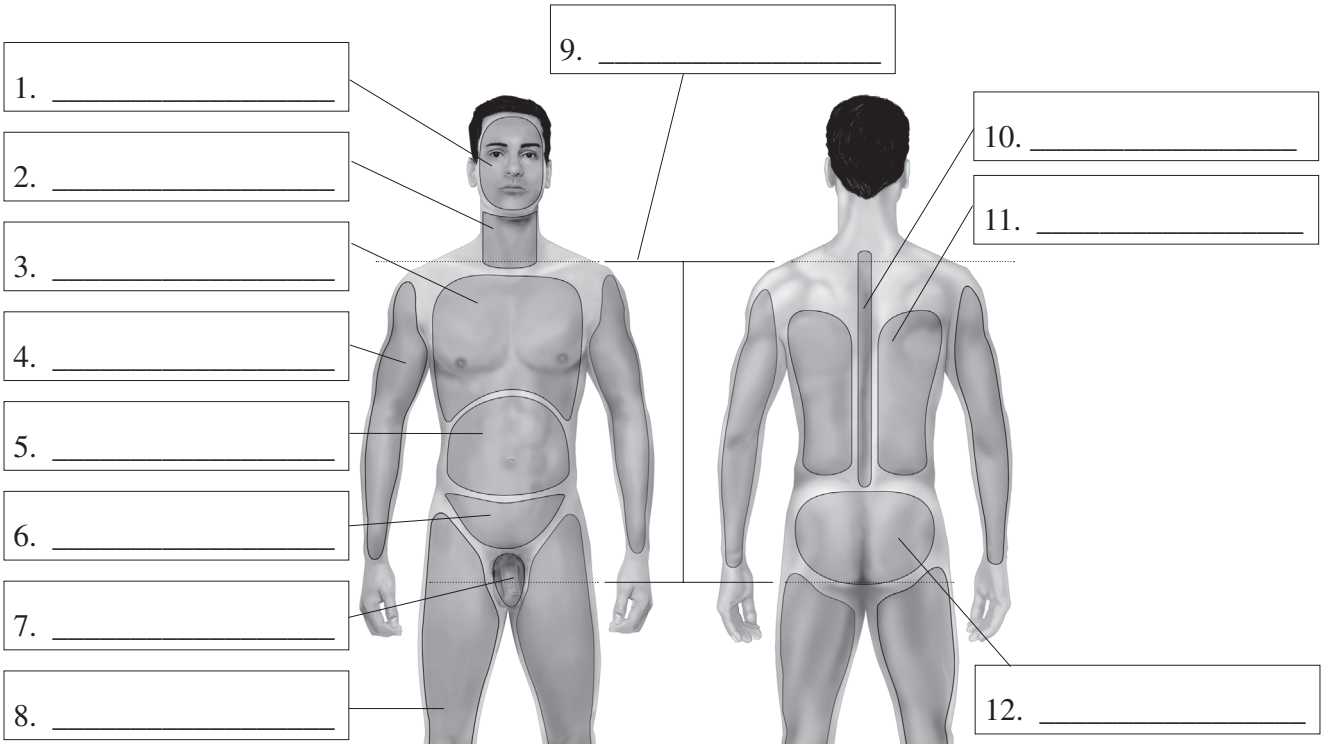
3. _____

Name _____ Date _____ Score _____

# Quiz 2D

## Labeling Diagram

**Directions: Label the regions of the body.**



Name _____ Date _____ Score _____

# Quiz 2E

## Word Building Quiz

**Directions: Build a single medical term for each phrase below.**

1. pertaining to the abdomen _____
2. pertaining to the front _____
3. pertaining to the arm _____
4. pertaining to the head _____
5. pertaining to the neck _____
6. pertaining to the skull _____
7. pertaining to the leg _____
8. pertaining to the back of the body _____
9. pertaining to the epithelium _____
10. pertaining to the buttocks _____
11. pertaining to below _____
12. pertaining to the side _____
13. pertaining to the middle _____
14. pertaining to muscles _____
15. pertaining to nerves _____
16. pertaining to organs _____
17. pertaining to the pelvis _____
18. pertaining to the genital region _____
19. pertaining to body _____
20. pertaining to the spine _____
21. pertaining to above _____
22. pertaining to systems _____
23. pertaining to the chest _____
24. pertaining to the belly side _____
25. pertaining to internal organs _____

Name _____ Date _____ Score _____

# Quiz 2F

## Abbreviations Quiz

**Directions: Write the medical term for which each abbreviation stands.**

**1.** AP _____

**2.** CV _____

**3.** ENT _____

**4.** GI _____

**5.** GYN _____

**6.** lat _____

**7.** LE _____

**8.** LLQ _____

**9.** LUQ _____

**10.** MS _____

**11.** OB _____

**12.** PA _____

**13.** RLQ _____

**14.** RUQ _____

**15.** UE _____

Name _____ Date _____ Score _____

# Quiz 2G

## Chapter Review

### PART I: Multiple Choice

**Directions: Circle the correct answer.**

**1.** Posterior is similar in meaning to
- **a.** dorsal.
- **b.** anterior.
- **c.** ventral.
- **d.** sagittal.

**2.** The body is divided into right and left sides by which of the following planes?
- **a.** coronal
- **b.** sagittal
- **c.** transverse
- **d.** frontal

**3.** The crural region is the
- **a.** leg.
- **b.** arm.
- **c.** buttocks.
- **d.** trunk.

**4.** The basic structural and functional unit of all living things is a(n)
- **a.** organ.
- **b.** nerve.
- **c.** tissue.
- **d.** cell.

**5.** Which is NOT an example of connective tissue?
- **a.** stomach lining
- **b.** bone
- **c.** cartilage
- **d.** adipose

**6.** Which is a visceral organ located in the thoracic cavity?
- **a.** stomach
- **b.** spleen
- **c.** pancreas
- **d.** heart

**7.** A structure located farthest from the surface of the body is
- **a.** deep.
- **b.** distal.
- **c.** proximal.
- **d.** superficial.

**8.** Which anatomical region of the abdominopelvic cavity is in the middle of the upper row?
- **a.** hypochondriac
- **b.** hypogastric
- **c.** inguinal
- **d.** epigastric

**9.** Which of the following does NOT describe the anatomical position?
- **a.** lying face up
- **b.** arms to the side
- **c.** palms forward
- **d.** toes pointing forward

**10.** Which of the following is the correct hierarchical organization of the body?
- **a.** tissues, cells, organs, systems, body
- **b.** cells, organs, tissues, systems, body
- **c.** cells, tissues, organs, systems, body
- **d.** cells, tissues, systems, organs, body

(*Continued*)

## PART II: Matching

**Directions: Match the organ with its system.**

| | | |
|---|---|---|
| _____ | **1.** stomach | **a.** female reproductive |
| _____ | **2.** skin | **b.** respiratory |
| _____ | **3.** uterus | **c.** endocrine |
| _____ | **4.** lungs | **d.** cardiovascular |
| _____ | **5.** bones | **e.** digestive |
| _____ | **6.** thyroid gland | **f.** male reproductive |
| _____ | **7.** brain | **g.** urinary |
| _____ | **8.** testes | **h.** musculoskeletal |
| _____ | **9.** heart | **i.** integumentary |
| _____ | **10.** bladder | **j.** nervous |

## PART III: Abbreviations

**Directions: Write the full meaning of the following abbreviations.**

**1.** lat _____

**2.** GYN _____

**3.** RUQ _____

**4.** LE _____

**5.** AP _____

# Chapter 2 Answer Keys

## Worksheet 2A Key

1. abdomen
2. fat
3. front
4. arm
5. tail
6. head
7. neck
8. cartilage
9. skull
10. leg
11. cell
12. away from
13. back of body
14. epithelium
15. buttock
16. tissue
17. below
18. side
19. middle
20. muscle
21. nerve
22. organ
23. bone
24. pelvis
25. peritoneum
26. pleura
27. back
28. near to
29. genital region
30. body
31. spine
32. above
33. system
34. chest
35. belly
36. vertebra
37. internal organ

## Worksheet 2B Key

1. cyt/o = cell; -logy = study of
2. cyt/o = cell; -plasm = formation
3. cardi/o = heart; -ac = pertaining to
4. adip/o = fat; -ose = pertaining to
5. abdomin/o = abdominal; pelv/o = pelvis; -ic = pertaining to
6. peri- = around; cardi/o = heart; -al = pertaining to
7. hypo- = below; chondr/o = cartilage; -iac = pertaining to
8. epi- = above; gastr/o = stomach; -ic = pertaining to
9. dermat/o = skin; -logy = study of
10. hemat/o = blood; -logy = study of
11. ot/o = ear; rhin/o = nose; laryng/o = voice box; -logy = study of
12. gastr/o = stomach; enter/o = small intestine; -logy = study of
13. nephr/o = kidney; -logy = study of
14. gynec/o = female; -logy = study of
15. ur/o = urine; -logy = study of
16. neur/o = nerve; -logy = study of
17. ophthalm/o = eye; -logy = study of
18. pulmon/o = lung; -logy = study of
19. immun/o = immunity; -logy = study of
20. cardi/o = heart; -logy = study of

## Worksheet 2C—Answer Key

**Body Structure**

1. tissue, organ, system
2. cell membrane, cytoplasm, nucleus
3. muscle
4. connective
5. neurons
6. anatomical
7. diaphragm
8. lungs
9. epithelial
10. histology

**Organs, Systems, and Medical Specialties**

1. integumentary; dermatology
2. cardiovascular; cardiology
3. lymphatic; immunology
4. respiratory; otorhinolaryngology, pulmonology, or thoracic surgery
5. digestive or gastrointestinal; gastroenterology or proctology
6. urinary; nephrology or urology
7. female reproductive; gynecology or obstetrics
8. male reproductive; urology
9. endocrine; endocrinology
10. nervous; neurology or neurosurgery

**Matching**

1. h
2. c
3. x
4. j
5. m
6. l
7. o
8. b
9. a
10. t
11. r
12. g
13. e
14. i
15. v
16. k
17. u
18. f
19. y
20. d
21. n
22. q
23. p
24. w
25. s

## Quiz 2A Answer Key

1. fat
2. arm
3. tail
4. head
5. cartilage
6. skull
7. cell
8. away from
9. back of body
10. buttock
11. tissue
12. below
13. side
14. middle
15. nerve
16. bone
17. pleura
18. back
19. near to
20. genital region
21. body
22. chest
23. belly
24. internal organ
25. front

## Quiz 2B Answer Key

1. cytoplasm
2. epithelium
3. anatomical
4. coronal
5. sagittal
6. brachial
7. crural
8. gluteal
9. dorsum
10. abdominopelvic
11. diaphragm
12. mediastinum

13. peritoneum
14. pleura
15. pericardial
16. viscera
17. otorhinolaryngology
18. ophthalmology
19. epigastric
20. hypochondriac

## Quiz 2C Answer Key

1. frontal or coronal plane
2. sagittal or median plane
3. transverse or horizontal plane

## Quiz 2D Answer Key

1. cephalic
2. cervical
3. thoracic
4. brachial
5. abdominal
6. pelvic
7. pubic
8. crural
9. trunk
10. vertebral
11. dorsum
12. gluteal

## Quiz 2E Answer Key

1. abdominal
2. anterior
3. brachial
4. cephalic
5. cervical
6. cranial
7. crural
8. dorsal
9. epithelial
10. gluteal
11. inferior
12. lateral
13. medial
14. muscular
15. neural
16. organic
17. pelvic
18. pubic
19. somatic
20. spinal
21. superior
22. systemic
23. thoracic
24. ventral
25. visceral

## Quiz 2F Answer Key

1. anteroposterior
2. cardiovascular
3. ear, nose, and throat
4. gastrointestinal
5. gynecology
6. lateral
7. lower extremity
8. left lower quadrant
9. left upper quadrant
10. musculoskeletal
11. obstetrics
12. posteroanterior
13. right lower quadrant
14. right upper quadrant
15. upper extremity

## Quiz 2G Answer Key

**Multiple Choice**

1. A
2. B
3. A
4. D
5. A
6. D
7. A
8. D
9. A
10. C

**Matching**

1. e
2. i
3. a
4. b
5. h
6. c
7. j
8. f
9. d
10. g

**Abbreviations**

1. lateral
2. gynecology
3. right upper quadrant
4. lower extermity
5. anteroposterior