

Student Workbook for

# FUNCTIONAL ANATOMY

Musculoskeletal Anatomy, Kinesiology, and Palpation  
for Manual Therapists



LWW Massage Therapy & Bodywork Educational Series

Christy Cael



Wolters Kluwer  
Health

Lippincott  
Williams & Wilkins

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for Manual Therapists

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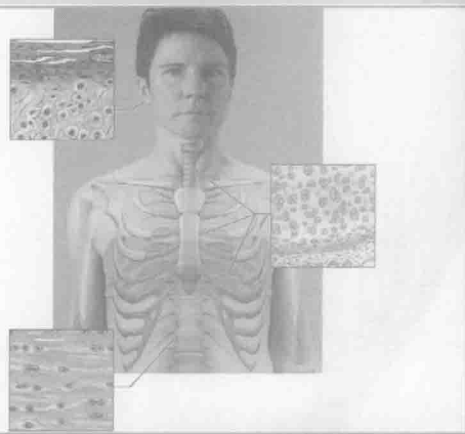
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# Introduction to the Human Body



Anatomists and clinicians use a common language and universally accepted points of reference. The activities in this chapter are designed to help you become familiar with these tools.

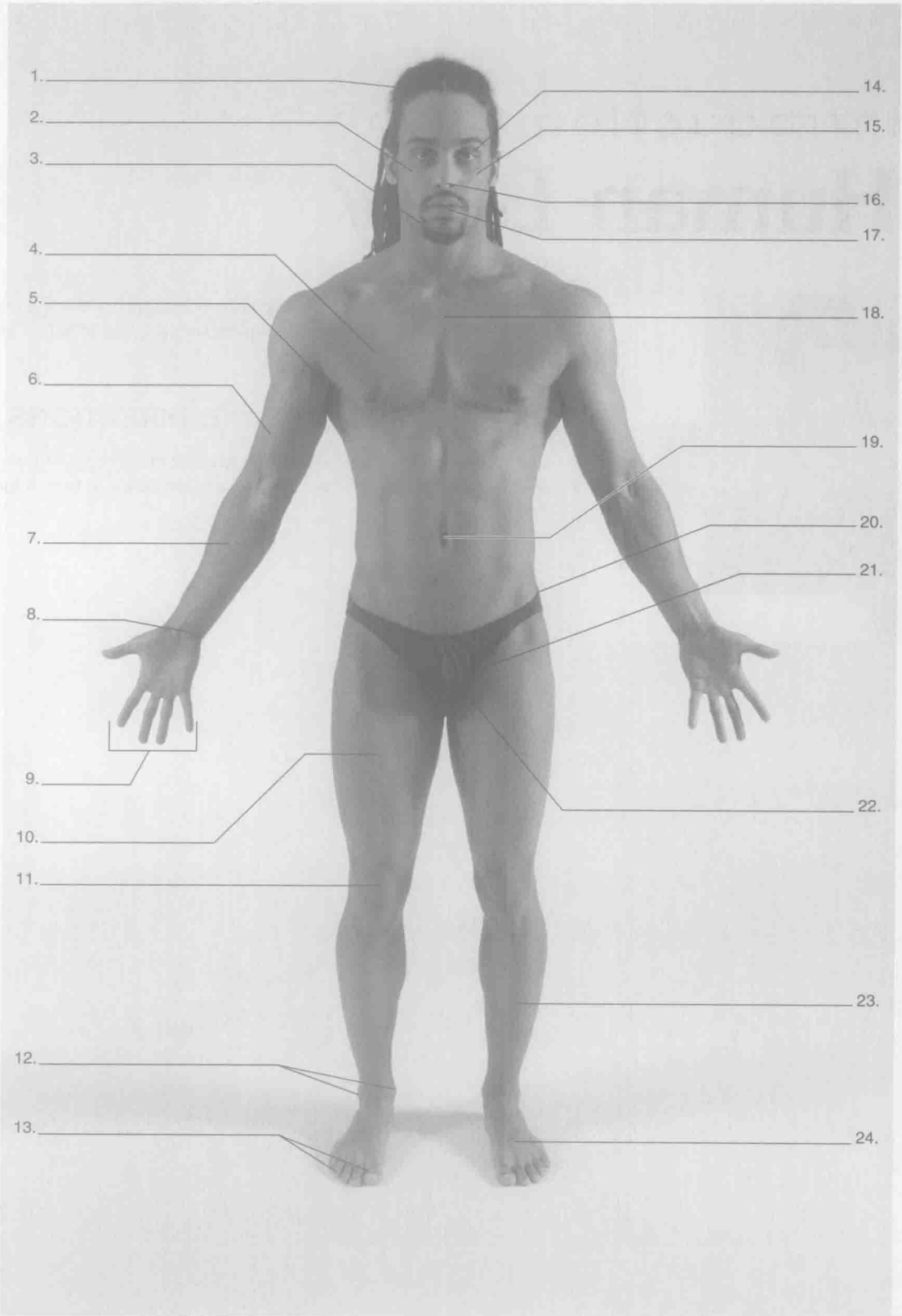
## IDENTIFY REGIONS AND DIRECTIONS

The following activities will help you more effectively communicate about the body, how it is organized, where structures are located, and how it moves.

**INSTRUCTIONS.** On the figures below, label the body region to which each line points.

**List of Regional Terms**

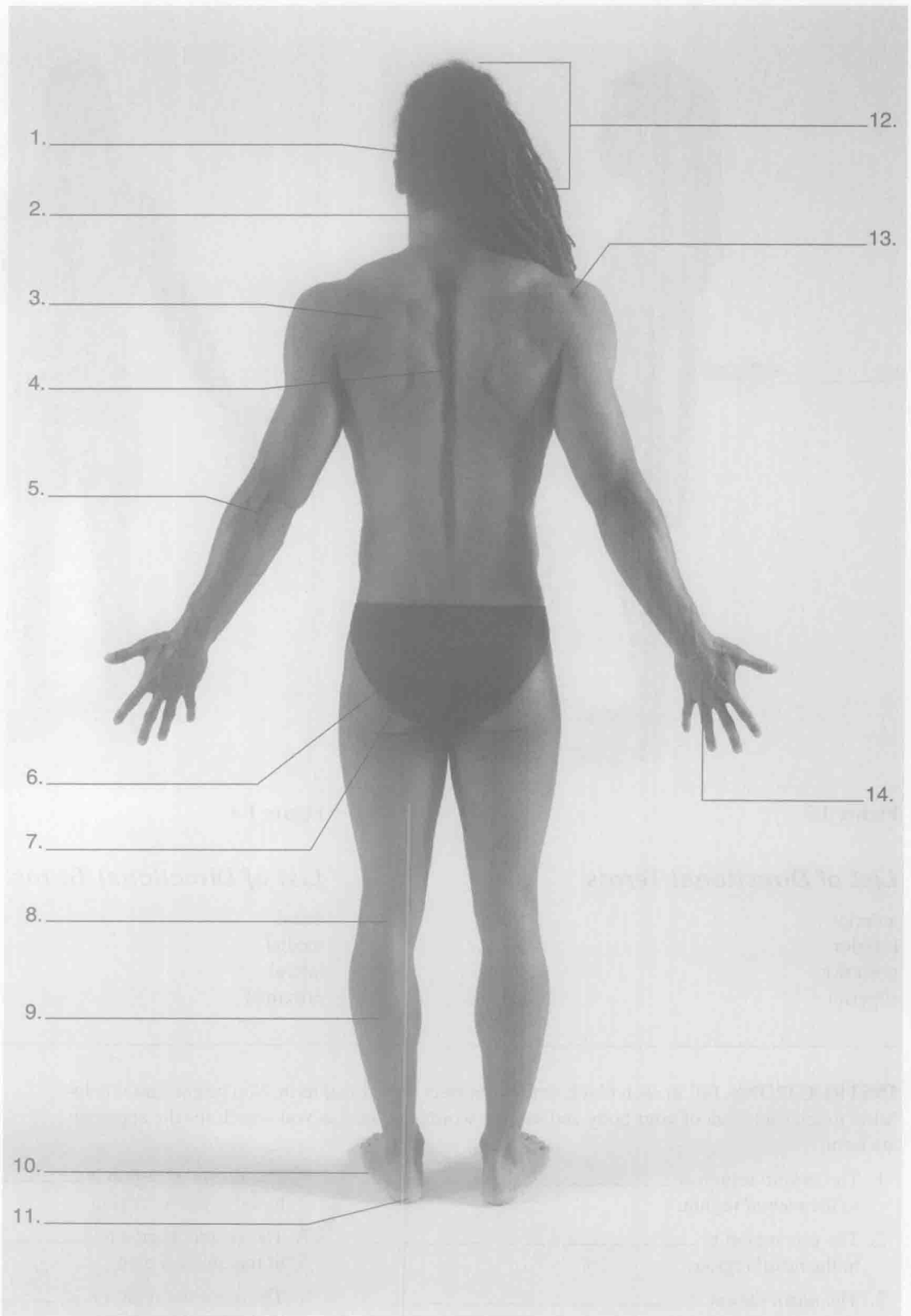
- antebrachial
- axillary
- brachial
- buccal
- carpal
- coxal
- cranial
- digital (use twice)
- dorsal
- facial
- femoral
- inguinal
- mental
- nasal
- oral
- orbital
- patellar
- pectoral
- pubic
- sternal
- tarsal
- tibial
- umbilical



**Figure 1.1**

## List of Regional Terms

acromial  
 calcaneal  
 cephalic  
 cervical  
 dorsal  
 gluteal  
 occipital  
 olecranal  
 plantar  
 popliteal  
 sacral  
 scapular  
 sural  
 vertebral



**Figure 1.2**



**INSTRUCTIONS.** Identify each relative direction in the pictures below by writing the appropriate term beside the arrow.

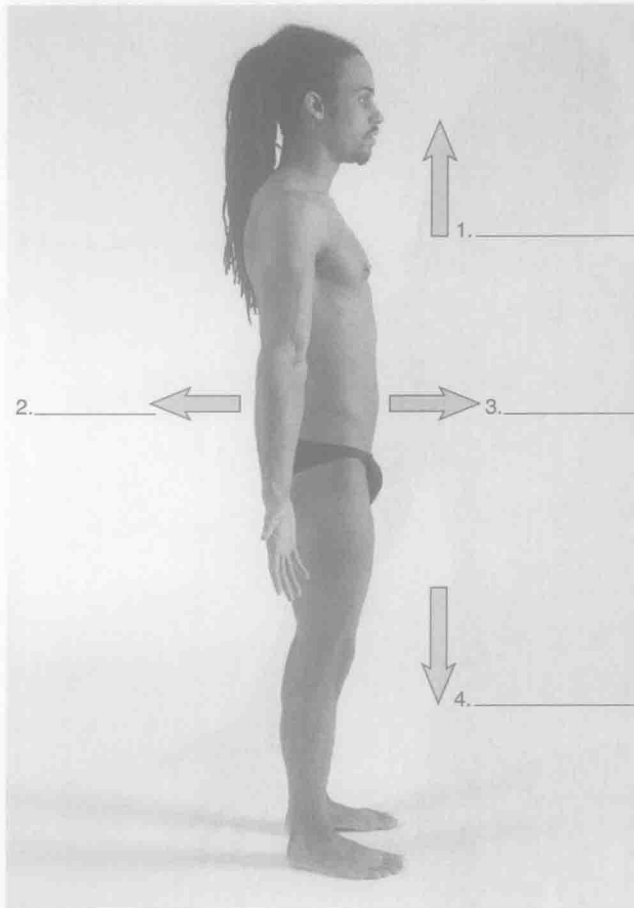


Figure 1.3

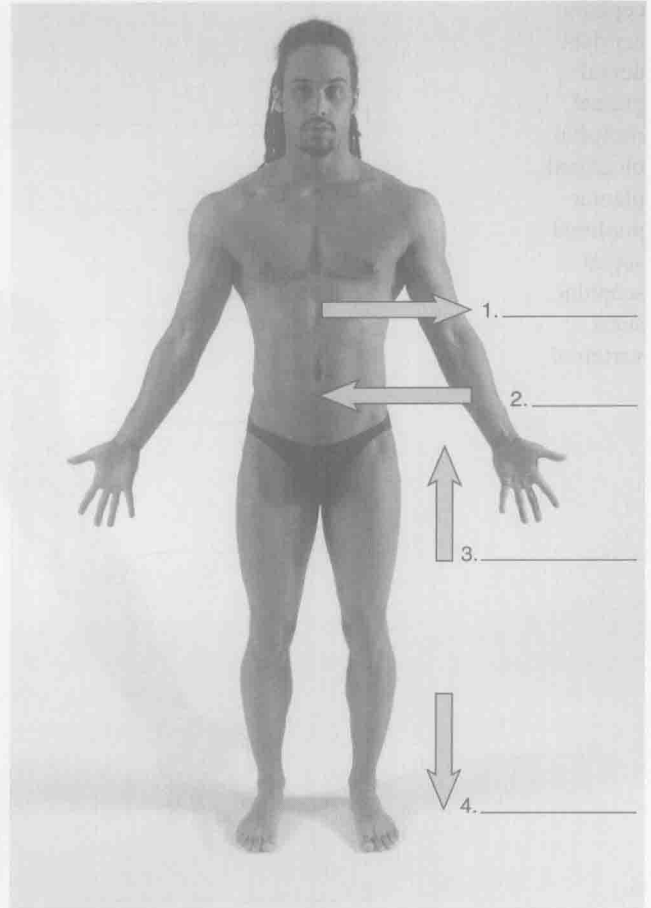


Figure 1.4

**List of Directional Terms**

anterior  
 inferior  
 posterior  
 superior

**List of Directional Terms**

distal  
 medial  
 lateral  
 proximal

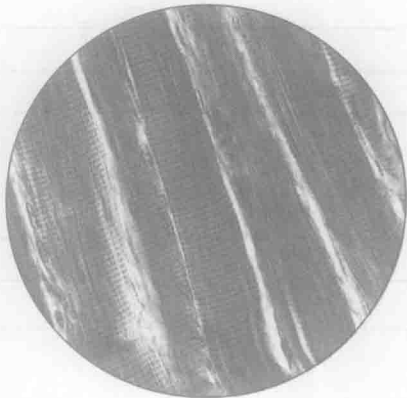
**INSTRUCTIONS.** Fill in each blank with the correct directional term. You might find it helpful to touch each area of your body and say the words out loud as you search for the appropriate term.

1. The *orbital* region is \_\_\_\_\_ to the *mental* region.
2. The *otic* region is \_\_\_\_\_ to the *nasal* region.
3. The *nasal* region is \_\_\_\_\_ to the *frontal* region.
4. The *manual* region is \_\_\_\_\_ to the *cubital* region.
5. The *abdominal* region is \_\_\_\_\_ to the *vertebral* region.
6. The *occipital* region is \_\_\_\_\_ to the *popliteal* region.
7. The *cranial* region is \_\_\_\_\_ to the *tarsal* region.
8. The *acromial* region is \_\_\_\_\_ to the *brachial* region.
9. The *sternal* region is \_\_\_\_\_ to the *pectoral* region.
10. The *sacral* region is \_\_\_\_\_ to the *pubic* region.

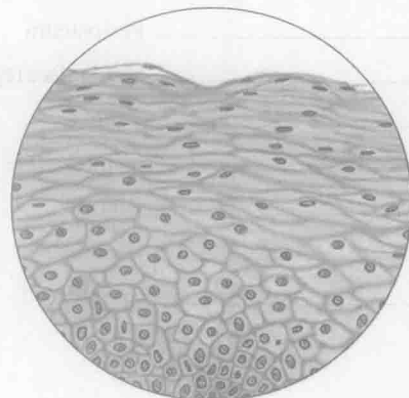
## IDENTIFY PLANES AND MOVEMENTS

**INSTRUCTIONS.** Fill in each blank with the correct term.

1. At the start of a card game, you cut the deck of cards by taking half the deck from the top. You have cut the deck in the \_\_\_\_\_ plane.
2. You are making a banana split. You peel the banana, then cut it lengthwise from top to bottom, separating it into a right and left side. You have cut the banana in the \_\_\_\_\_ plane.
3. You are building a campfire. You take a dead tree branch and snap it in two. You have snapped the branch along the \_\_\_\_\_ plane.
4. A child making a snow angel \_\_\_\_\_ and \_\_\_\_\_ the arms and legs.
5. In kicking a ball, a player \_\_\_\_\_ and \_\_\_\_\_ the knee.
6. In scanning the horizon, a sailor \_\_\_\_\_ the head.



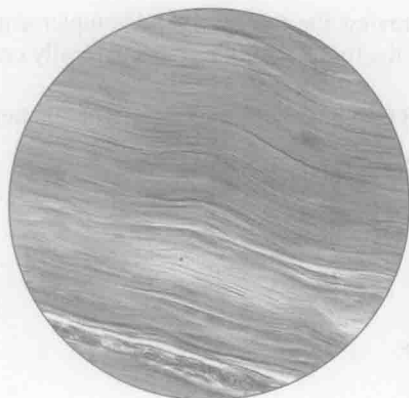
1. \_\_\_\_\_



2. \_\_\_\_\_



3. \_\_\_\_\_



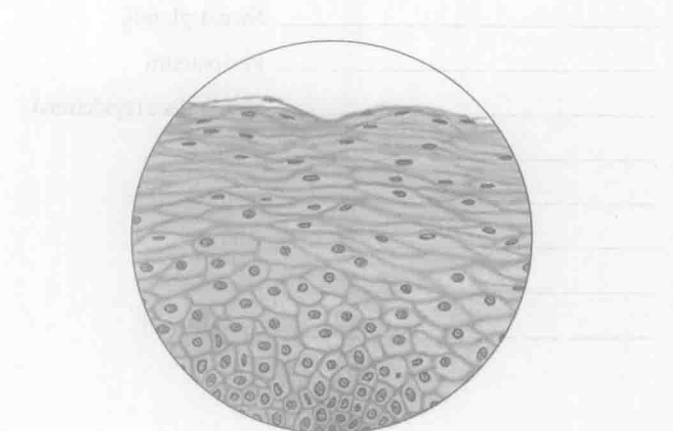
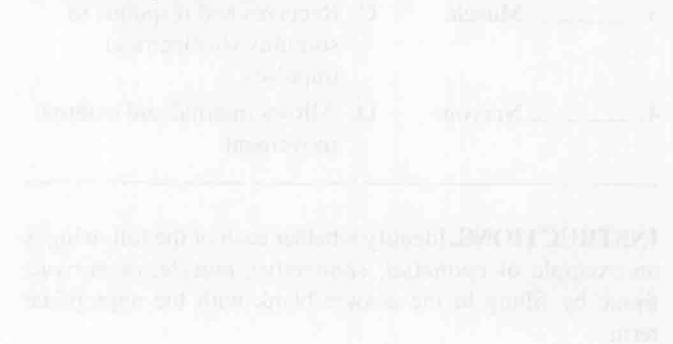
4. \_\_\_\_\_

**Figure 1.5**

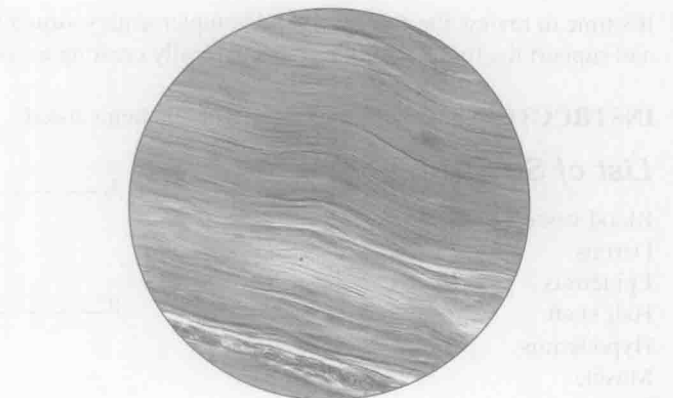
## IDENTIFY TISSUES AND THEIR FUNCTIONS

Now that you've practiced the language of anatomy, it's time to dive into specific structures of the human body! Let's begin with tissues.

**INSTRUCTIONS.** Each image depicts one of the four types of tissue found in the human body. Beneath each, identify which type of tissue is depicted: *epithelial*, *connective*, *muscle*, or *nervous*.



5. \_\_\_\_\_



6. \_\_\_\_\_

**INSTRUCTIONS.** Match each of the four types of tissue with the correct function.

- |                     |  |
|---------------------|--|
| 1. _____ Epithelial | A. Supports other tissues, transports nutrients and wastes, protects against outside invaders, and stores energy |
| 2. _____ Connective | B. Protects, absorbs, filters, and secretes substances in the body   |
| 3. _____ Muscle     | C. Receives and responds to stimulus via electrical impulses   |
| 4. _____ Nervous    | D. Allows internal and external movement   |

**INSTRUCTIONS.** Identify whether each of the following is an example of *epithelial*, *connective*, *muscle*, or *nervous* tissue by filling in the answer blank with the appropriate term.

- \_\_\_\_\_ Fat
- \_\_\_\_\_ Sweat glands
- \_\_\_\_\_ Periosteum
- \_\_\_\_\_ Skin surface (epidermis)
- \_\_\_\_\_ Tongue
- \_\_\_\_\_ Joint capsule
- \_\_\_\_\_ Blood
- \_\_\_\_\_ Cartilage
- \_\_\_\_\_ Spinal cord

## DESCRIBE STRUCTURES INVOLVED IN MOVEMENT

Now let's explore the structure, function, and location of structures involved in movement.

**INSTRUCTIONS.** On the lines provided for each structure, list two functions and two properties that help you identify or differentiate the structure from other structures during palpation.

*Bone* \_\_\_\_\_

*Ligament* \_\_\_\_\_

*Muscle* \_\_\_\_\_

*Tendon* \_\_\_\_\_

*Fascia* \_\_\_\_\_

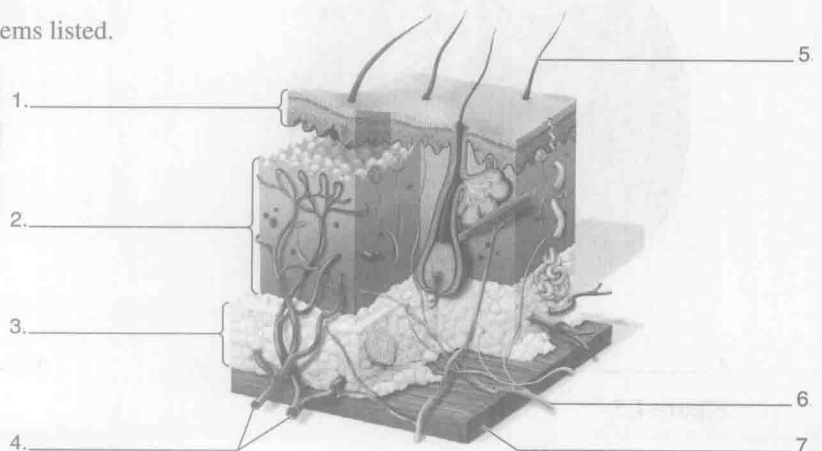
## IDENTIFY SPECIAL STRUCTURES

It's time to review the role of several complementary structures that protect, nourish, regulate, and support the function of those mechanically creating movement.

**INSTRUCTIONS.** Label each image with the items listed.

### List of Structures

- Blood vessels
- Dermis
- Epidermis
- Hair shaft
- Hypodermis
- Muscle
- Nerve



**Figure 1.6**

## List of Structures

Abdominal aorta  
 Anterior tibial artery  
 Anterior tibial vein  
 Axillary artery  
 Axillary vein  
 Brachial artery  
 Brachial vein  
 Brachiocephalic artery  
 Cephalic vein  
 Common carotid artery  
 Common iliac artery  
 Common iliac vein  
 External jugular vein  
 Femoral artery  
 Femoral vein  
 Great saphenous vein  
 Heart  
 Inferior vena cava  
 Popliteal artery  
 Popliteal vein  
 Posterior tibial artery  
 Radial artery  
 Subclavian artery  
 Subclavian vein  
 Superior vena cava  
 Ulnar artery

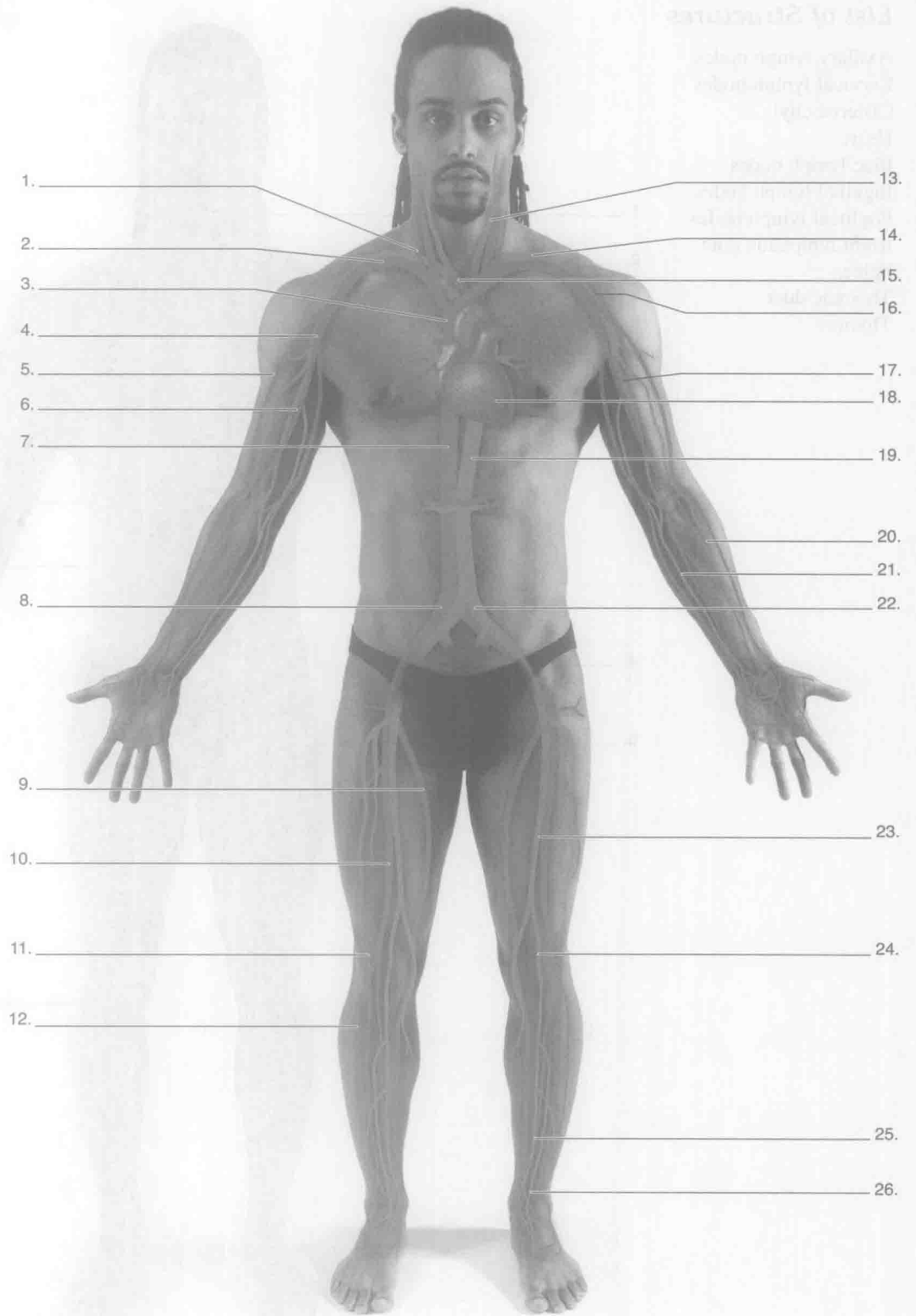
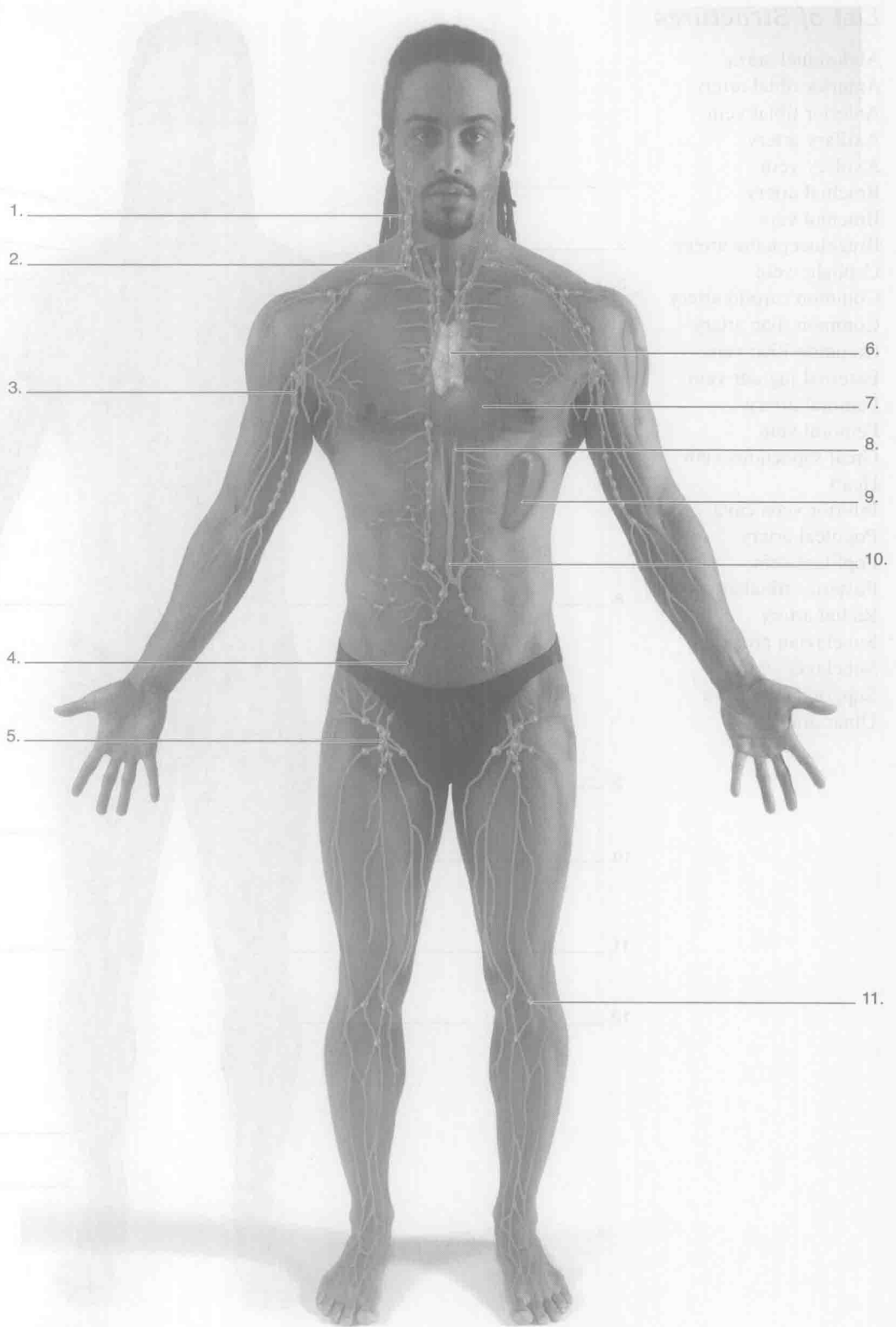


Figure 1.7

**List of Structures**

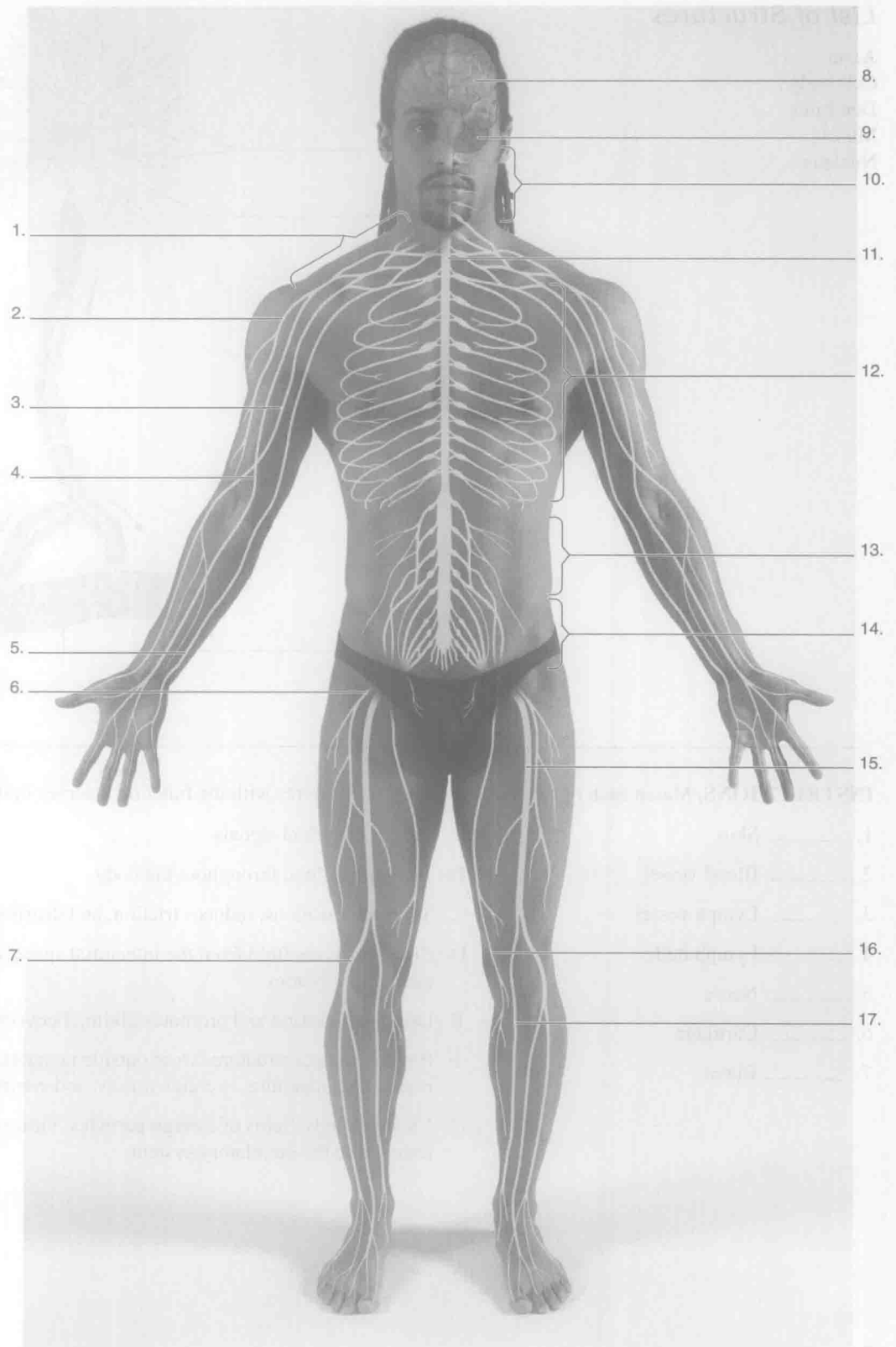
- Axillary lymph nodes
- Cervical lymph nodes
- Cisterna chyli
- Heart
- Iliac lymph nodes
- Inguinal lymph nodes
- Popliteal lymph nodes
- Right lymphatic duct
- Spleen
- Thoracic duct
- Thymus



**Figure 1.8**

### List of Structures

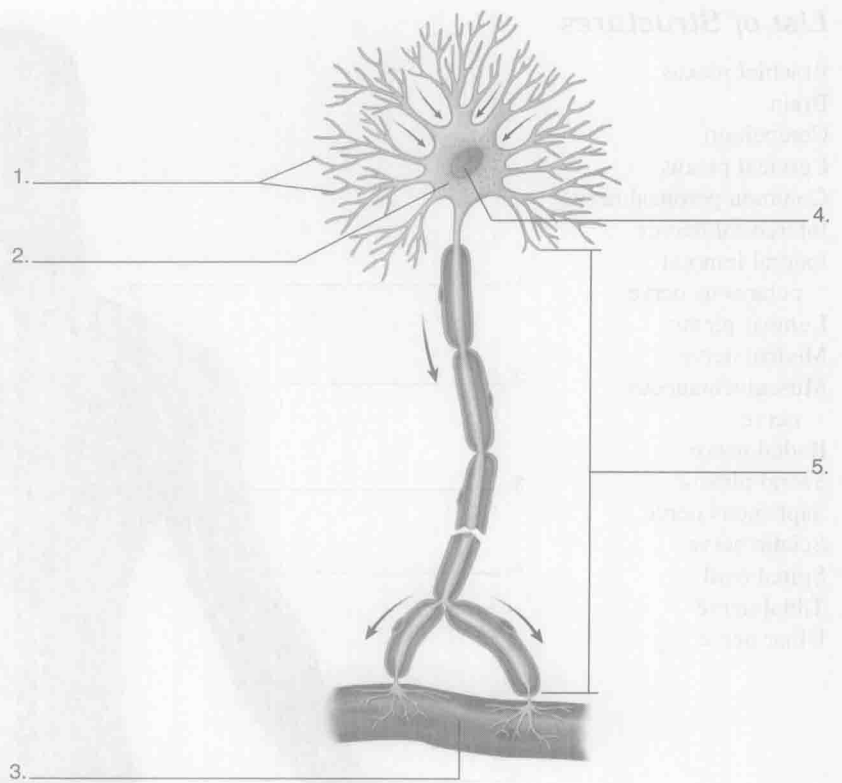
Brachial plexus  
 Brain  
 Cerebellum  
 Cervical plexus  
 Common peroneal nerve  
 Intercostal nerves  
 Lateral femoral  
   cutaneous nerve  
 Lumbar plexus  
 Median nerve  
 Musculocutaneous  
   nerve  
 Radial nerve  
 Sacral plexus  
 Saphenous nerve  
 Sciatic nerve  
 Spinal cord  
 Tibial nerve  
 Ulnar nerve



**Figure 1.9**

**List of Structures**

- Axon
- Cell body
- Dendrites
- Muscle
- Nucleus



**Figure 1.10**

**INSTRUCTIONS.** Match each of the following special structures with the function it serves in the human body.

- |                       |   |
|-----------------------|---|
| 1. _____ Skin         | A. Carries electrical signals   |
| 2. _____ Blood vessel | B. Transports blood throughout the body   |
| 3. _____ Lymph vessel | C. Supports, cushions, reduces friction, and distributes force at joints  |
| 4. _____ Lymph node   | D. Collects excess fluid from the interstitial space and returns it to the circulatory system   |
| 5. _____ Nerve        | E. Decreases friction and promotes gliding between structures of movement   |
| 6. _____ Cartilage    | F. Protects deeper structures from outside invaders and radiation, helps regulate temperature, excretes wastes, and contributes to sensation of touch |
| 7. _____ Bursa        | G. Cleanses body fluids of foreign particles, viruses, and bacteria before it is returned to the circulatory system                                   |

## WORD CHALLENGE

This final exercise checks your recall of terms and concepts introduced throughout the chapter.

**INSTRUCTIONS.** Unscramble each word and match it to its description.

- |                     |  |
|---------------------|--|
| 1. ipifusreal _____ | A. Protein in branched, wavy fibers that confer resiliency to tissue |
| 2. acadul _____     | B. Fibrous structure that connects bones                             |
| 3. milui _____      | C. Small, flat sac containing synovial fluid                         |
| 4. eastnail _____   | D. Term for the center of the body                                   |
| 5. tomosh _____     | E. Type of muscle present in the walls of hollow organs              |
| 6. iltengam _____   | F. Closer to the surface of the body                                 |
| 7. meade _____      | G. A pivot point   |
| 8. usrab _____      | H. Synonym for inferior  |
| 9. sixa _____       | I. Abnormal accumulation of interstitial fluid                       |
| 10. nilidem _____   | J. Example of a flat bone  |



# Osteology and Arthrology

The activities in this chapter will help you develop your knowledge of bones and joints. You will relate the structure and shape of bones to the various roles they play in the human body.

