Anatomi

Bambang Soegeng H. drg.

Anatomi

Pendahuluan :

- Plant anatomy
- Zoological anatomy
- Human anatomy

Cabang-cabang Ilmu Anatomi

- Comparative anatomy
- Topografi
- Antropologi
- Embryology
- Experimental anatomy →teratology
- Clinical anatomy

Cara Mempelajari Anatomi

a. Gross Anatomy, perlu alat :
    * Pinset anatomis
    * Scalpel
    * Gunting
    * Loupe
b. Microscopis Anatomy → alat :
    * Light Microscope → histology
    * Electron Microscope → histology
    * Slide Preparat

Posisi Anatomy

Adalah : posisi dimana tubuh berdiri tegak pandangan ke depan dan ***telapak tangan menghadap ke depan***

- Linea mediana
- Ventral (anterior) lawannya dorsal (posterior)
- Medial lawannya lateral
- Superior (cranial) lawannya inferior (caudal)
- Superficial lawannya profundus
- Proximal lawannya distal
- Truncus dan extremitas

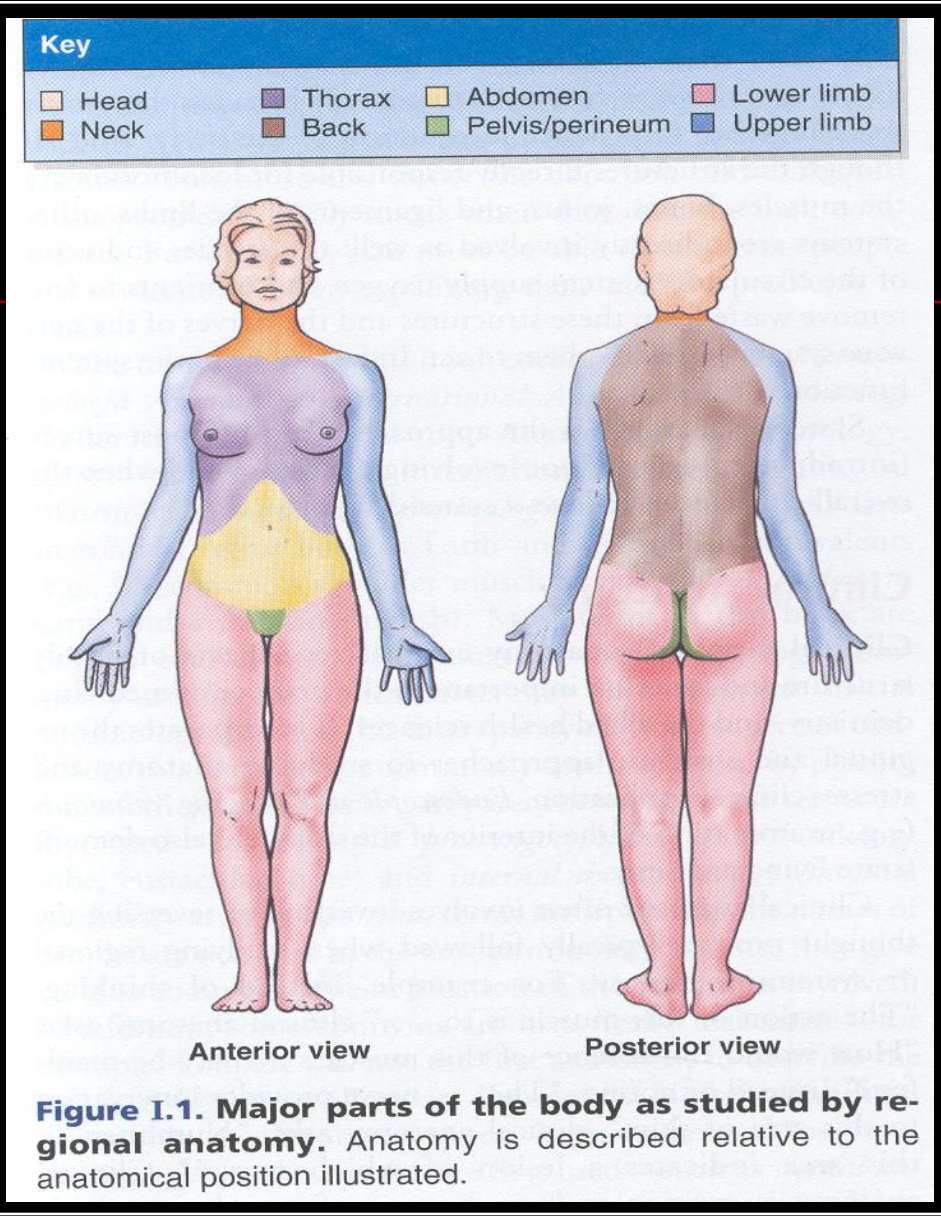


Figure I.1. Major parts of the body as studied by regional anatomy. Anatomy is described relative to the anatomical position illustrated.

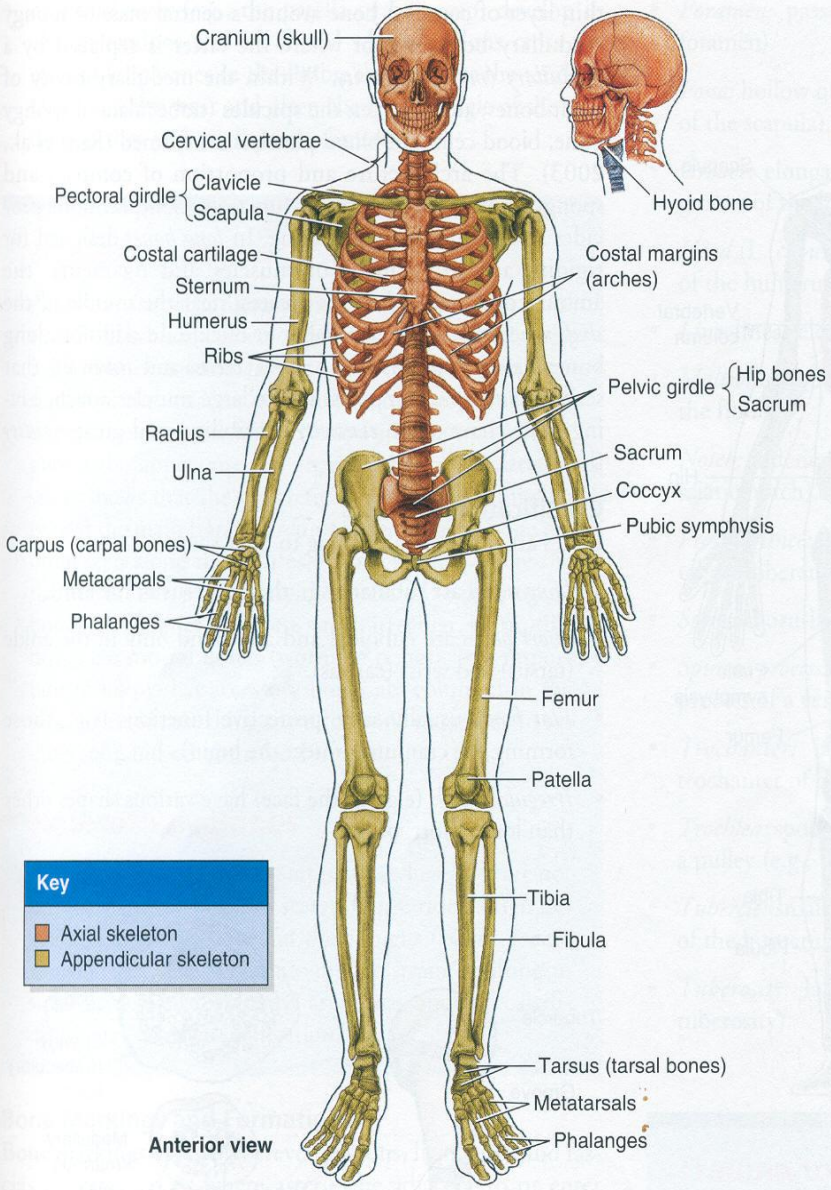


Figure I.11. Skeletal system. The skeleton of the head, neck, and trunk forms the axial skeleton; the skeleton of the limbs forms the appendicular skeleton.

Untuk extremitas superior ***medial*** sama dengan ***ulnar***

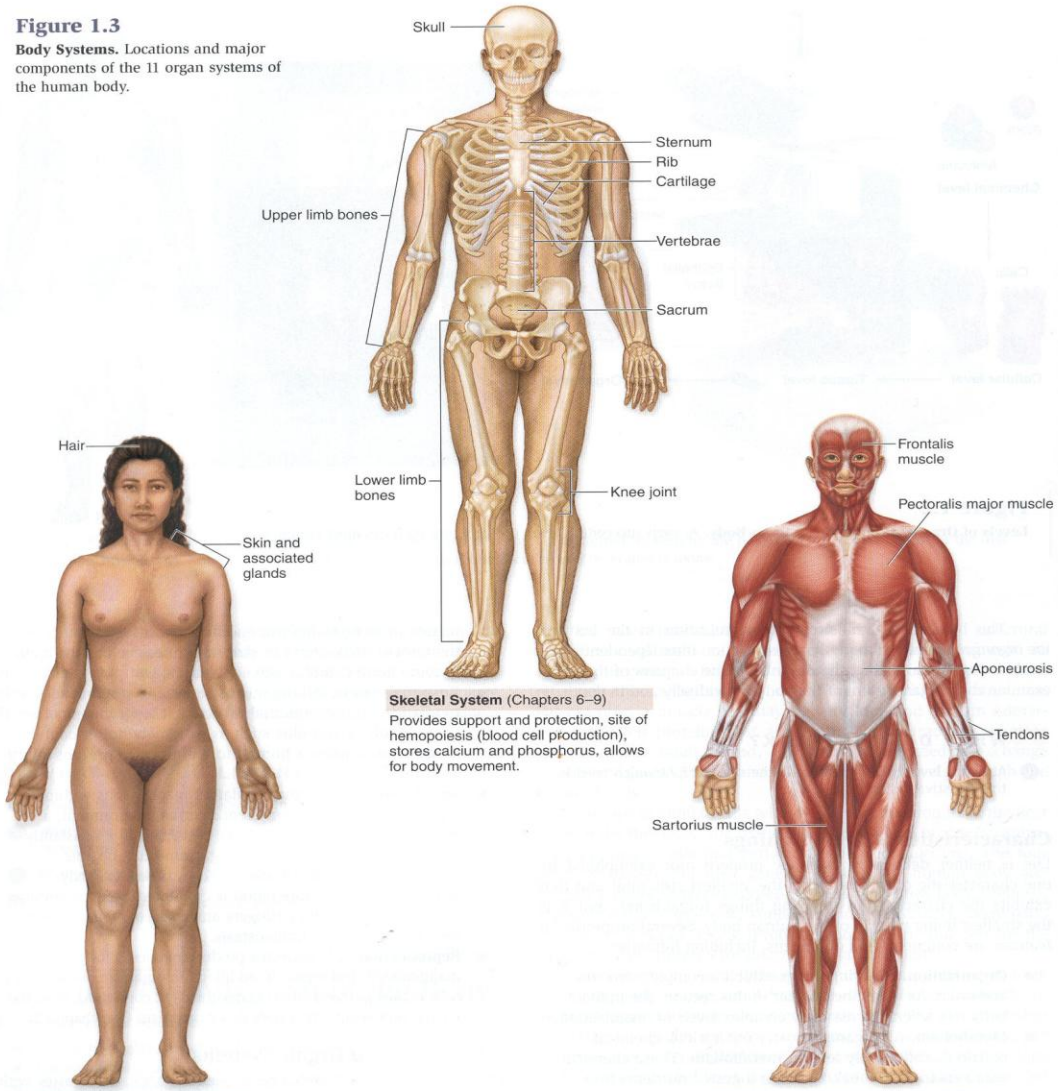
Lateral sama dengan ***radial***

Untuk extremitas inferior ***medial*** sama dengan ***tibial***

Lateral sama dengan ***fibular***

Figure 1.3

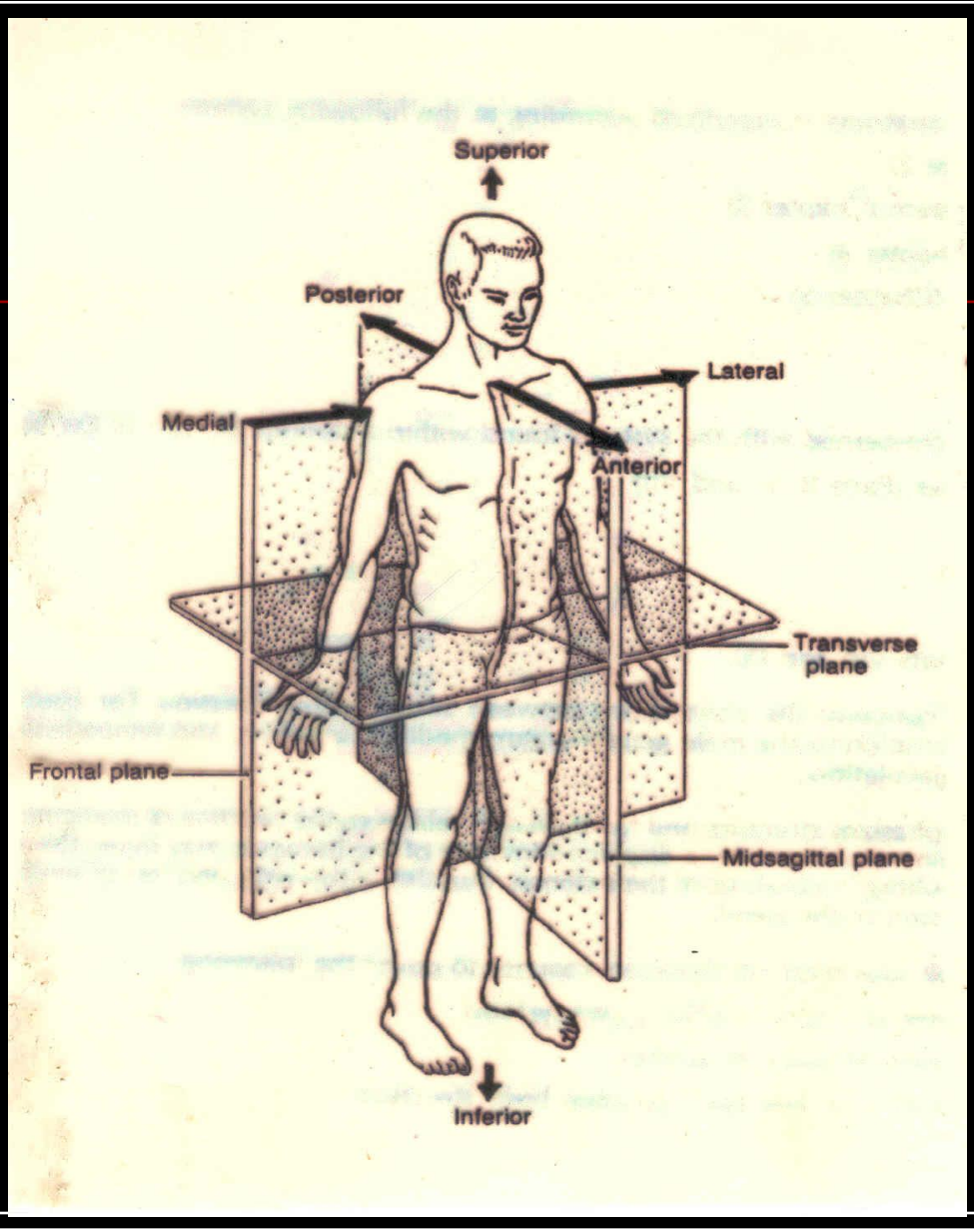
Body Systems. Locations and major components of the 11 organ systems of the human body.



Skeletal System (Chapters 6–9)
Provides support and protection, site of hemopoiesis (blood cell production), stores calcium and phosphorus, allows for body movement.

Integumentary System (Chapter 5)
Provides protection, regulates body temperature, site of cutaneous receptors, synthesizes vitamin D, prevents water loss.

Muscular System (Chapters 10–12)
Produces body movement, generates heat when muscles contract.


Superior
Posterior
Lateral
Medial
Anterior
Transverse plane
Frontal plane
Midsagittal plane
Inferior

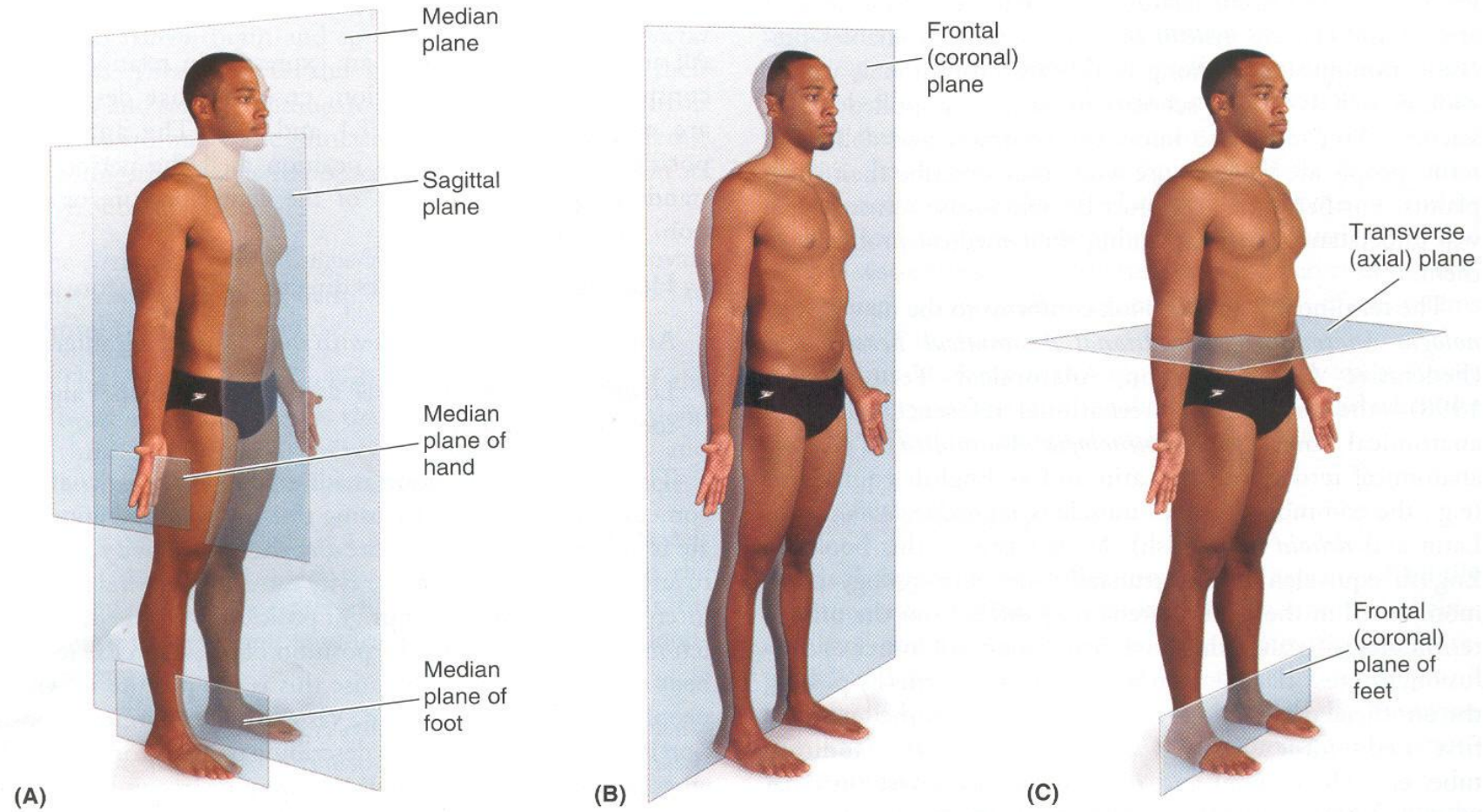


Figure I.2. Anatomical planes. The main planes of reference in the body are illustrated.

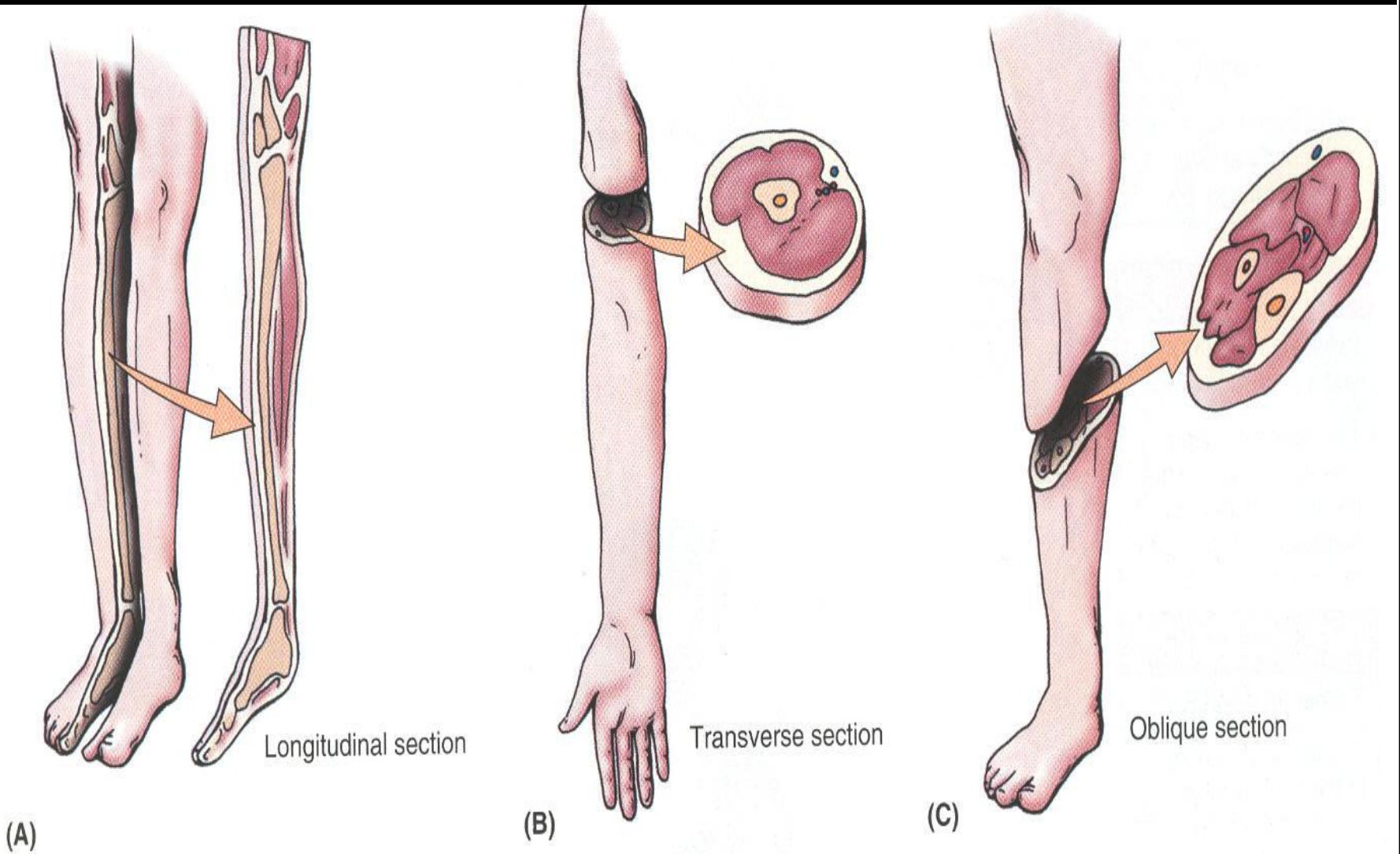
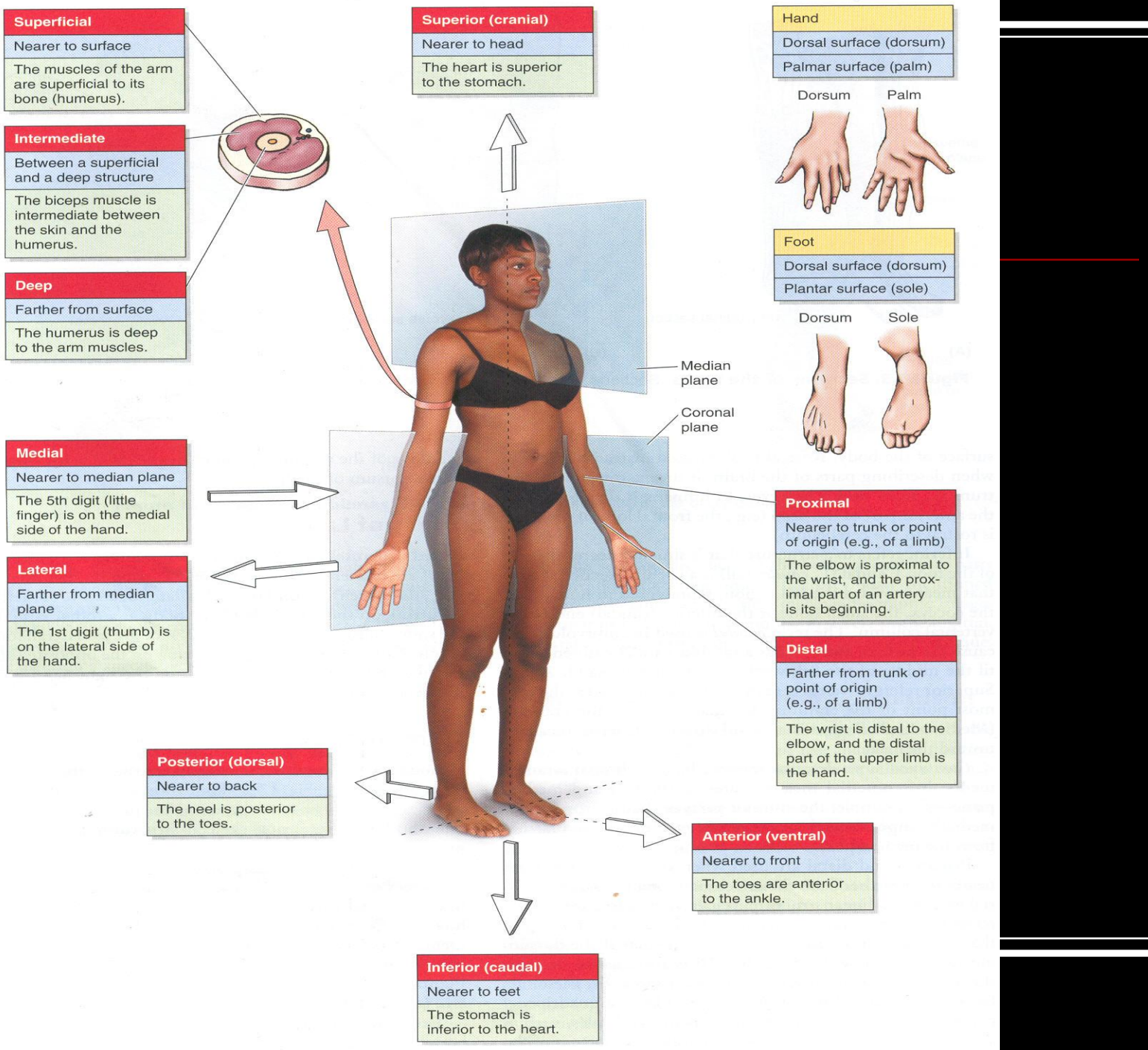
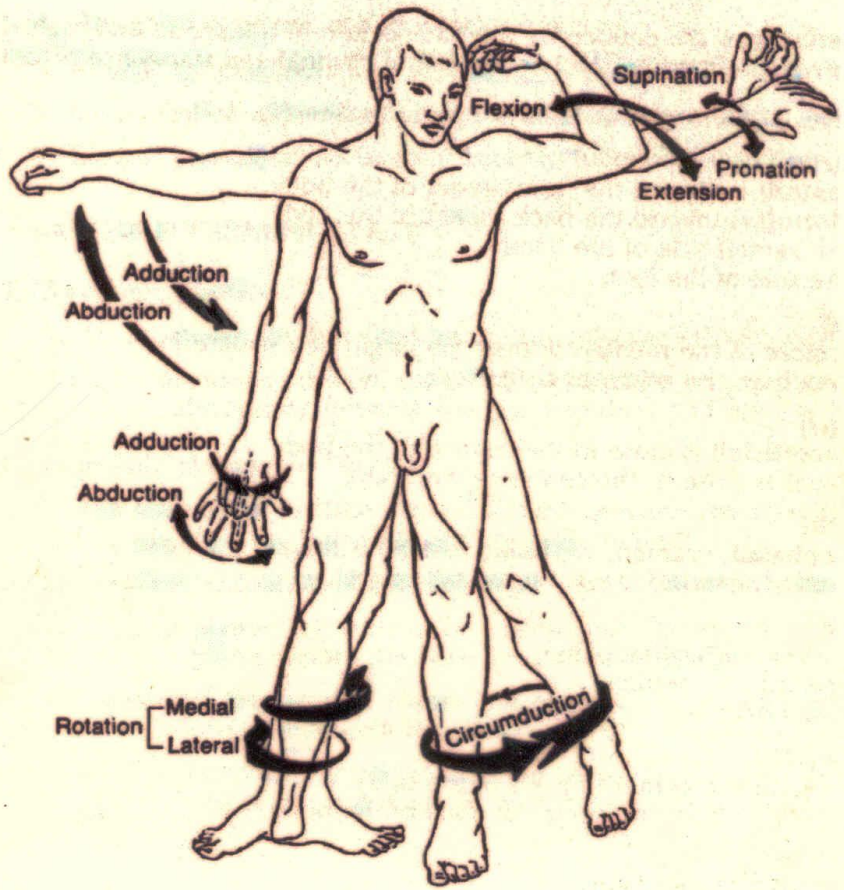


Figure I.3. Sections of the limbs. Sections may be obtained by anatomical sectioning or medical imaging techniques.


Superficial
Nearer to surface
The muscles of the arm are superficial to its bone (humerus).
Intermediate
Between a superficial and a deep structure
The biceps muscle is intermediate between the skin and the humerus.
Deep
Farther from surface
The humerus is deep to the arm muscles.
Superior (cranial)
Nearer to head
The heart is superior to the stomach.
Hand
Dorsal surface (dorsum)
Palmar surface (palm)
Dorsum
Palm
Foot
Dorsal surface (dorsum)
Plantar surface (sole)
Dorsum
Sole
Median plane
Coronal plane
Medial
Nearer to median plane
The 5th digit (little finger) is on the medial side of the hand.
Lateral
Farther from median plane
The 1st digit (thumb) is on the lateral side of the hand.
Proximal
Nearer to trunk or point of origin (e.g., of a limb)
The elbow is proximal to the wrist, and the proximal part of an artery is its beginning.
Distal
Farther from trunk or point of origin (e.g., of a limb)
The wrist is distal to the elbow, and the distal part of the upper limb is the hand.
Posterior (dorsal)
Nearer to back
The heel is posterior to the toes.
Anterior (ventral)
Nearer to front
The toes are anterior to the ankle.
Inferior (caudal)
Nearer to feet
The stomach is inferior to the heart.


Supination
Flexion
Pronation
Extension
Adduction
Abduction
Adduction
Abduction
Rotation
Medial
Lateral
Circumduction

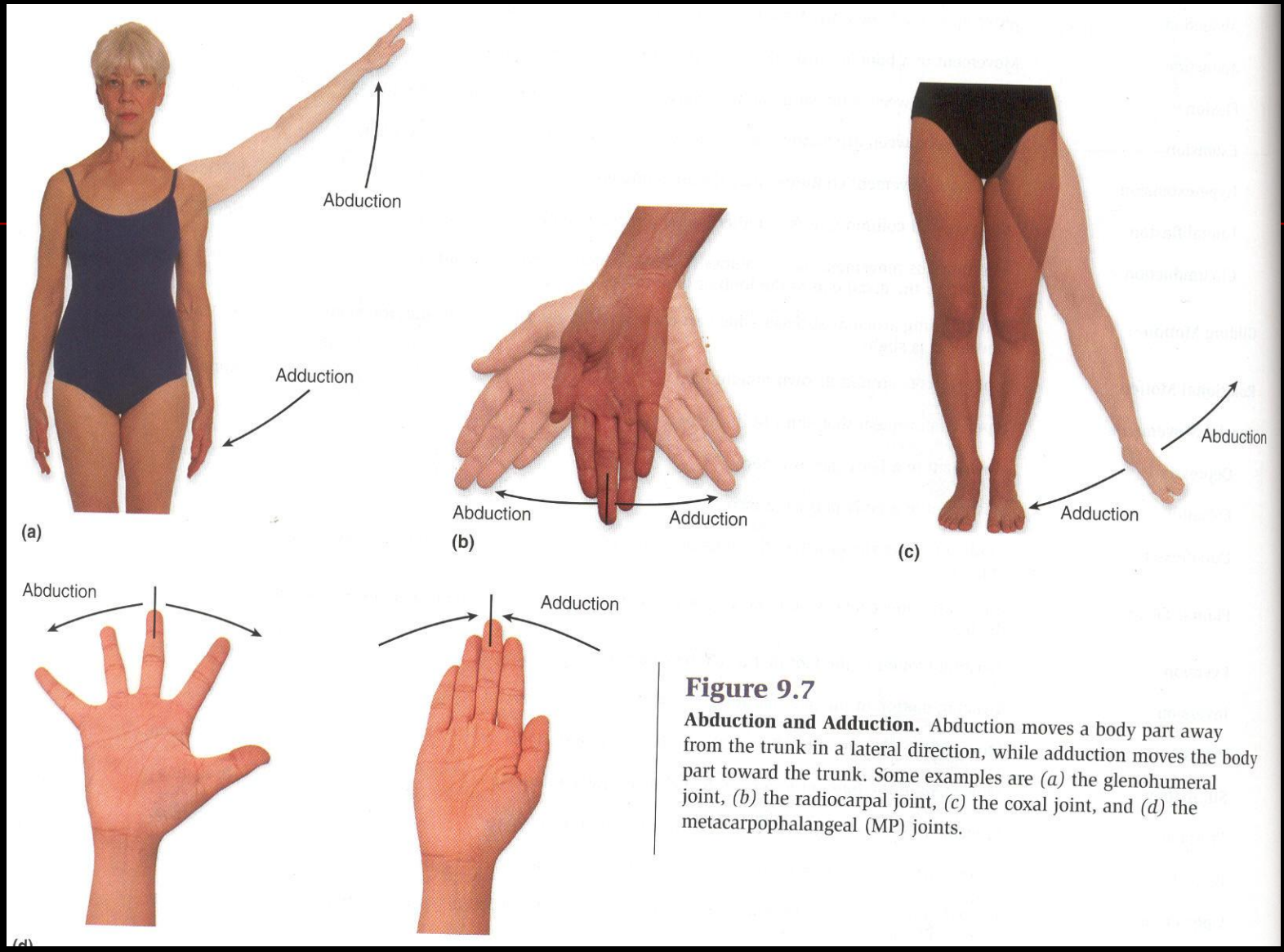


Figure 9.7

Abduction and Adduction. Abduction moves a body part away from the trunk in a lateral direction, while adduction moves the body part toward the trunk. Some examples are *(a)* the glenohumeral joint, *(b)* the radiocarpal joint, *(c)* the coxal joint, and *(d)* the metacarpophalangeal (MP) joints.

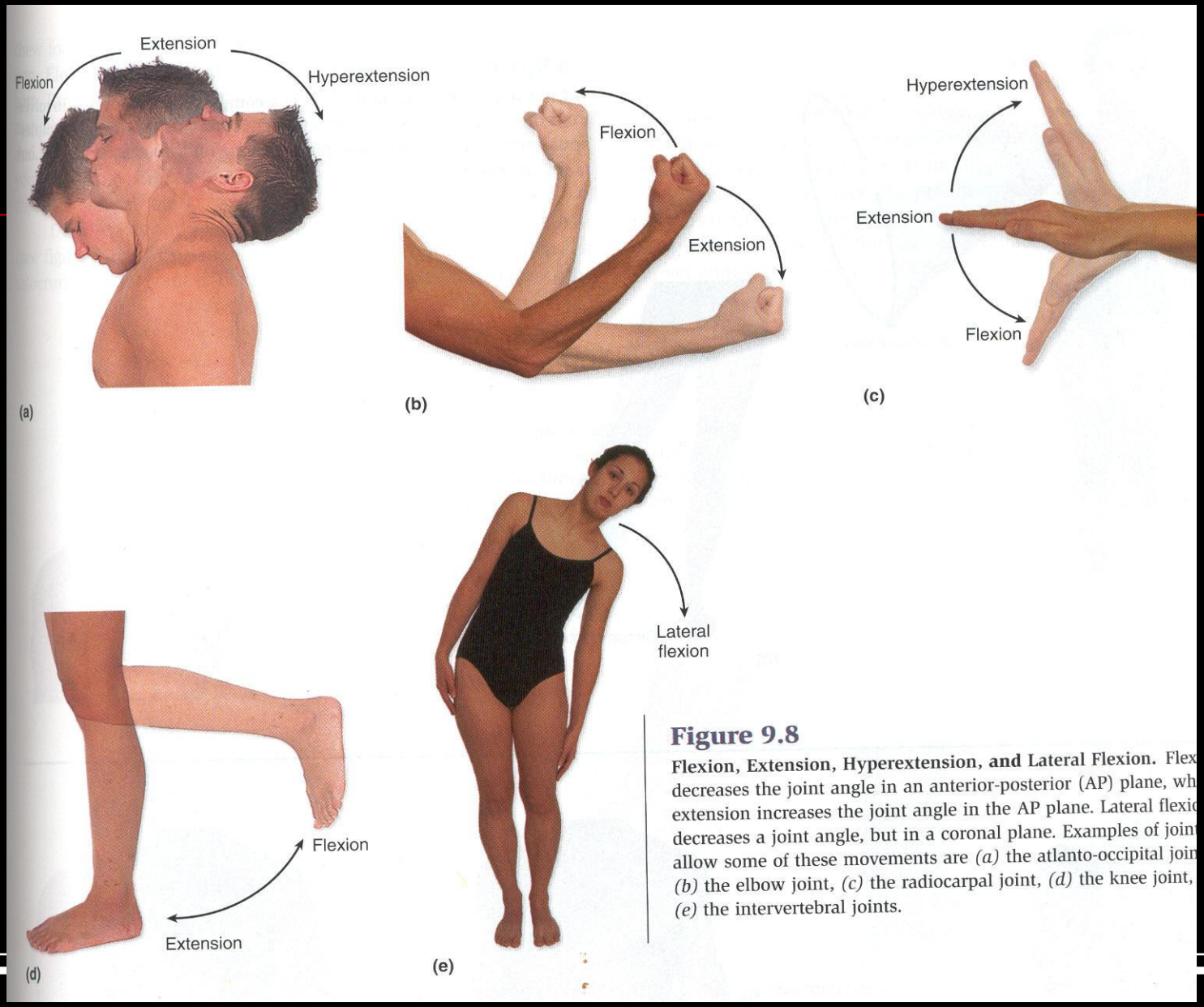
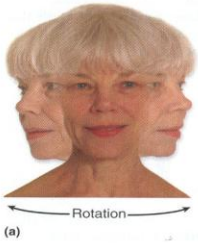


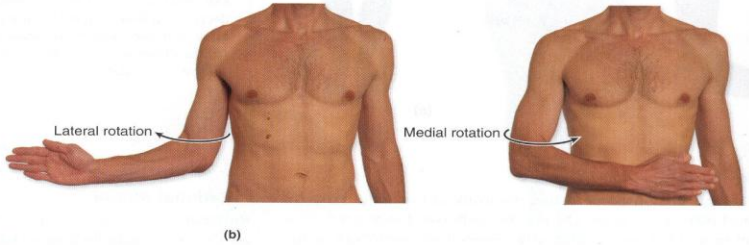
Figure 9.8

Flexion, Extension, Hyperextension, and Lateral Flexion. Flex
decreases the joint angle in an anterior-posterior (AP) plane, wh
extension increases the joint angle in the AP plane. Lateral flexio
decreases a joint angle, but in a coronal plane. Examples of joint
allow some of these movements are *(a)* the atlanto-occipital join
(b) the elbow joint, *(c)* the radiocarpal joint, *(d)* the knee joint,
(e) the intervertebral joints.

Figure 9.9

Circumduction. Circumduction is a complex movement that involves flexion, abduction, extension, and adduction in succession. Examples of joints that allow this movement are *(a)* the glenohumeral joint and *(b)* the coxal joint.





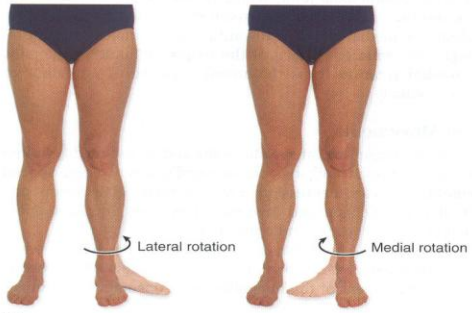


Figure 9.10

Rotational Movements. Rotation allows a bone to pivot on its longitudinal axis. Examples of joints that allow this movement are *(a)* the atlantoaxial joint, *(b)* the glenohumeral joint, and *(c)* the coxal joint.

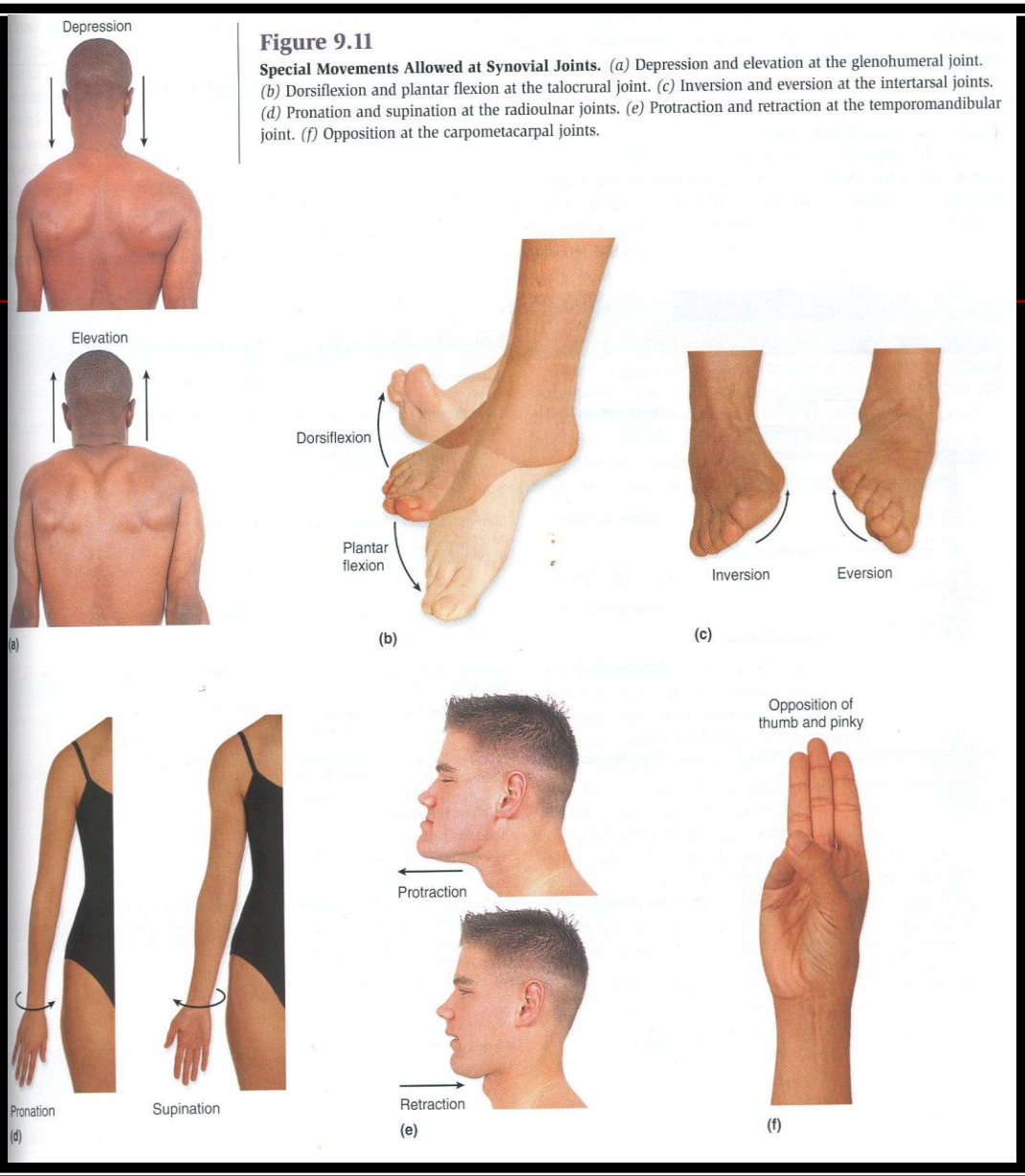


Figure 9.11

Special Movements Allowed at Synovial Joints. *(a)* Depression and elevation at the glenohumeral joint. *(b)* Dorsiflexion and plantar flexion at the talocrural joint. *(c)* Inversion and eversion at the intertarsal joints. *(d)* Pronation and supination at the radioulnar joints. *(e)* Protraction and retraction at the temporomandibular joint. *(f)* Opposition at the carpometacarpal joints.

Tubuh Manusia dibagi menjadi :

1. **Regio (daerah)**
   a. extremitas inferior
   b. extremitas superior
   c. thorax → situs thoracis
   d. abdomen → situs abdominis
   e. pelvis → situs pelvicus
   f. regio facei dan cervicalis
   g. sistim syaraf pusat

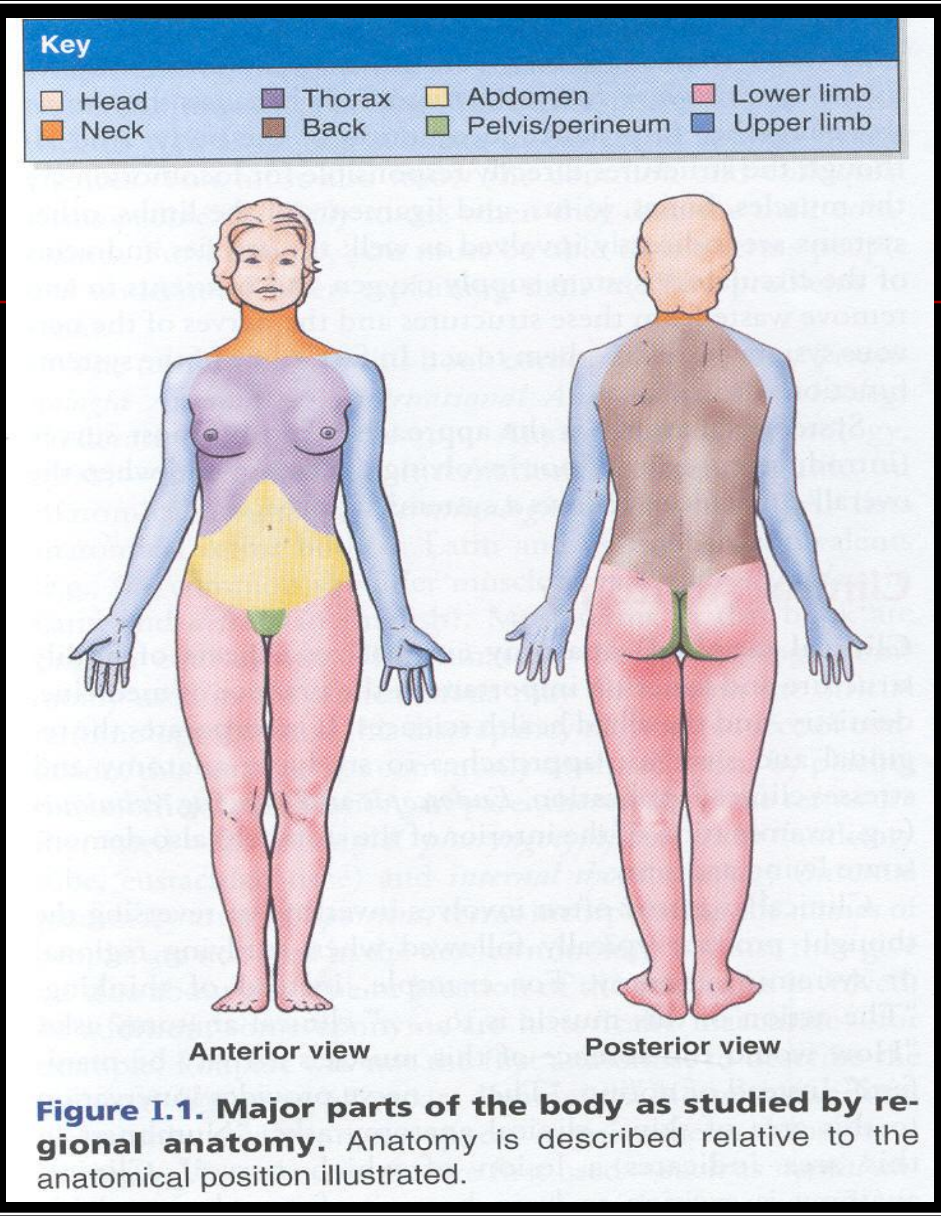


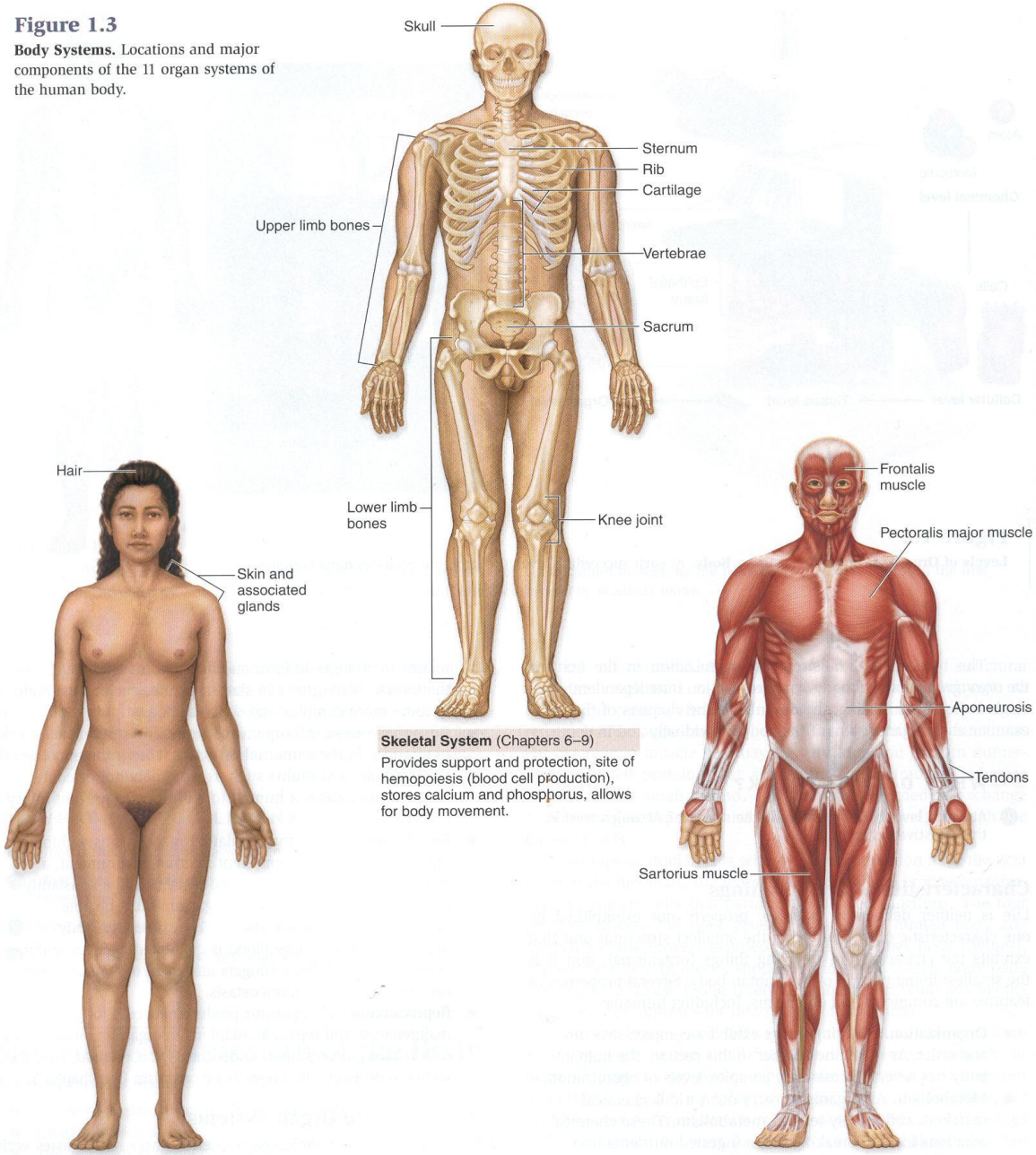
Figure I.1. Major parts of the body as studied by regional anatomy. Anatomy is described relative to the anatomical position illustrated.

2. Sistemik :

a. Systema Musculo skeletal
   (apparatus locomotorius)
b. Systema respiratorius
c. Systema circulatorius
d. Systema digestivus
e. Systema uropoetica
f. Systema genetalia
g. Systema nervosum

Figure 1.3

Body Systems. Locations and major components of the 11 organ systems of the human body.



Integumentary System (Chapter 5)

Provides protection, regulates body temperature, site of cutaneous receptors, synthesizes vitamin D, prevents water loss.

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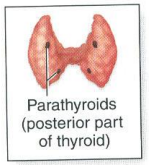
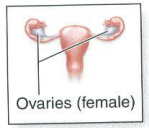
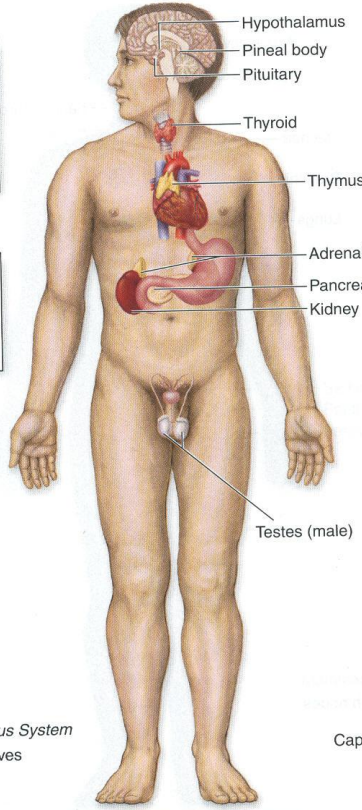
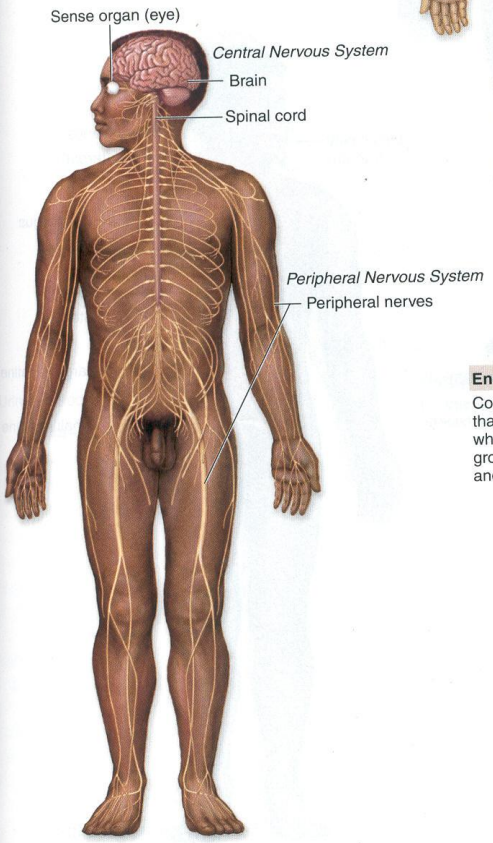






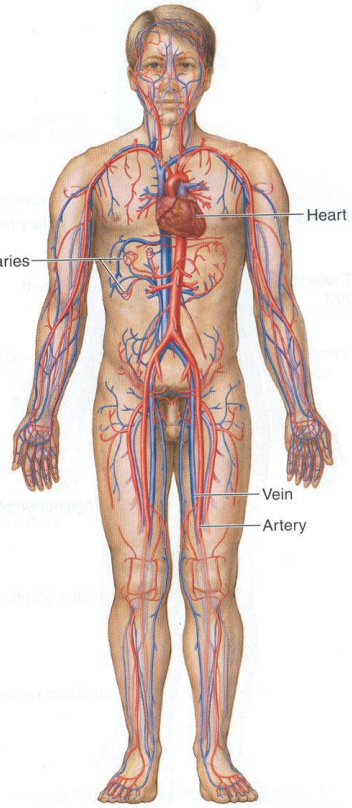
Endocrine System (Chapter 20)

Consists of glands and cell clusters that secrete hormones, some of which regulate body and cellular growth, chemical levels in the body, and reproductive functions.



Nervous System (Chapters 14–19)

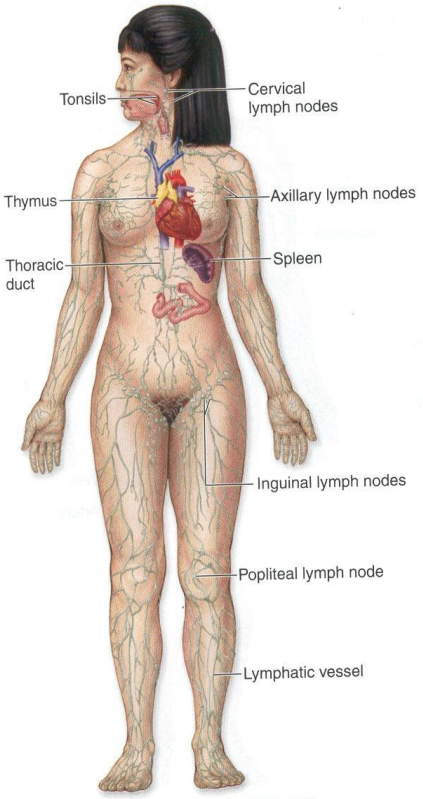
A regulatory system that controls body movement, responds to sensory stimuli, and helps control all other systems of the body. Also responsible for



Cardiovascular System (Chapters 21–23)

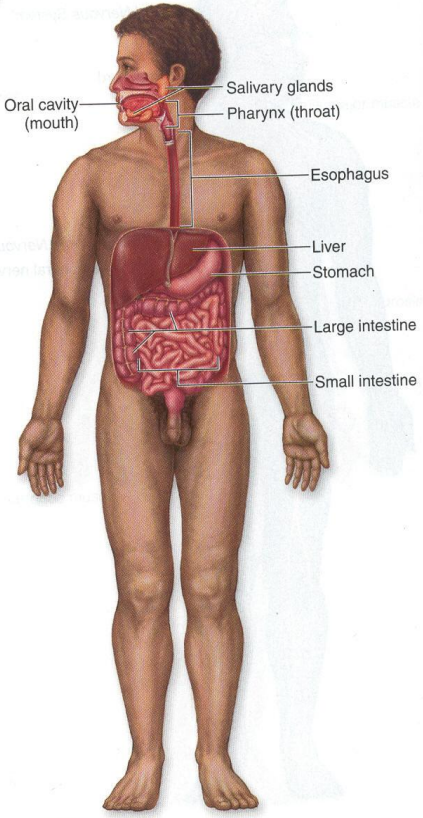
Consists of a pump (the heart) that moves blood through blood vessels in order to distribute hormones, nutrients, and gases, and pick up waste products.

Figure 1.3
Body Systems. ***(continued)***

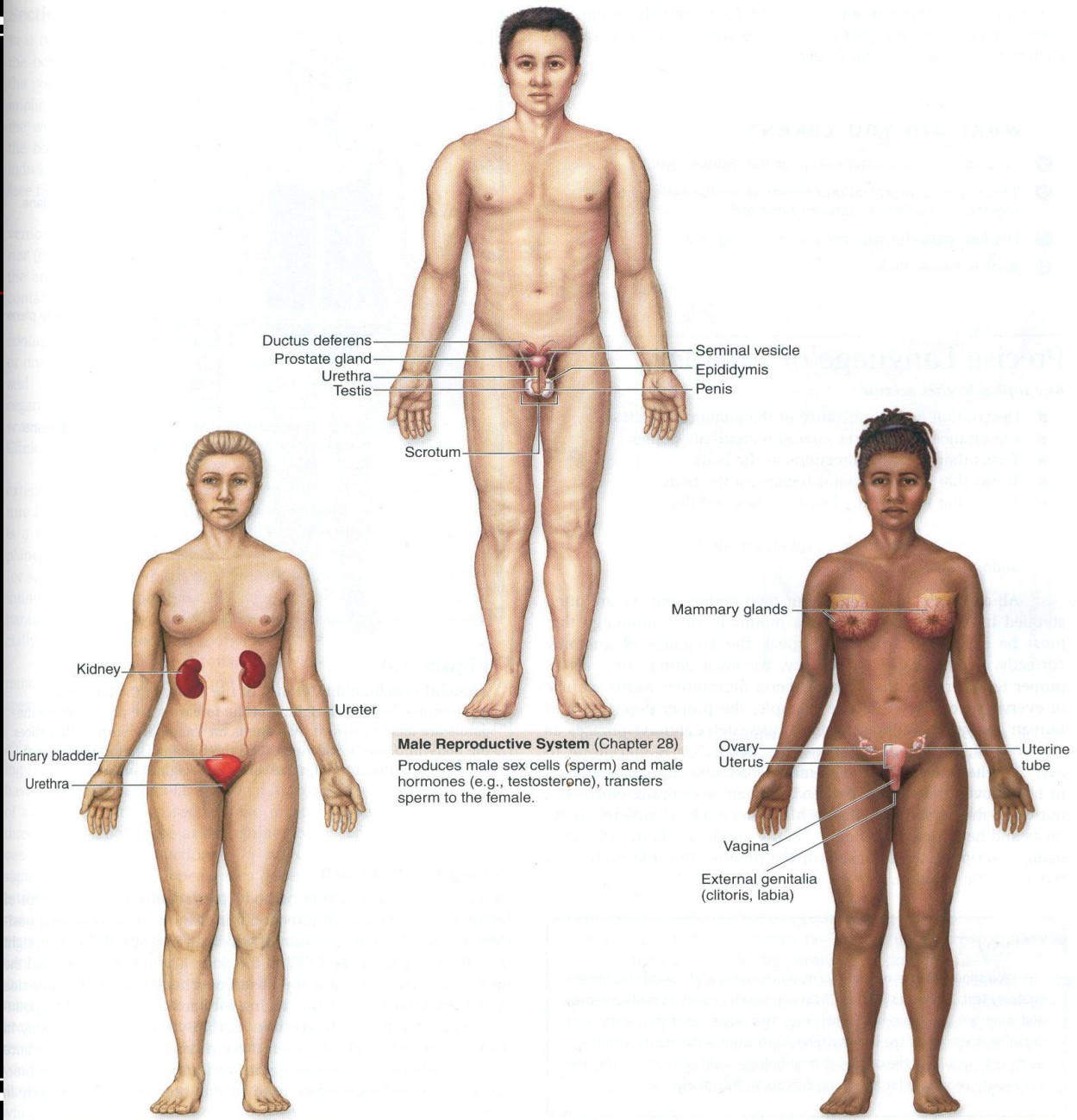


Lymphatic System (Chapter 24)
Transports and filters lymph (interstitial fluid) and initiates an immune response when necessary.

Respiratory System (Chapter 25)
Responsible for exchange of gases (oxygen and carbon dioxide) between blood and the air in the lungs.



Digestive System (Chapter 26)
Mechanically and chemically digests food materials, absorbs nutrients, and expels waste products.



Male Reproductive System (Chapter 28)

Produces male sex cells (sperm) and male hormones (e.g., testosterone), transfers sperm to the female.

Urinary System (Chapter 27)

Filters the blood and removes waste products from the blood, concentrates waste products in the form of urine, and expels urine from the body.

Female Reproductive System (Chapter 28)

Produces female sex cells (oocytes) and female hormones (e.g., estrogen and progesterone), receives sperm from male, site of fertilization of oocyte, site of growth

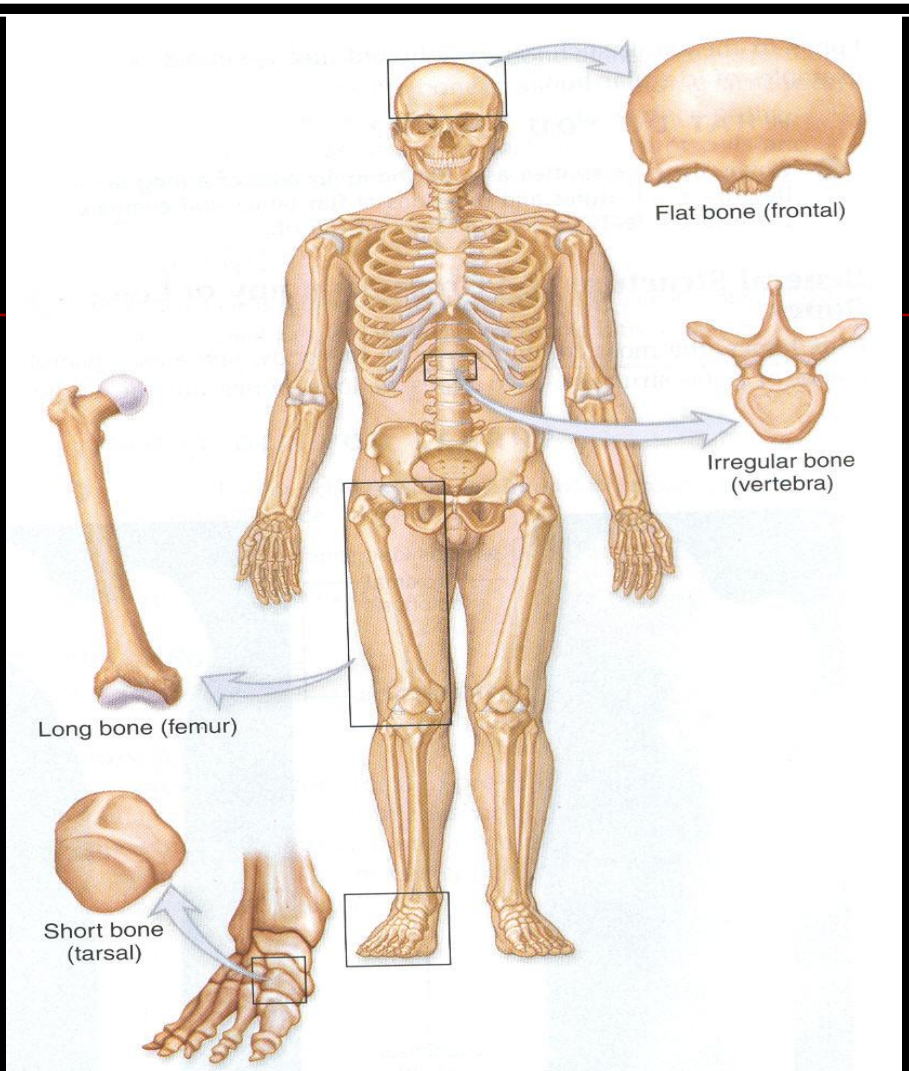


Figure 6.3

Classification of Bone by Shape. Four different classes of bone are recognized according to shape: long, short, flat, and irregular.

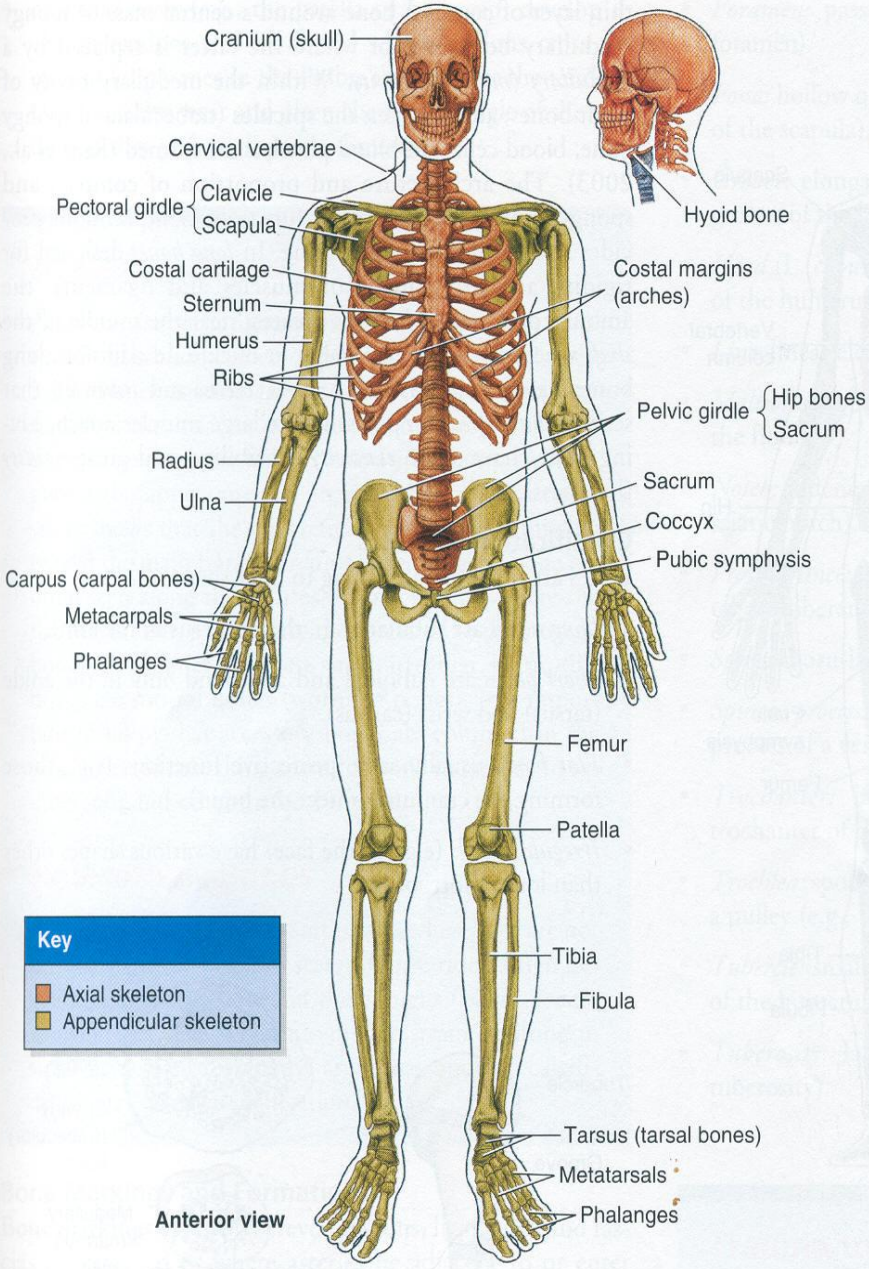


Figure I.11. Skeletal system. The skeleton of the head, neck, and trunk forms the axial skeleton; the skeleton of the limbs forms the appendicular skeleton.

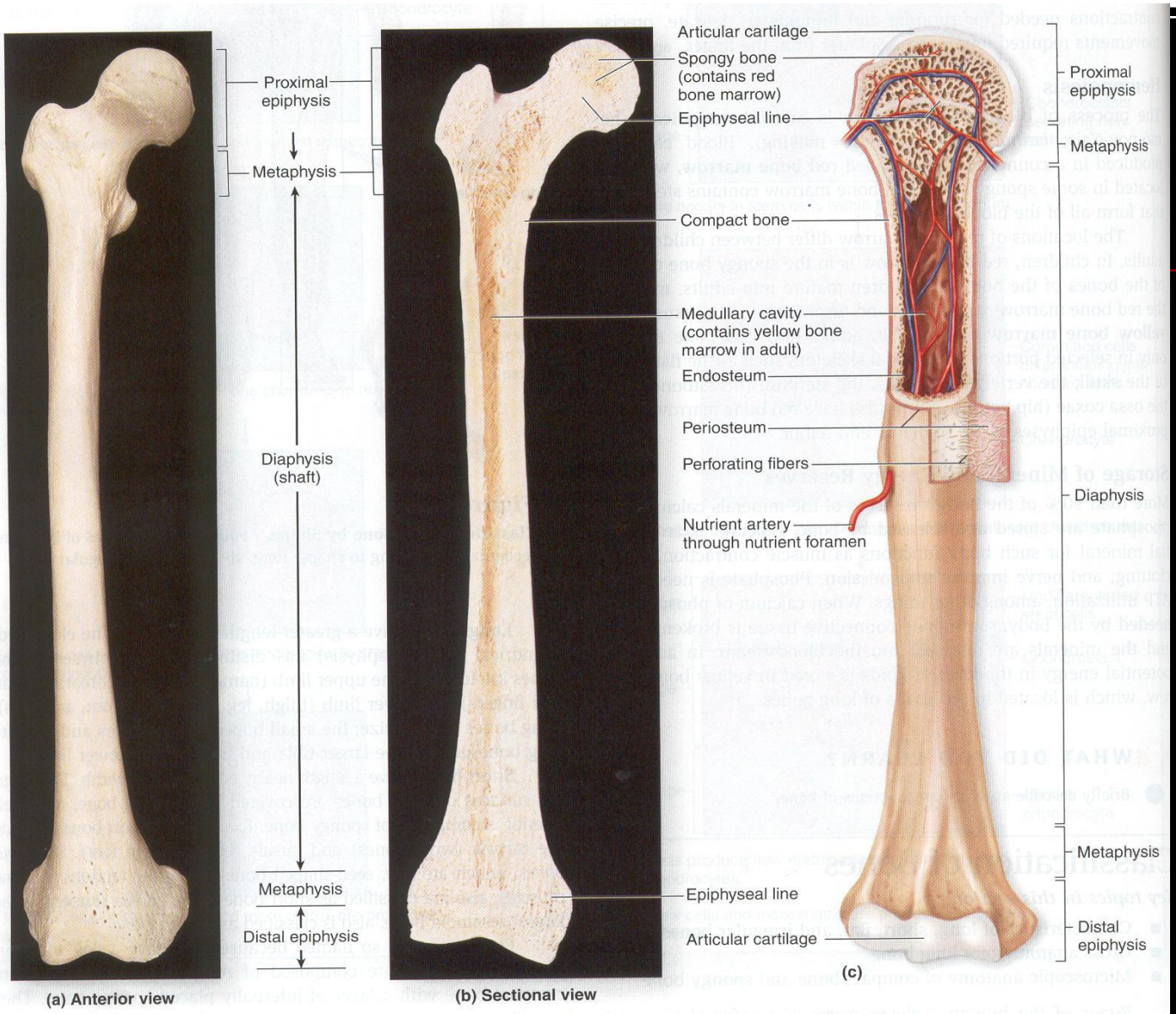


Figure 6.4

Gross Anatomy of a Long Bone. Long bones support soft tissues in the limbs. The femur, the bone of the thigh, is shown in both *(a)* anterior and *(b)* sectional views. *(c)* A typical long bone, such as the humerus, contains both compact and spongy bone.

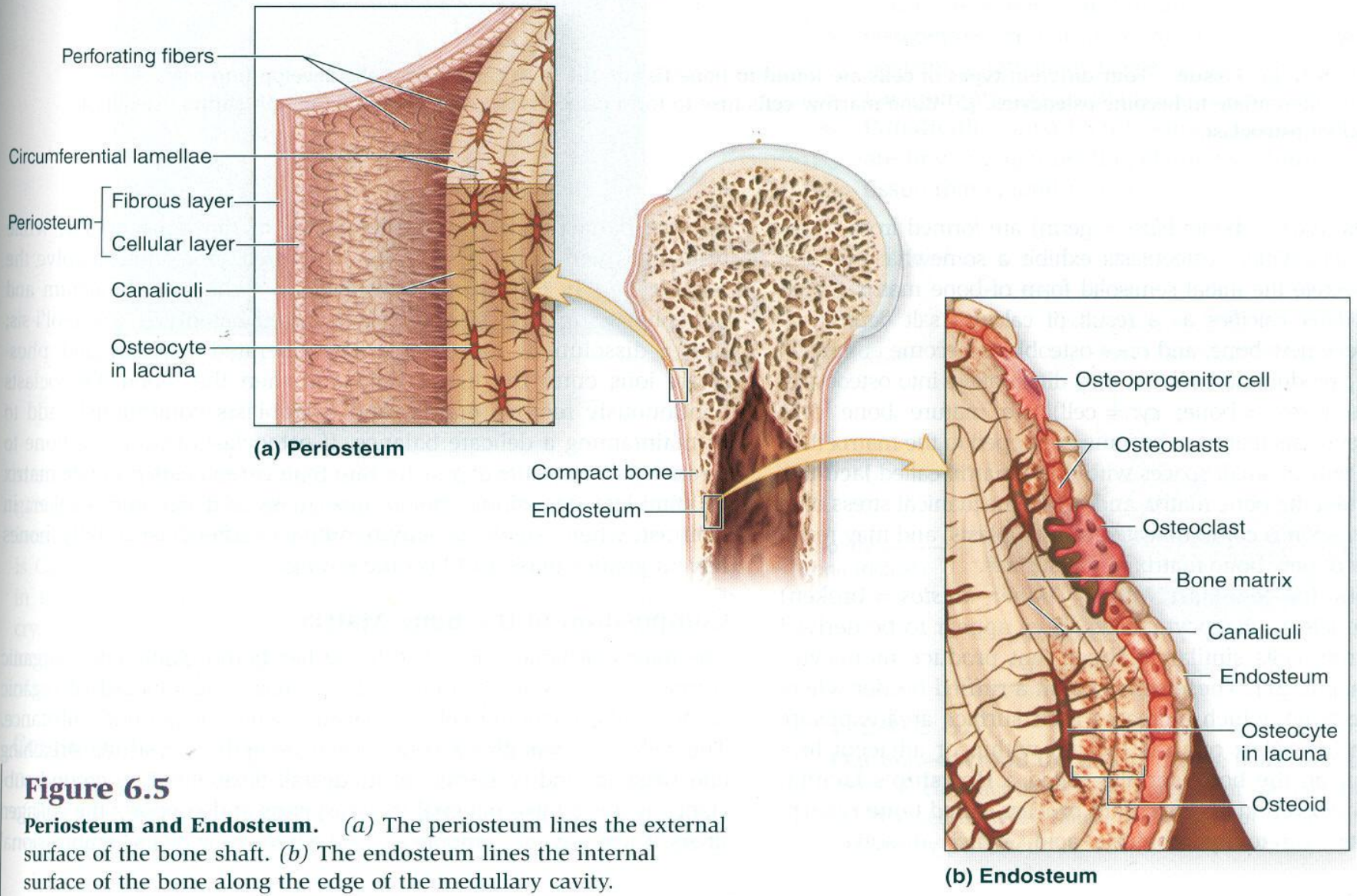


Figure 6.5

Periosteum and Endosteum. *(a)* The periosteum lines the external surface of the bone shaft. *(b)* The endosteum lines the internal surface of the bone along the edge of the medullary cavity.

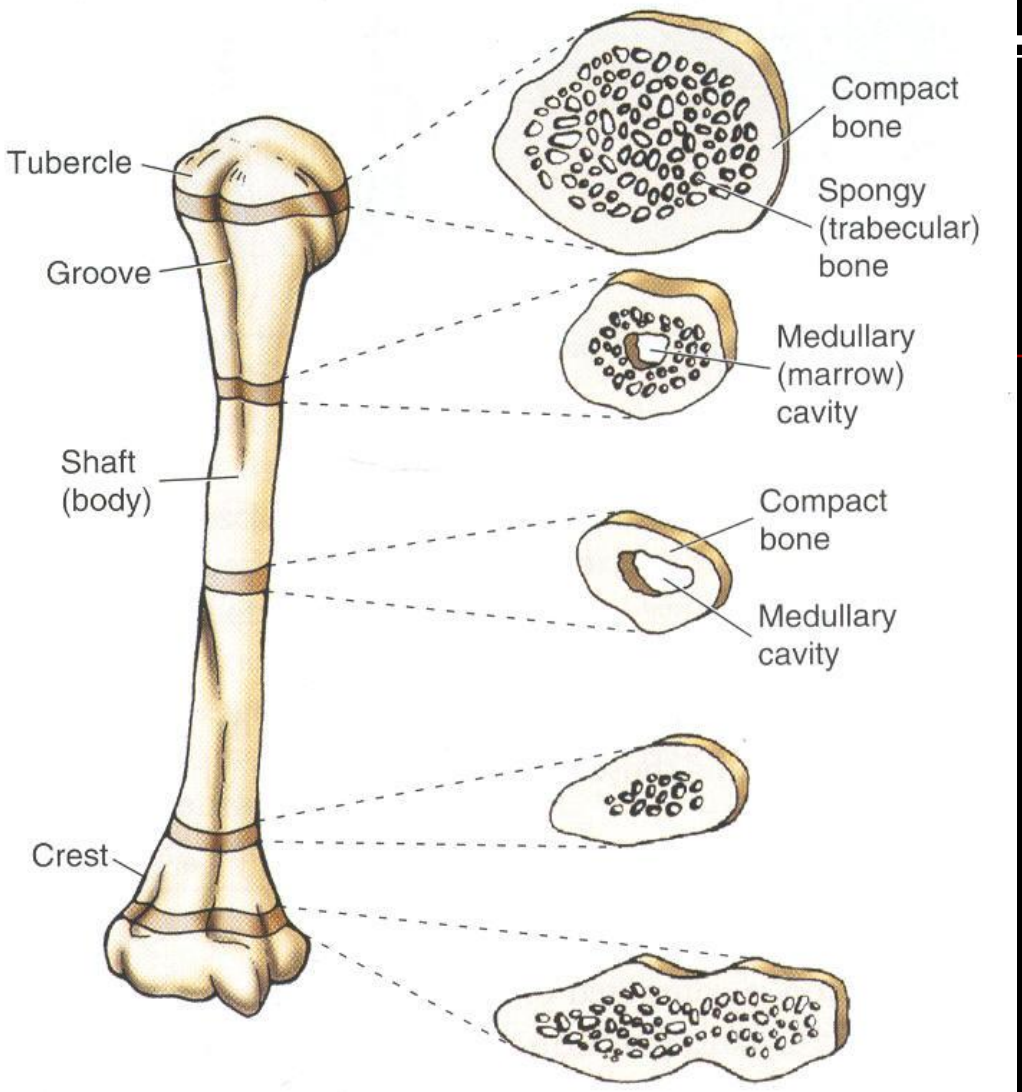


Figure I.12. Transverse sections of the humerus (upper arm bone). The shaft of a living bone is a tube of compact bone that surrounds a medullary cavity, which contains red or yellow bone marrow or a combination of both.

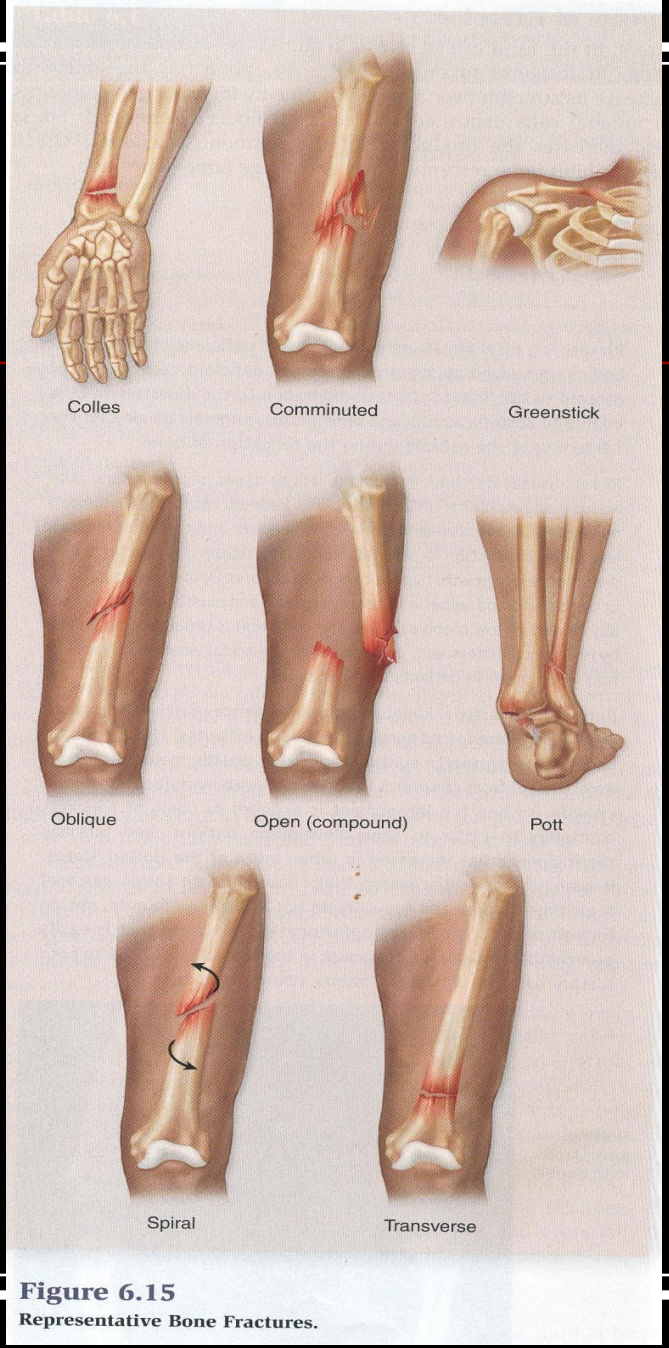
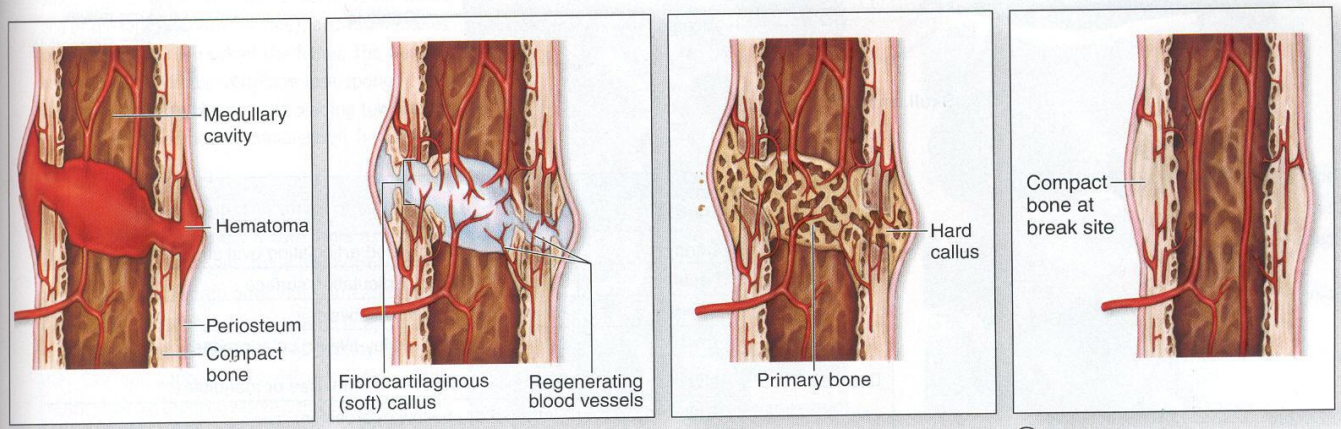


Figure 6.15
Representative Bone Fractures.

Table 6.2 Classification of Bone Fractures

Fracture	Description	Fracture	Description
Avulsion	Complete severing of a body part (typically a toe or finger)	Impacted	One fragment of bone is firmly driven into the other
Closed (simple)	Bone does not break through the skin	Incomplete	Partial fracture that extends only partway across the bone
Colles	Fracture of the distal end of the lateral forearm bone (radius)	Linear	Fracture is parallel to the long axis of the bone
Comminuted	Bone is splintered into several small pieces between the main parts	Oblique	Diagonal fracture at an angle between linear and transverse
Complete	Bone is broken into two or more pieces	Open (compound)	Broken ends of the bone protrude through the skin
Compression	Bone is squashed (may occur in vertebra during a fall)	Pathologic	Weakening of a bone caused by disease processes (e.g., cancer)
Depressed	Broken part of the bone forms a concavity (as in skull fracture)	Pott	Fracture at the distal end of the tibia, fibula, or both
Displaced	Fractured bone parts are out of anatomic alignment	Spiral	Fracture spirals around axis of long bone; results from twisting stress
Epiphyseal	Epiphysis is separated from the diaphysis at the epiphyseal plate	Stress	Thin fractures due to repeated, stressful impact such as running. (These fractures sometimes are difficult to see on x-rays, and a bone scan may be necessary to accurately identify their presence.)
Greenstick	Partial fracture; one side of bone breaks—the other side bends	Transverse	Fracture at right angles to the long axis of the bone
Hairline	Fine crack in which sections of bone remain aligned (common in skull)		



1 A fracture hematoma forms.

2 A fibrocartilaginous (soft) callus forms.

3 A hard (bony) callus forms.

4 The bone is remodeled.

Figure 6.16

Fracture Repair. The repair of a bone fracture occurs in a series of continuous steps.

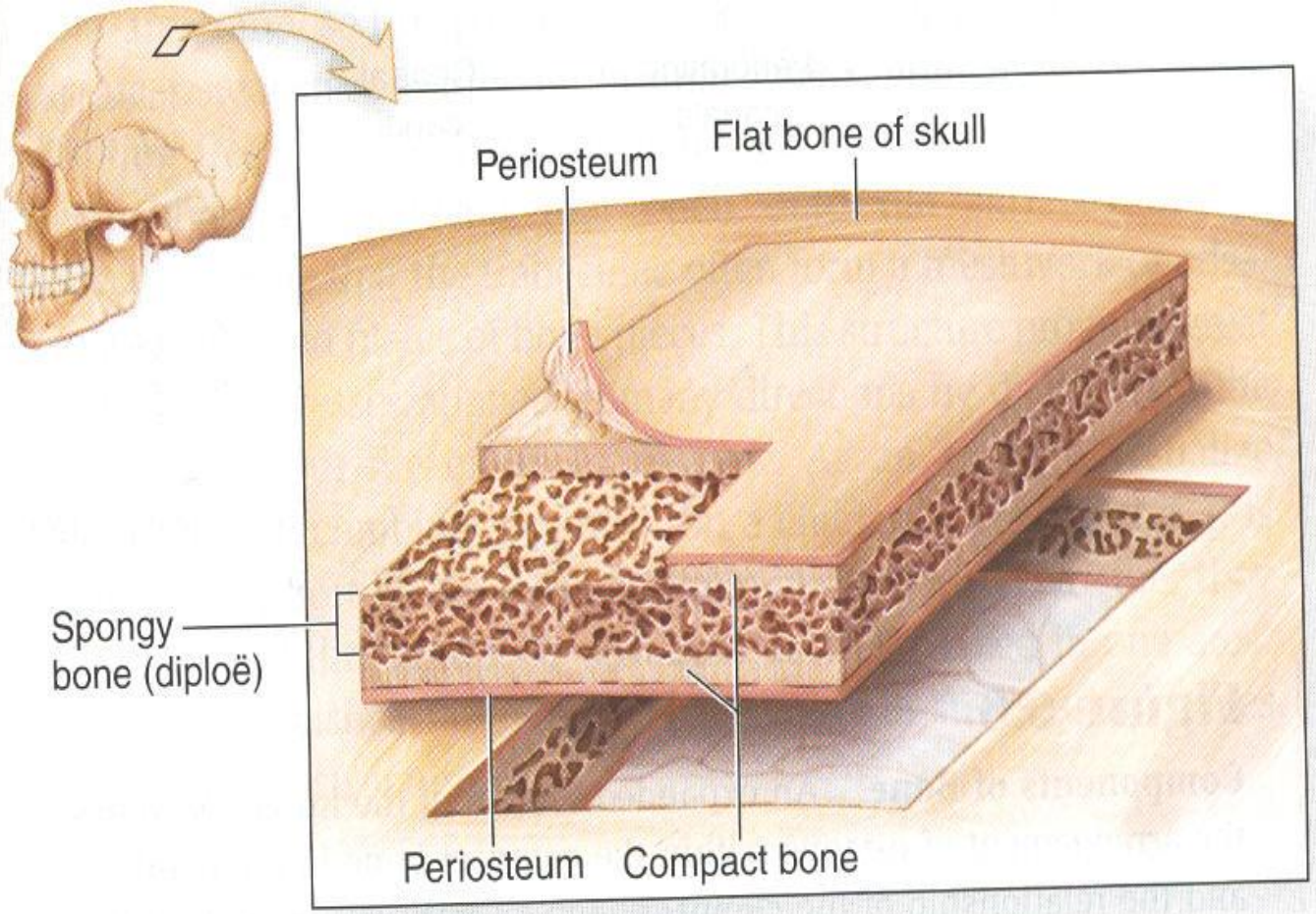
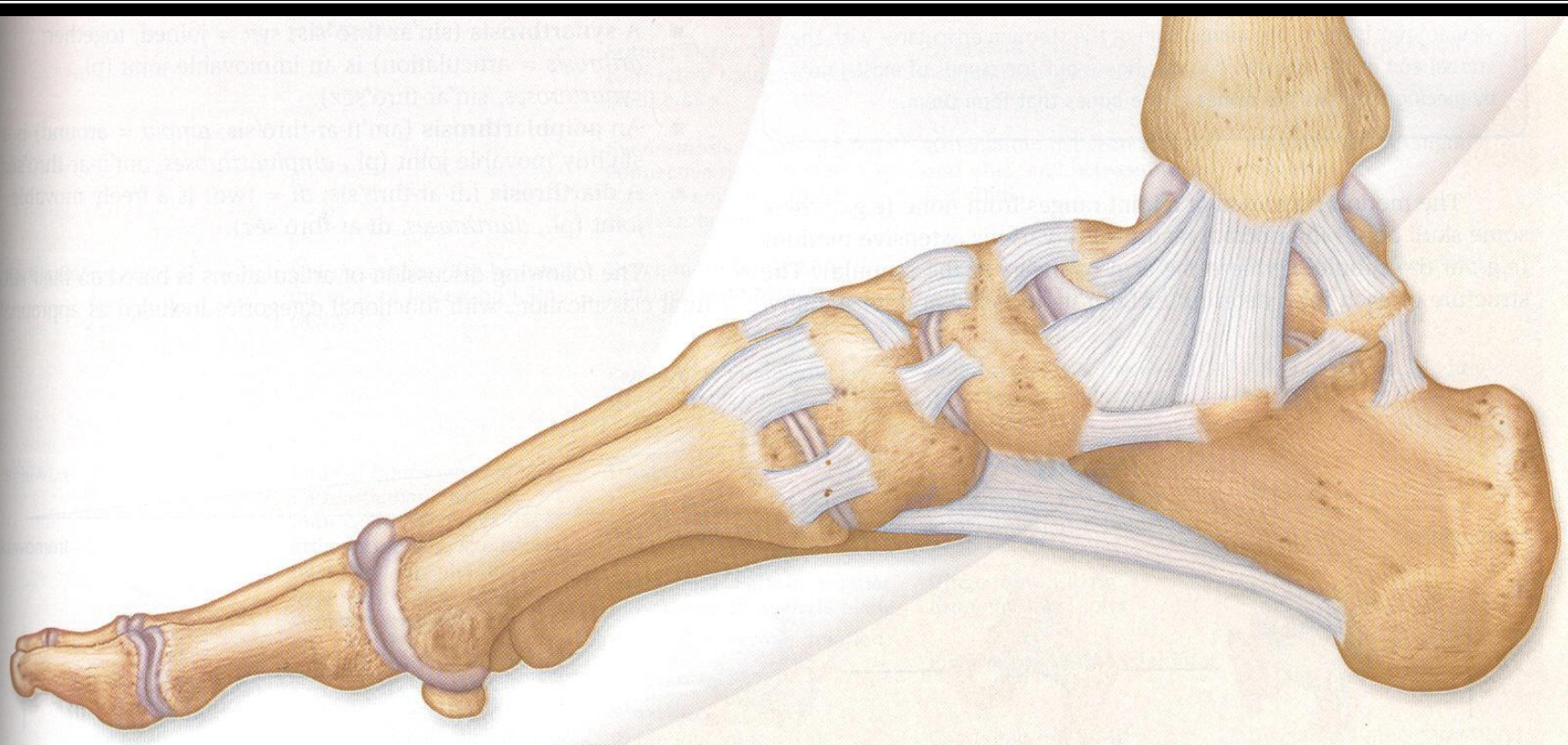
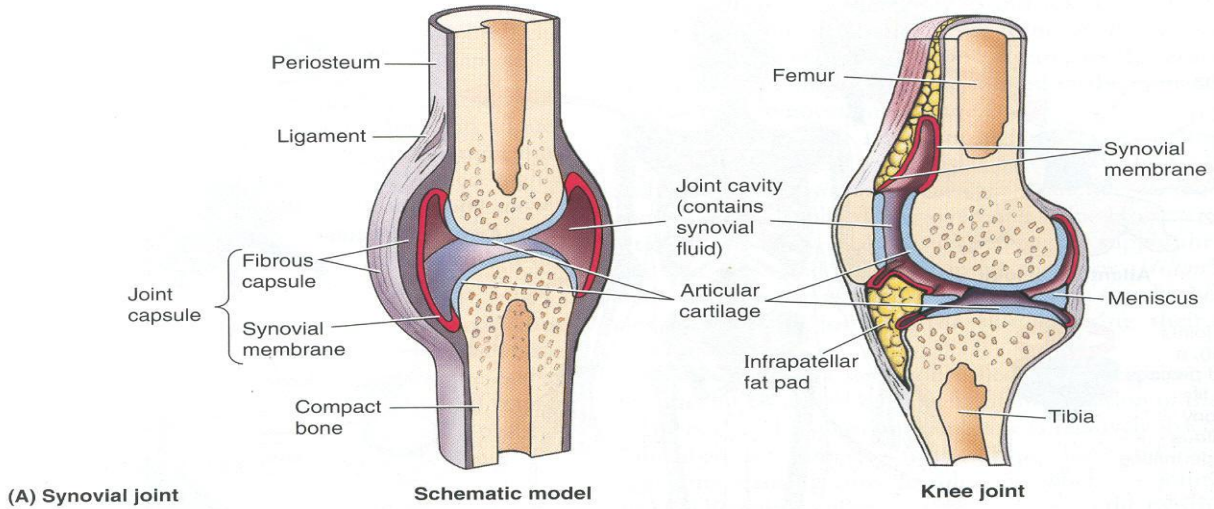


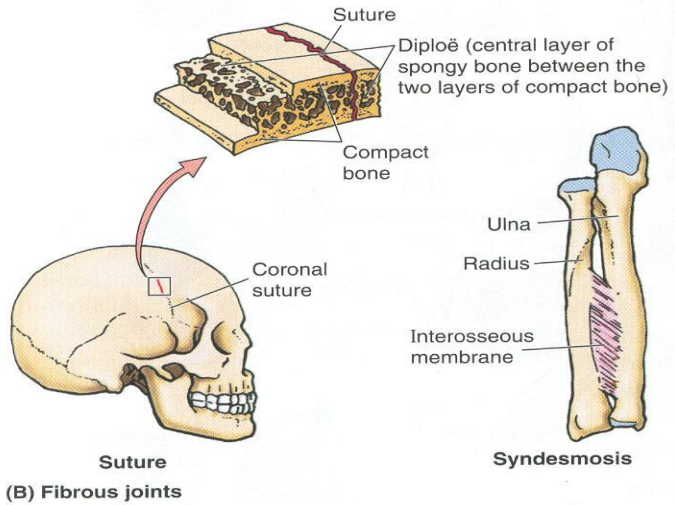
Figure 6.7

Flat Bones Within the Skull. These bones are composed of two layers of compact bone, with a region of spongy bone (diploë) sandwiched between them. Both layers of compact bone are covered by periosteum.



Articulations





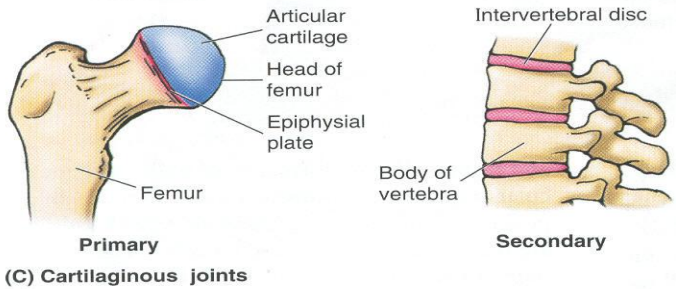


Figure I.16. Three classes of joints. Examples of each class are shown, as well as a model demonstrating the basic features of a synovial joint.

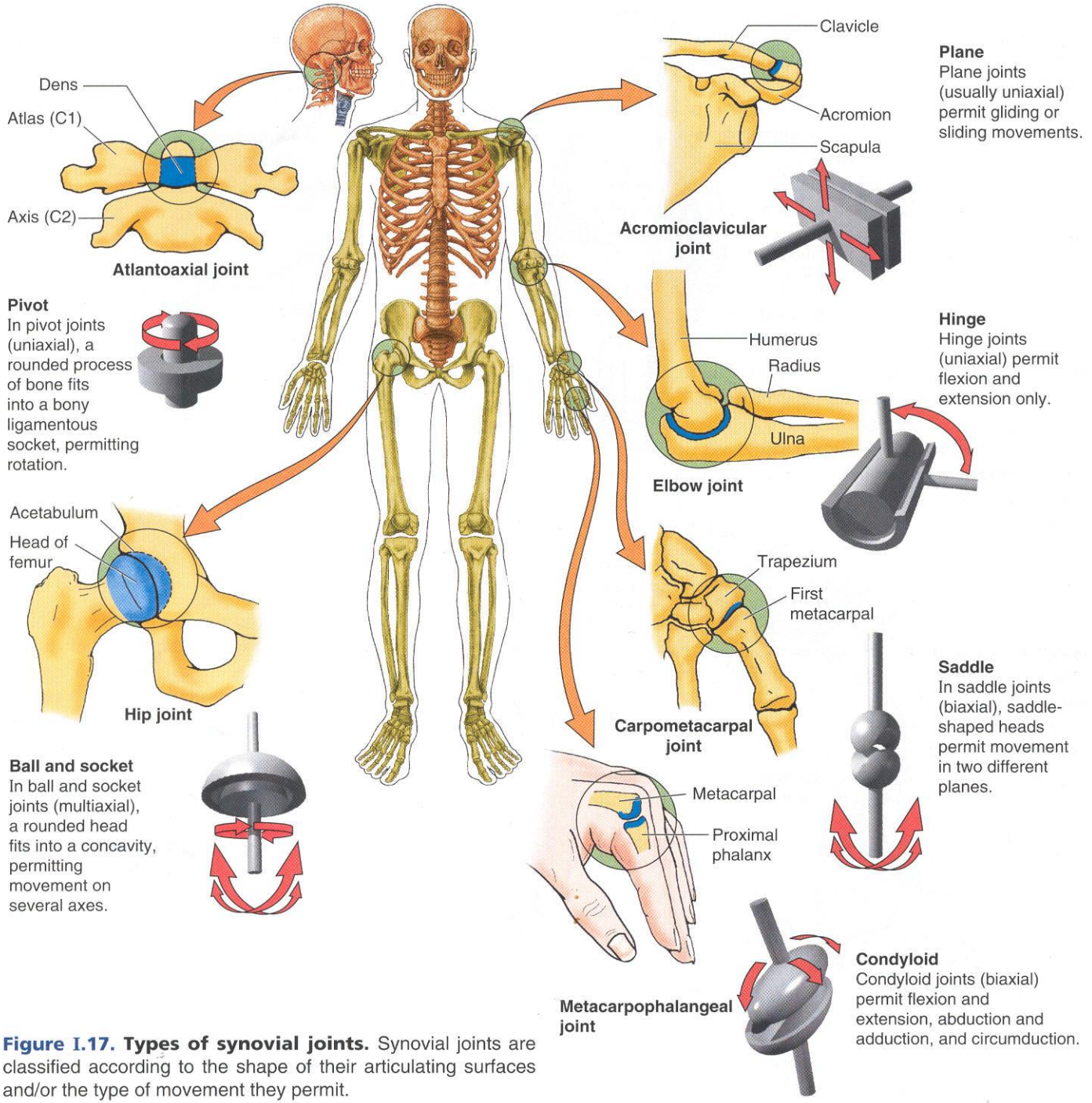


Figure I.17. Types of synovial joints. Synovial joints are classified according to the shape of their articulating surfaces and/or the type of movement they permit.

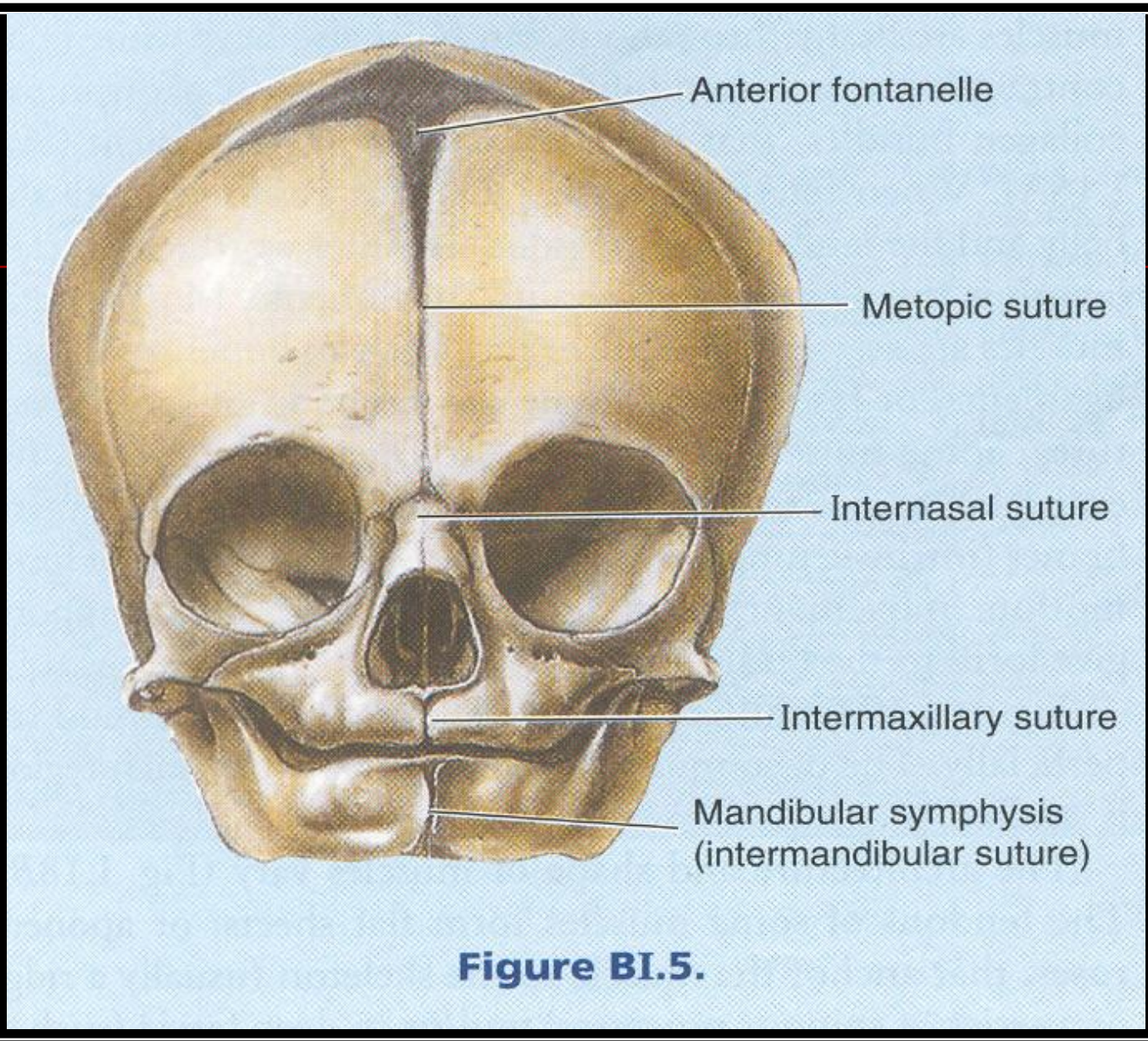

Anterior fontanelle
Metopic suture
Internasal suture
Intermaxillary suture
Mandibular symphysis
(intermandibular suture)

Figure BI.5.

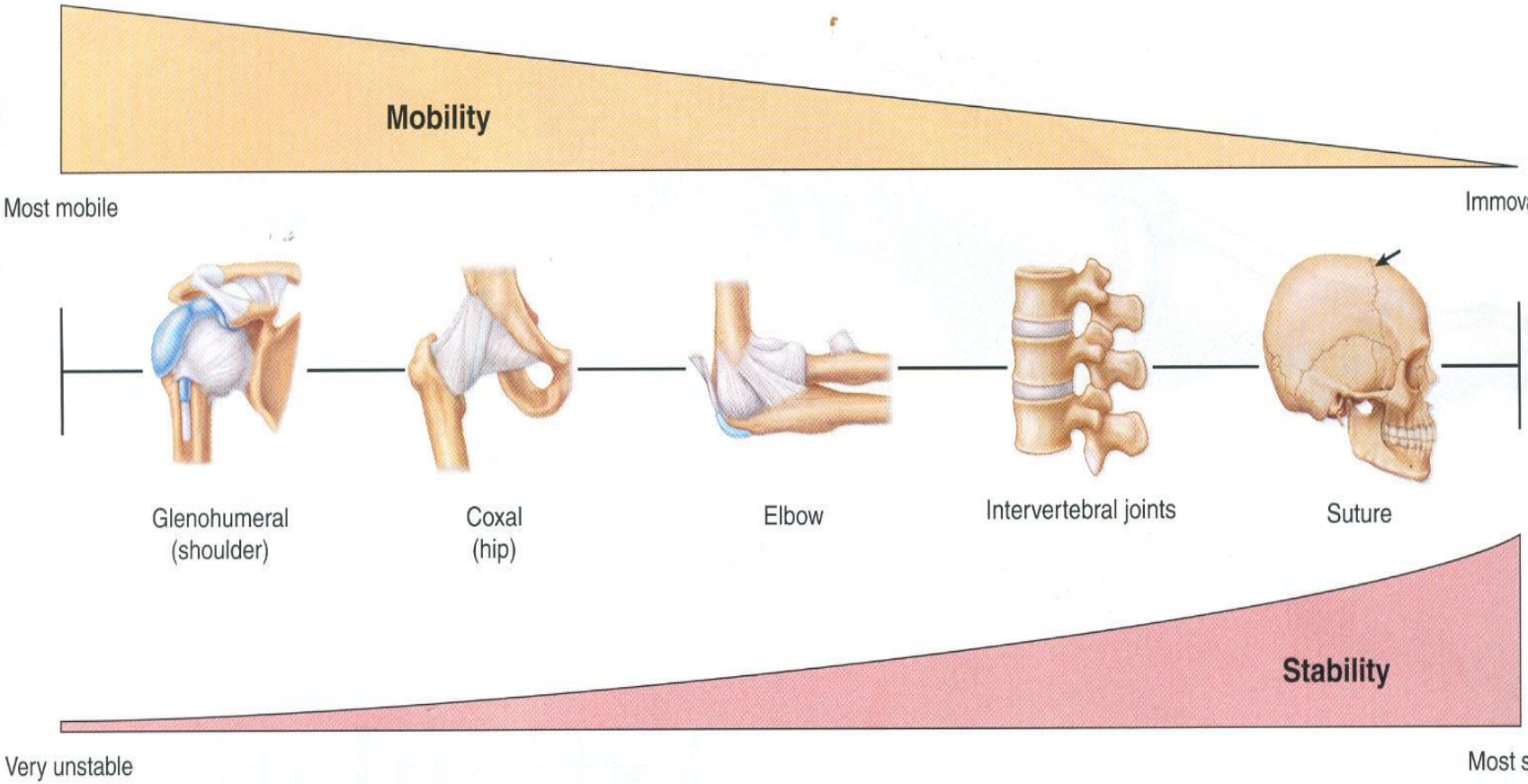
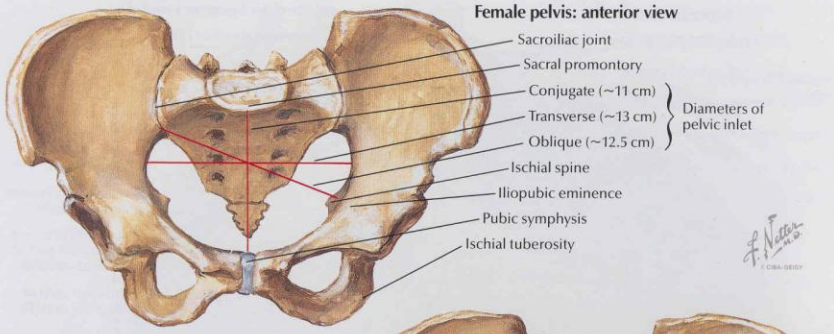


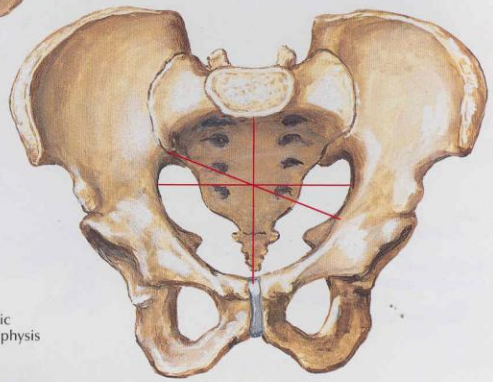
Figure 9.1

Relationship Between Mobility and Stability in Joints. In every joint, there is a "tradeoff" between mobility and stability. The more movable the joint, the less stable it can be. Conversely, the more stable the joint, the less movable it can be. Note how the glenohumeral (shoulder) joint is very mobile but not very stable, while a suture is immovable and yet very stable.

Sex Differences of Pelvis: Measurements

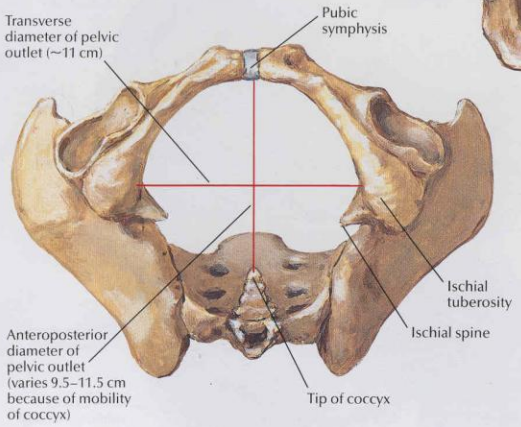
SEE ALSO PLATE 231



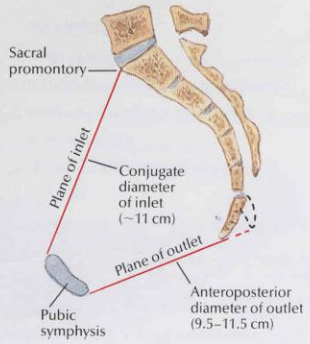


Male pelvis: anterior view

All measurements slightly shorter in relation to body size than in female
Pelvic inlet oriented more antero-posteriorly than in female where it tends to be transversely oval
Pubic symphysis deeper (taller)
Pubic arch (subpubic angle) narrower
Ischial tuberosities less far apart
Iliac wings less flared



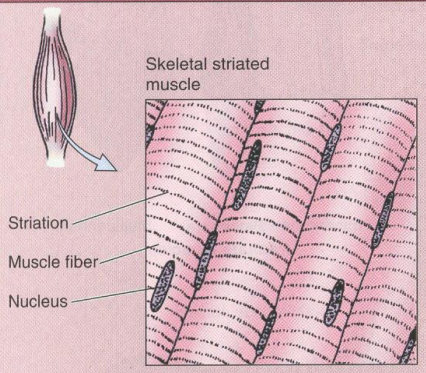
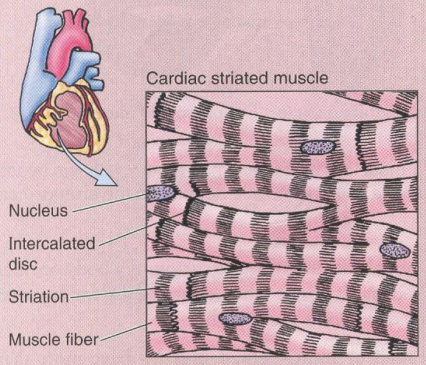
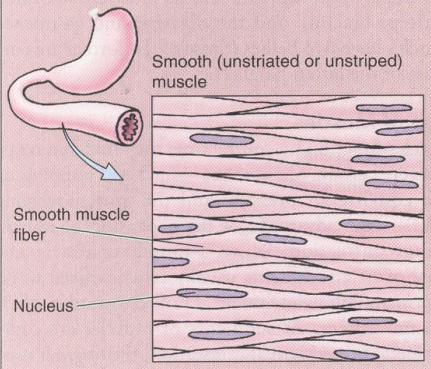
Female pelvis: inferior view



Female: sagittal section

OTOT
(MUSCULUS)

Table I.1. Types of Muscle

Muscle Type	Location	Appearance of Cells	Type of Activity	Stimulation
	Composes gross, named muscles (e.g., biceps of arm) attached to skeleton and fascia of limbs, body wall, and head/neck	Large, very long, unbranched, cylindrical fibers with transverse striations (stripes) arranged in parallel bundles; multiple, peripherally located nuclei	Strong, quick intermittent (phasic) contraction above a baseline tonus; acts primarily to produce movement or resist gravity	Voluntary (or reflexive) by somatic nervous system
	Muscle of heart (myocardium) and adjacent portions of great vessels (aorta, vena cava)	Branching and anastomosing shorter fibers with transverse striations (stripes) running parallel and connected end to end by complex junctions (intercalated discs); single, central nucleus	Strong, quick, continuous rhythmic contraction; acts to pump blood from heart	Involuntary; intrinsically (myogenically) stimulated and propagated; rate and strength of contraction modified by autonomic nervous system
	Walls of hollow viscera and blood vessels, iris, and ciliary body of eye; attached to hair follicles of skin (arrector muscle of hair)	Single or agglomerated small, spindle-shaped fibers without striations; single, central nucleus	Weak, slow, rhythmic, or sustained tonic contraction; acts mainly to propel substances (peristalsis) and to restrict flow (vasoconstriction and sphincteric activity)	Involuntary by autonomic nervous system

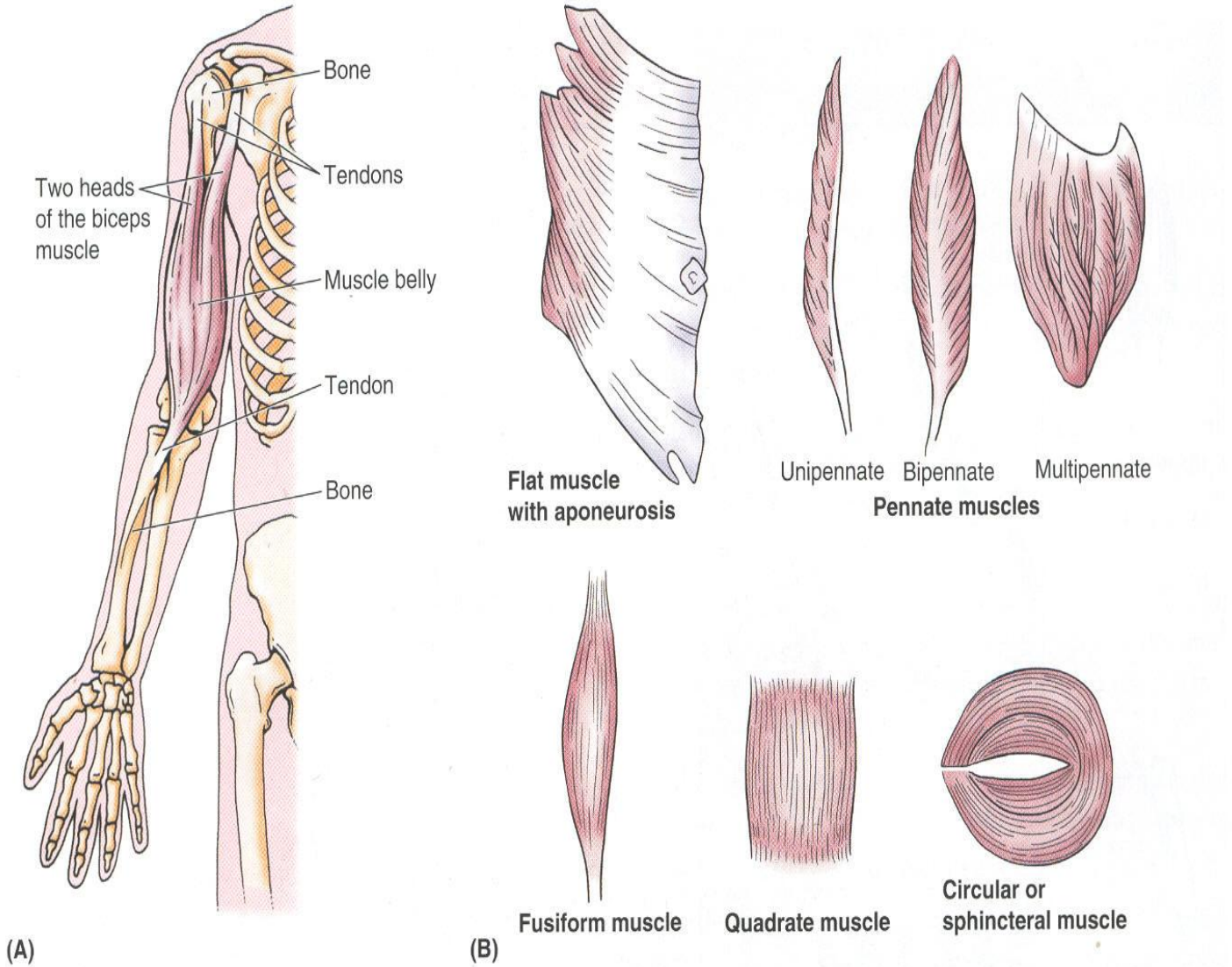


Figure I.18. Skeletal muscles. A. The belly is the fleshy contractile part of a muscle. This muscle has a belly with two heads; tendons provide attachment to bone at both ends. **B.** The architecture and shape of a skeletal muscle depend on the arrangement of its fibers.

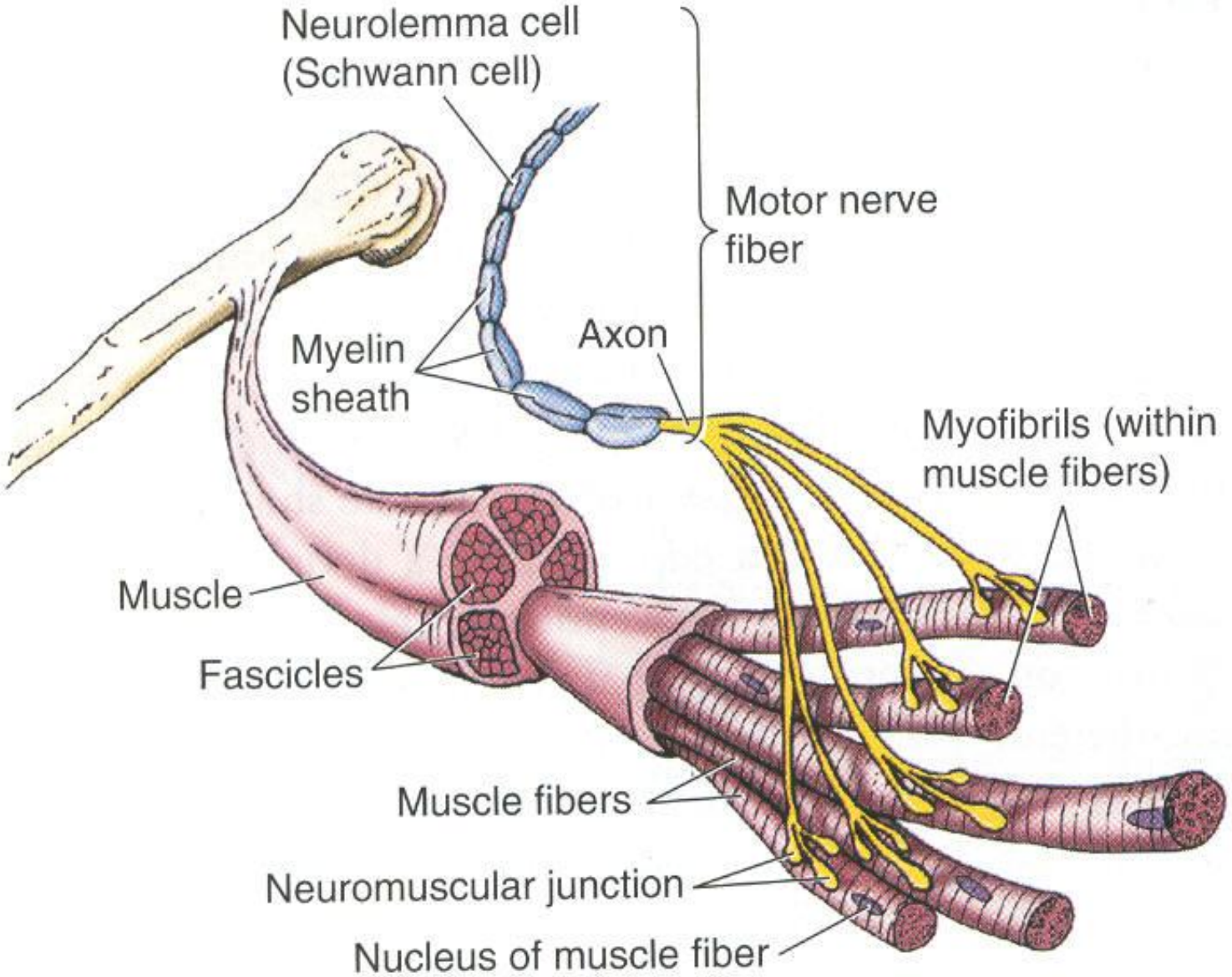


Figure I.21. Motor unit. A motor unit consists of a single motor neuron and the muscle fibers innervated by it.

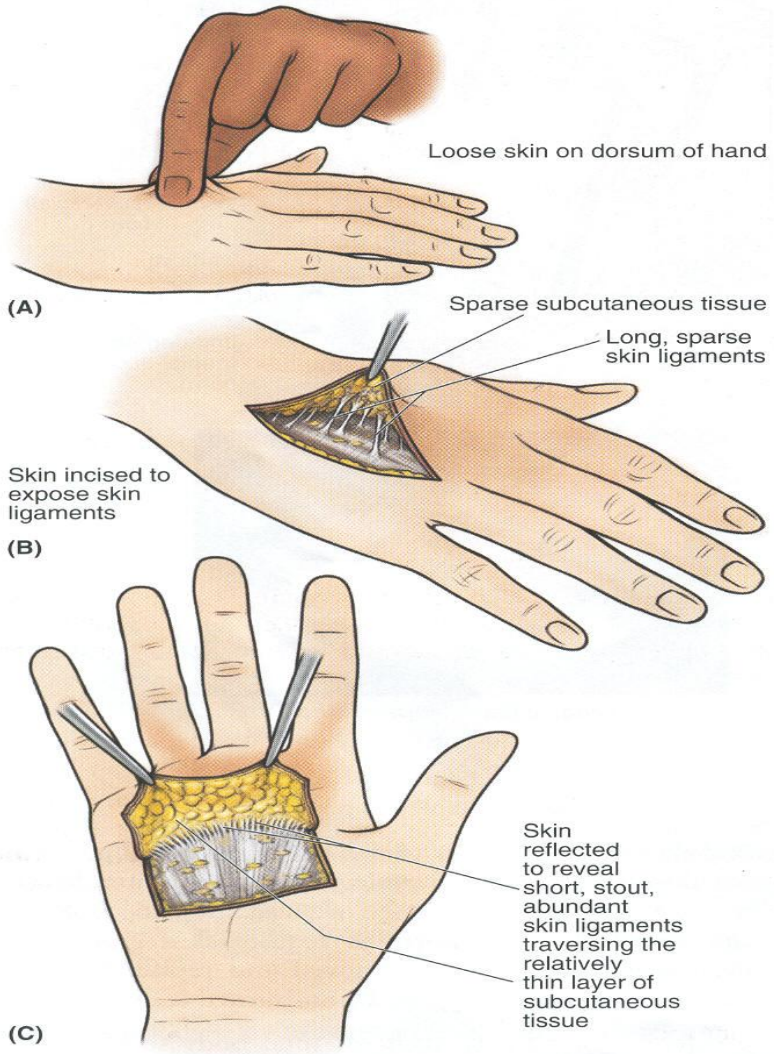


Figure I.8. Skin ligaments of subcutaneous tissue. A. The thickness of subcutaneous tissue can be estimated as being approximately half that of a pinched fold of skin (i.e., a fold of skin includes a double thickness of subcutaneous tissue). The dorsum of the hand has relatively little subcutaneous tissue. **B.** Long, relatively sparse skin ligaments allow the mobility of the skin demonstrated in part **A**. **C.** The skin of the palm of the hand (like that of the soles of the feet) is firmly attached to the underlying deep fascia.

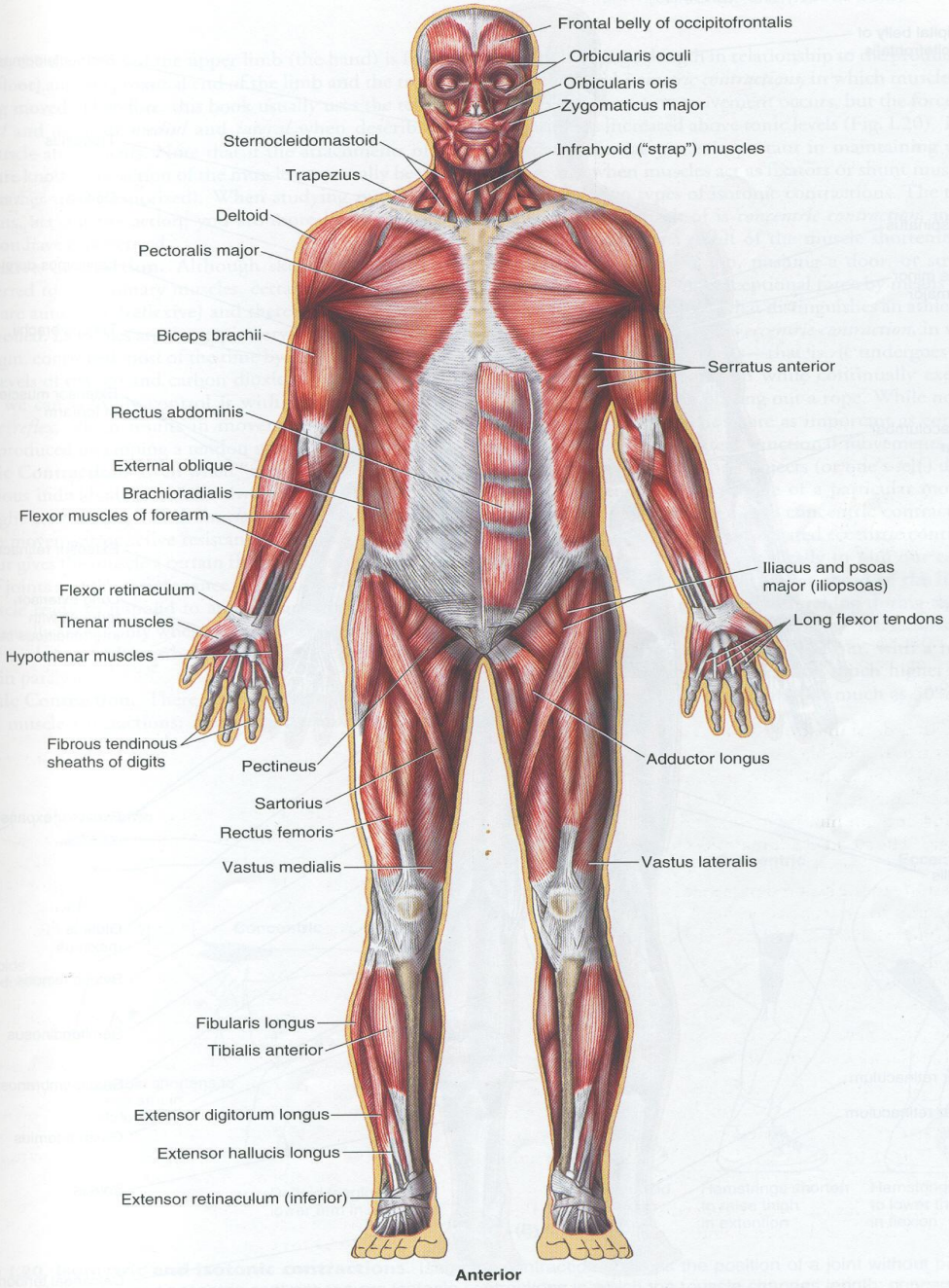
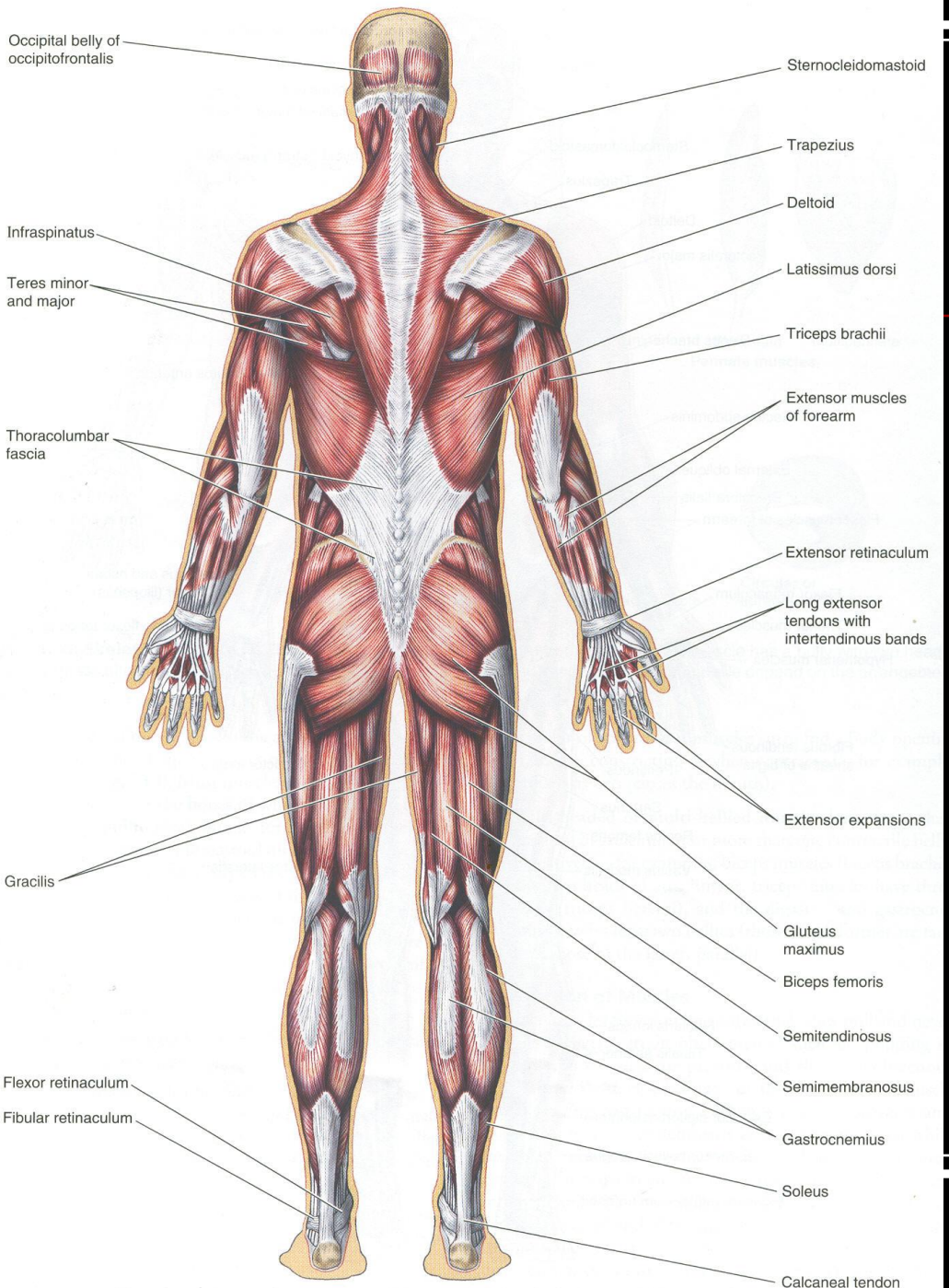


Figure I.19. Superficial skeletal muscles. Most of these muscles move the skeleton, but some muscles move other parts (e.g., the eyeballs and scalp). The sheath of the left rectus abdominis has been opened to reveal the muscle. The orbicularis oris encircles the mouth and plays important roles in controlling entrance and exit, chewing, speech, and facial expression.


Occipital belly of occipitofrontalis
Sternocleidomastoid
Trapezius
Deltoid
Infraspinatus
Teres minor and major
Latissimus dorsi
Triceps brachii
Extensor muscles of forearm
Thoracolumbar fascia
Extensor retinaculum
Long extensor tendons with intertendinous bands
Extensor expansions
Gracilis
Gluteus maximus
Biceps femoris
Semitendinosus
Semimembranosus
Flexor retinaculum
Fibular retinaculum
Gastrocnemius
Soleus
Calcaneal tendon
Posterior

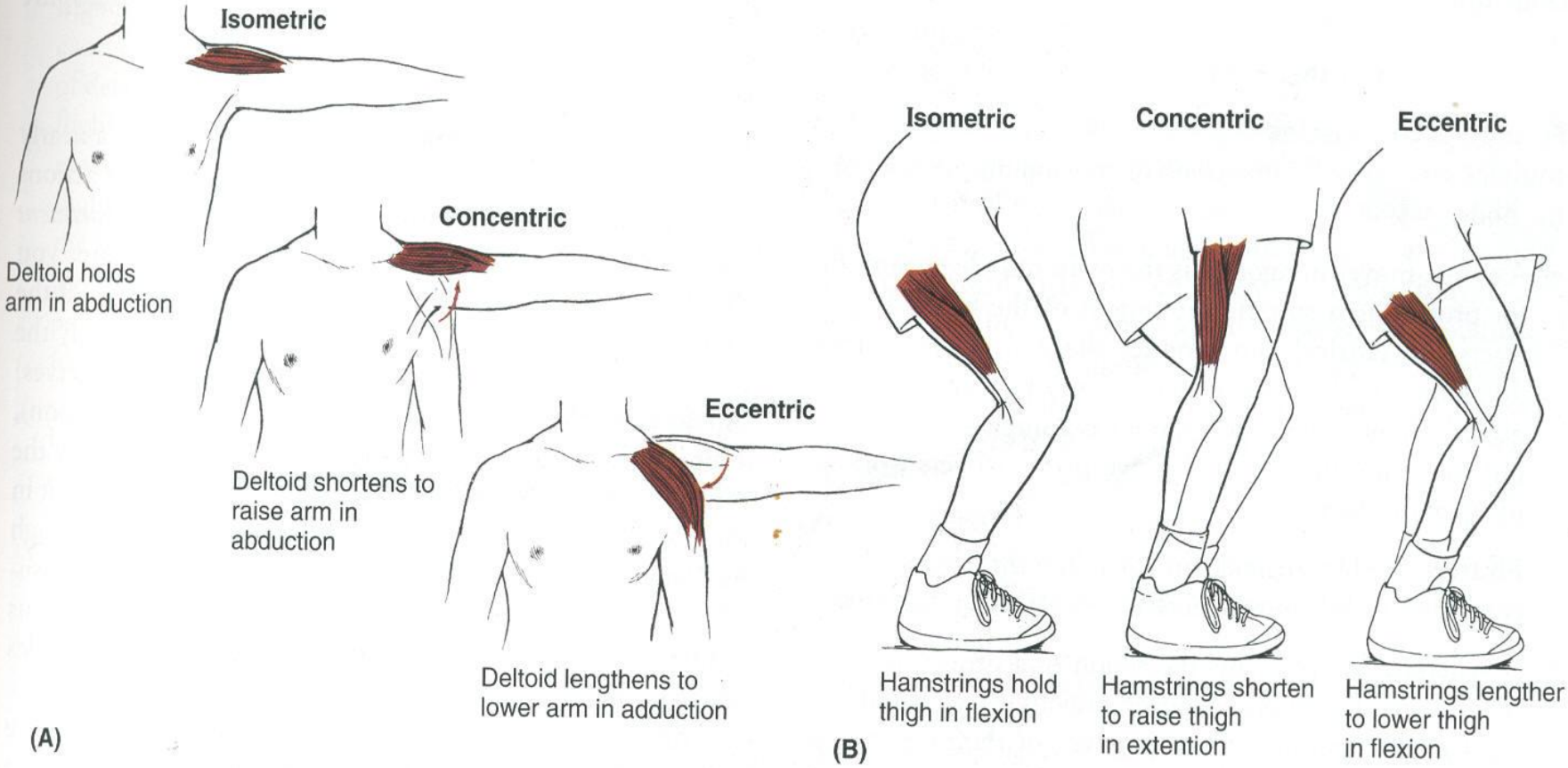


Figure I.20. Isometric and isotonic contractions. Isometric contraction sustains the position of a joint without producing movement. Concentric and eccentric contractions are isotonic contractions in which the muscle changes length: concentric contractions by shortening, and eccentric contractions by actively controlled lengthening (relaxation).

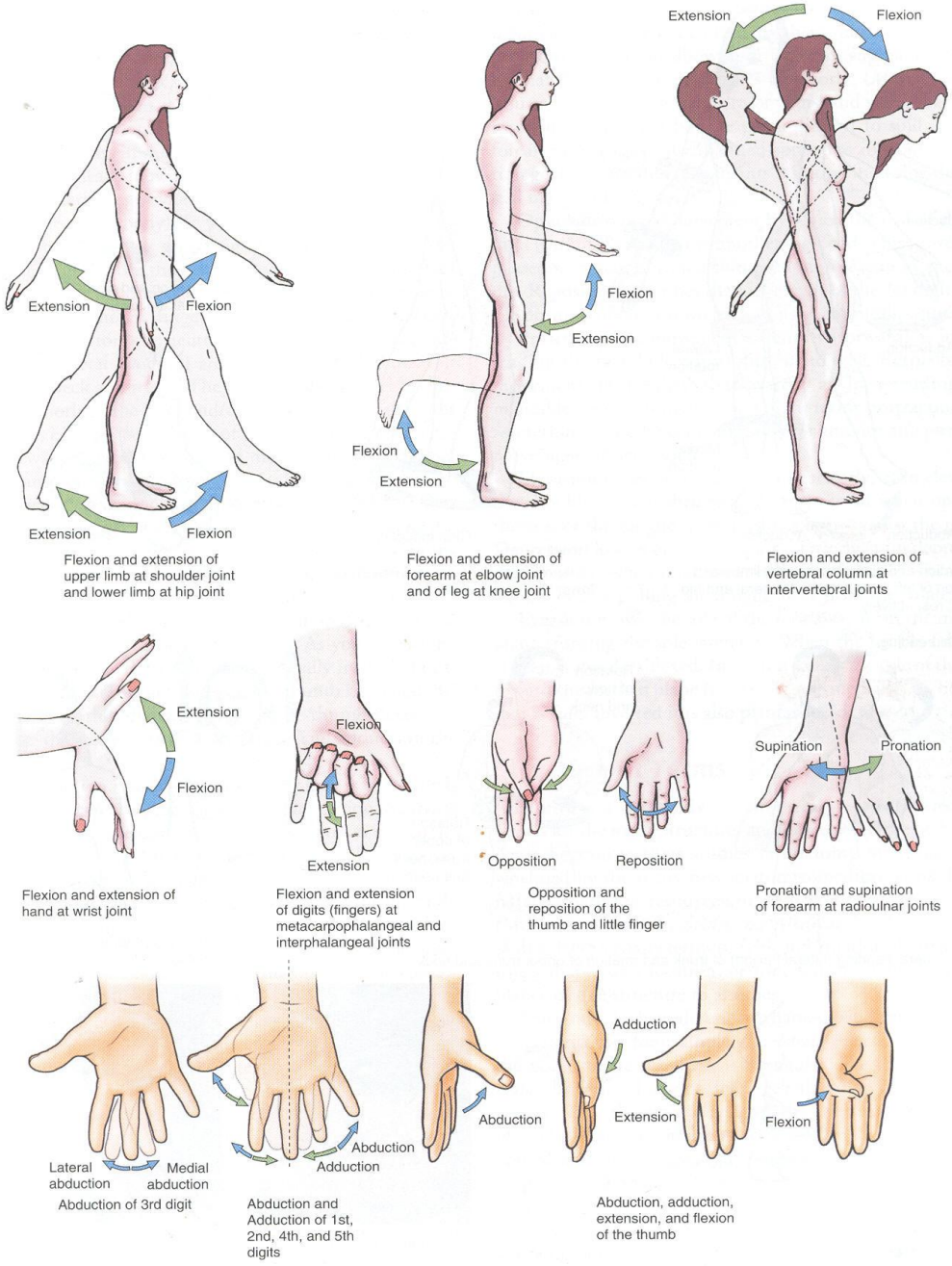
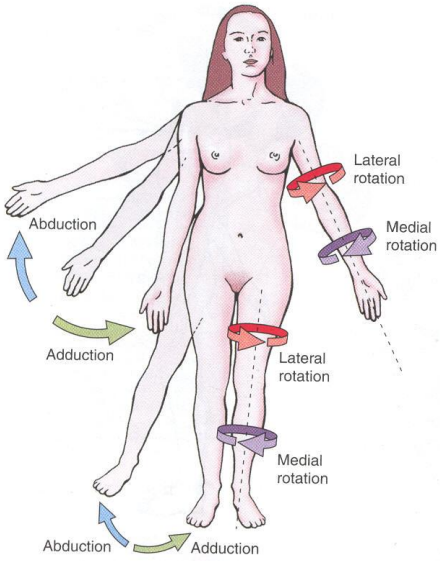
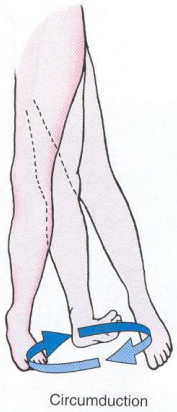


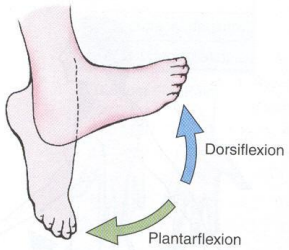
Figure I.5. Terms of movement. These terms describe movements of the limbs and other parts of the body; the movements take place at joints, where two or more bones or cartilages articulate with one another.



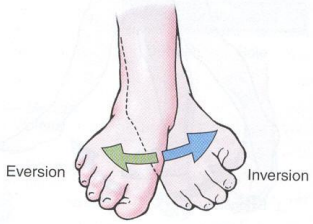
Abduction and adduction of right limbs and rotation of left limbs at glenohumeral and hip joints, respectively



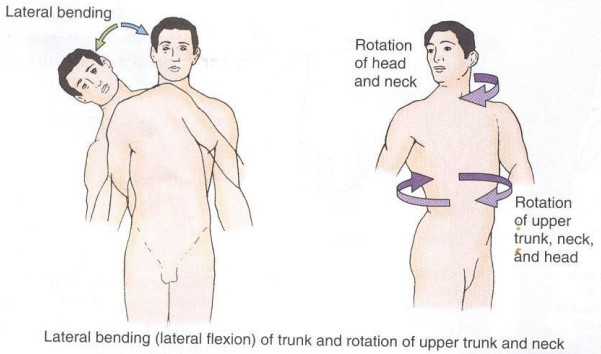
Circumduction (circular movement) of lower limb at hip joint



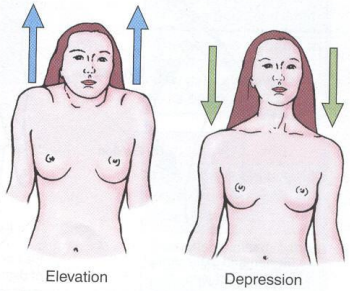
Dorsiflexion and plantarflexion of foot at ankle joint



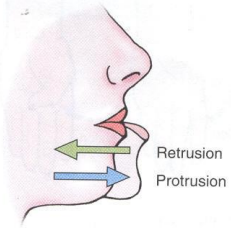
Inversion and eversion of foot at subtalar and transverse tarsal joints



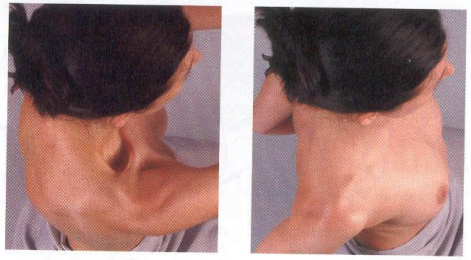
Lateral bending (lateral flexion) of trunk and rotation of upper trunk and neck



Elevation and depression of shoulders



Protrusion and retrusion of jaw at temporomandibular joints



Protraction and retraction of scapula on thoracic wall

Figure I.5. *(Continued)*

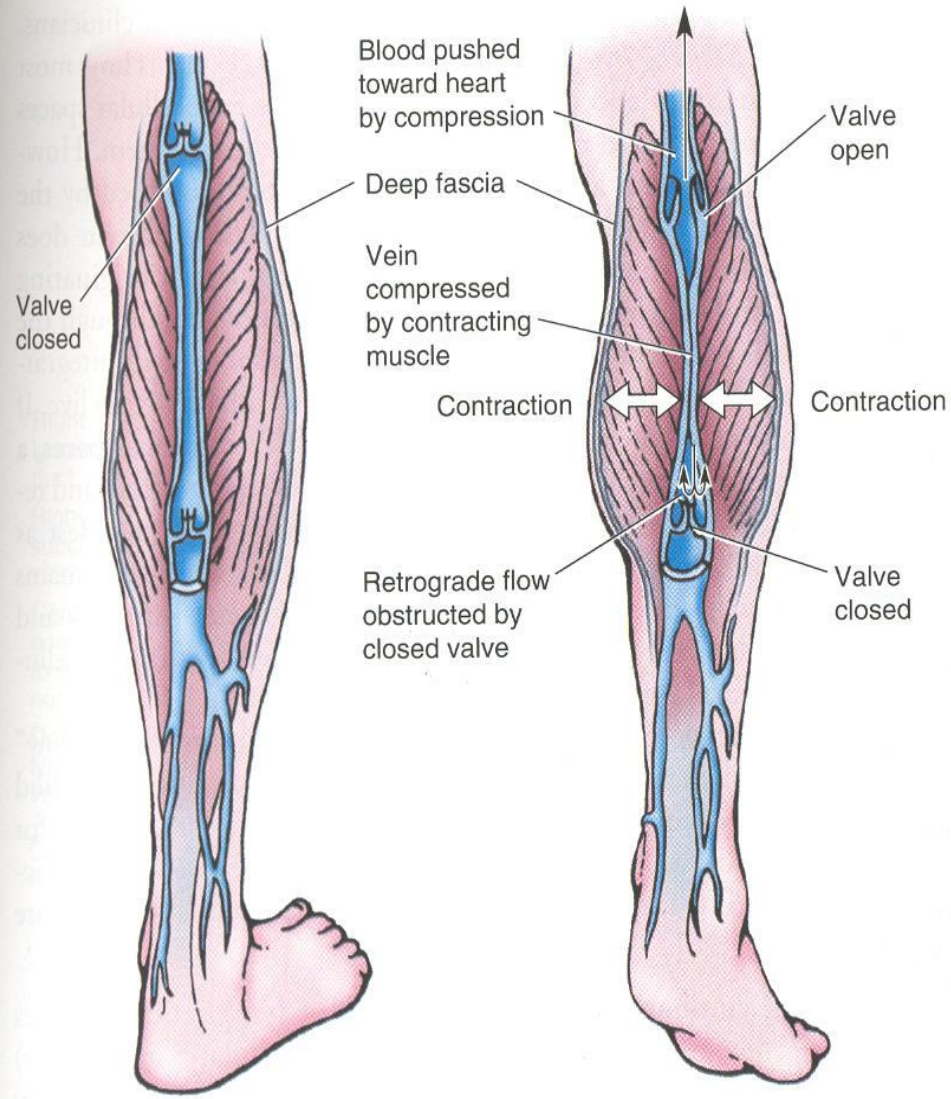


Figure I.25. Musculovenous pump. Muscular contractions in the limbs function with the venous valves to move blood toward the heart. The outward expansion of the bellies of contracting muscles is limited by deep fascia and becomes a compressive force, propelling the blood against gravity. *Black arrows* indicate the direction of blood flow.

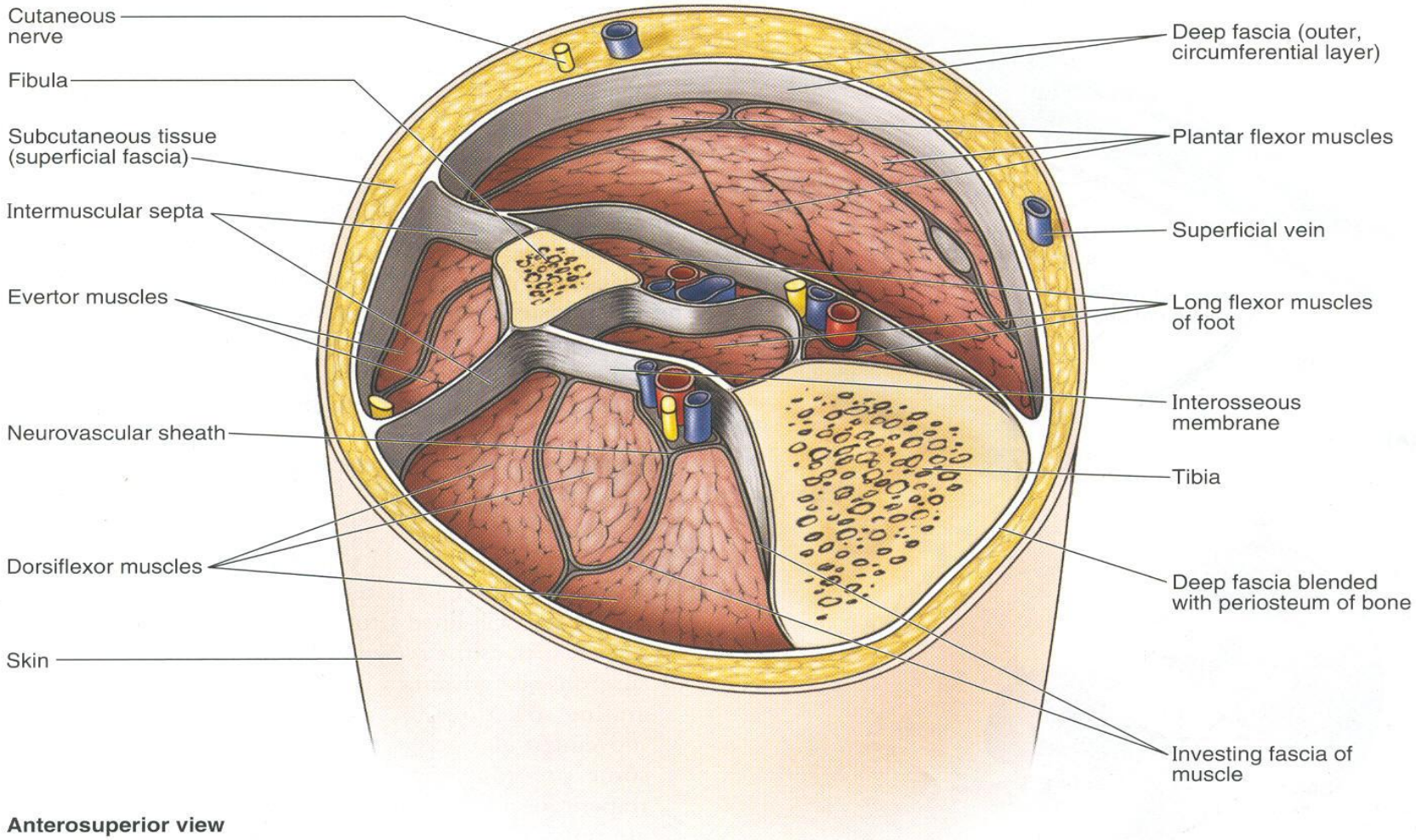


Figure I.9. Excavated section of the leg demonstrating the deep fascia and fascial formations. Deep to the skin and subcutaneous tissue, a circumferential layer of deep fascia covers the musculoskeletal structures. Thick intermuscular septa extend centrally from the outer layer, forming fascial compartments containing muscles of similar function. Individual muscles are covered by investing fascia.

Varicose Veins

When the walls of veins lose their elasticity, they become weak. A weakened vein dilates under the pressure of supporting a column of blood against gravity. This results in *varicose veins*—abnormally swollen, twisted veins—most often seen in the legs (Fig. BI.8). Varicose veins have a caliber greater than normal, and their valve cusps do not meet or have been destroyed by inflammation. These veins have *incompetent valves;* thus the column of blood ascending toward the heart is unbroken, placing increased pressure on the weakened walls, further exacerbating the varicosity problem. Varicose veins also occur in the presence of degenerated deep fascia. Such incompetent fascia is incapable of containing the expansion of contracting muscles; thus the (musculofascial) musculovenous pump is ineffective.

Figure BI.8.

TERIMA KASIH, SEMOGA DAPAT BERMANFAAT…… AMIIEN .-

BILA ADA SALAH KATA YANG SAYA SAMPAIKAN, ITU SEMATA KESALAHAN SAYA ; DAN APABILA YANG SAYA SAMPAIKAN BENAR , ITU SEMATA HANYA KARENA ALLOH ……