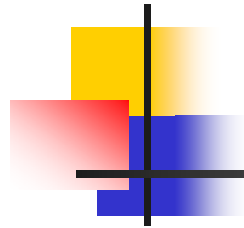




Human Anatomy

Surface Anatomy

www.fisiokinesiterapia.biz



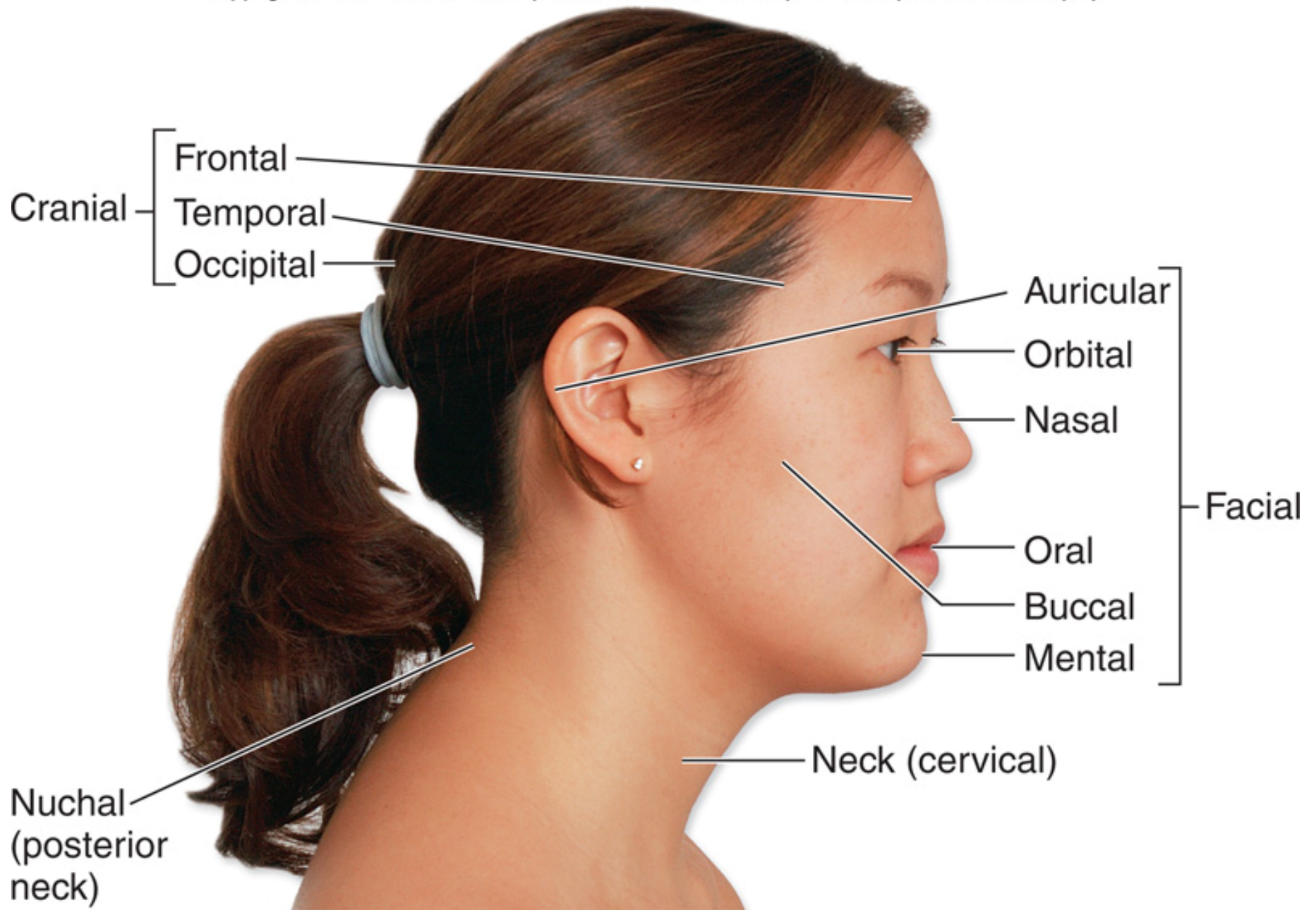
Surface Anatomy

- A branch of gross anatomy that examines shapes and markings on the surface of the body as they relate to deeper structures.
- Essential in locating and identifying anatomic structures prior to studying internal gross anatomy.
- Health-care personnel use surface anatomy to help diagnose medical conditions and to treat patients.

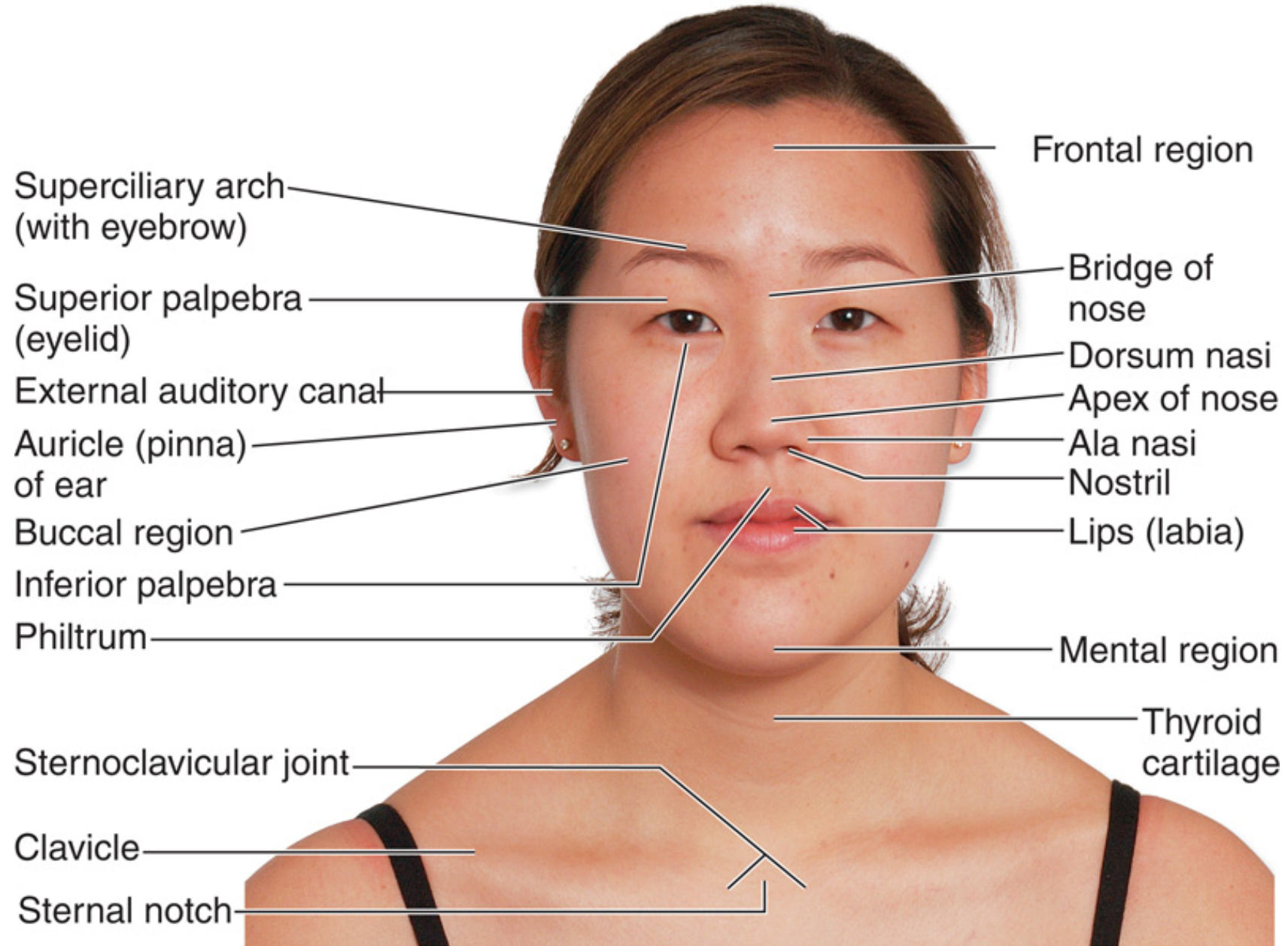


Surface Anatomy

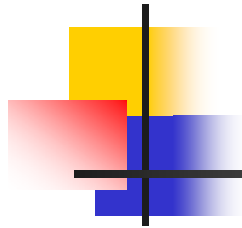
- four techniques when examining surface anatomy
- visual inspection
 - directly observe the structure and markings of surface features
- palpation
 - feeling with firm pressure or perceiving by the sense of touch)
 - precisely locate and identify anatomic features under the skin
- percussion
 - tap sharply on specific body sites to detect resonating vibrations
- auscultation
 - listen to sounds emitted from organs



(a) Lateral view



(b) Anterior view



Cranium

- Cranium (cranial region or braincase) is covered by the scalp, which is composed of skin and subcutaneous tissue.
- Cranium can be subdivided into three regions, each having prominent surface anatomy features.
 - the frontal region of the cranium is the forehead
 - covering the frontal region is the frontalis muscle, which overlies the frontal bone
 - the frontal region terminates at the superciliary arches



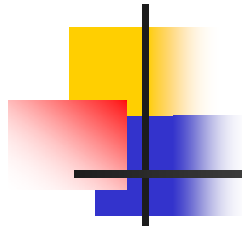
Face – The Auricular Region

- Composed of the visible surface structures of the ear as well as the ear's internal organs, which function in hearing and maintaining equilibrium.
- Auricle, or pinna, is the fleshy part of the external ear.
- Within the auricle is a tubular opening into the middle ear called the external auditory canal.
- The mastoid process is posterior and inferior to the auricle.



The Face – Orbital (or Ocular) Region

- Includes the eyeballs and associated structures.
- Surface features protect the eye.
- Eyebrows protect against sunlight and potential mechanical damage.
- Eyelids close reflexively to protect against objects moving near the eye.
- Eyelashes prevent airborne particles from contacting the eyeball.
- The superior palpebral fissure, or upper eyelid crease.
 - Asians do not have a superior palpebral fissure



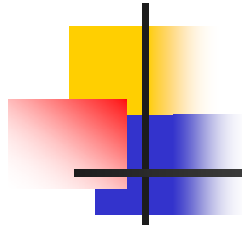
The Face – Nasal Region

- Contains the nose.
 - the bridge; it is formed by the union of the nasal bones
- The fleshy part of the nose is called the dorsum nasi.
- The tip of the nose is called the apex.
- Nostrils, or external nares, are the paired openings into the nose.
- Ala nasi (wing of the nose) forms the flared lateral margin of each nostril.



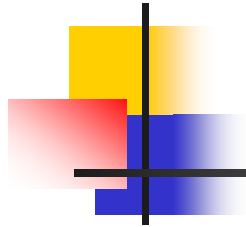
The Face – Oral Region

- Inferior to the nasal region.
- Includes the buccal (cheek) region, the fleshy upper and lower lips (labia), and the structures of the oral cavity (mouth) that can be observed when the mouth is open.
- The vertical depression between your nose and upper lip is called the philtrum.



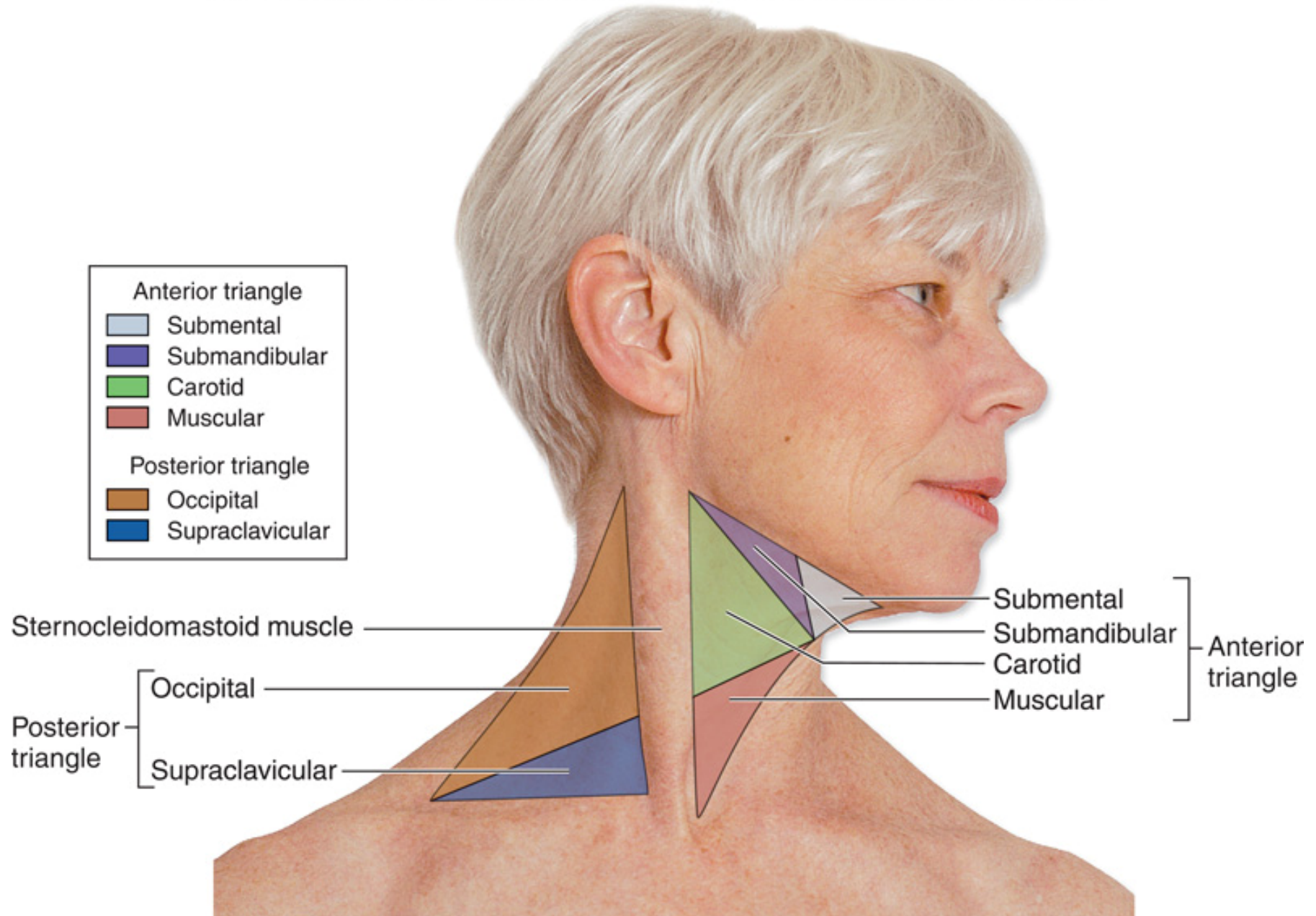
The Face – Mental Region

- The mental region contains the mentum, or chin.
- The mentum tends to be pointed and almost triangular in females.
- Males tend to have a “squared-off” mentum.



Triangles of the Neck

- Neck/cervical region/cervix is a complex region that connects the head to the trunk.
- Spinal cord, nerves, trachea, esophagus, and major vessels traverse this highly flexible area.
- Neck contains other organs and several important glands.
- Neck can be subdivided into anterior, posterior, and lateral regions.





The Anterior Region of the Neck

- Has several palpable landmarks, including the larynx, trachea, and sternal notch.
- The larynx.
 - found in the middle of the neck
 - composed of multiple cartilages
 - thyroid cartilage
 - “Adam’s apple”
- Inferior to the larynx are the cricoid cartilage and trachea.
- Terminates at the sternal (jugular) notch of the manubrium and the left and right clavicles.



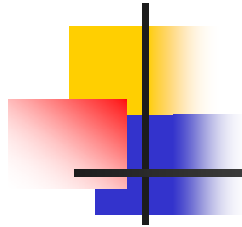
The Nuchal Region

- The posterior neck region.
- Houses the spinal cord, cervical vertebrae, and associated structures.
- The bump at the lower boundary of this region is the vertebra prominens.
- Superiorly along the midline of the neck, is the ligamentum nuchae, a thick ligament that runs from C7 to the nuchal lines of the skull.



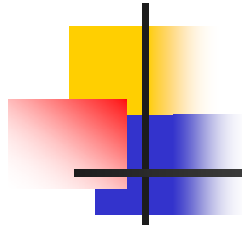
Left and Right Lateral Portions of the Neck

- Contain the sternocleidomastoid muscles which partitions the neck into two clinically important triangles, an anterior triangle and a posterior triangle.
- Each triangle houses important structures that run through the neck.
- Triangles are further subdivided into smaller triangles.
- Anterior triangle lies anterior to the sternocleidomastoid muscle and inferior to the mandible.
 - subdivided into four smaller triangles
 - the submental, submandibular, carotid, and muscular triangles



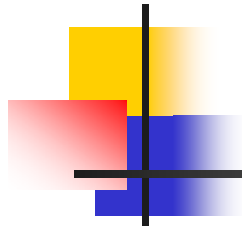
The Submental Triangle

- The most superiorly placed of the four triangles.
- Inferior to the chin in the midline of the neck.
- Partially bounded by the anterior belly of the digastric muscle.
- Contains some cervical lymph nodes and tiny veins.
- With illness these lymph nodes enlarge and become tender.
- Palpation can determine if an infection is present.



The Submandibular Triangle

- Inferior to the mandible and lateral to the submental triangle.
- Bounded by the mandible and the bellies of the digastric muscle.
- The submandibular gland is the bulge under the mandible.



The Carotid Triangle

- Bounded by the sternocleidomastoid, omohyoid, and posterior digastric muscles.
- The strong pulsation is the common carotid artery.
- Contains the internal jugular vein and some cervical lymph nodes.



The Muscular Triangle

- Most inferior of the four triangles.
- Contains the sternohyoid and sternothyroid muscles, as well as the lateral edges of the larynx and the thyroid gland.
- Also contains cervical lymph nodes which are present throughout the neck.



The Posterior Triangle

- Lateral region of the neck.
- Posterior to the sternocleidomastoid muscle.
- Superior to the clavicle inferiorly.
- Anterior to the trapezius muscle.
- Subdivided into two smaller triangles.
 - the occipital triangle
 - supraclavicular triangle



The Occipital Triangle

- Larger and more posteriorly placed.
- Bounded by the omohyoid, trapezius, and sternocleidomastoid muscles.
- Contains the external jugular vein, the accessory nerve, the brachial plexus, and some lymph nodes.



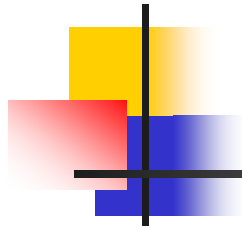
Supraclavicular Triangle

- Also called omoclavicular and subclavian.
- Bounded by the clavicle, omohyoid, and sternocleidomastoid muscles.
- Contains part of the subclavian vein and artery as well as some lymph nodes.



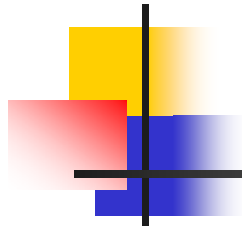
Thorax

- The superior portion of the trunk sandwiched between the neck superiorly and the abdomen inferiorly.
- Consists of the chest and the “upper back.”
- On the anterior surface of the chest are the two dominating surface features of the thorax.
 - the clavicles and the sternum



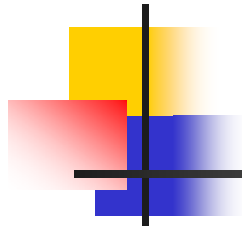
The Clavicles

- Paired clavicles and the sternal (jugular) notch represent the border between the thorax and the neck.
- On the superior anterior surface where they extend between the base of the neck on the right and left sides laterally to the shoulders.
- Left and right costal margins of the rib cage form the inferior boundary of the thorax.
- Costal angle (costal arch) is where the costal margins join to form an inverted V at the xiphoid process.
- On a thin person, many of the ribs can be seen.
- Most of the ribs (with the exception of the first one) can be palpated.



The Sternum

- Palpated readily as the midline bony structure in the thorax.
- The manubrium, the body, and the xiphoid process may also be palpated.
- Sternal angle can be felt as an elevation between the manubrium and the body.
- Sternal angle is clinically important because it is at the level of the costal cartilage of the second rib.
 - it is often used as a landmark for counting the ribs



The Abdomen

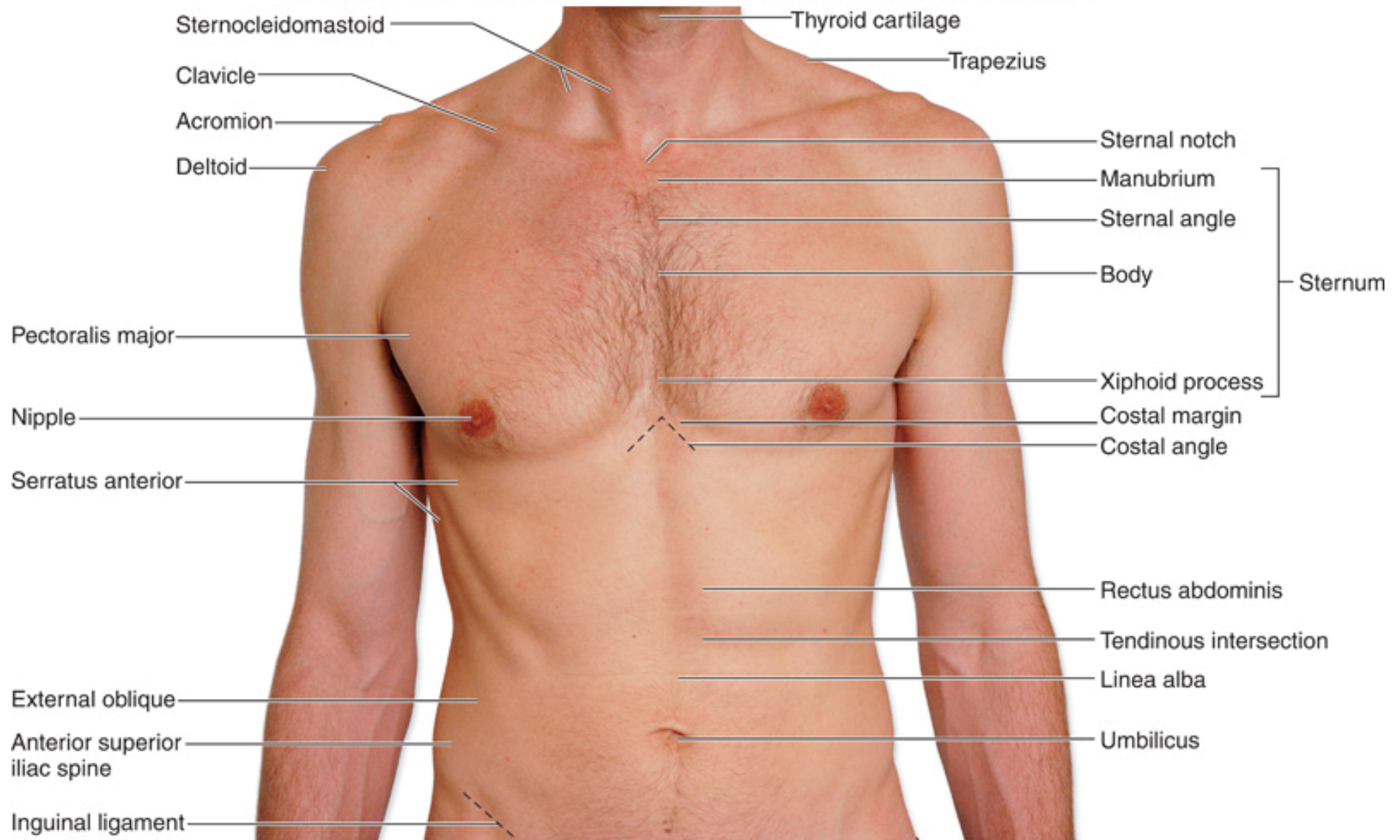
- On the anterior surface of the abdomen, the umbilicus (navel) is the prominent depression or projection in the midline of the abdominal wall.
- In the midline of the abdominal anterior surface is the linea alba, a tendinous structure that extends inferiorly from the xiphoid process to the pubic symphysis.
- The left and right rectus abdominis muscles and their tendinous insertions are referred to as "six-pack abs."
- The superior aspect of the ilium (iliac crest) terminates anteriorly at the anterior superior iliac spine.
- Attached to the anterior superior iliac spine is the inguinal ligament, which forms the lower boundary of the abdominal wall.



The Inguinal Ligament

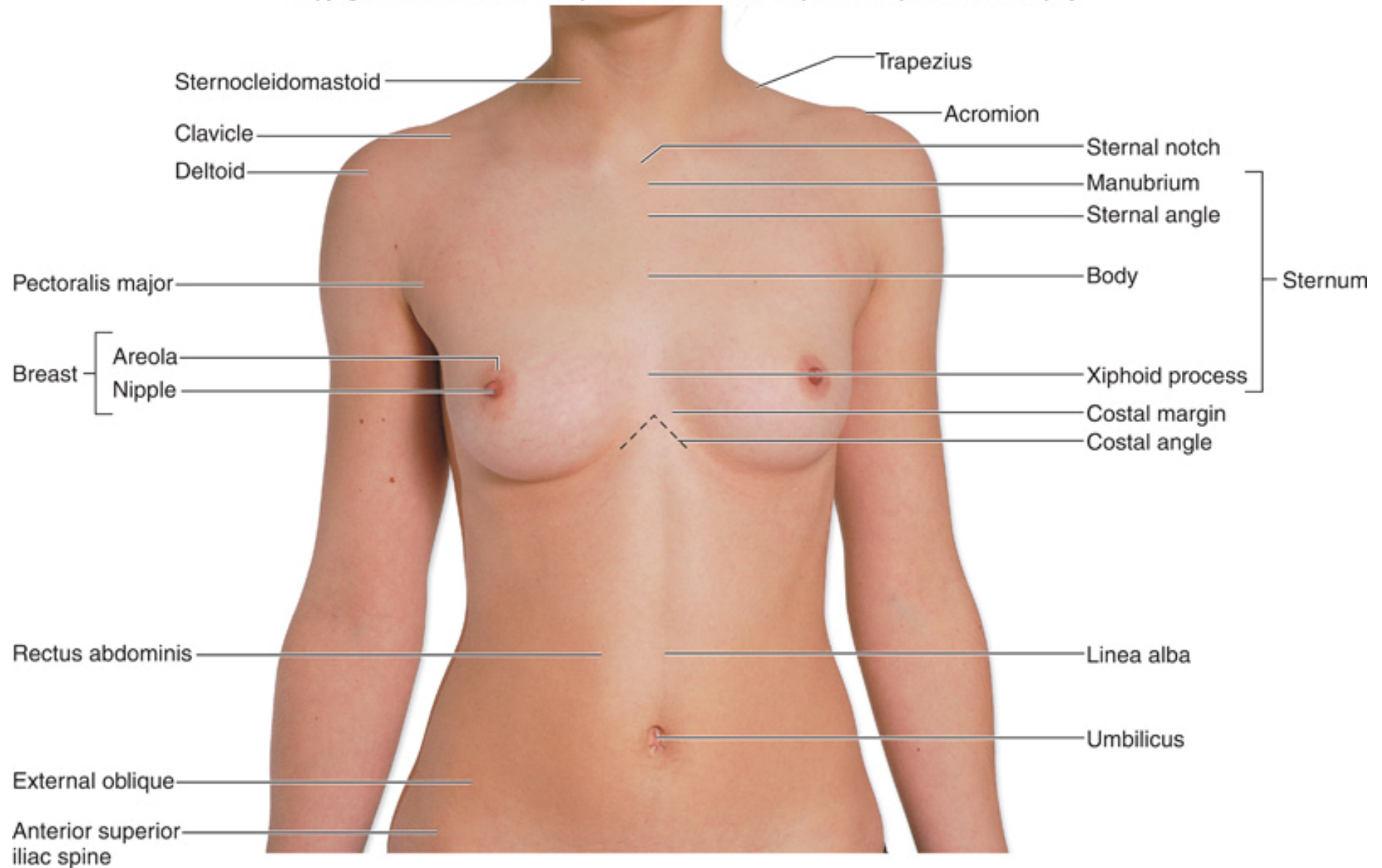
- Terminates on a little anterior bump on the pubis called the pubic tubercle.
- Superior to the medial portion of the inguinal ligament is the superficial inguinal ring.
 - a superficial opening in the lower anterior abdominal wall
 - represents a weak spot in the wall
 - can be palpated to detect an inguinal hernia

Copyright © The McGraw-Hill Companies, Inc. Permission required for reproduction or display.



(a) Male, anterior view

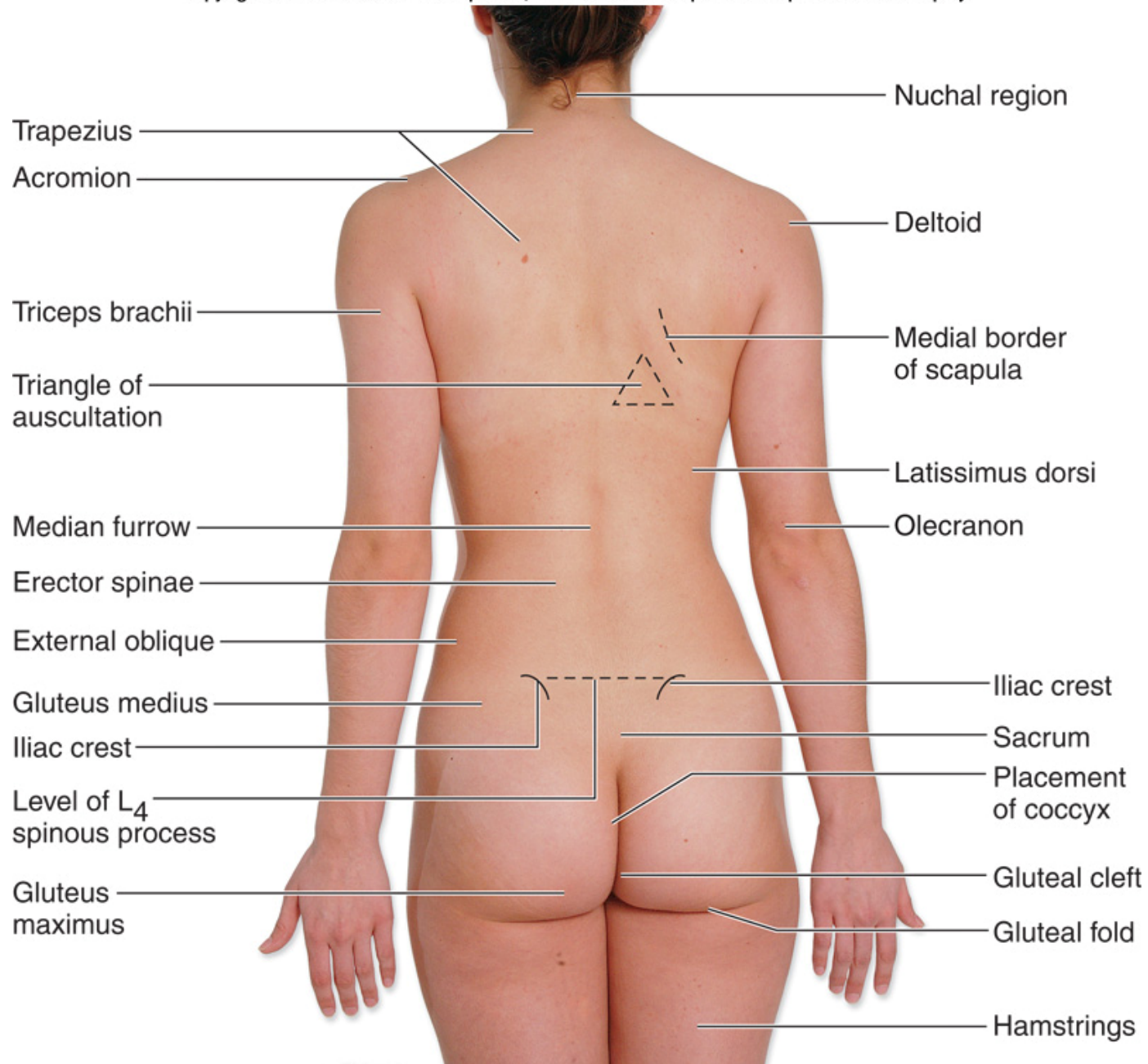
Copyright © The McGraw-Hill Companies, Inc. Permission required for reproduction or display.



(b) Female, anterior view



(a) Male, posterior view



(b) Female, posterior view

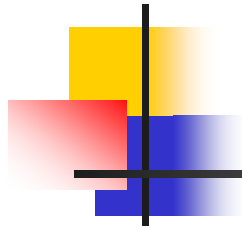


Anterolateral view



Shoulder and Upper Limb Region

- Clinically important because of frequent trauma to these body regions.
- Vessels of the upper limb are often used as pressure sites and as sites for drawing blood, providing nutrients and fluids, and administering medicine.



Shoulder

- The scapula, clavicle, and proximal part of the humerus collectively form the shoulder. The acromion is the bump on your anterior shoulder.
- The rounded curve of the shoulder is formed by the thick deltoid muscle, which is a frequent site for intramuscular injections.



Axilla

- Commonly called the armpit, is clinically important because of the nerves, axillary blood vessels, and lymph nodes located there.
- The pectoralis major forms the fleshy anterior axillary fold, which acts as the anterior border of the axilla.
- The latissimus dorsi and teres major muscles form the fleshy posterior axillary fold, which is the posterior border of the axilla.



Arm

- The brachium which extends from the shoulder to the elbow on the upper limb.
- On the anterior side of the arm, the cephalic vein is evident in muscular individuals as it traverses along the lateral border of the entire upper limb.
- This vein originates in a small surface depression, bordered by the deltoid and pectoralis major muscles, called the clavipectoral triangle.



Arm

- The basilic vein is sometimes evident along the medial side of the upper limb.
- Brachial artery becomes subcutaneous along the medial side of the brachium, and its pulse may be detected here.
- Clinically important in measuring blood pressure.



Right brachium, anterior view



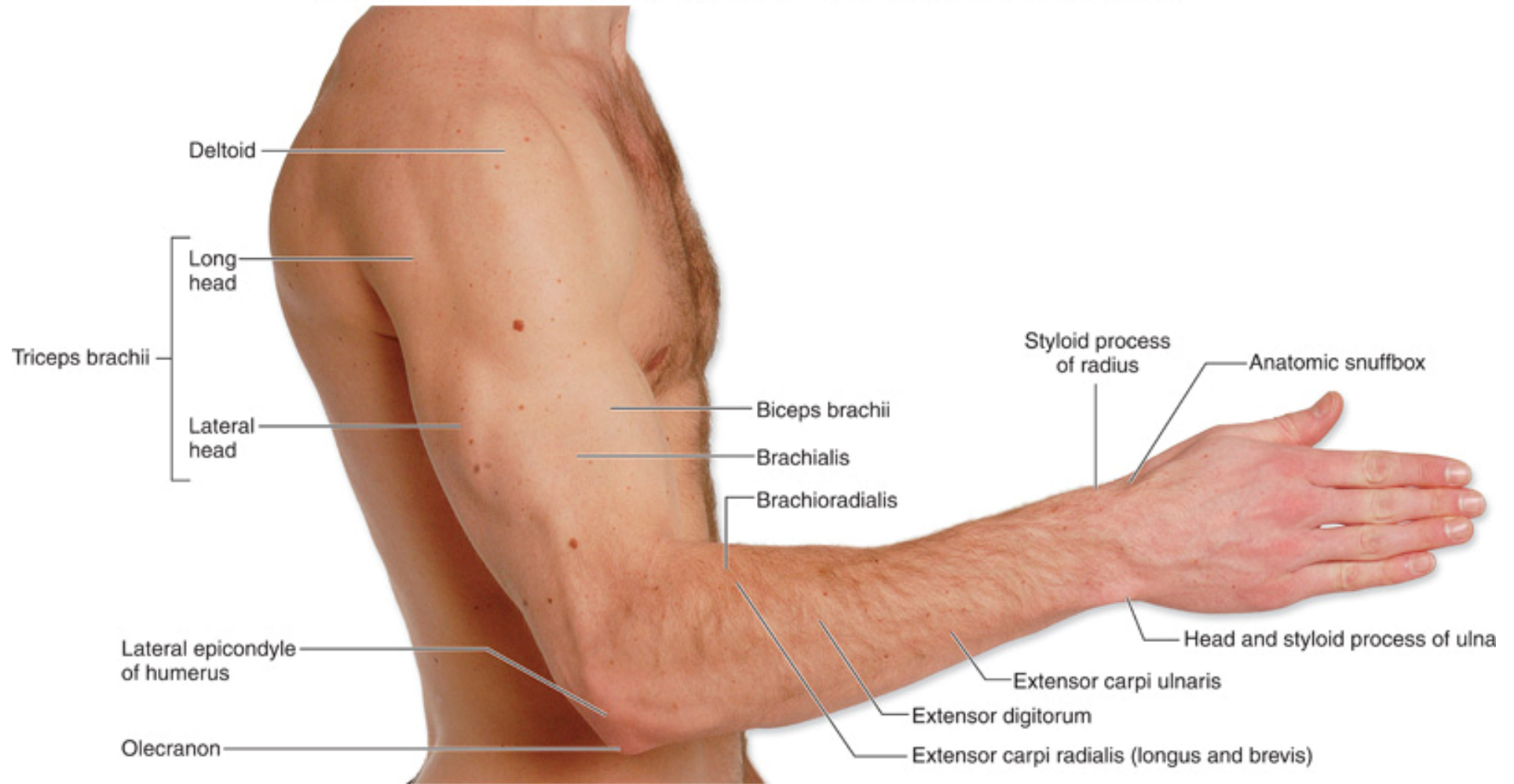
The Arm and Elbow

- The biceps brachii muscle becomes prominent when the elbow is flexed.
- Located on the anterior surface of the elbow region, the cubital fossa is a depression within which the median cubital vein connects the basilic and cephalic veins.
- The cubital fossa is a common site for venipuncture (removal of blood from a vein).

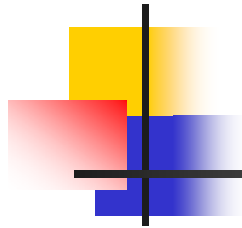


The Arm and Elbow

- The bulk of the posterior surface of the brachium is formed by the triceps brachii muscle.
- Three bony prominences are readily identified in the distal region of the brachium near the elbow.
- The lateral epicondyle of the humerus is a rounded lateral projection at the distal end of the humerus.
- The olecranon of the ulna is palpated easily along the posterior aspect of the elbow.
- The medial epicondyle of the humerus is more prominent and may be easily palpated.

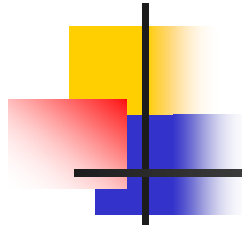


Right upper limb, lateral view



Forearm

- The radius, the ulna, and the muscles that control hand movements form the forearm, or antebrachium.
- Proximal part of the forearm is bulkier, due to the fleshy bellies of the forearm muscles.
- Distally, the forearm becomes thinner as you are palpating the tendons of these muscles.
- The styloid processes of the radius and ulna are readily palpable as the lateral and medial bumps along the wrist, respectively.

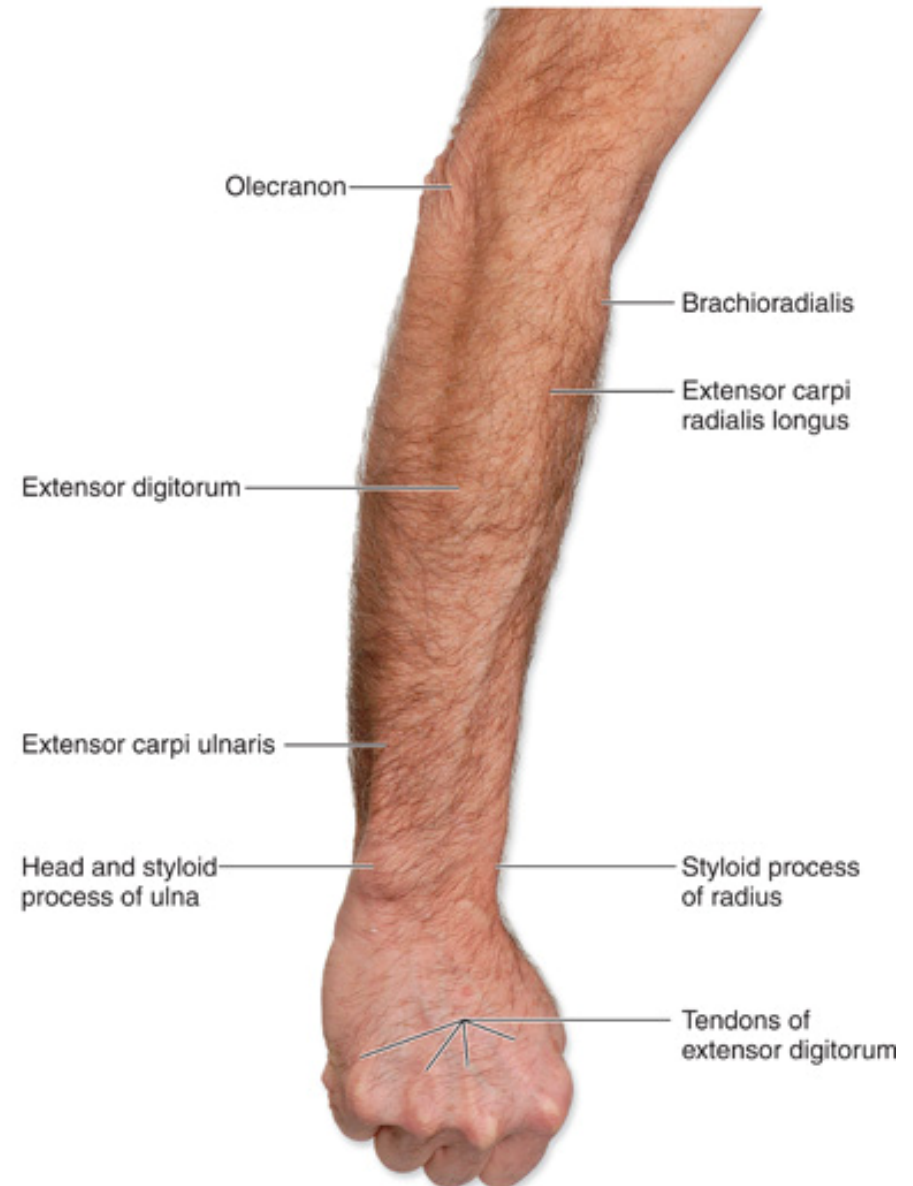


The Forearm

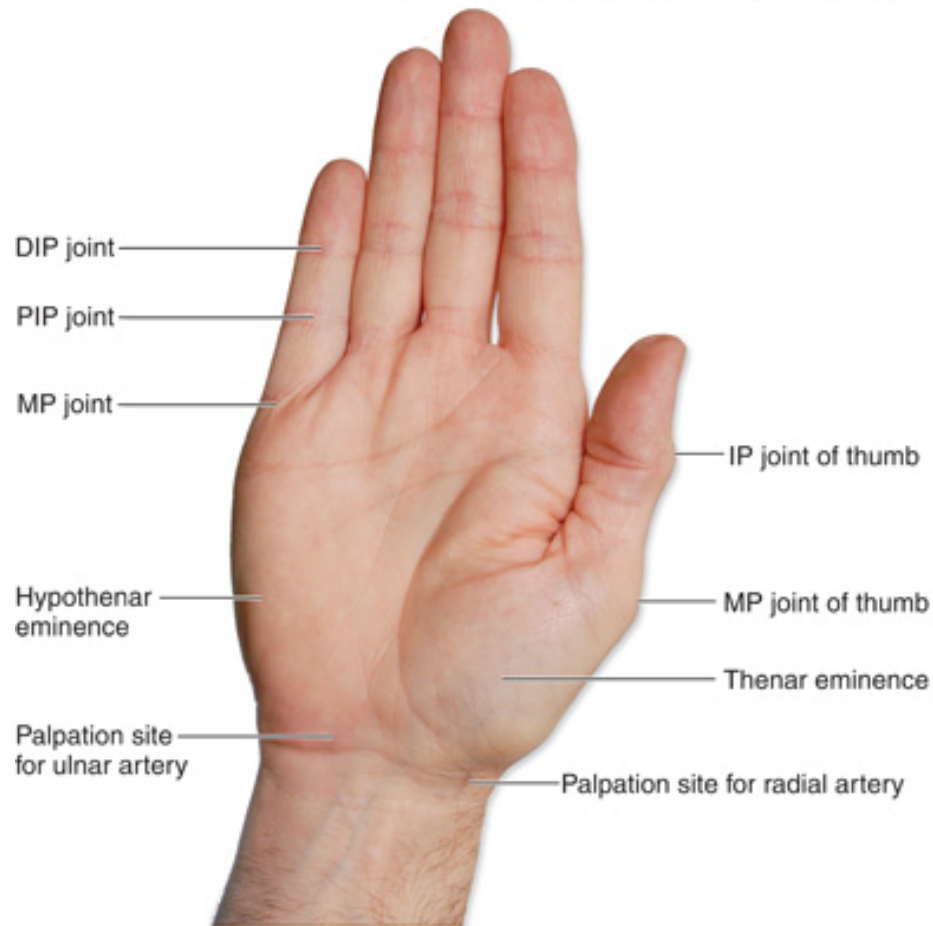
- Tendons of the extensor pollicis brevis, abductor pollicis longus, and extensor pollicis longus muscles mark the boundary of the triangular **anatomic snuffbox**.
- Palpate the pulse of the radial artery here.
- Palpate the scaphoid bone in this region.



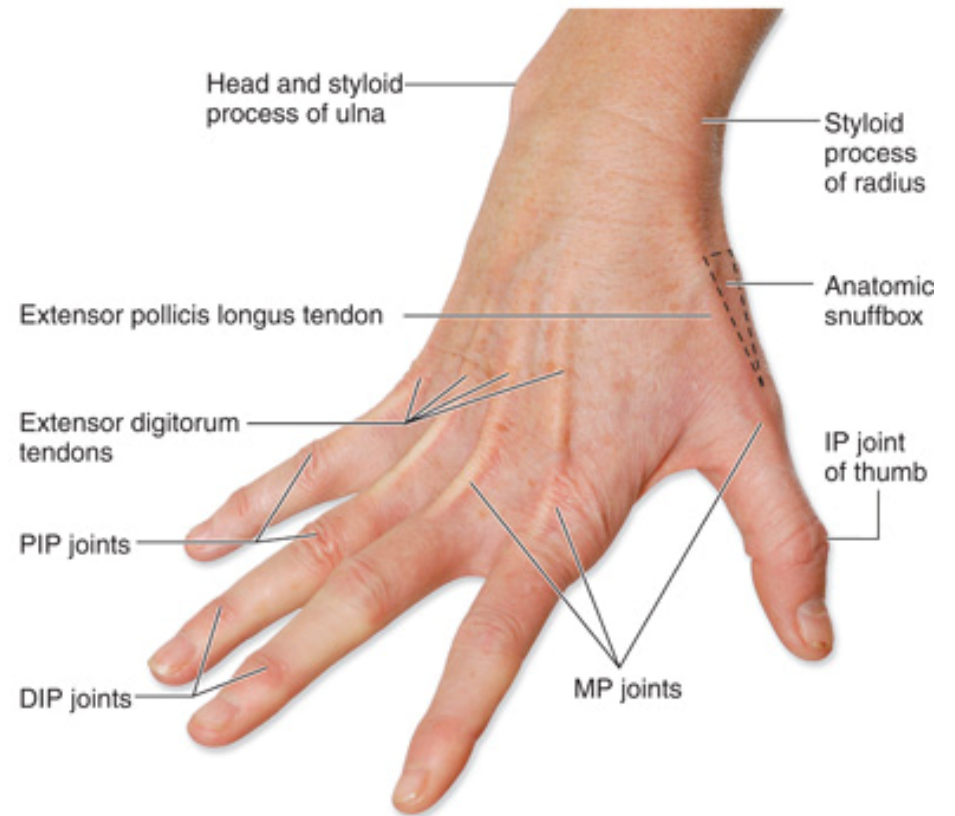
(a) Right forearm, anterior view



(b) Right forearm, posterior view



(a) Right hand, palmar view

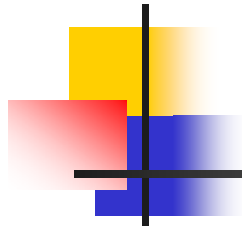


(b) Right hand, dorsal view



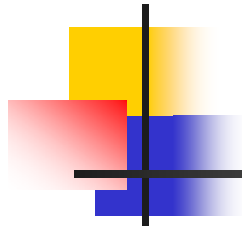
Gluteal Region

- The inferior border of the gluteus maximus muscle forms the gluteal fold.
- The gluteal (natal) cleft extends vertically to separate the buttocks into two prominences.
- In the inferior portion of each buttock, an ischial tuberosity can be palpated; these tuberosities support body weight while seated.
- The gluteus maximus muscle forms most of the inferolateral “fleshy” part of the buttock.
- The gluteus medius muscle may be palpated only in the superolateral portion of each buttock.



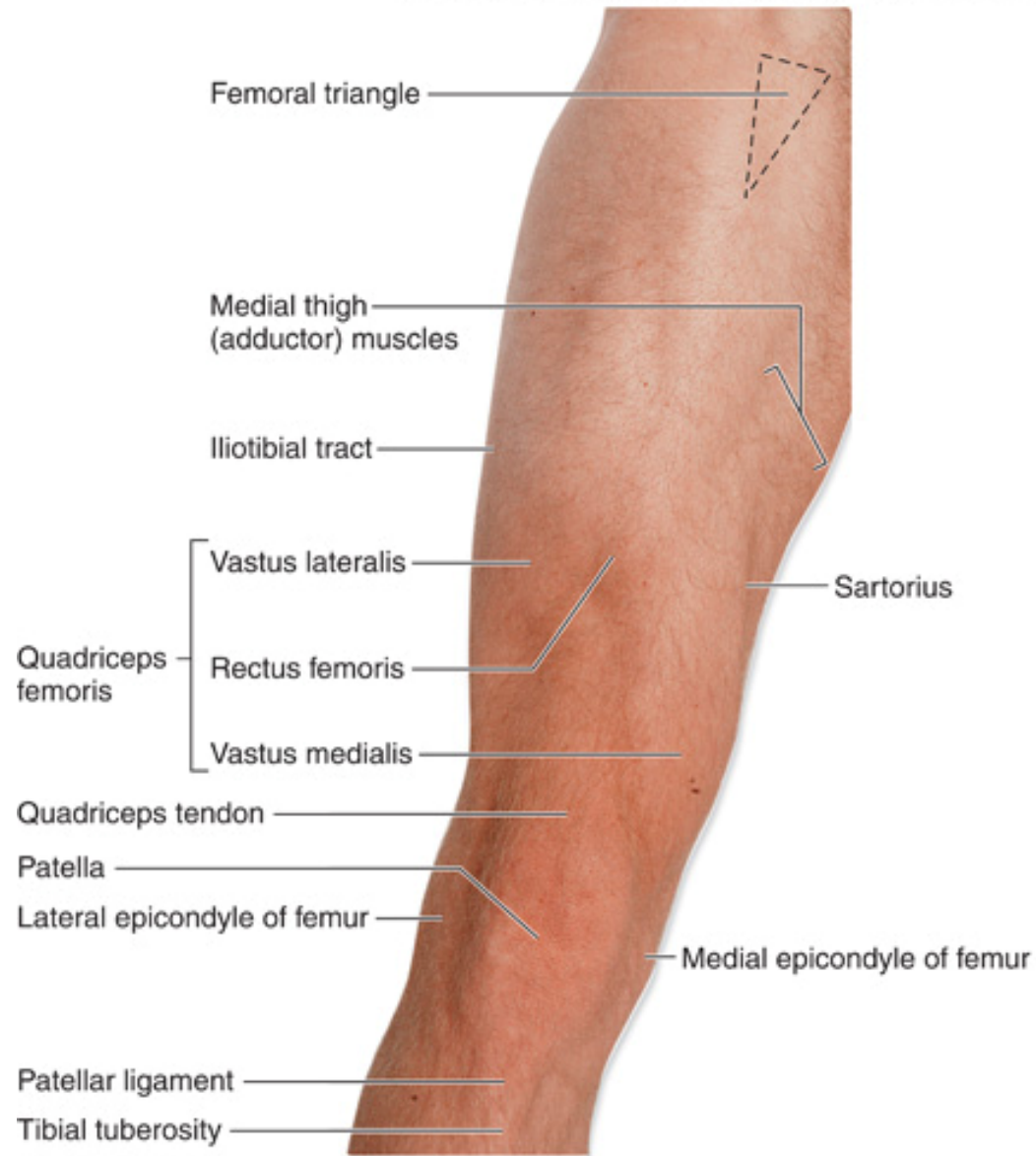
The Thigh

- Many muscular and bony features are readily identified in the thigh, which extends between the hip and the knee on each lower limb.
- An extremely important element of thigh surface anatomy is a region called the femoral triangle.
- The femoral triangle is a depression inferior to the groove that overlies the inguinal ligament on the anteromedial surface in the superior portion of the thigh.
- The femoral artery, vein, and nerve travel through this region, making it an important arterial pressure point for controlling lower limb hemorrhage.

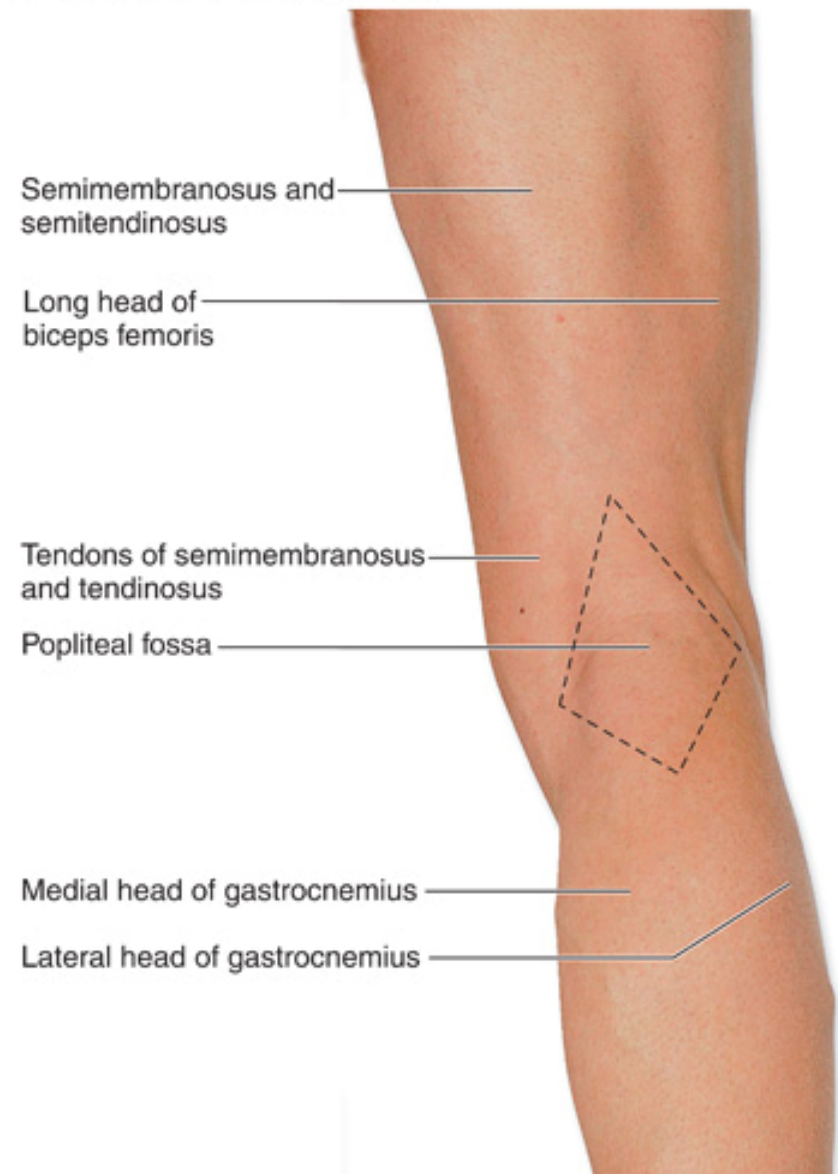


Thigh and Knee

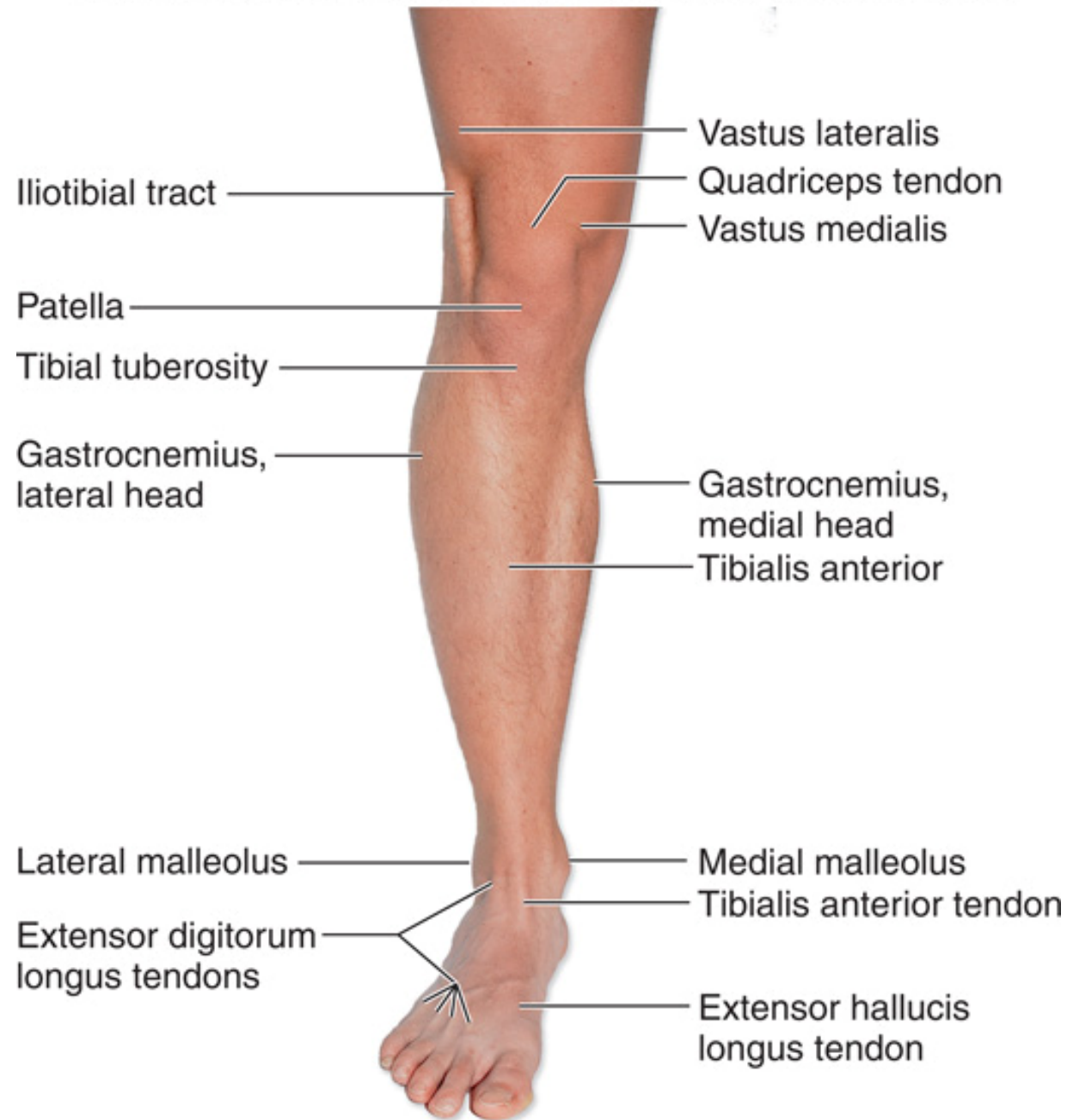
- On the distal part of the anterior thigh, are the three parts of the quadriceps femoris as they approach the knee.
- Still on the anterior side of the thigh, three obvious skeletal features can be observed and palpated:
 - (1) The greater trochanter is palpated on the superior lateral surface of the thigh;
 - (2) the patella is located easily within the patellar tendon; and
 - (3) the lateral and medial condyles of both the femur and tibia are identified and palpated at each knee.



(a) Right thigh, anterior view



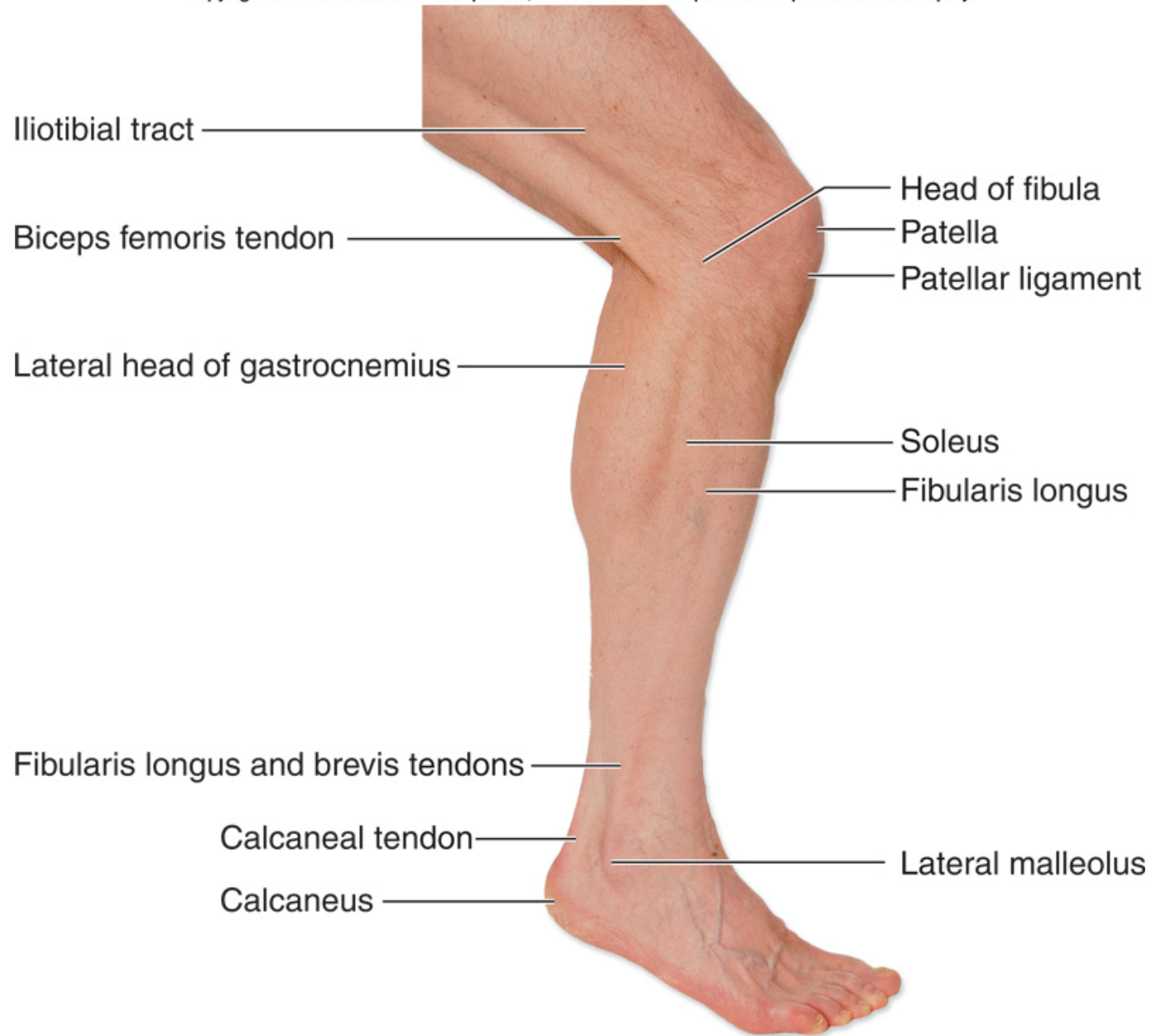
(b) Right thigh, posterior view



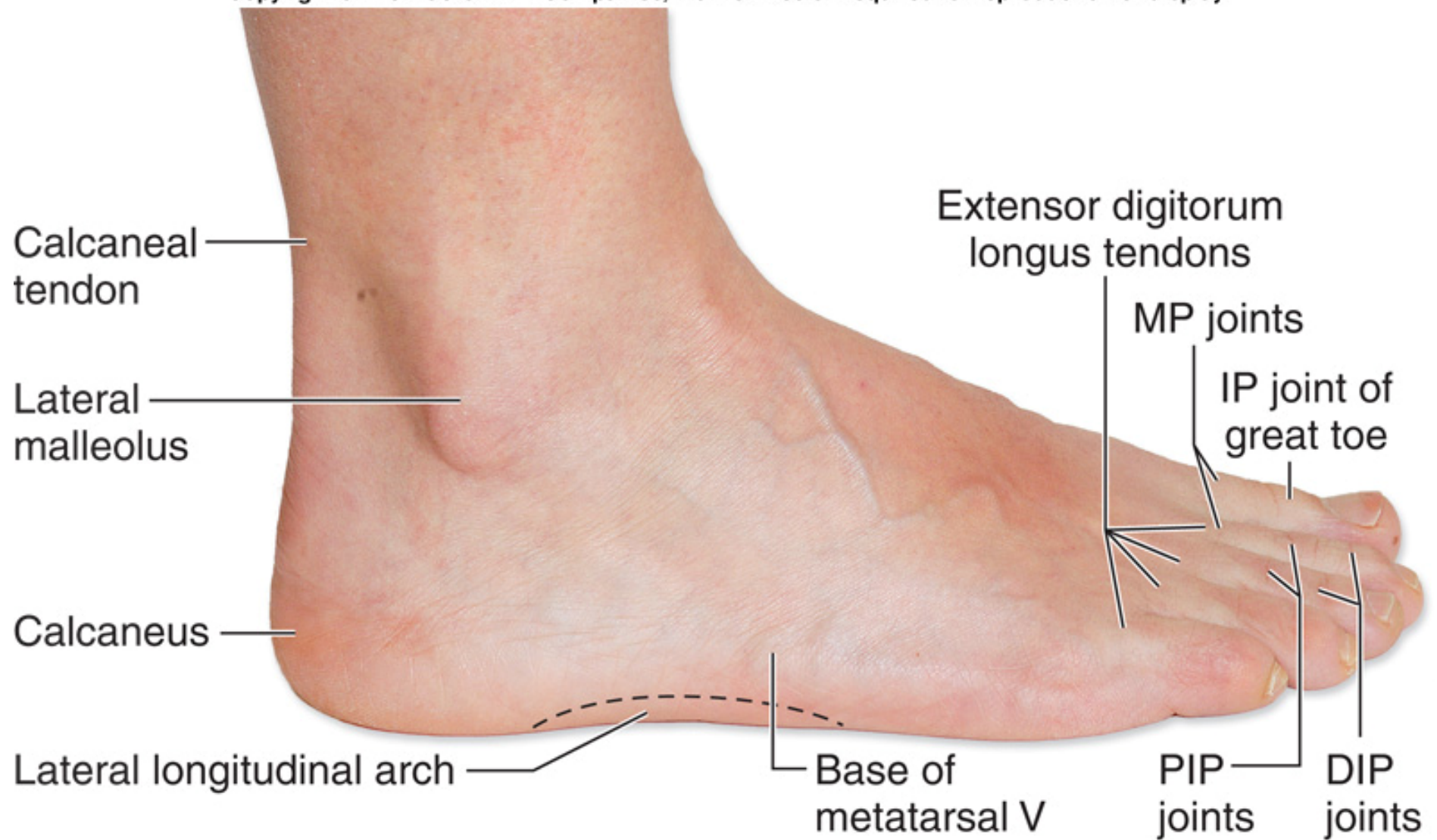
(a) Right leg, anterior view



(b) Right leg, posterior view



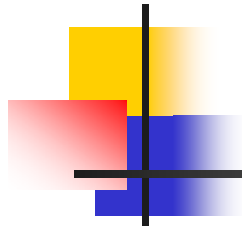
(c) Right leg, lateral view



(a) Right foot, lateral view



(b) Right foot, medial view



Foot and Toes

- The phalanges, metatarsophalangeal joints, PIP and DIP joints, and toenails are obvious surface landmarks readily observed when viewing either the lateral side or the dorsum of the foot.
- The medial surface of the foot clearly illustrates the high, arched medial longitudinal arch.
- At the distal end of the medial longitudinal arch, the head of metatarsal I appears as a prominent bump.