BACHELOR OF MEDICAL LABORATORY TECHNOLOGY LAB MANUAL

1st Semester

Prepared By

Paramedical & Allied Science Dept.

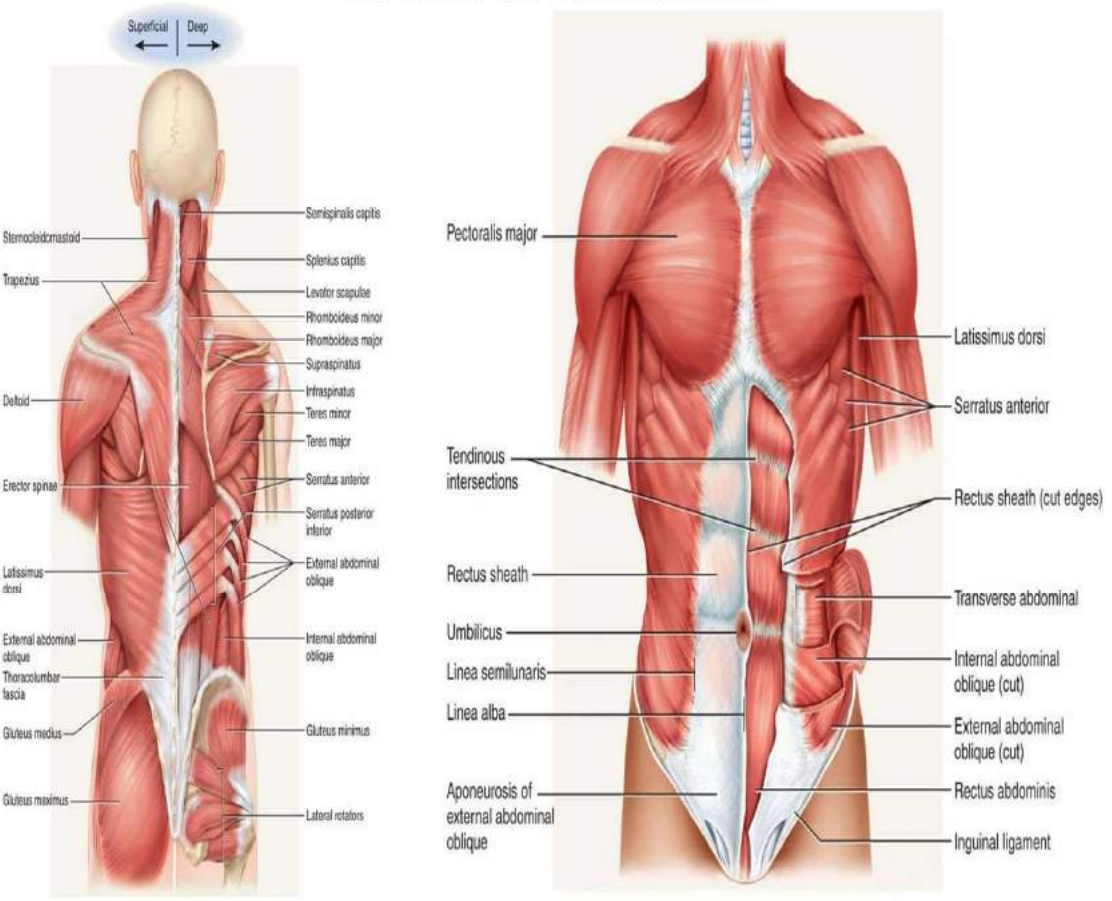
BMLT

MIDNAPORE CITY COLLEGE

LABORATORY MANUAL

HUMAN ANATOMY, PAPER III, UNIT-5, BMLT (VU)/1ST SEM

DEMONSTRATION ON MUSCLES OF TRUNK



Trunk muscles

DEMONSTRATION ON MUSCLES OF FACE

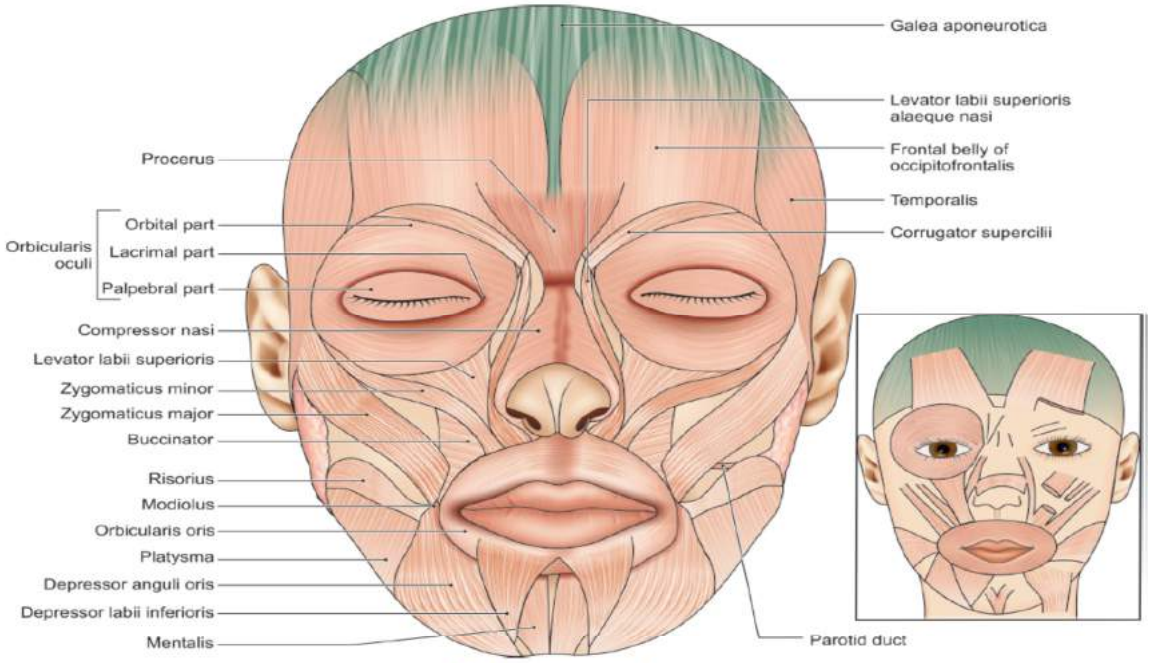


Fig. 2.9: The facial muscles

Muscles around the Mouth

1 Orbicularis oris (Fig. 2.9)
2 *Buccinator* (Latin cheek) (Fig. 2.10)
3 Levator labii superioris alaeque nasi (Fig. 2.10)
4 Zygomaticus major (Fig. 2.9)
5 Levator labii superioris (Fig. 2.9)

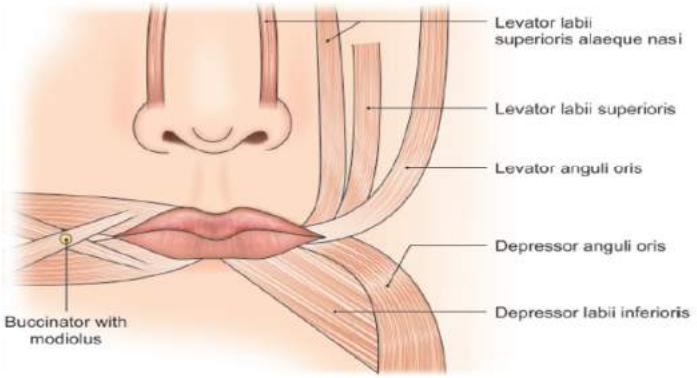
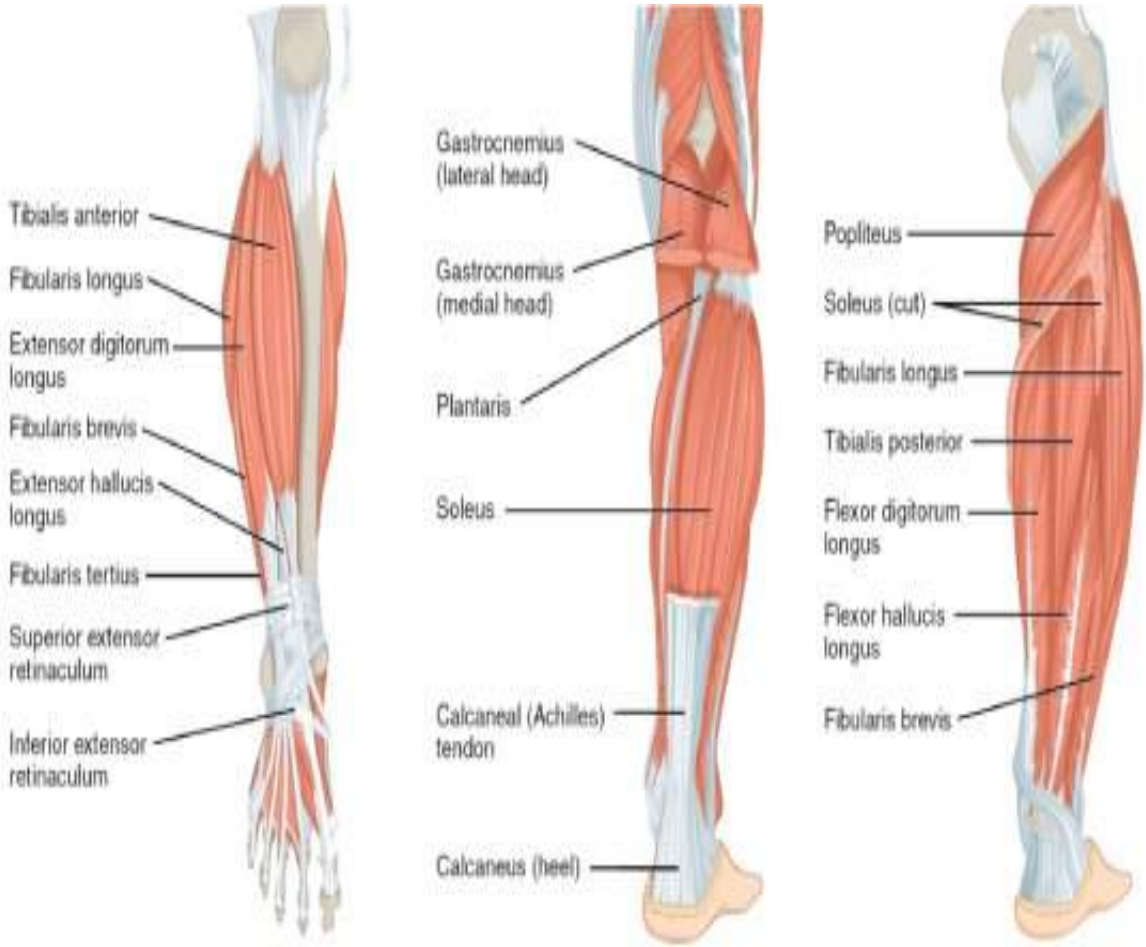
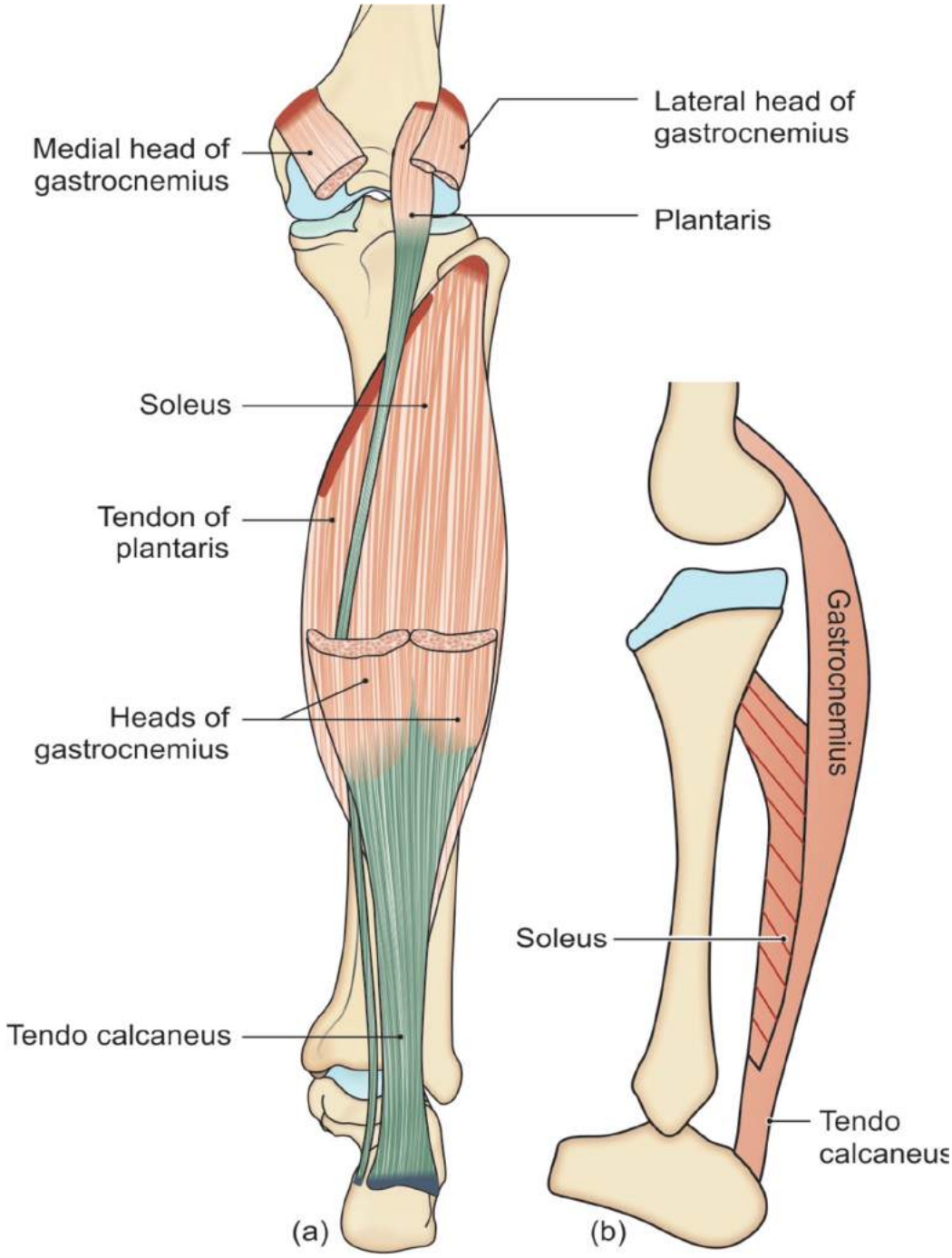


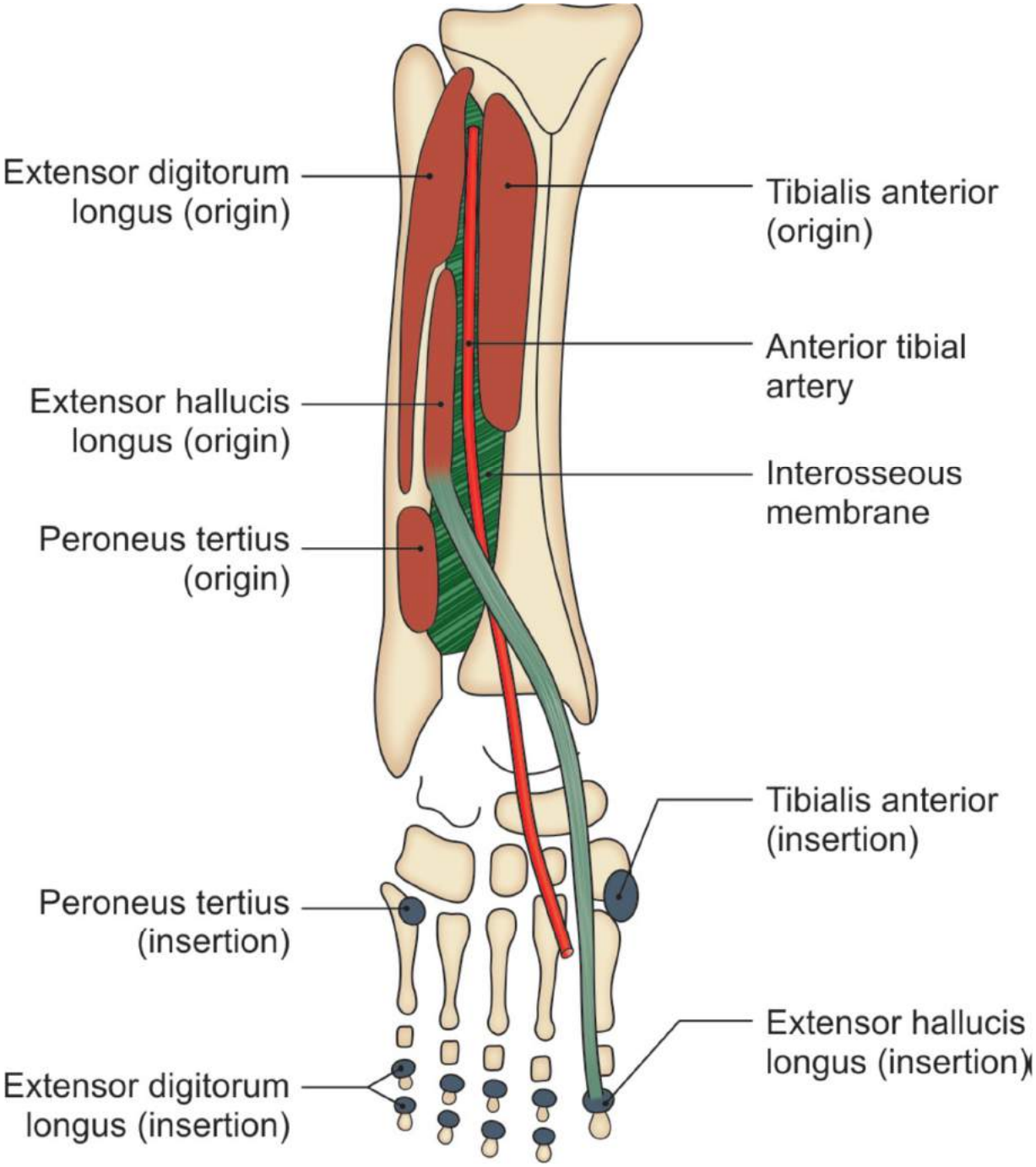
Fig. 2.10: Some facial muscles

DEMONSTRATION ON MUSCLES OF LOWER EXTREMITIES

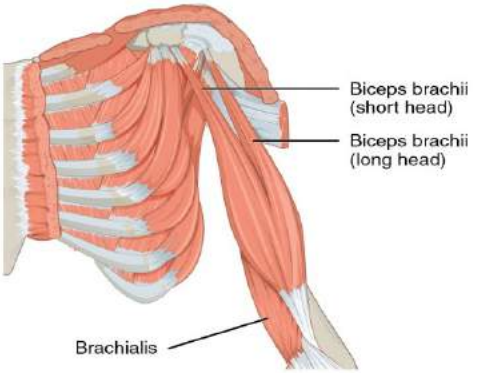




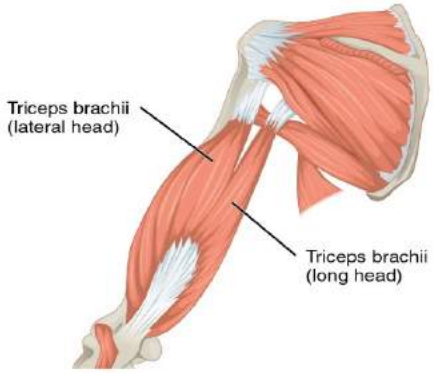
lowerextrimities muscles



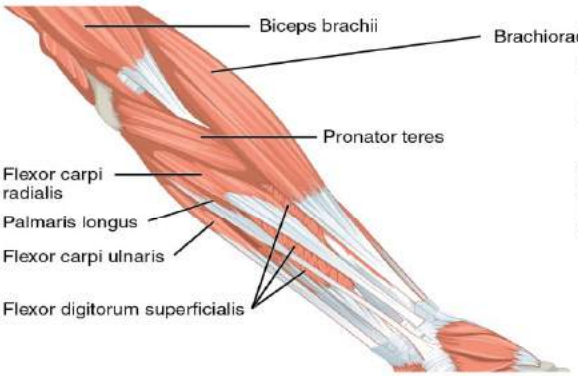
upper extrimities muscles



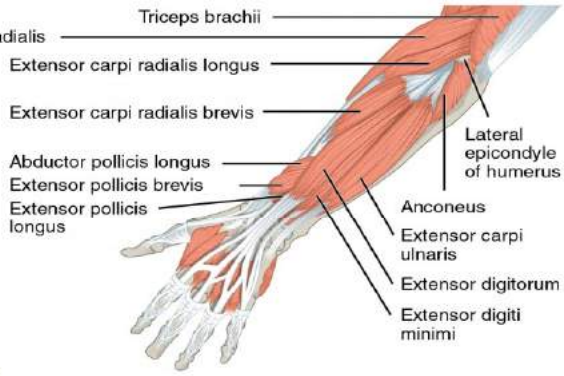
Left upper arm muscles (anterior lateral view)



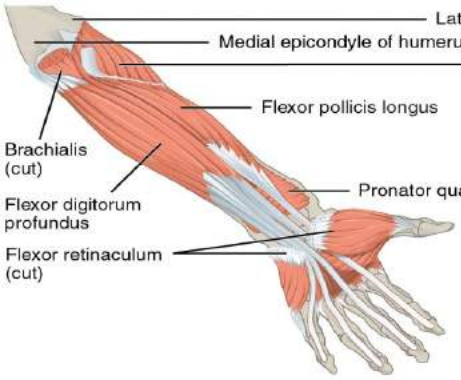
Left upper arm muscles (posterior view)



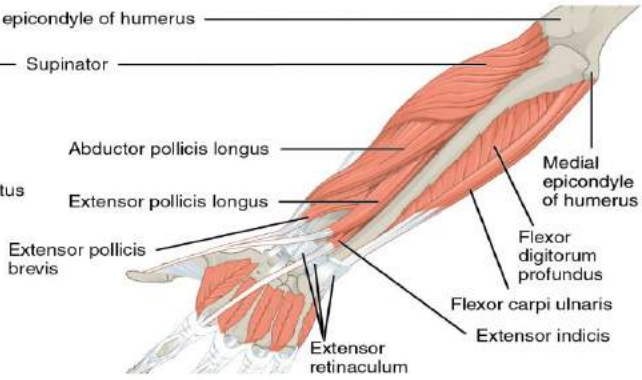
Left forearm superficial muscles (palmar view)



Left forearm superficial muscles (dorsal view)



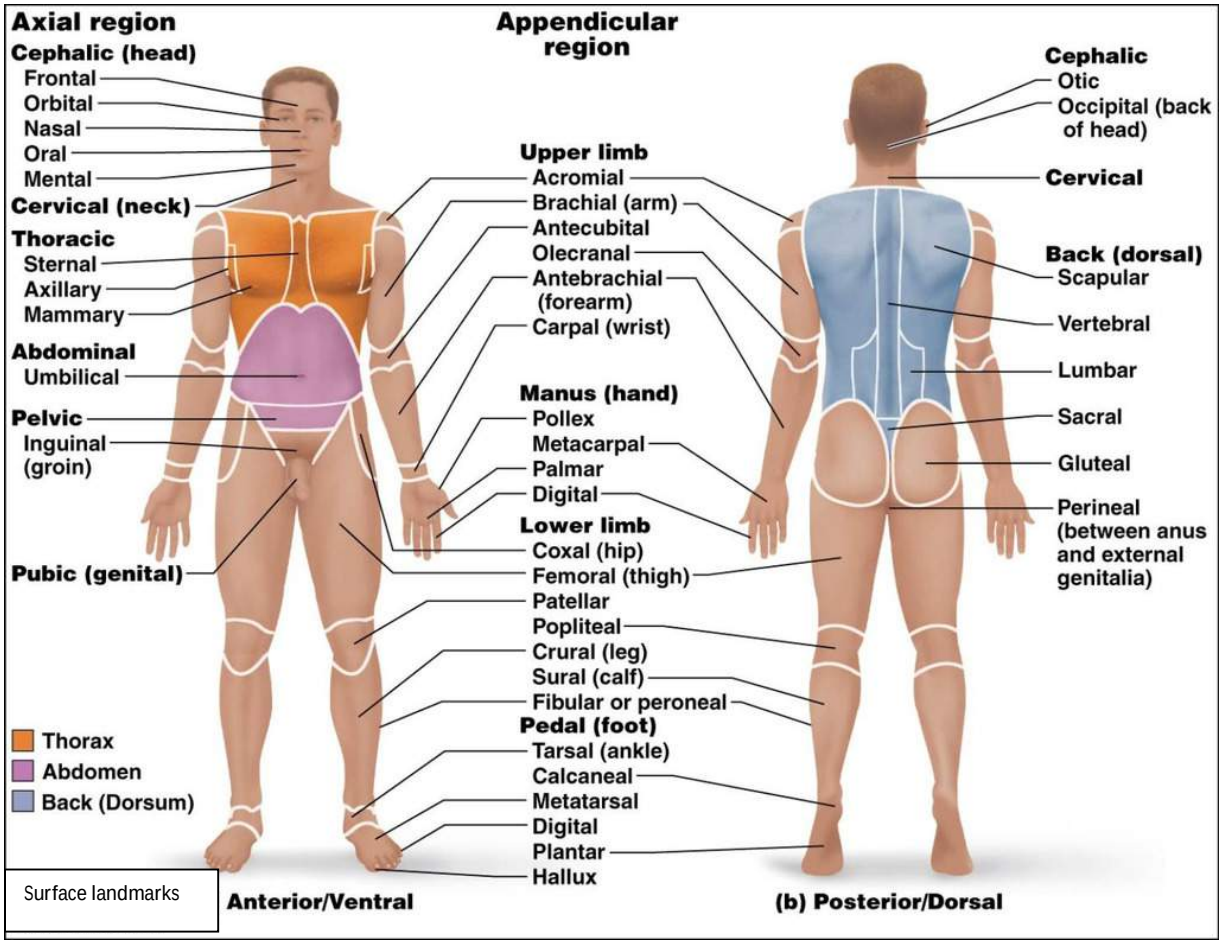
Left forearm deep muscles (palmar view)



Left forearm deep muscles (dorsal view)

DEMONSTRATION ON MUSCLES OF UPPER EXTREMITIES

Identification of surface land marks of a human body



The anatomical position - This is a standard position used in anatomy and clinical medicine to allow accurate and consistent description of one body part in relation to another • The head is directed forwards with eyes looking into the distance. • The body is upright, legs together, and directed forwards. • The palms are turned forward, with the thumbs laterally.

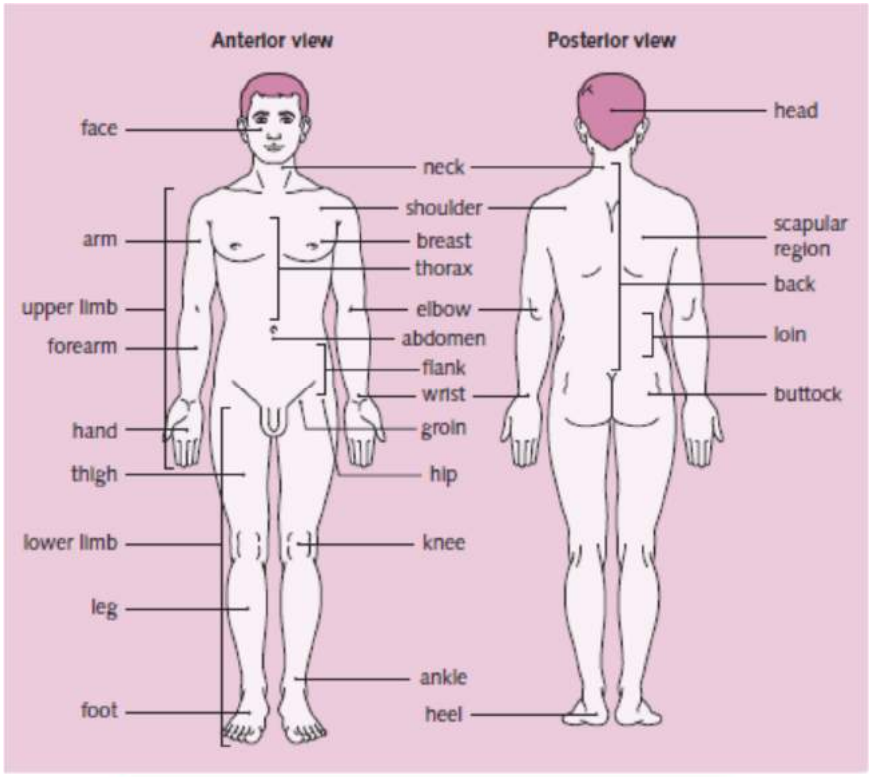
Anatomical planes these comprise the following • **The median sagittal plane** is the vertical plane passing through the midline of the body from the front to the back. Any plane parallel to this is termed **paramedian or sagittal**. • **Coronal (or frontal)** *planes* are vertical planes perpendicular to the sagittal planes. • **Horizontal or transverse planes** lie at right angles to both the sagittal and coronal planes.

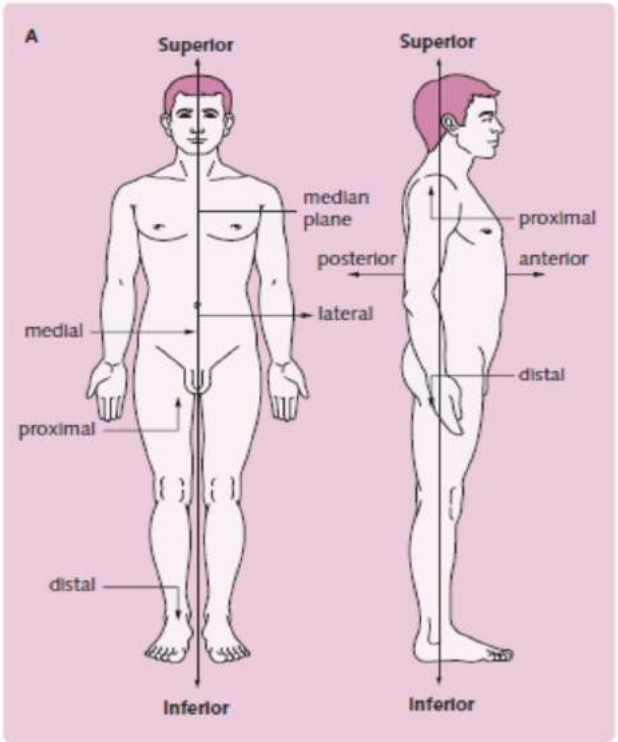
Such anatomical planes are frequently used in computer tomography (CT) scans and magnetic resonance imaging (MRI), to visualize muscle, bone, lung and other soft tissues as well as pathologies, for example pancreatic cancer or a brain abscess.

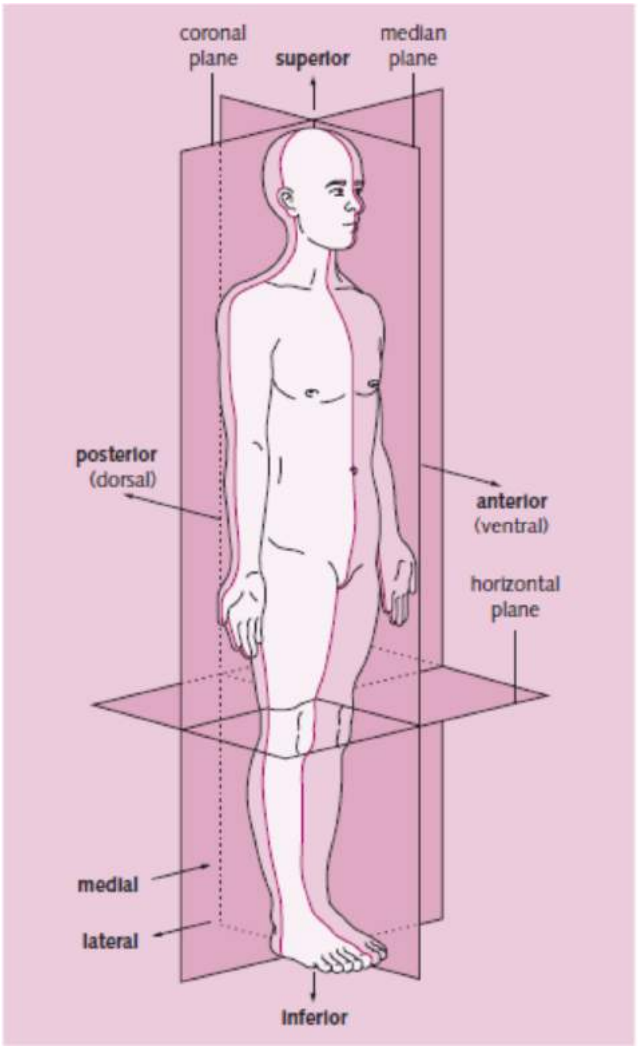
Terms of position The terms of position commonly used in clinical practice and anatomy are illustrated in

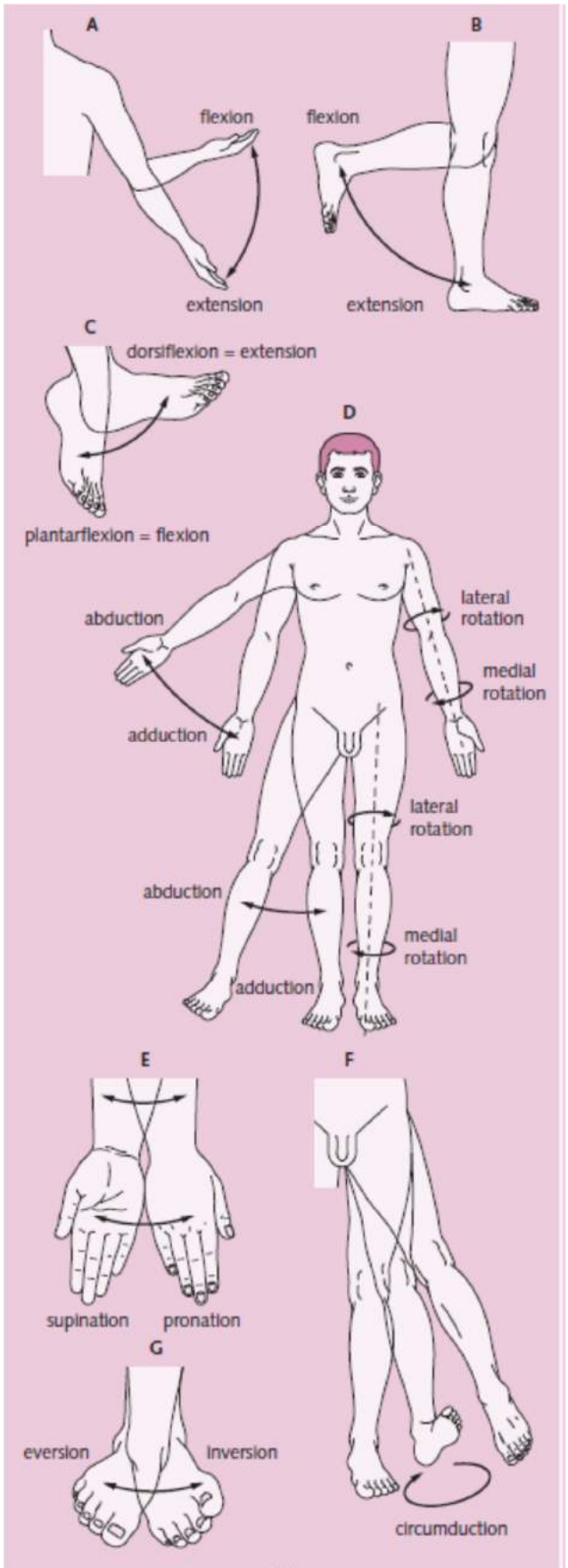
Terms of movement various terms are used to describe movements of the body • **Flexion**—forward movement in a sagittal plane which in general reduces the angle at thejoint, e.g. bending the elbow. Exceptions areat the ankle joint (when the angle is increased) and the shoulder joint (when the angle between the upper limb and trunk is increased). • **Extension**—backward movement in a sagittal plane which in general increases the angle atjoints except at the ankle joint (when theangleis decreased) and the knee joint due to lower limb rotation during embryonic development. **Abduction**—movement away from the median plane. • **Adduction**—movement towards the median plane. • **Supination**—lateral rotation of the forearm, causing the palm to face anteriorly. • **Pronation**—medial rotation of the forearm, causing the palm to face posteriorly. • **Eversion**—turning the sole of the foot outwards. • Inversion—turning the sole of the foot inwards. • **Rotation**—movement of part of the body around its long axis. • **Circumduction**—a combination of flexion, extension, abduction, and adduction. The terms used to describe movements of the thumb are perpendicular to the movements of the body, e.g. flexion of the thumb is at 90°to that of flexion of the fingers

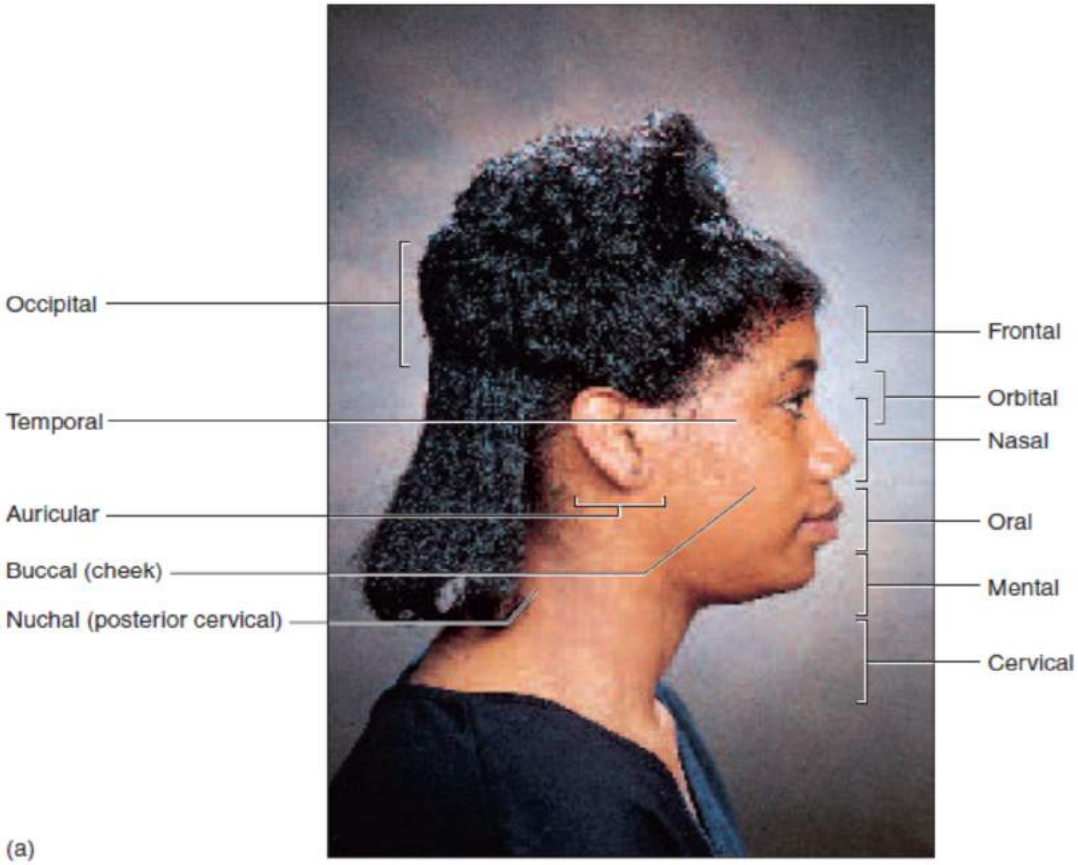
Anatomical landmarks



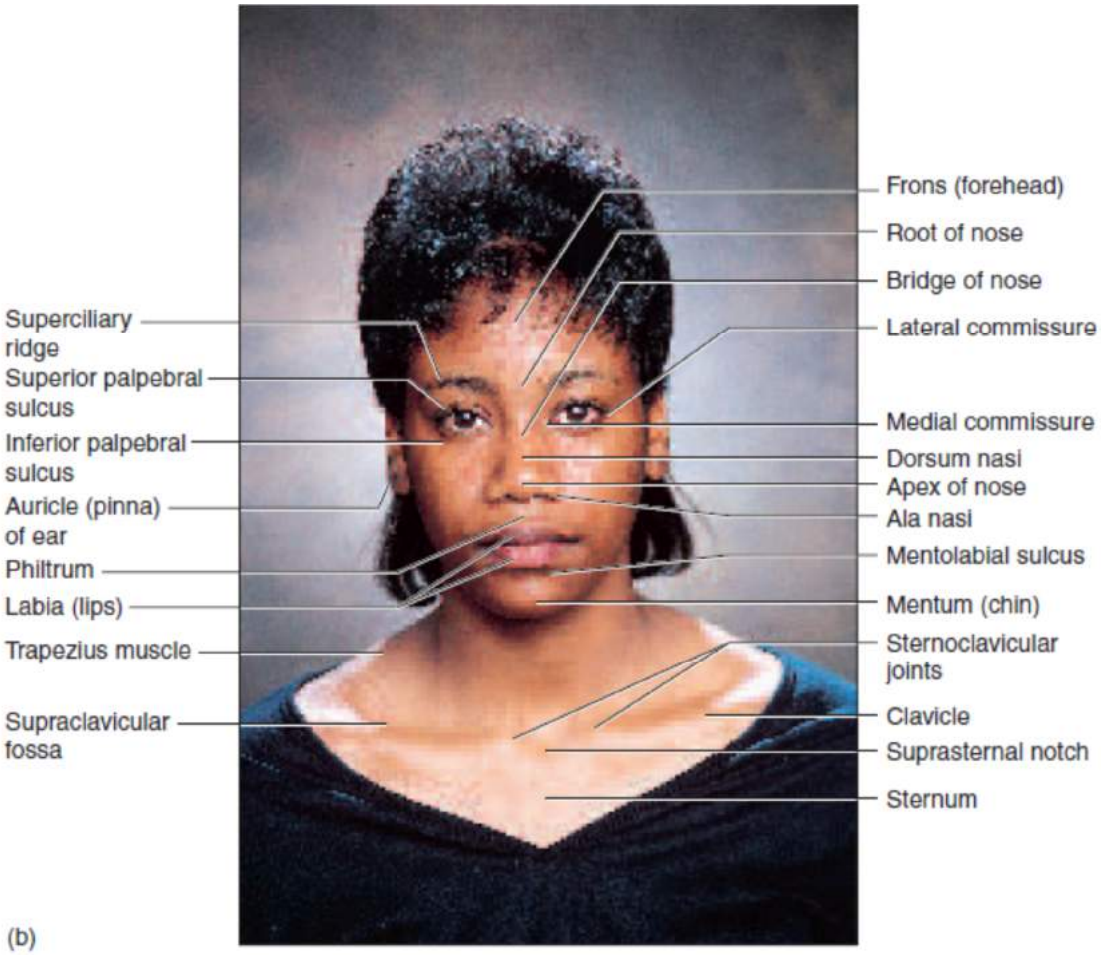



coronal plane
superior
median plane
posterior (dorsal)
anterior (ventral)
horizontal plane
medial
lateral
inferior

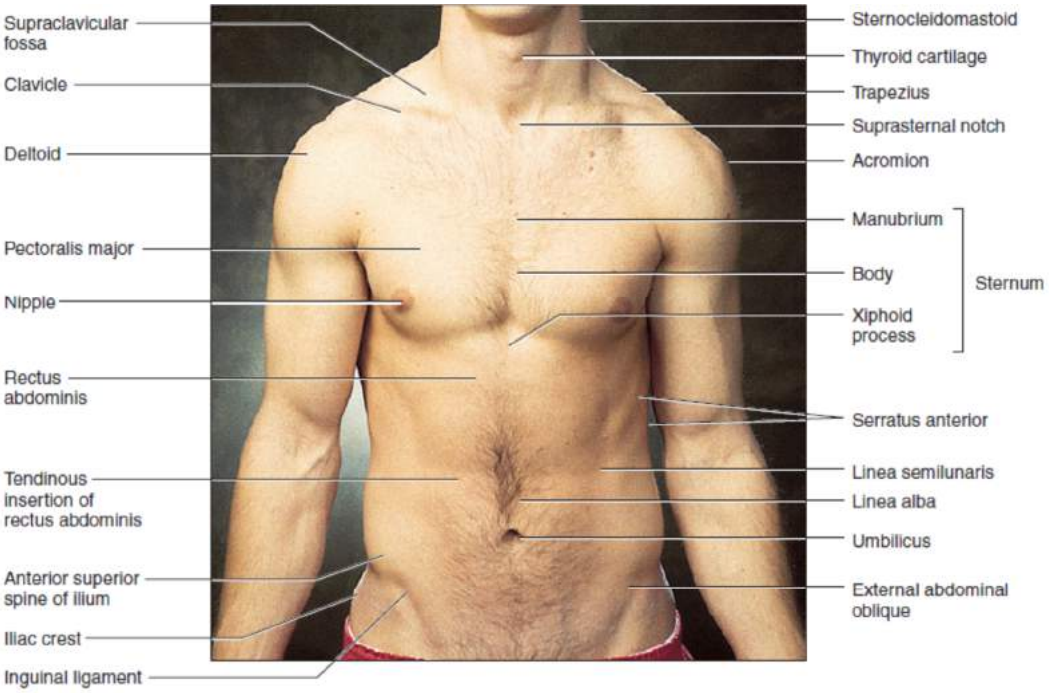

A
flexion
extension
B
flexion
extension
C
dorsiflexion = extension
plantarflexion = flexion
D
abduction
adduction
lateral rotation
medial rotation
lateral rotation
abduction
medial rotation
adduction
E
supination
pronation
F
circumduction
G
eversion
inversion



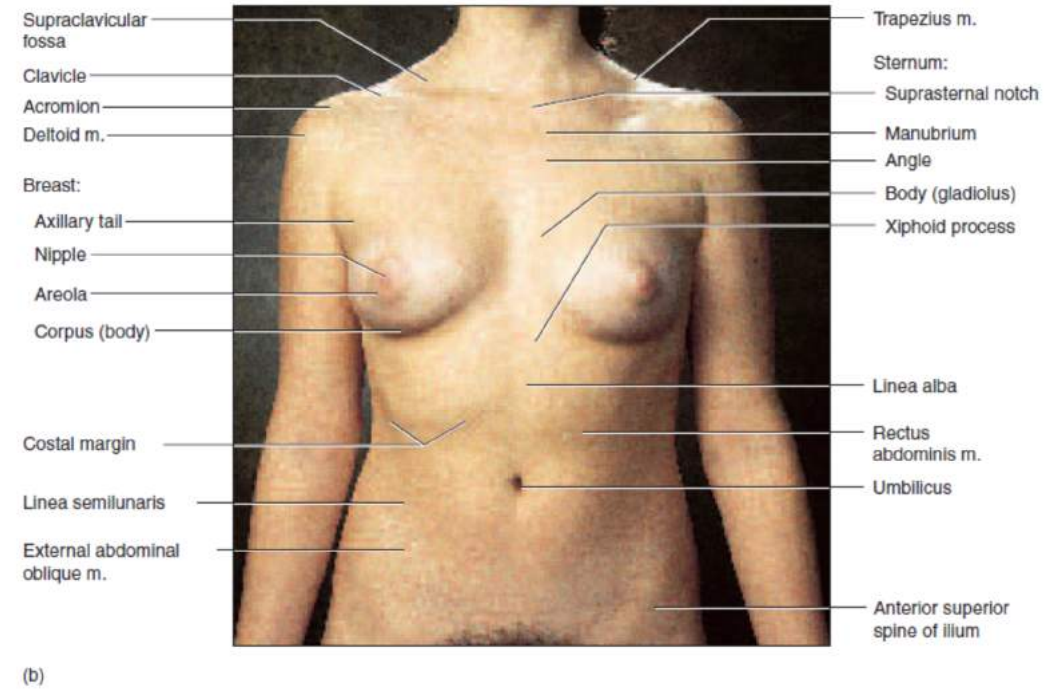
ANATOMICAL SURFACES OF FACE


Frons (forehead)
Root of nose
Bridge of nose
Lateral commissure
Medial commissure
Dorsum nasi
Apex of nose
Ala nasi
Mentolabial sulcus
Mentum (chin)
Sternoclavicular joints
Clavicle
Suprasternal notch
Sternum
Superciliary ridge
Superior palpebral sulcus
Inferior palpebral sulcus
Auricle (pinna) of ear
Philtrum
Labia (lips)
Trapezius muscle
Supraclavicular fossa

(b)

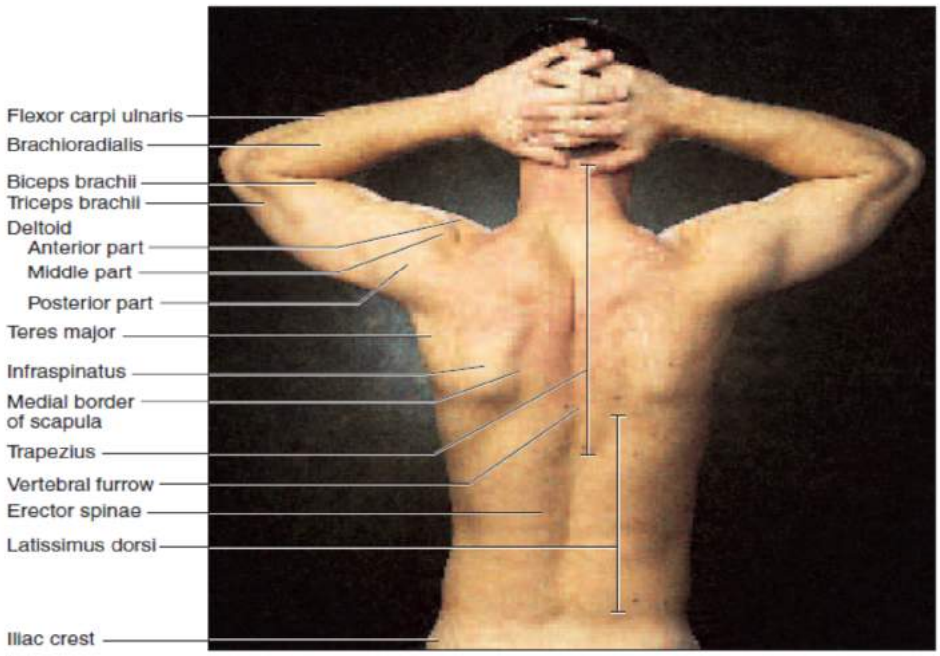


(a)

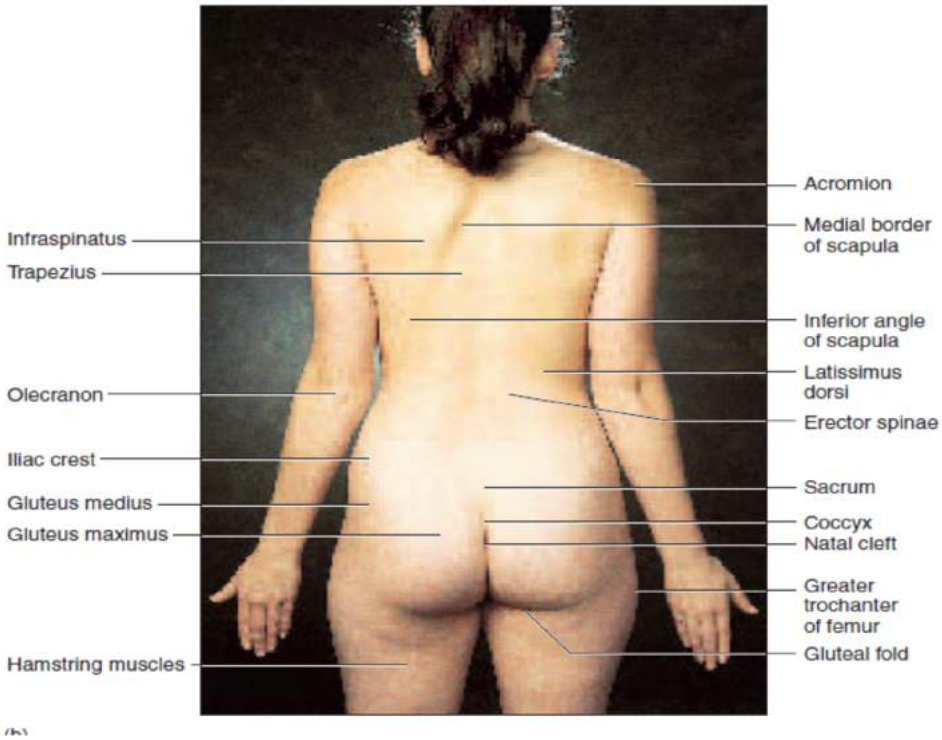


(b)

ANATOMICAL SURFACES OF CHEST AND ABDOMEN

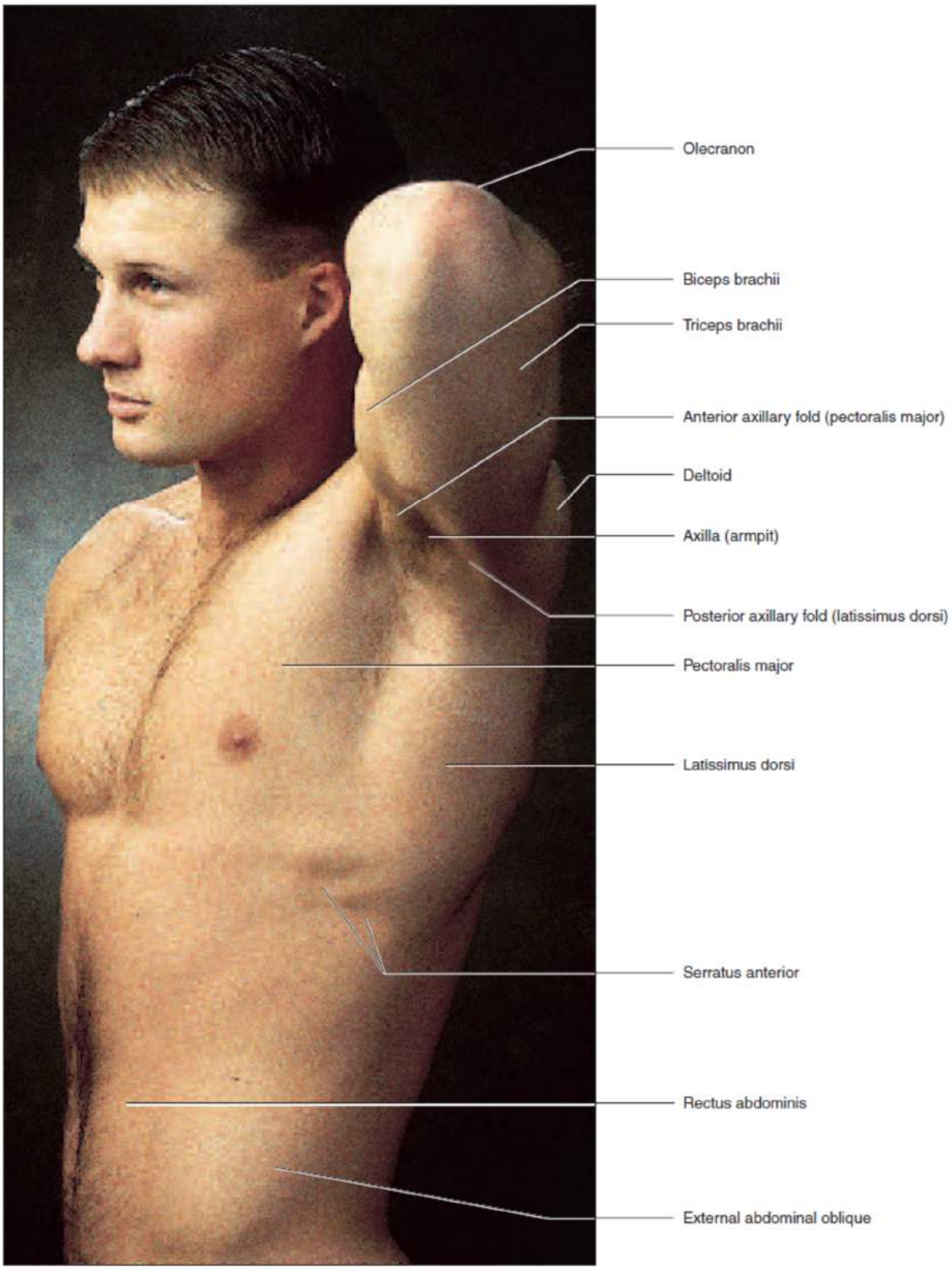


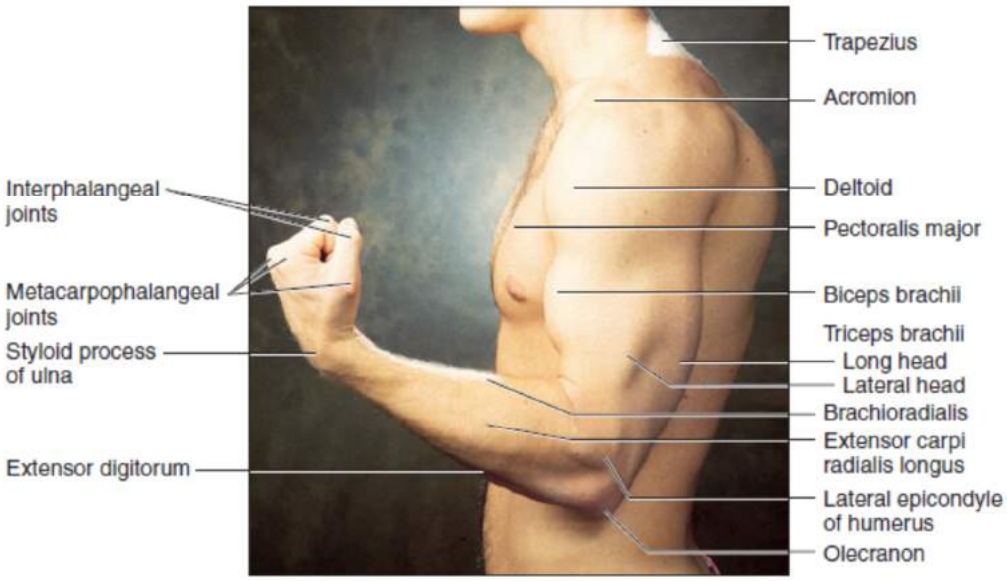
(a)



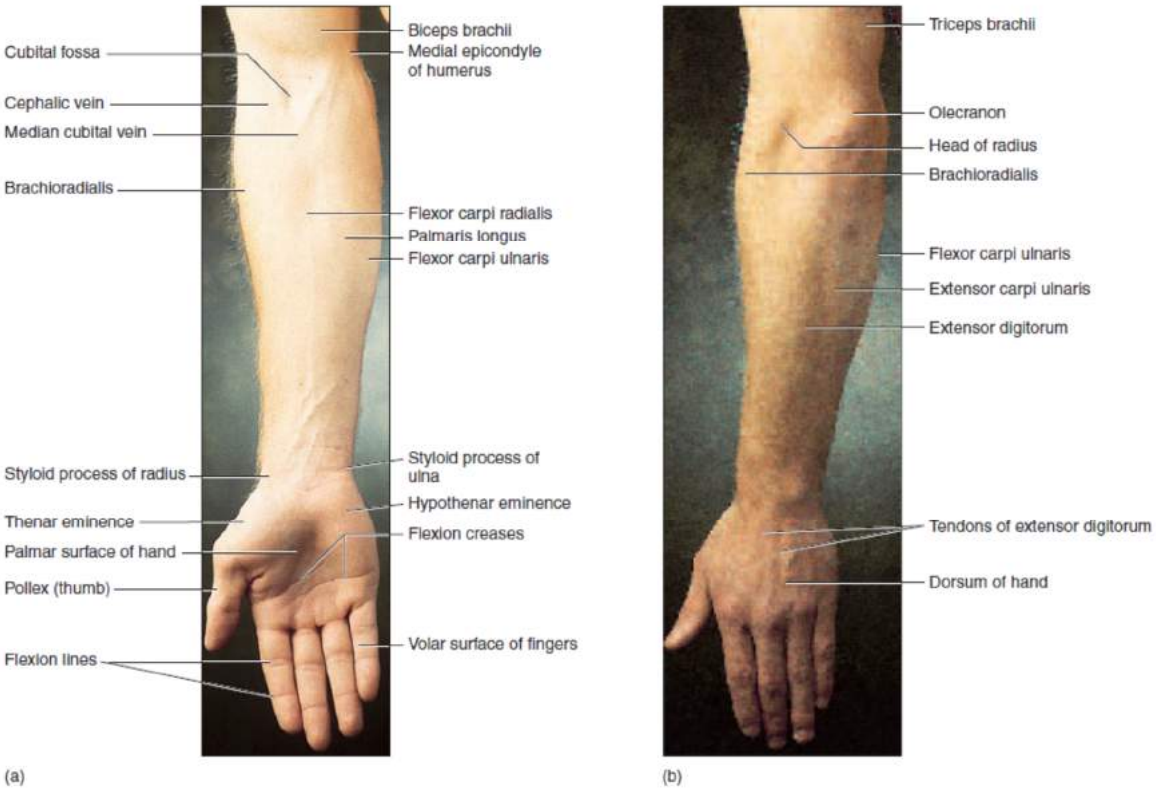
(b)

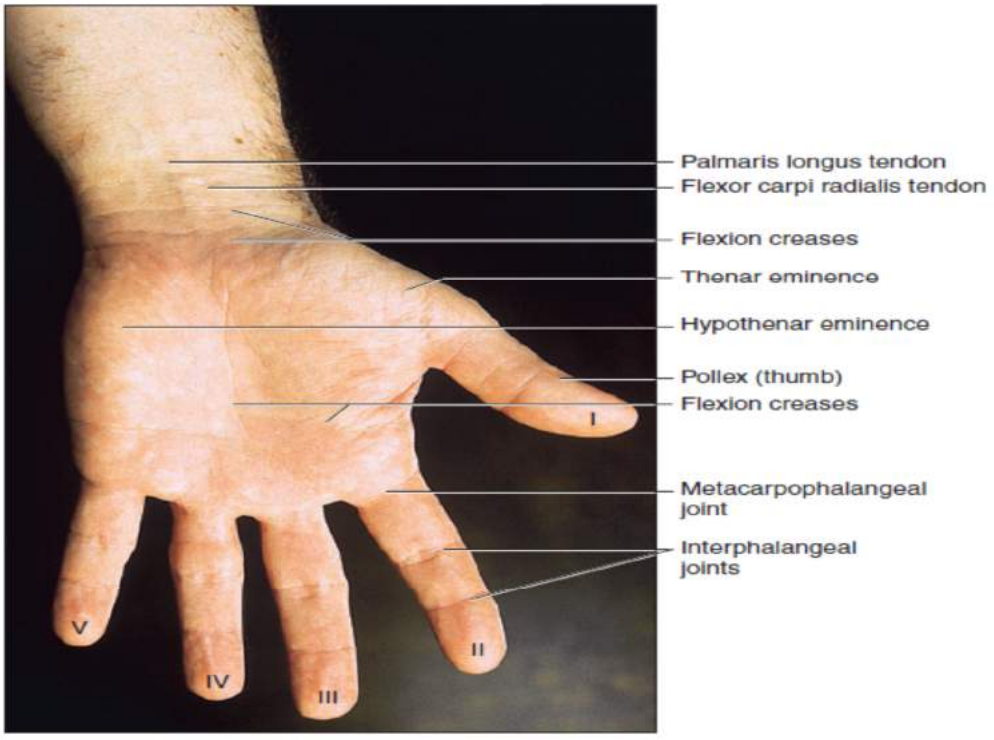
ANATOMICAL SURFACES OF BACK


Olecranon
Biceps brachii
Triceps brachii
Anterior axillary fold (pectoralis major)
Deltoid
Axilla (armpit)
Posterior axillary fold (latissimus dorsi)
Pectoralis major
Latissimus dorsi
Serratus anterior
Rectus abdominis
External abdominal oblique

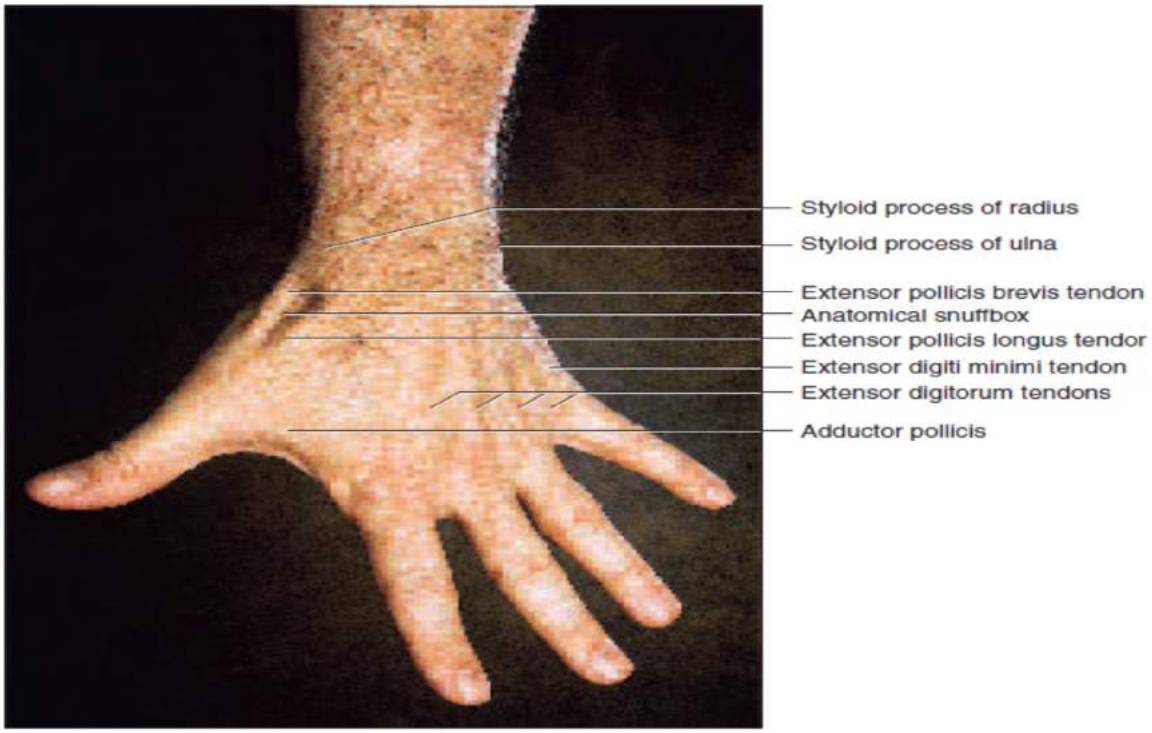


The Upper Limb, Lateral Aspect.



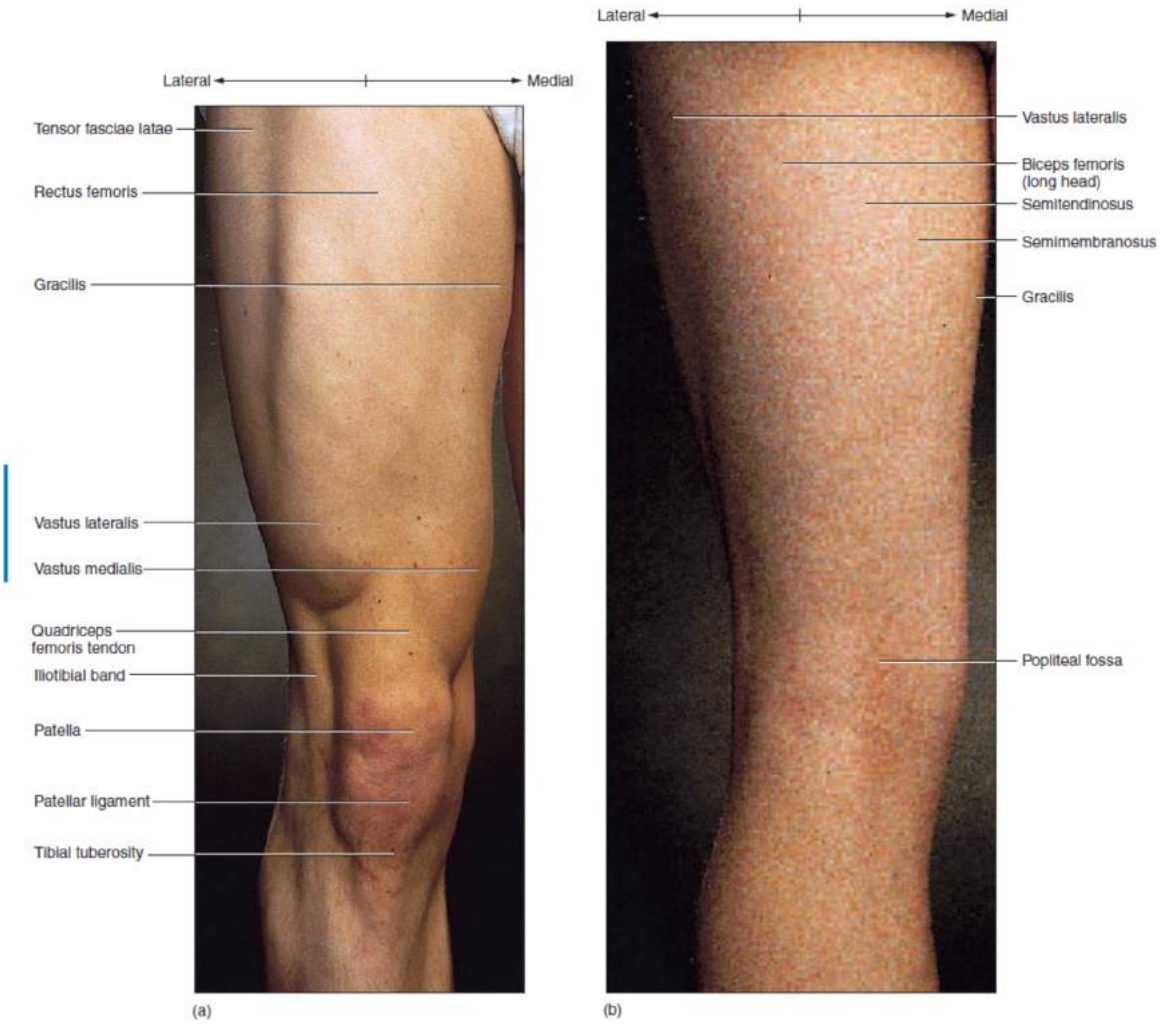


(a)

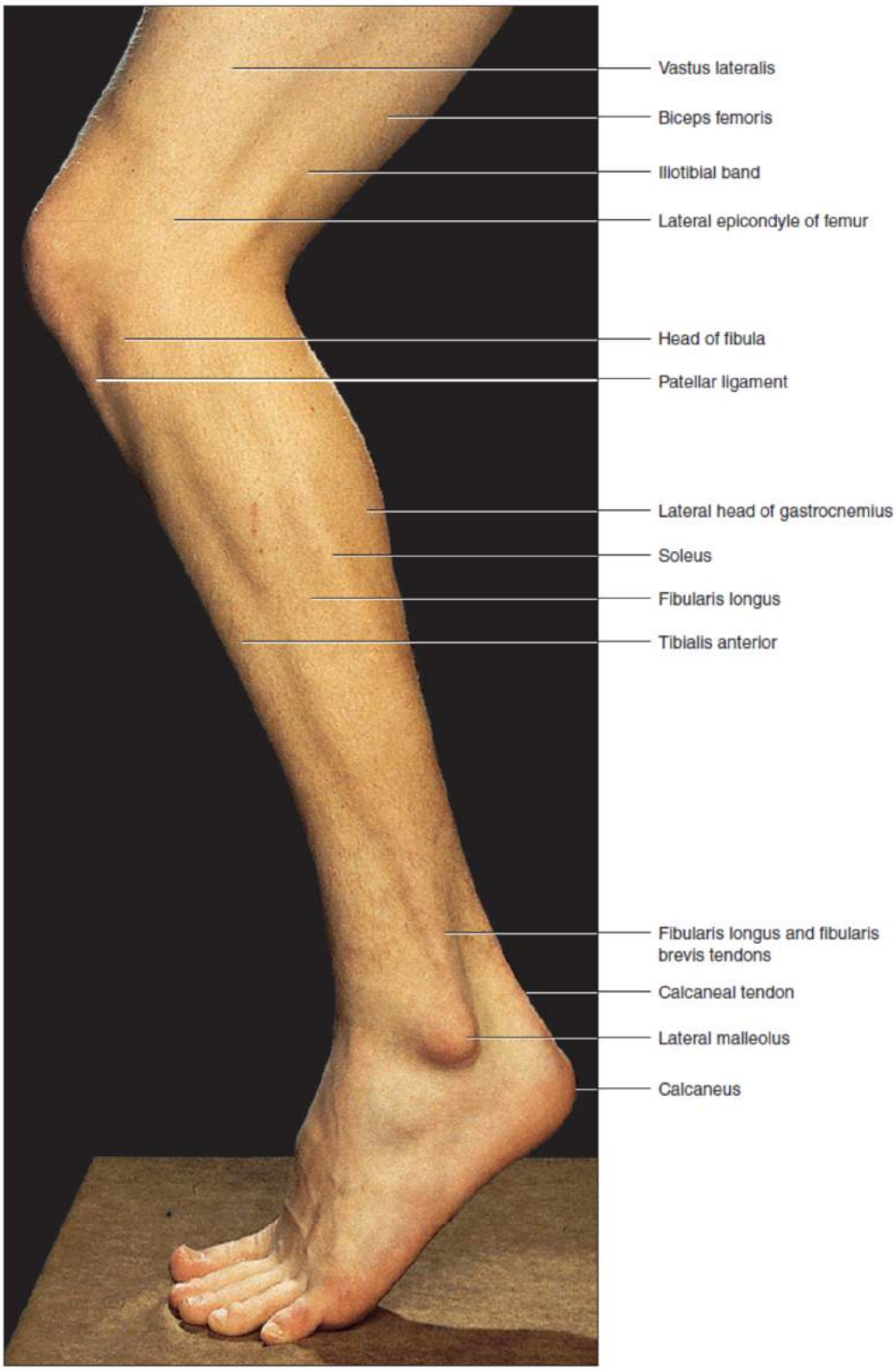


(b)

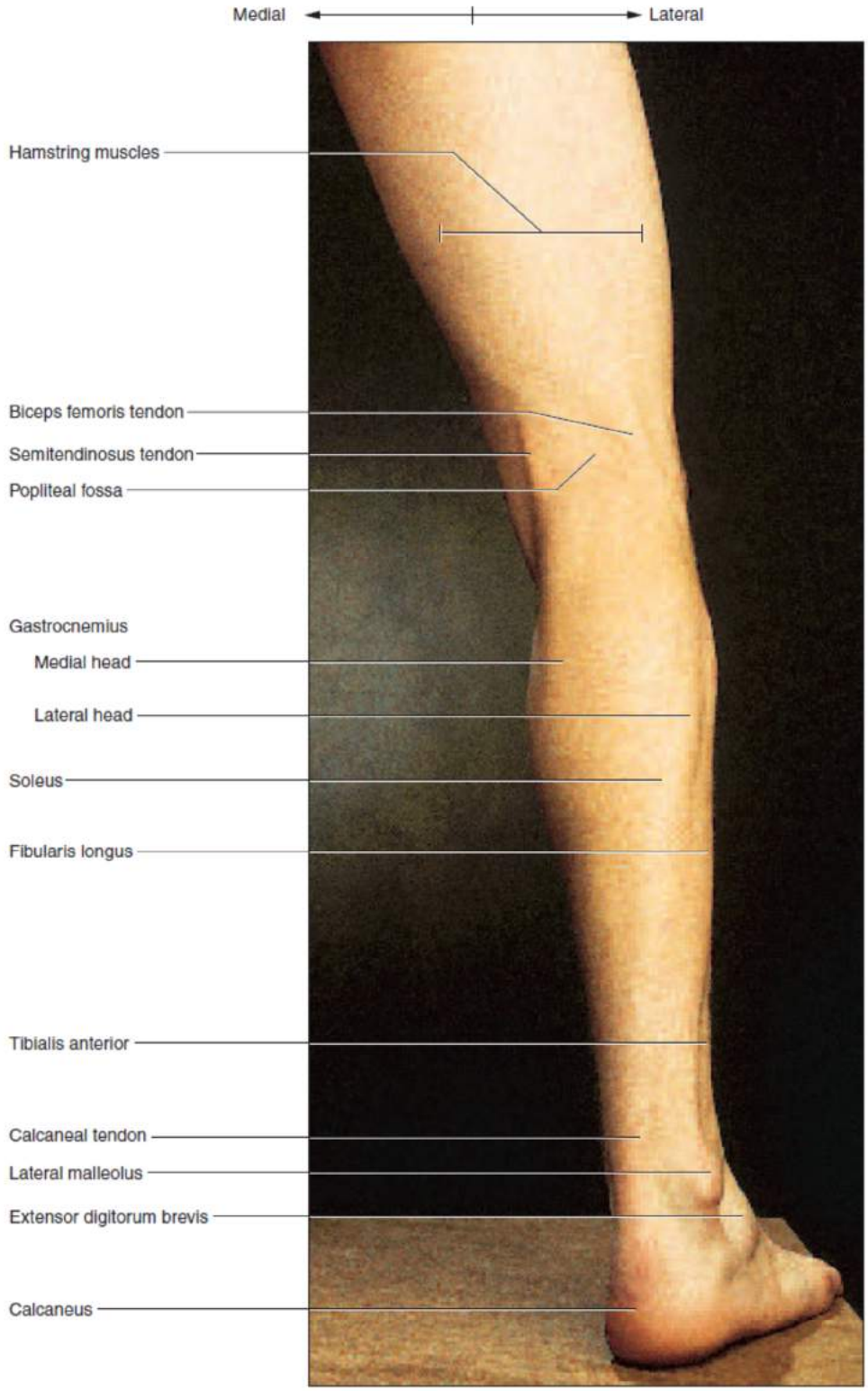
ANATOMICAL SURFACES OF THE FINGER



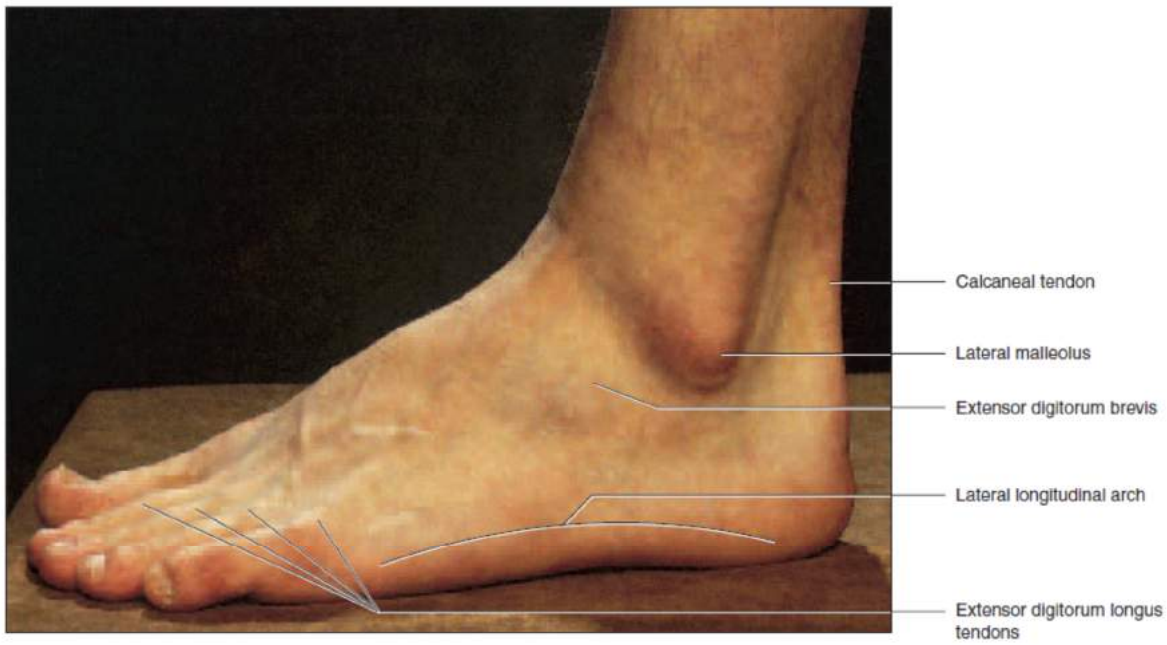
ANATOMICAL SURFACES OF LEG



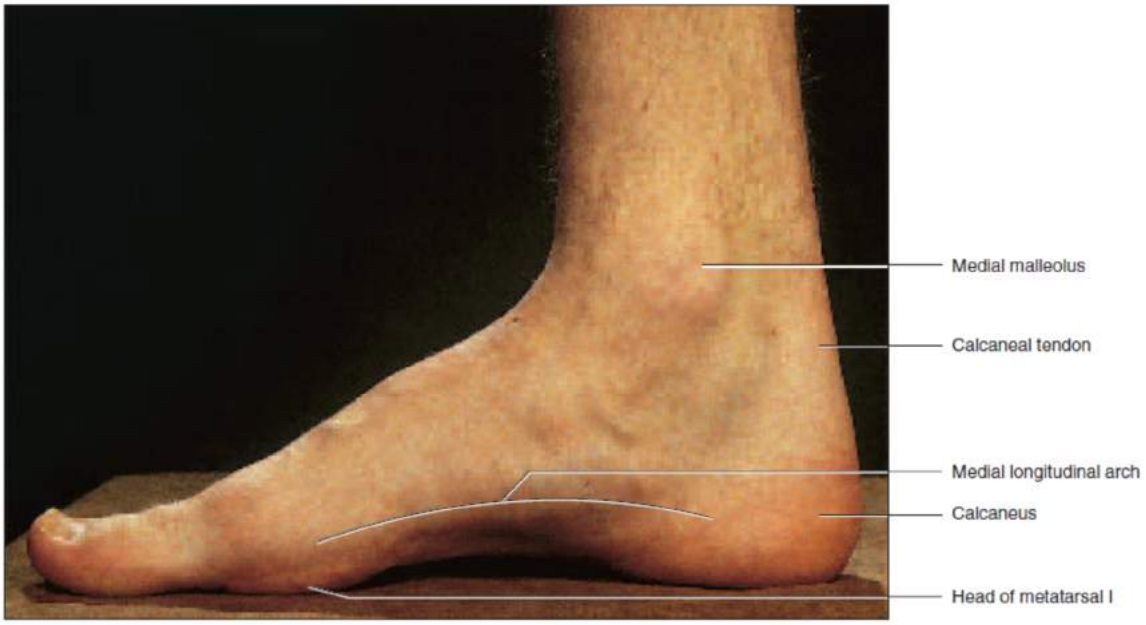
The Leg and Foot, Lateral Aspect.



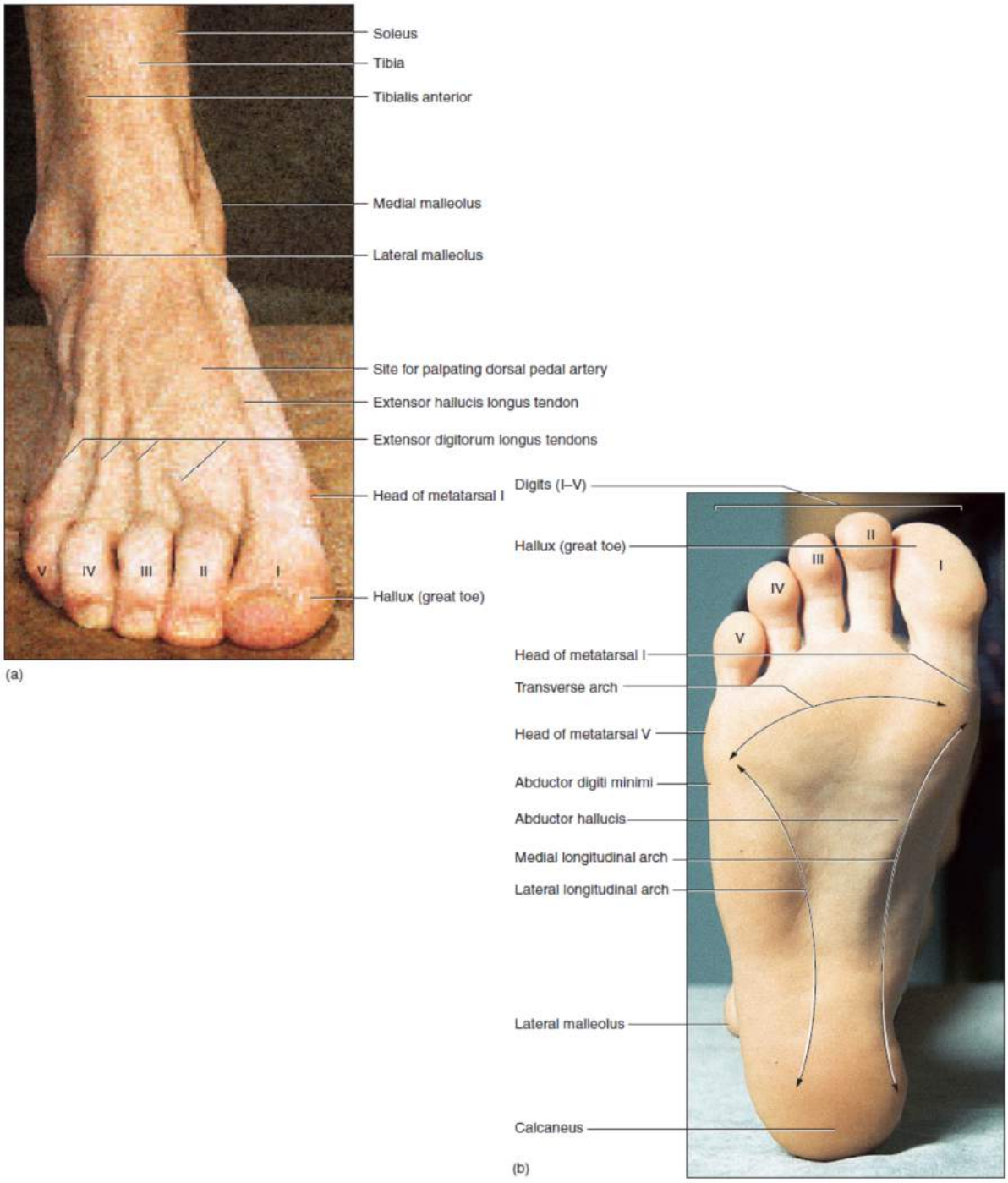
The Leg and Foot, Dorsal Aspect.


Calcaneal tendon
Lateral malleolus
Extensor digitorum brevis
Lateral longitudinal arch
Extensor digitorum longus tendons

(a)


Medial malleolus
Calcaneal tendon
Medial longitudinal arch
Calcaneus
Head of metatarsal I

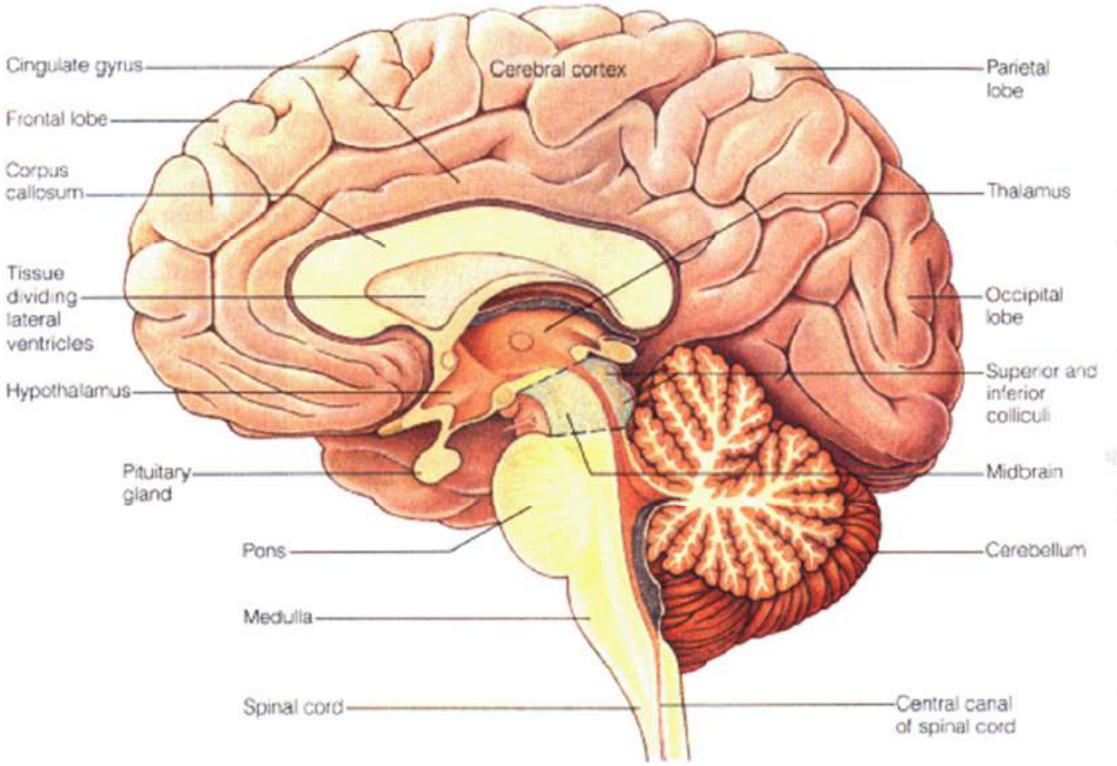
(b)

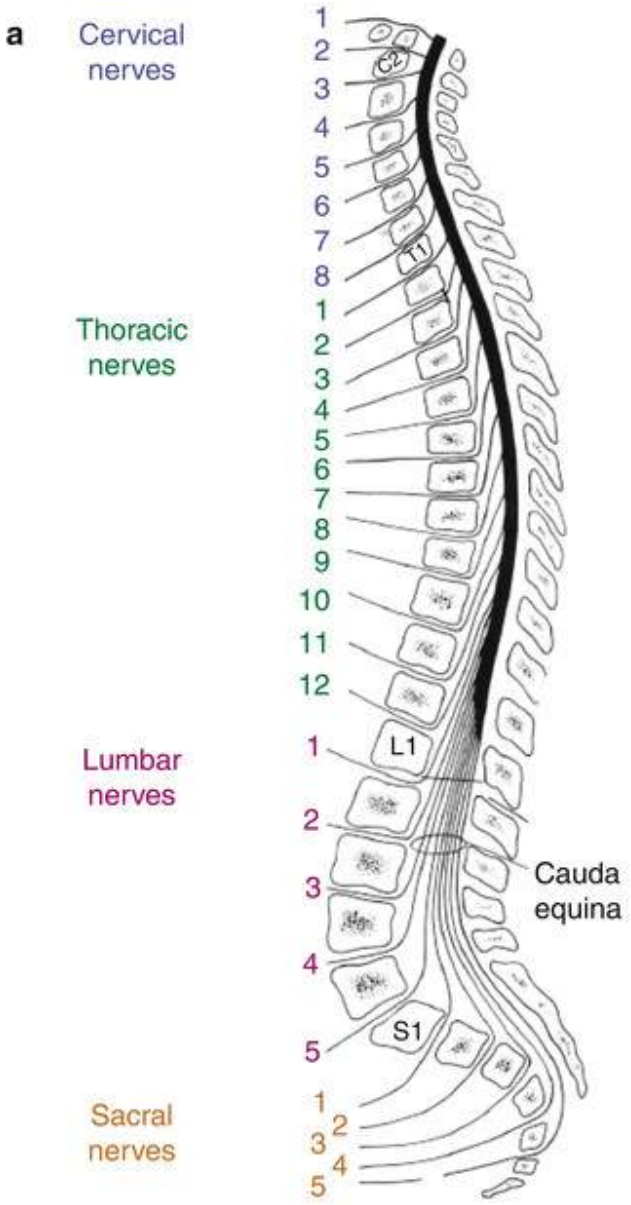


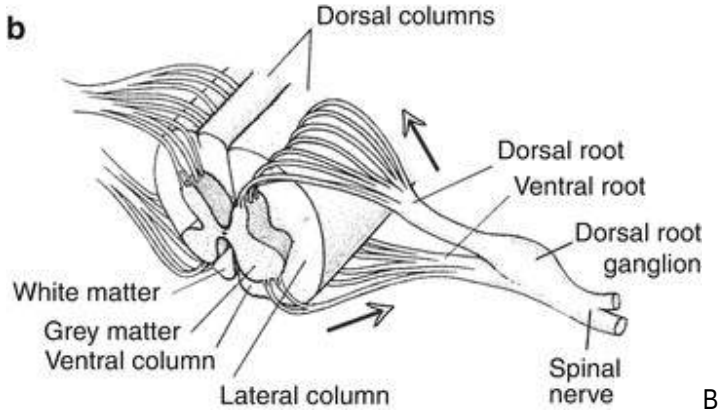
ANATOMICAL SURFACES OF FOOT

ANATOMY OF CNS

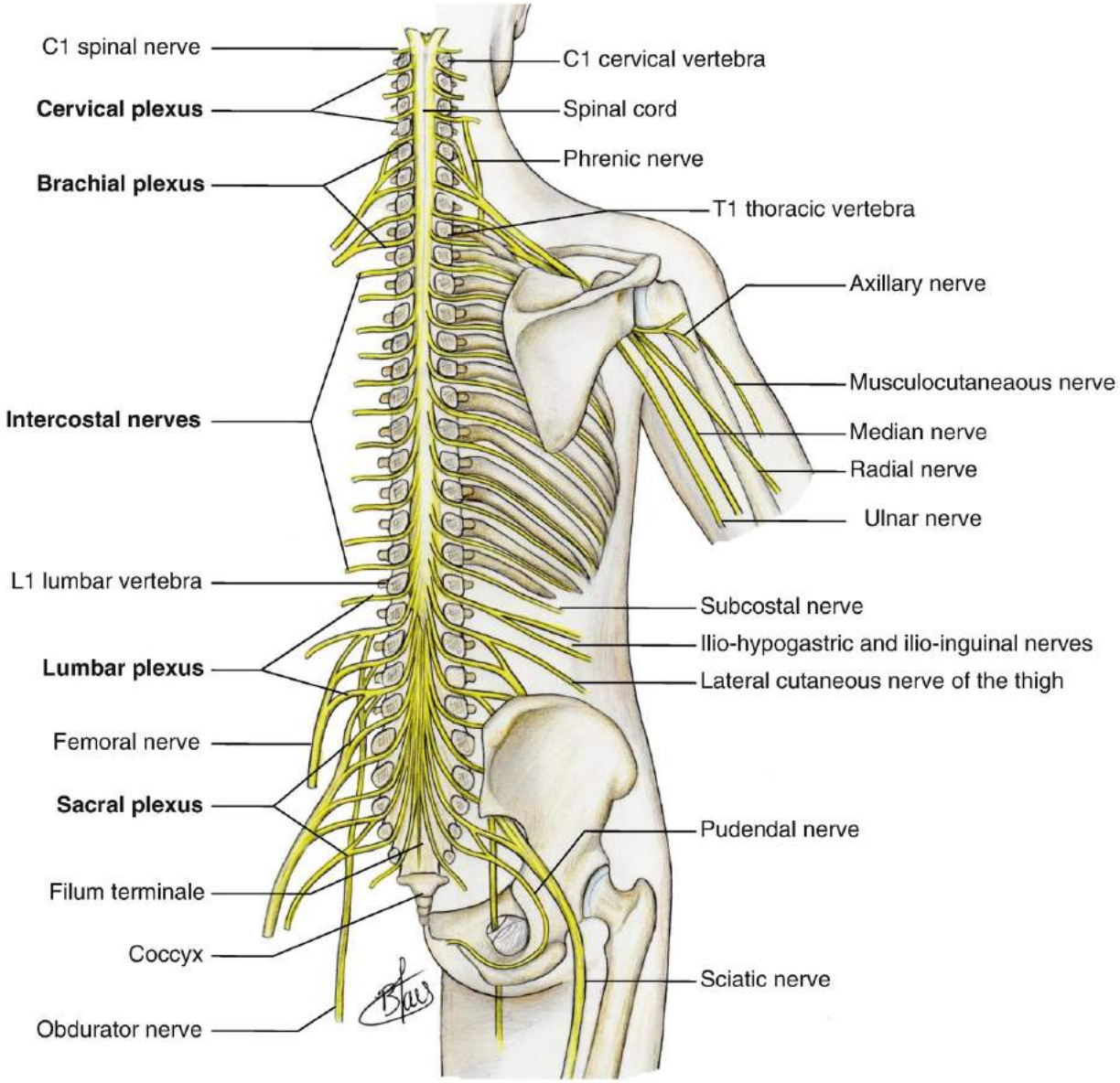
A. Anatomy of BRAIN





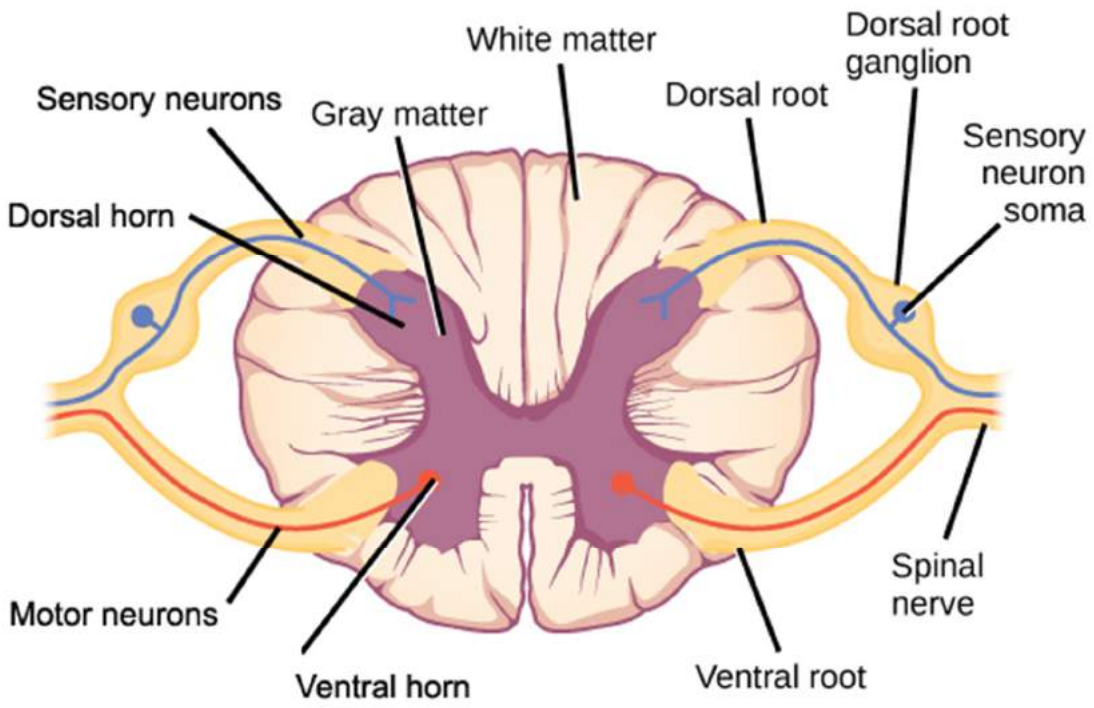


B. **ANATOMY OF SPINAL CORD**



ANATOMY OF SPINAL NERVES

CROSS SECTION OF SPINAL CORD



Cross Section of Spinal Cord

The spinal nerves are peripheral nerves that transmit messages between the spinal cord and the rest of the body, including muscles, skin, and internal organs. Each spinal nerve is dedicated to certain regions of the body.

Structure

The spinal nerves are relatively large nerves that are formed by the merging of a sensory nerve root and a motor nerve root. These nerve roots emerge directly from the spinal cord—sensory nerve roots from the back of the spinal cord and the motor nerve roots from the front of the spinal cord. As they join, they form the spinal nerves on the sides of the spinal cord.

The spinal cord is composed of nerve cells that serve to relay messages between the brain and the peripheral nerves.

The spinal nerves receive sensory messages from tiny nerves located in areas such as the skin, internal organs, and bones. The spinal nerves send sensory messages to the sensory roots, then to sensory fibers in the posterior (back or dorsal) part of the spinal cord.

The motor roots receive nerve messages from the anterior (front or ventral) part of the spinal cord and send the nerve messages to the spinal nerves, and eventually to small nerve branches that activate muscles in the arms, legs, and other areas of the body.

There are 31 pairs of spinal nerves including:

- Eight cervical spinal nerves on each side of the spine called C1 through C8
- Twelve thoracic spinal nerves in each side of the body called T1 through T12
- Five lumbar spinal nerves on each side called L1 through L5
- Five sacral spinal nerves in each side called S1 through S5
- One coccygeal nerve on each side, Co1

Location

Spinal nerves are distributed approximately evenly along the spinal cord and spine. The spine is a column of vertebral bones that protects and surrounds the spinal cord. Each spinal nerve exits the spine by traveling through the foramen, which are openings at the right and left sides of the vertebral bones of the spine.

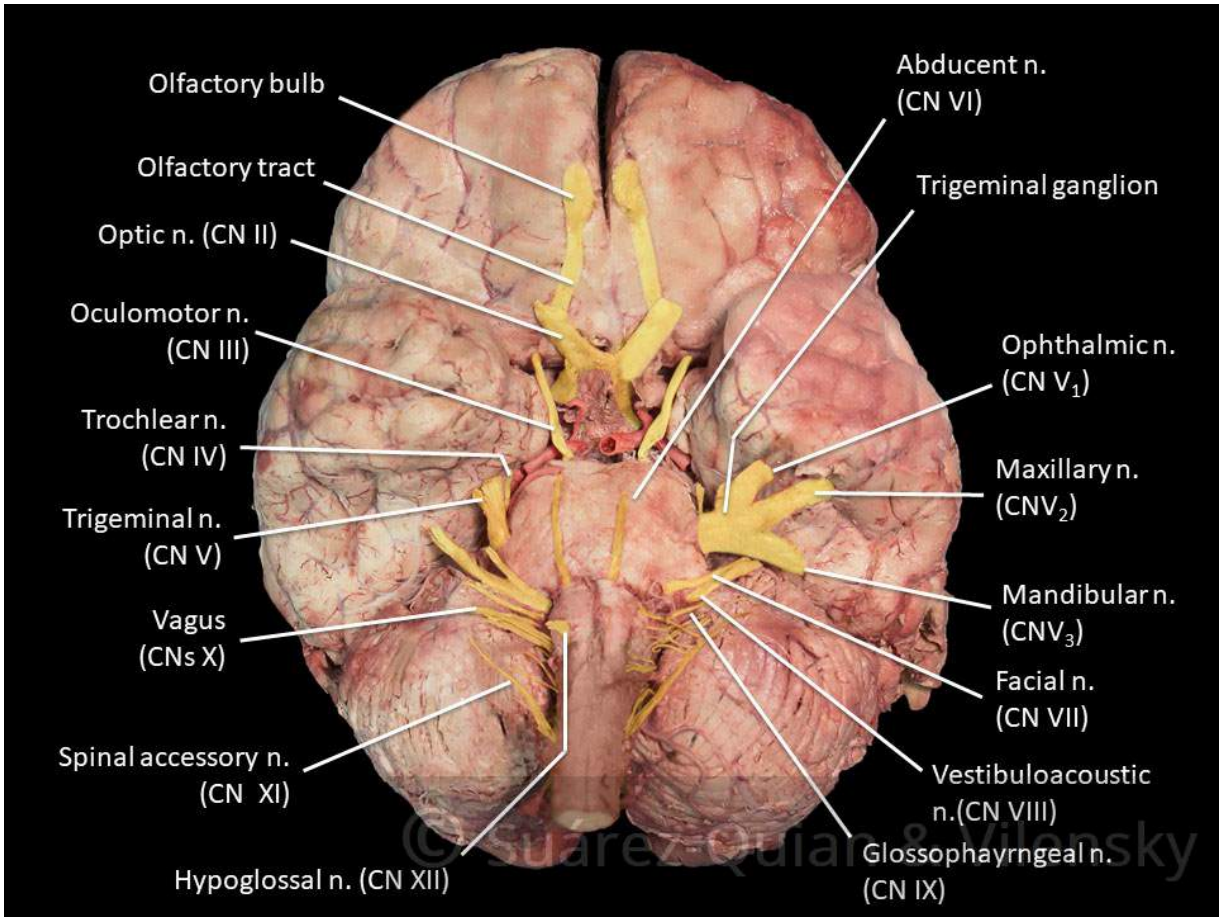
The spinal nerves are formed within a few centimeters of the spine on each side. Some groups of spinal nerves merge with each other to form a large plexus. Some spinal nerves divide into smaller branches, without forming a plexus.

A plexus is a group of nerves that combine with each other. There are five main plexi formed by the spinal nerves:

- **Cervical Plexus**: Composed of the merging of spinal nerves C1 through 5, these divide into smaller nerves that carry sensory messages and provide motor control to the muscles of the neck and shoulders.
- **Brachial Plexus**: Formed by the merging of spinal nerves C5 through T1, this plexus branches into nerves that carry sensory messages and provide motor control to the muscles of the arm and upper back.
- **Lumbar Plexus**: Spinal nerves L1 through L4 converge to form the lumbar plexus. This plexus splits into nerves that carry sensory messages and provide motor control to the muscles of the abdomen and leg.
- **Sacral Plexus**: Spinal nerves L4 through S4 join together, and then branch out into nerves that carry sensory messages and provide motor control to the muscles of the legs.

- **Coccygeal Plexus**: Composed of the merging of nerves S4 through Co1, this plexus supplies motor and sensory control of the genitalia and the muscles that control defecation.

ANATOMY OF CRANIAL NERVES



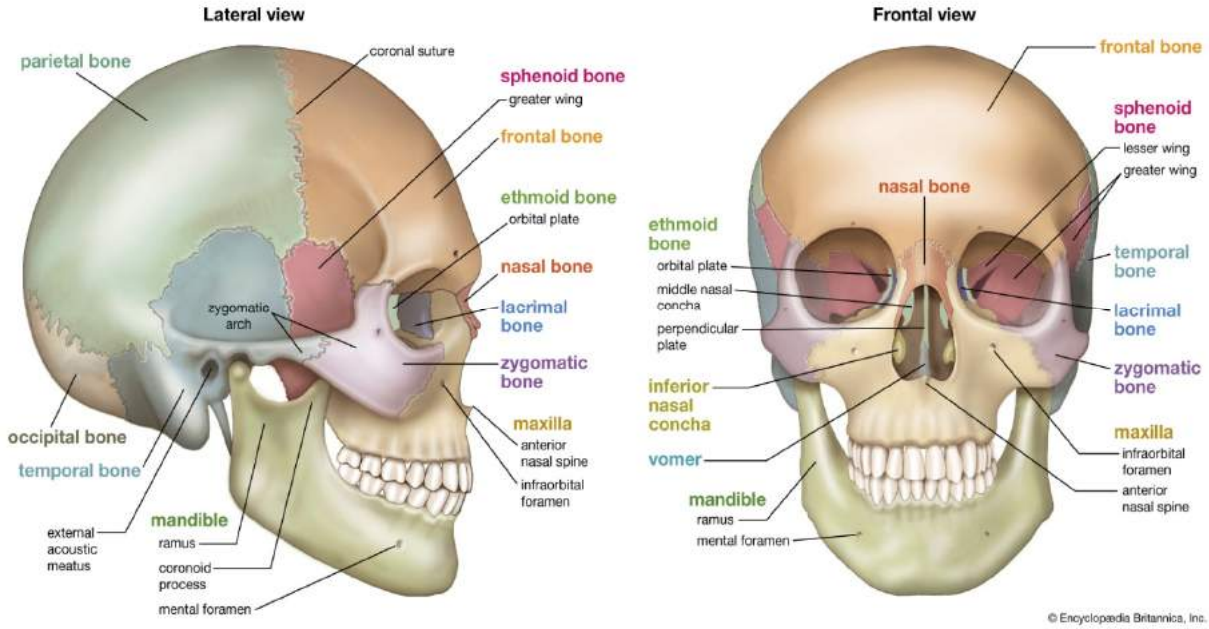
Twelve pairs of nerves (the cranial nerves) lead directly from the brain to various parts of the head, neck, and trunk. Some of the cranial nerves are involved in the special senses (such as seeing, hearing, and taste), and others control muscles in the face or regulate glands. The nerves are named and numbered (according to their location, from the front of the brain to the back).

Image 1: Twelve pairs of cranial nerves emerge from the underside of the brain, pass through openings in the skull, and lead to parts of the head, neck, and trunk. The nerves are named and numbered, based on their location, from the front of the brain to the back. Thus, the olfactory nerve is the 1st cranial nerve, and the hypoglossal nerve is the 12th cranial nerve

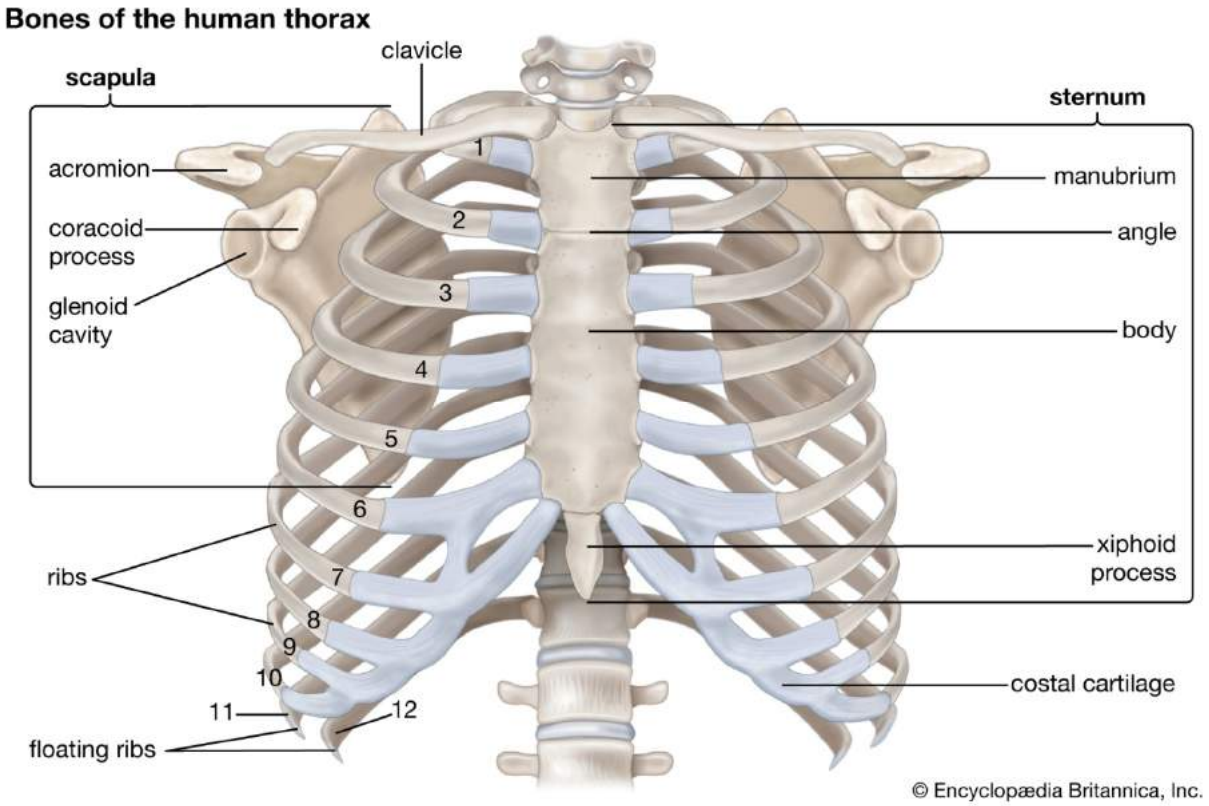
Unlike spinal nerves whose roots are neural fibers from the spinal grey matter, cranial nerves are composed of the neural processes associated with distinct brainstem nuclei and cortical structures.[1]

The names of the cranial nerves (CN) are: CN I - Olfactory, CN II - Optic, CN III - Oculomotor, CN IV - Trochlear, CN V - Trigeminal, CN VI - Abducens, CN VII - Facial, CN VIII - Vestibulocochlear, CN IX - Glossopharyngeal, CN X - Vagus, CN XI - Accessory, and CN XII - Hypoglossal.

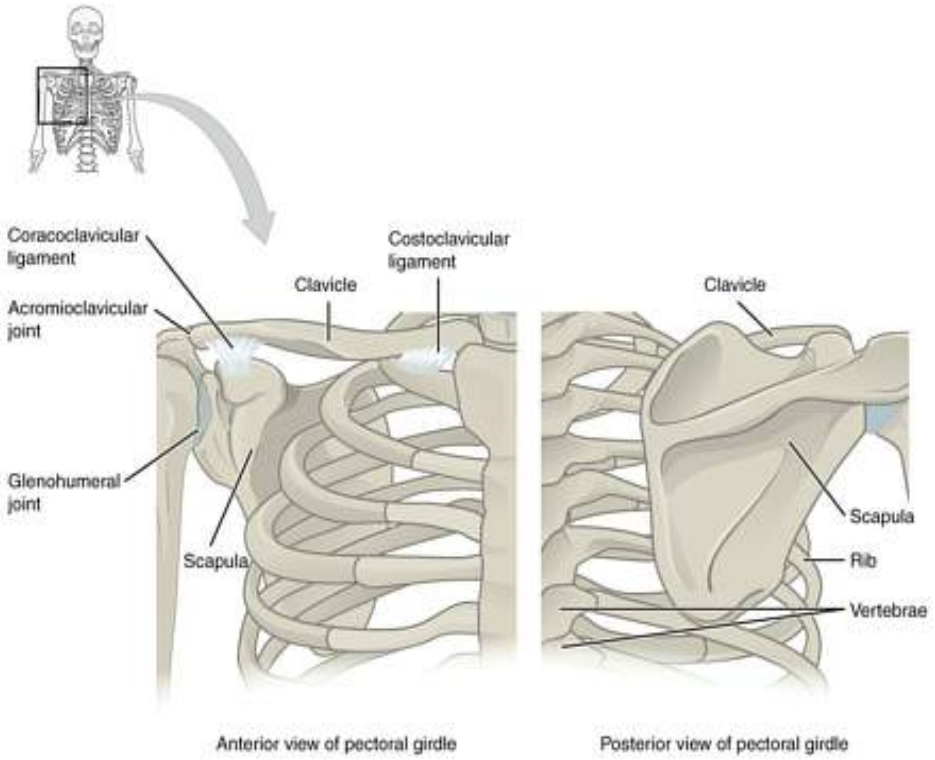
BONES OF THE SKULL



BONES OF THE THORAX



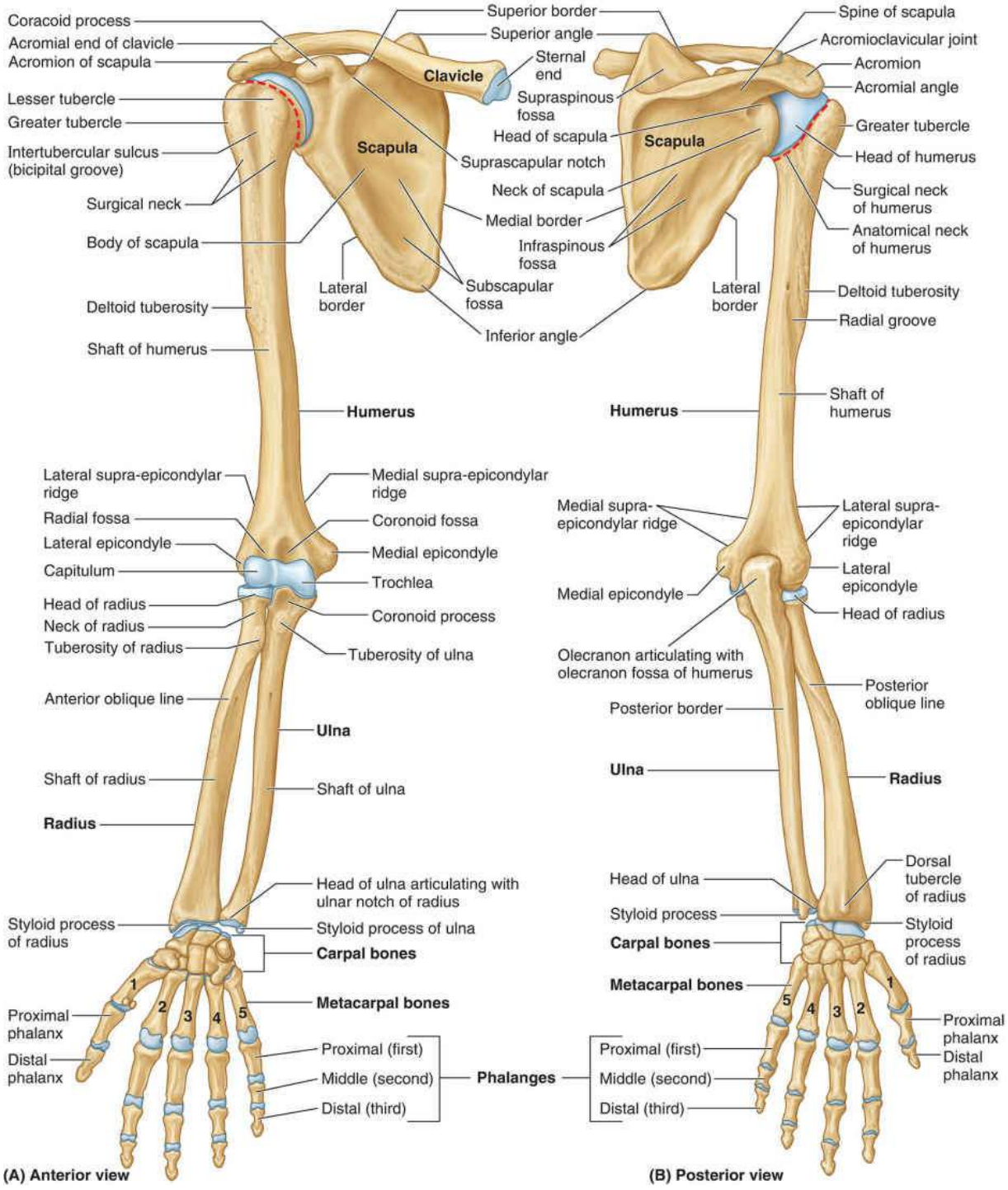
BONES OF PECTORAL GIRDLE



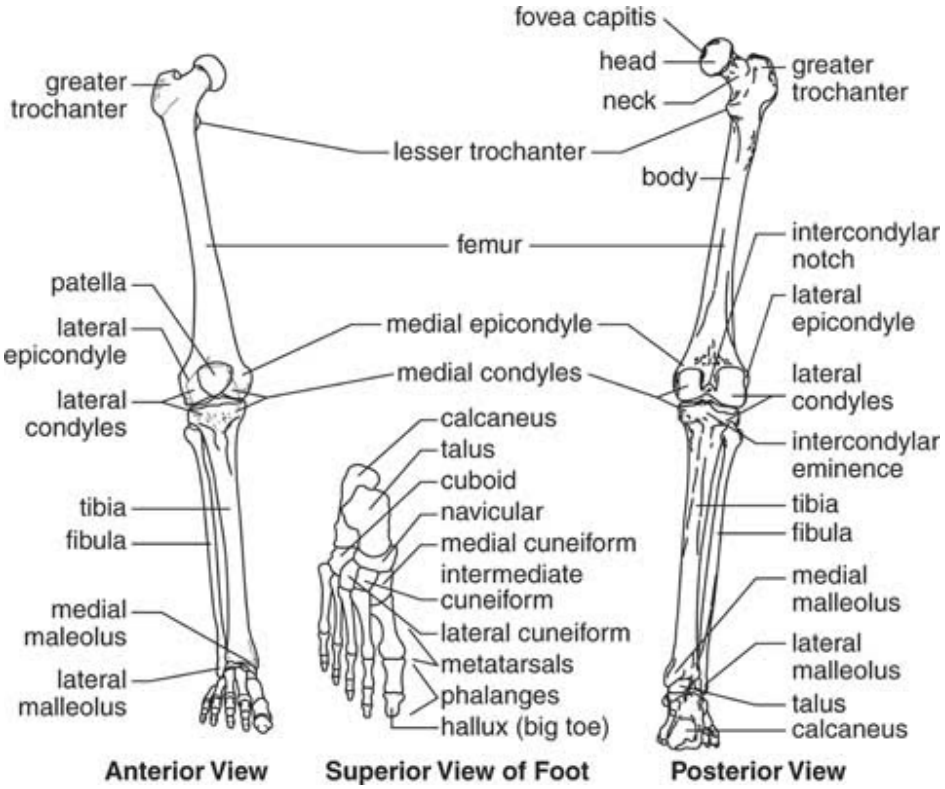
Anterior view of pectoral girdle

Posterior view of pectoral girdle

BONES OF UPPER LIMBS



BONES OF LOWER LIMB



BONES OF PELVIC GIRDLE