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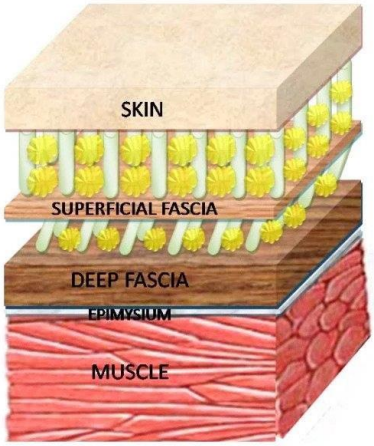
ANATOMY

Layers of the body:

1. Skin
2. Superficial fascia
3. Deep fascia
4. Muscles
5. Bones



Skin

1) <u>According to its thickness :</u>
   a) Thick skin: example (palm of hand, sole of foot)
   b) Thin skin : example (Eyelids)

Figure 1 a ((palm of hand, sole of foot))

Figure 2 : b ((Eyelids))

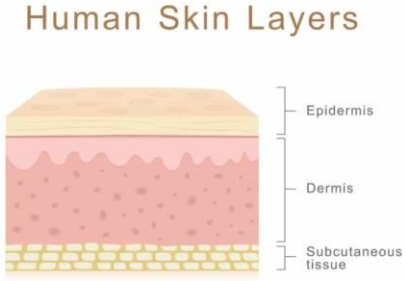
2) <u>According to Hair :</u>
   a) Hairy skin : example (scalp)
   b) None hairy skin : example (palm of hand, sole of foot, Eyelids)

Figure 3: a ((scalp))

3) <u>According to its color</u> : it is determined by the number of melanocytes
   a) Dark skin : increased in the number of melanocytes
   b) White skin : decreased in the number of melanocytes

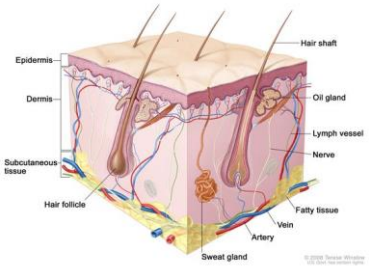
❖ **<u>Skin structure:</u>** The skin is formed of two layers:

1) Epidermis
2) Dermis



❖ **<u>Skin Appendages:</u>** The skin has mainly 4 appendages which are developed from epidermis :

1) Nails
2) Hair
3) Sebaceous glands
4) Sweat glands



It also contains muscles (erector pili),vessels, nerves and lymphatics .

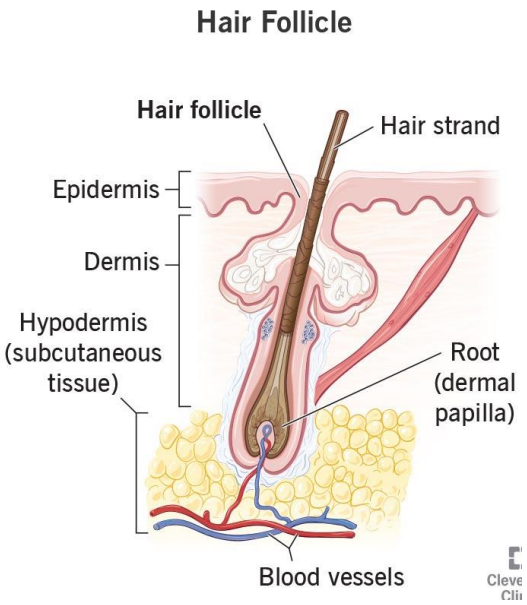
<u>Functions of Skin :</u>

1) Protection:
   - It protects the body and its internal structures against harmful organisms, sunlight and trauma.

2) Sensation:
   - It is a sensory organ for sensation of pain, touch and temperature.
3) Excretory function:
   - The body can get rid of harmful products through the skin.
4) Nutrition:
   - It has a rule in vitamin D synthesis.
5) Fluid balance:
   - It prevents excessive fluid loss.
6) Thermo-regulation:
   - It is produced by sweating and control of blood flow.

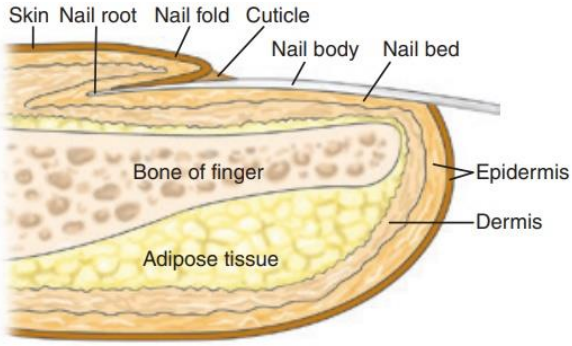
Hair

- **Hair Follicles**: Hair grows from follicles, which are invaginations of the epidermis into the dermis.
- **Hair Bulb**: The lower end of the follicle, called the hair bulb, penetrates deep into the dermis.
- **Hair Papilla**: A concavity at the base of the hair bulb contains vascular connective tissue (hair papilla) that provides nutrients for hair growth.
- **Arrector Pili Muscle**: A small smooth muscle connects the follicle to the superficial dermis.
  - **Function**: Contraction of this muscle makes the hair stand upright, compresses sebaceous glands to release oil, and causes goosebumps.
- **Nerve Supply**: The arrector pili is innervated by sympathetic nerve fibers.
- **Hair Distribution**: Hair is found all over the body except in specific areas like:
  - Lips
  - Palms of the hands and soles of the feet
  - Sides of fingers and toes
  - Glans penis, clitoris, labia minora, and inner labia majora



Nails :

- **Composition**: Nails are keratinized plates located on the dorsal surfaces of the fingers and toes.
- **Nail Root**: The proximal edge of the nail plate is called the nail root.
- **Nail Folds**: The nail is bordered and overlapped on all sides, except the distal edge, by skin folds known as nail folds.
- **Nail Bed**: The skin underneath the nail plate is called the nail bed.



Superficial fascia

Characters of superficial fascia :

- It lies either under the skin.
- It is formed of superficial fatty layer and deep membranous layer.

Functions of Superficial Fascia :

1) The fat content of the superficial fascia.
- Acts as a food reservoir
- Insulates the body heat from the environment.
- Gives the rounded contour of female body.

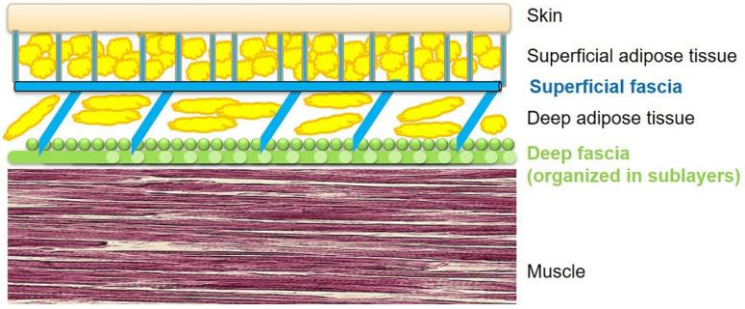
2) The vessels and nerves in the superficial fascia
- The vessels help in regulating body temperature.
- The nerves carry the sensations from the skin.

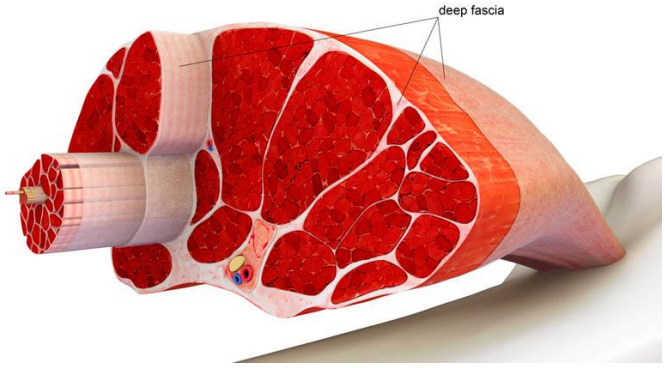
3) Special contents in the superficial fascia in certain places
- In the pectoral region it contains the mammary gland.
- Contains muscles in certain places as the following:
  - Face: Contains facial muscles.
  - Neck: Contains platysma.

Deep Fascia

Characters of Deep Fascia:

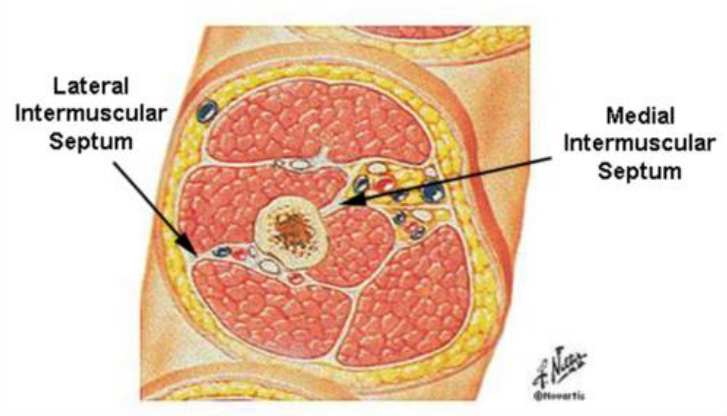
- It lies deep to superficial fascia.
- It is a strong dense white fibrous membrane.

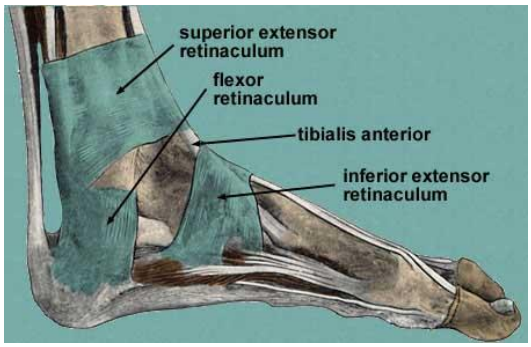


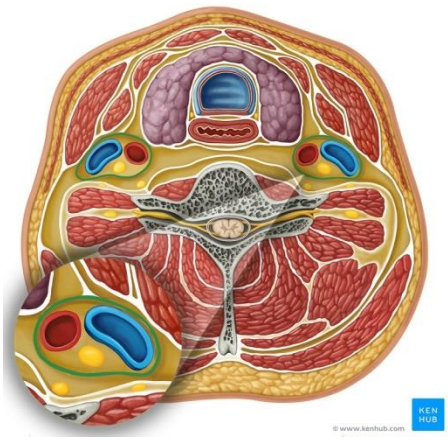


Functions of Deep Fascia:

1) Formation of "intermuscular septa":
   - ❖ The intermuscular septa separate the different groups of muscules facilitate their action.
2) Formation of "retinacula":
   - ❖ The retinacula at the wrist and ankle keep the tendons close to the bones.
3) Formation of "sheathes" around blood vessels and nerves
   - ❖ Around the big vessels the deep fascia thickens in a form of a sheathes surrounding vessels and nerves to protect them.
4) In some places, it gives attachments to muscles.

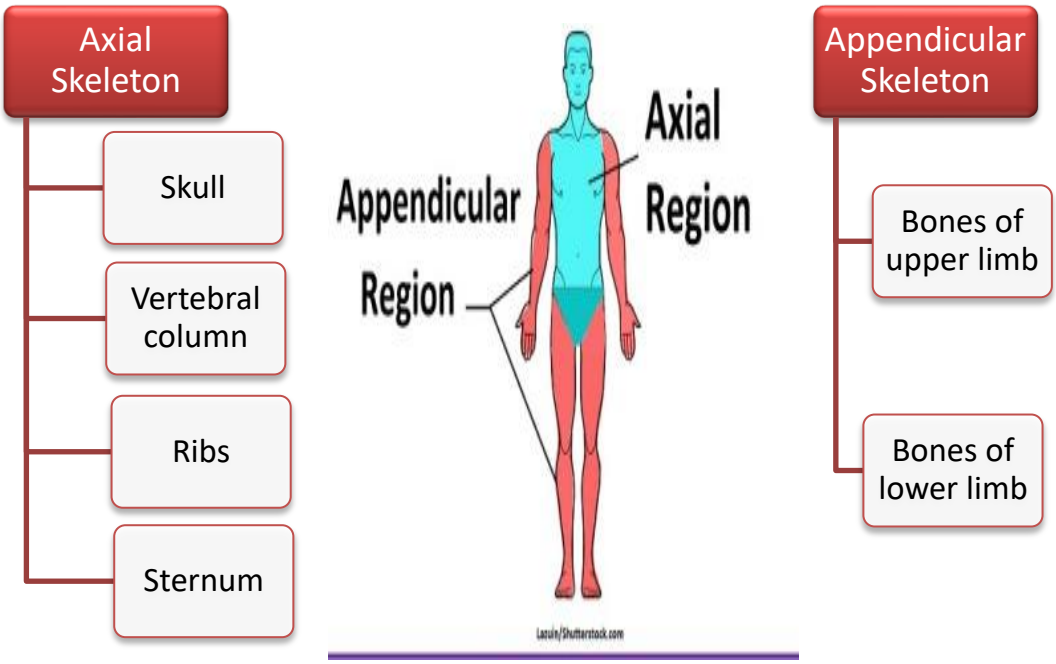

Lateral
Intermuscular
Septum
Medial
Intermuscular
Septum


superior extensor
retinaculum
flexor
retinaculum
tibialis anterior
inferior extensor
retinaculum



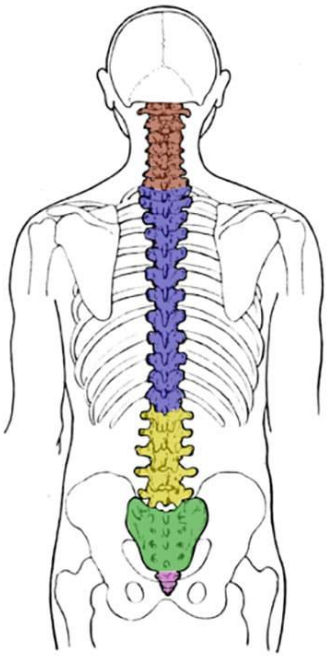
Skeletal system

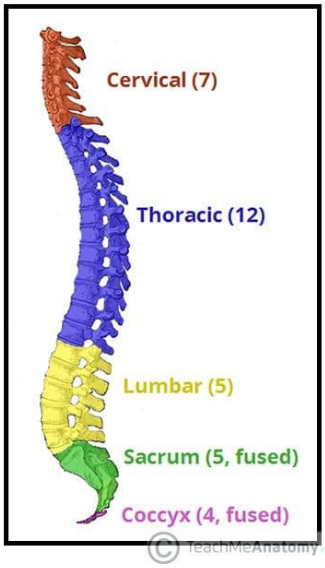
Parts of Skeletal System:



- **Axial System:**

1. **Skull**





2. **Vertebral Column:**
    a) Cervical vertebrae (7)
    b) Thoracic vertebrae (12)
    c) Lumbar vertebrae (5)
    d) Sacral vertebrae (5 fused)
    e) Coccygeal vertebrae (4)

3.

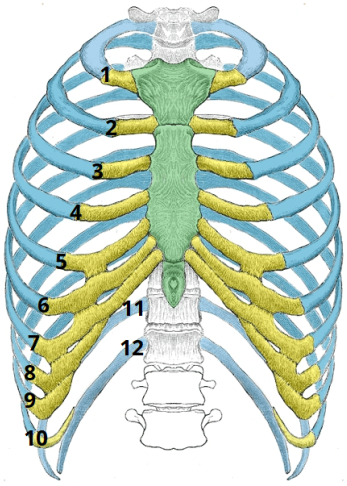
4. **Ribs:**

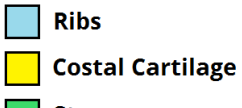
➢ They are 12 on each side.

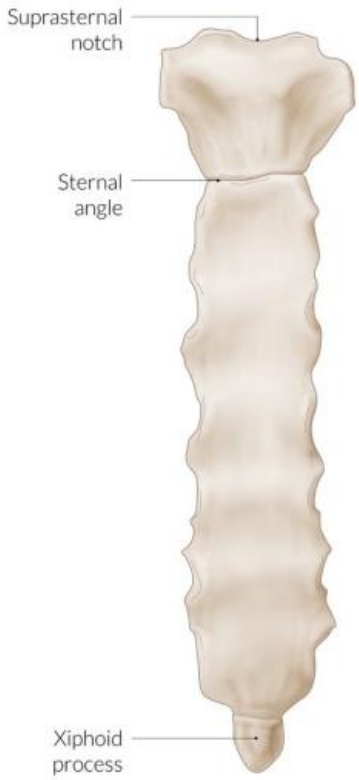
5. **Sternum:**

➢ It is one in the midline.

❖ Sternal angle lies at the level of the 2nd rib.



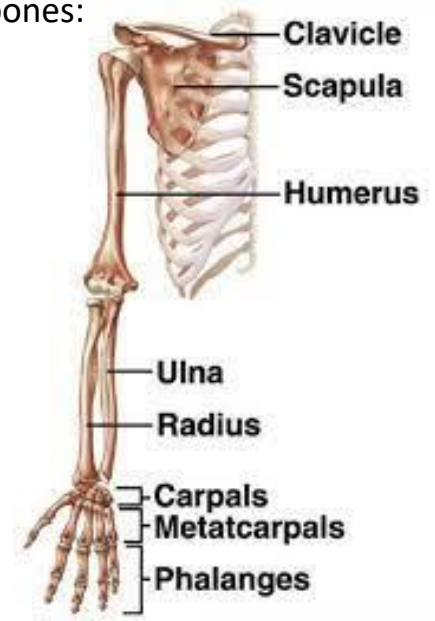




Appendicular system :

1. Bones of the Upper Limb

❖ The skeleton of the upper limb consists of the following bones:



I. Shoulder girdle is formed of:

- Clavicle (anterior).
- Scapula (posterior).

II. Skeleton of the arm is formed of:

- Humerus.

III. Skeleton of the forearm is formed of:

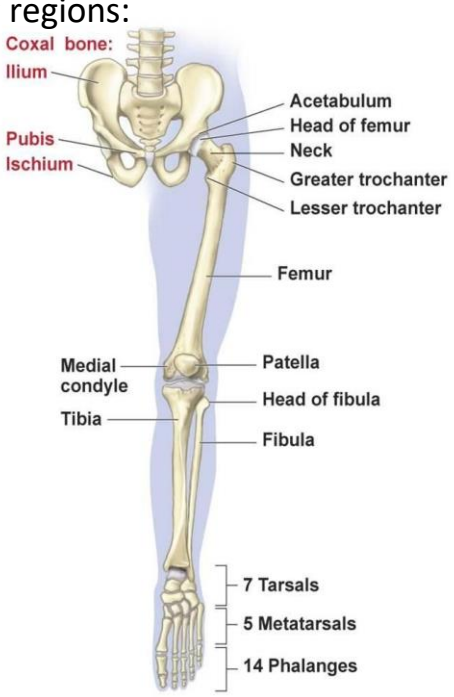
- Radius (lateral).
- Ulna (medial).

IV. Skeleton of the hand is formed of three regions:

a) Carpus (proximal, 8 carpal bones).
b) Metacarpus (intermediate, 5 metacarpal bones).
c) Phalanges (distal, 14 Phalanx 3 for each finger and 2 for the thumb).

2. Bones of the Lower Limb:

❖ The skeleton of the lower limb consists of the following regions:



I. Pelvic girdle is formed of:

- Hip bone.

II. Skeleton of the thigh is formed of:

- Femur.

III. Skeleton of the leg is formed of:

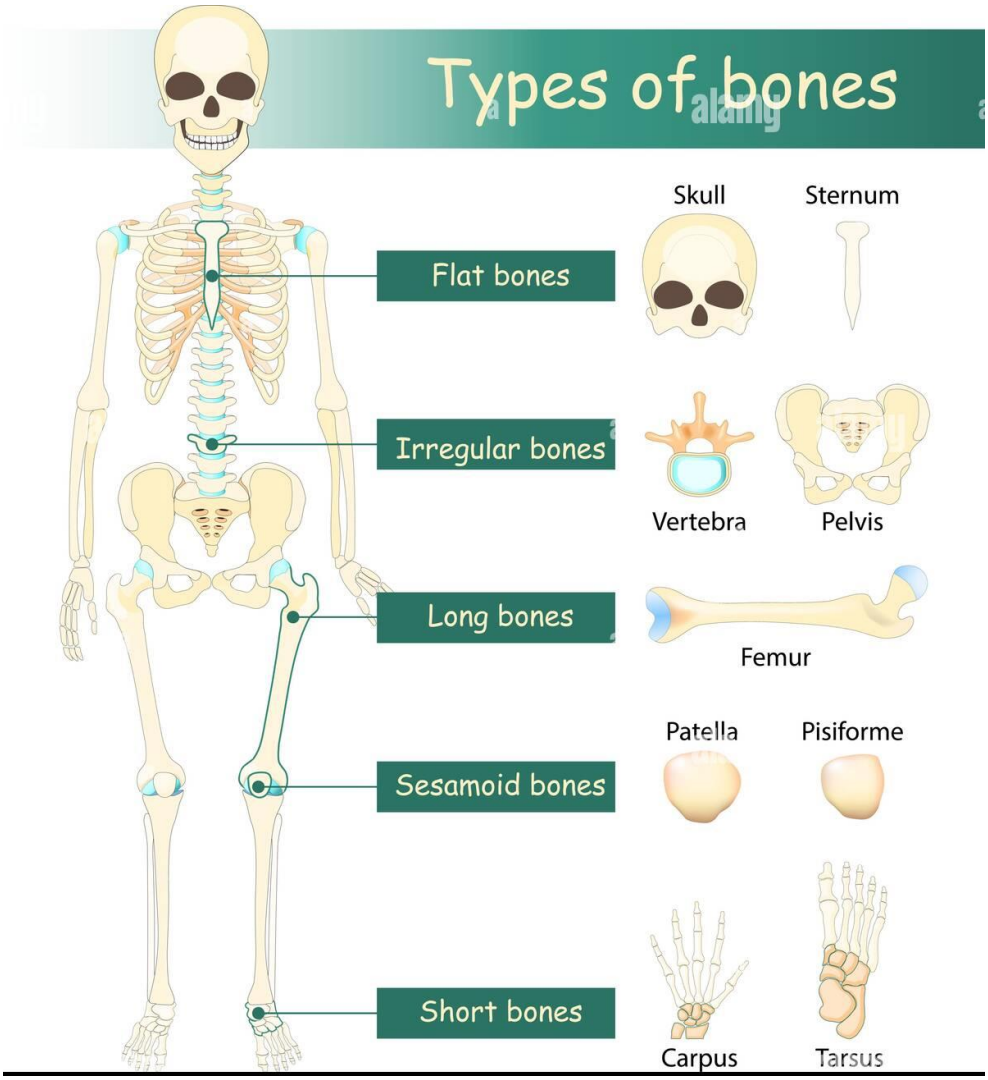
- Tibia (medial).
- Fibula (lateral).

IV. Skeleton of the foot is formed of three regions:

a) Tarsus (proximal, 7 tarsal bones).
b) Metatarsus (intermediate, 5 metatarsal bones).
c) Phalanges (distal, 14 phalanx).

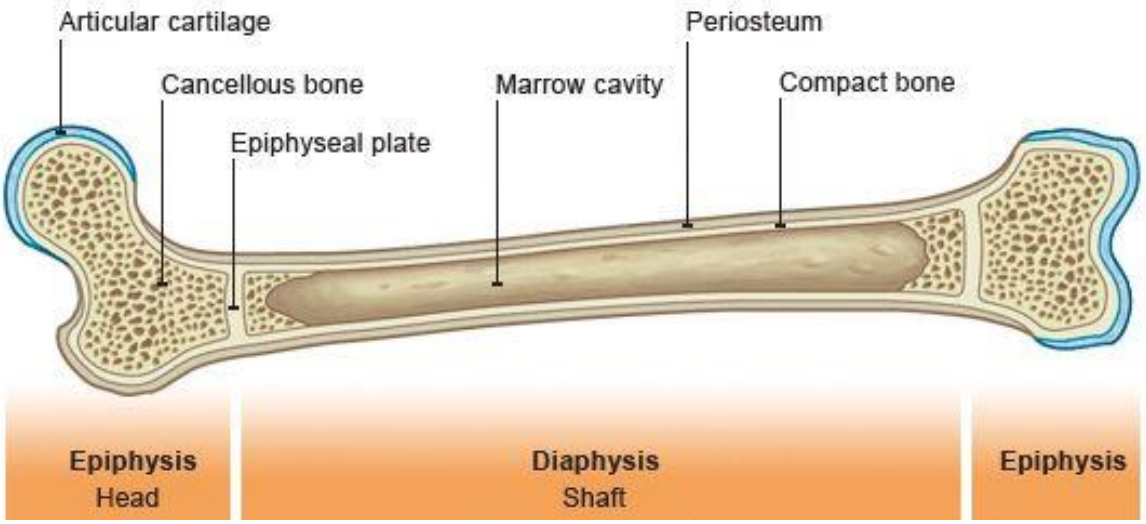
Types of Bones According to its Shape

1. Long bones : Example: Humerus
2. Short bones : Example: Phalanges
3. Irregular bones: Example: Vertebrae
4. Flat bones: Example: sternum , Scapula
5. Sesamoid bones (bones developed inside tendons) : Example: Patella
6. Pneumatic bones (bones containing air cavities) : Example: Skull



Types of Bones According to its Structure

1. Compact bone
- It is firm and forms the outer layer of the bone.
2. Cancellous (spongy) bone
- It is formed of interlacing trabeculae and it is present at ends of the long bones.



Types of ossification:

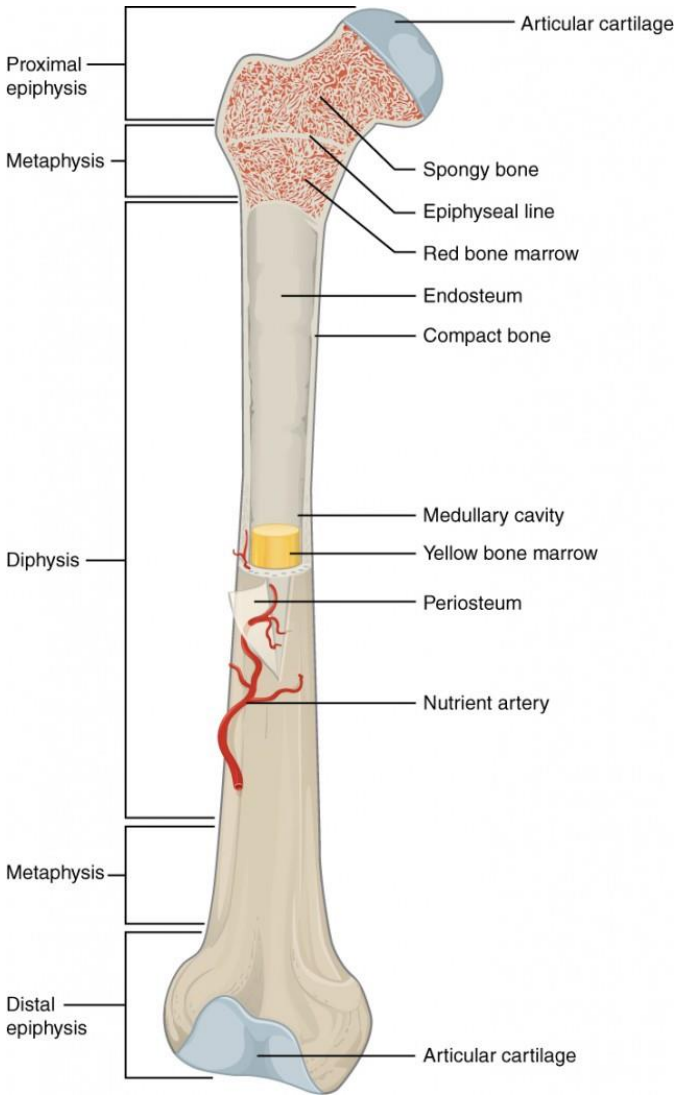
1. Membranous ossification
- It means that a membrane changes into a bone: Example: Skull or clavicle
2. Cartilaginous ossification
- It means that a model of cartilage changes into bone:Example: Long bones

Growth of bones

1. Increase in thickness
- Through intramembranous ossification
2. Increase in length
- Through intracartilaginous ossification.

Parts of the Growing Long Bone:

1. Epiphysis
   - ➢ It is the upper and lower ends of the long bone.
2. Epiphyseal plate
   - ➢ A plate of cartilage in the growing bone that separate the epiphysis from the diaphysis (shaft).
   - ➢ It is the site of increase in length of the bone.
3. Diaphysis
   - ➢ It is the shaft of the bone.
4. Metaphysis
   - ➢ It is the region of the shaft close to the epiphyseal plate.



Blood Supply of bones:

- ❖ Each bone is supplied by nutrient artery.
- ❖ It pierces the shaft.

Functions of the Skeletal System (bones)

1. It supports the body weight (such as the bones of the lower limb).
2. It supports the body organs (such as organs of thorax and abdomen).
3. It gives attachments to muscles
4. Protection of certain structures (such as the skull protects the brain).
5. Formation of the blood cells by bone marrow.
6. Storage of calcium and phosphorus.