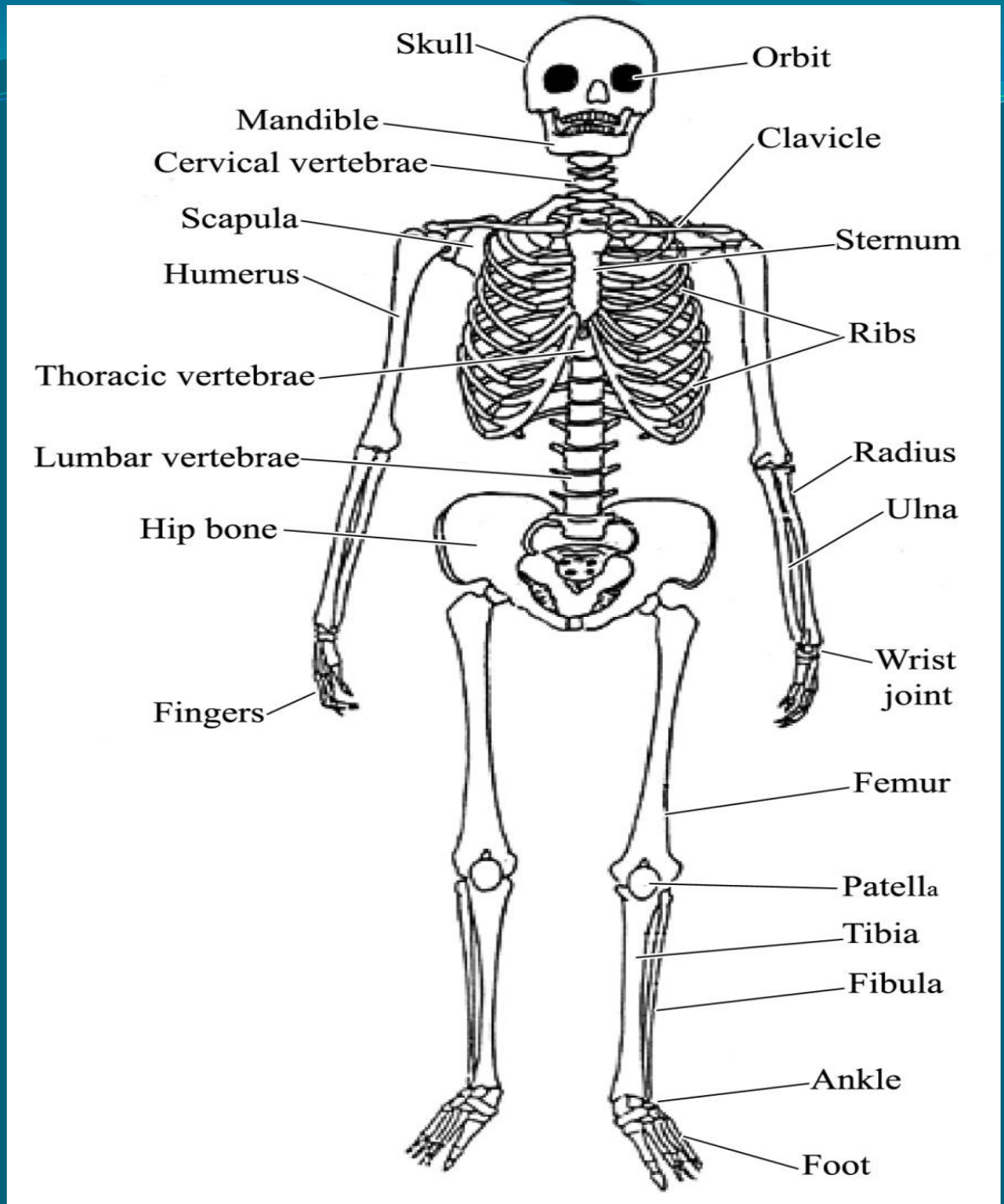
skeleton

BY DR. DALIA M. BIRAM

The skeletal system consists Of:

- Axial skeleton

-Appendicular skeleton


Skull
Orbit
Mandible
Clavicle
Cervical vertebrae
Scapula
Sternum
Humerus
Ribs
Thoracic vertebrae
Lumbar vertebrae
Radius
Ulna
Hip bone
Wrist joint
Fingers
Femur
Patella
Tibia
Fibula
Ankle
Foot

I. Axial Skeleton

A. Skull

B. Vertebral column

C. Ribs (12 on each side)

D. Sternum (one in the midline)

Vertebral column

consists of:

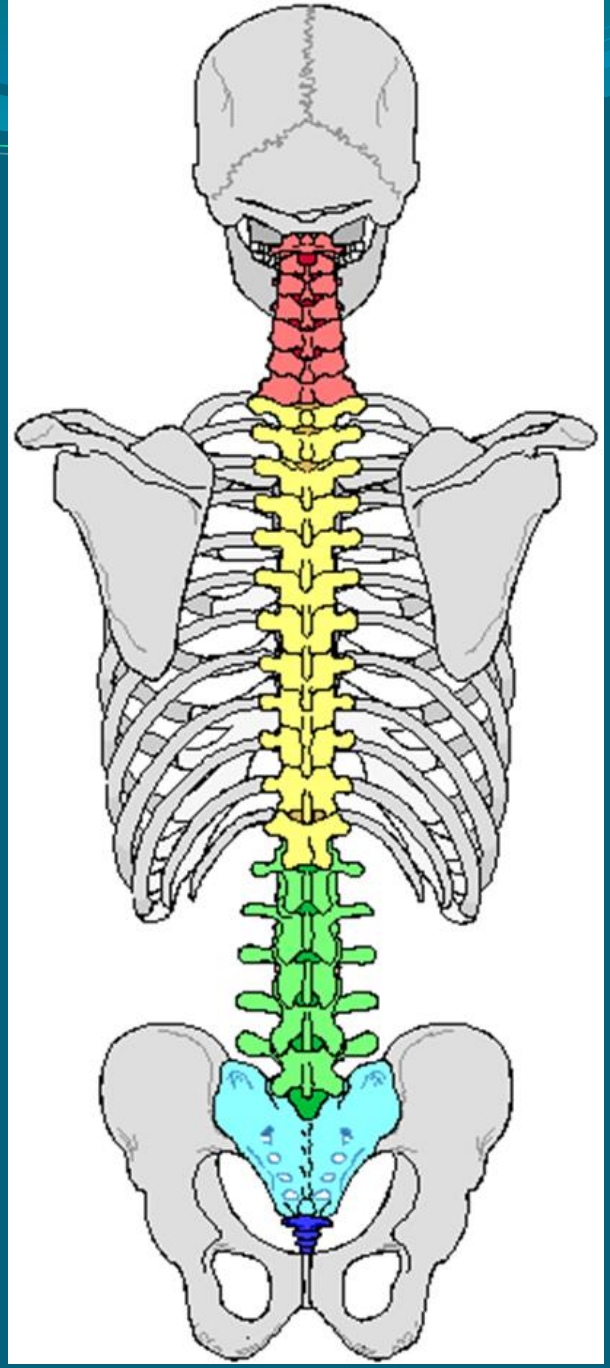
a. Cervical vertebrae (7)

b. Thoracic vertebrae (12)

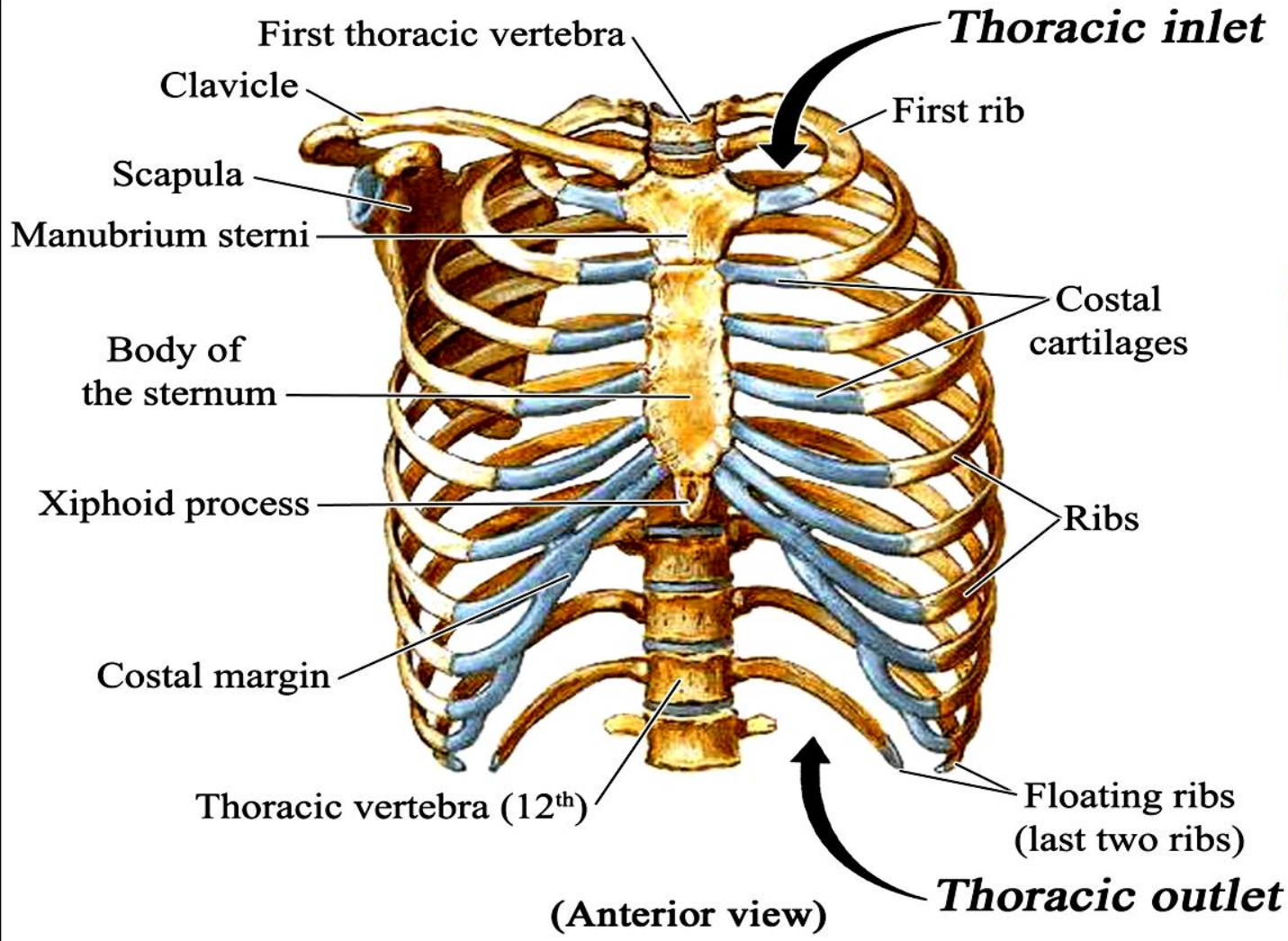
c. Lumbar vertebrae (5)

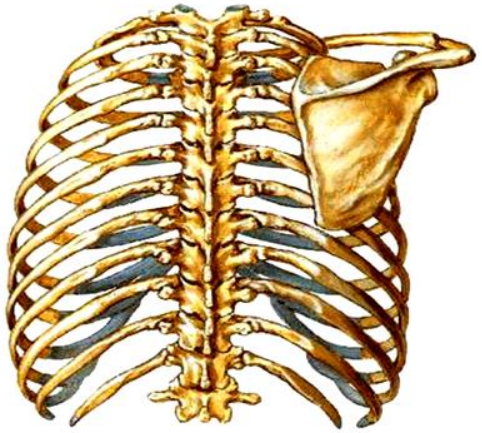
d. Sacral vertebrae (5 fused)

e. Coccygeal vertebrae (4fused)



Thoracic Cage





(Posterior view)

Sternum

-manubrium sterni - body
-xiphoid process.

Ribs

twelve (12)

I. True ribs: Upper **seven** ribs.

II. False ribs: Lower **five** ribs

lower **two** ribs are called the ***floating ribs*** because they are *free* anteriorly.

Thoracic Vertebrae

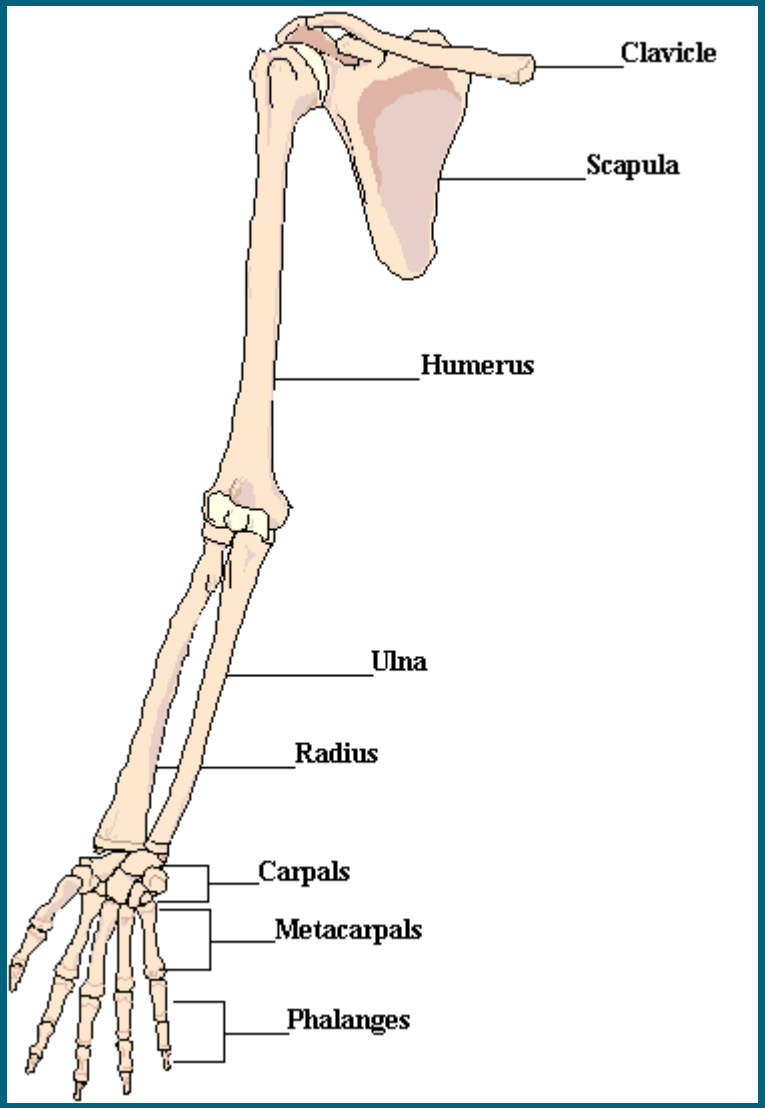
twelve (12)

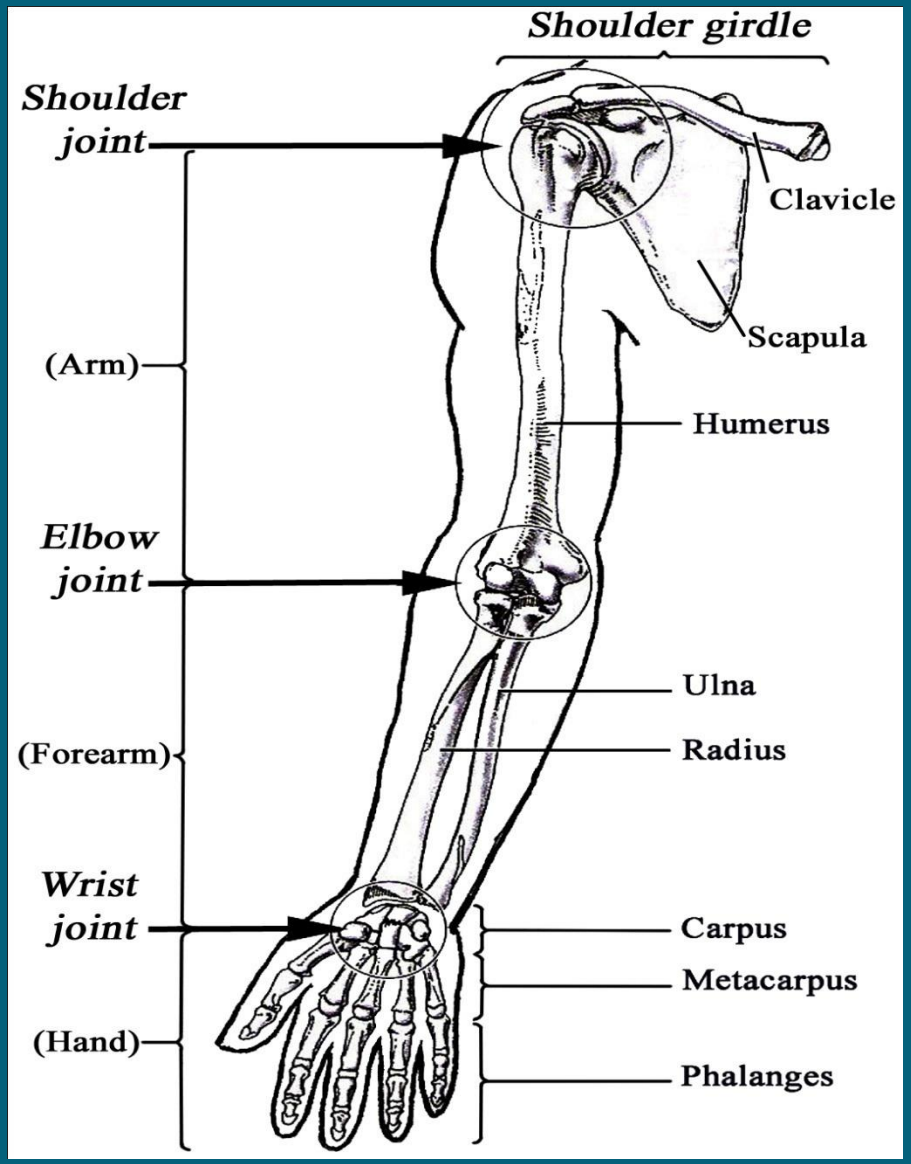
II. Appendicular Skeleton

1- Bones of the upper limb

2- Bones of the lower limb

Bones of the upper limb





I. Shoulder girdle is formed of:

-Clavicle - Scapula

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 (three regions):

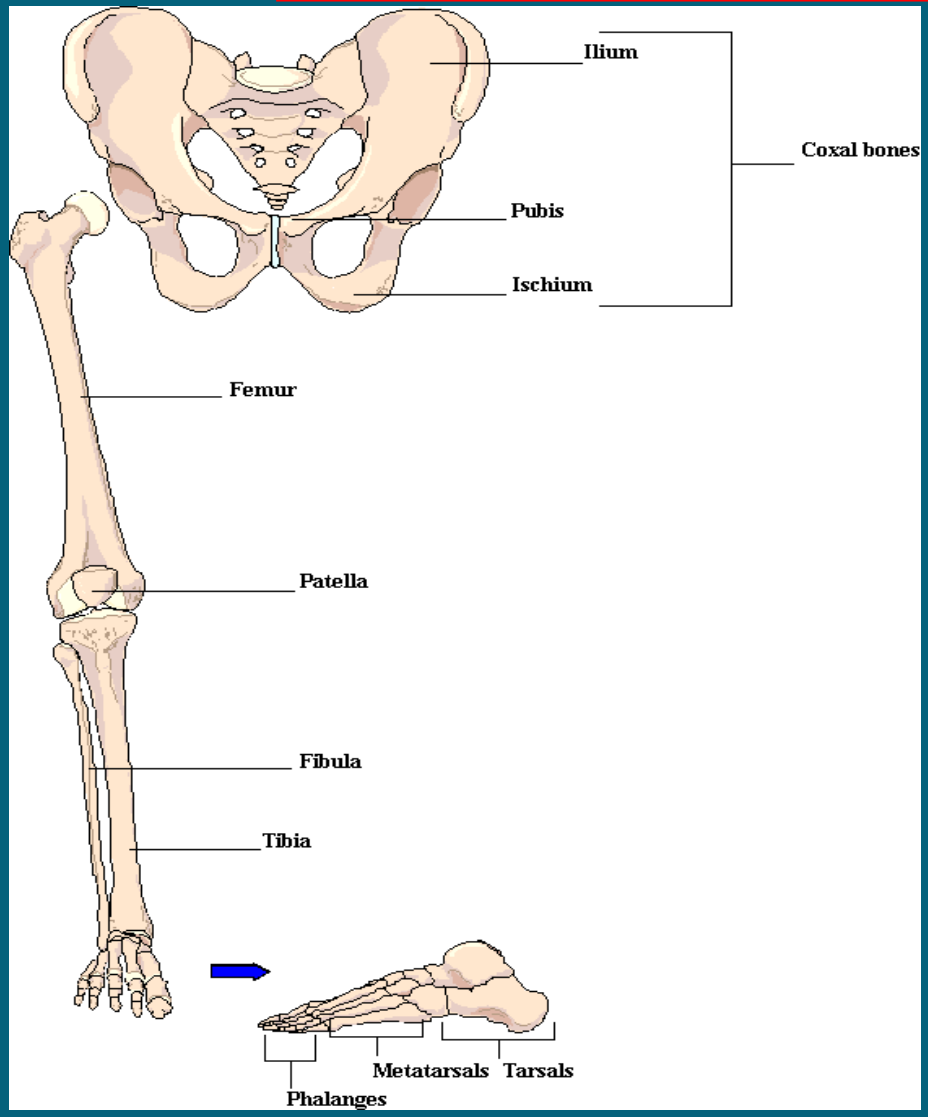
A. Carpus (proximal, **8** carpal bones).

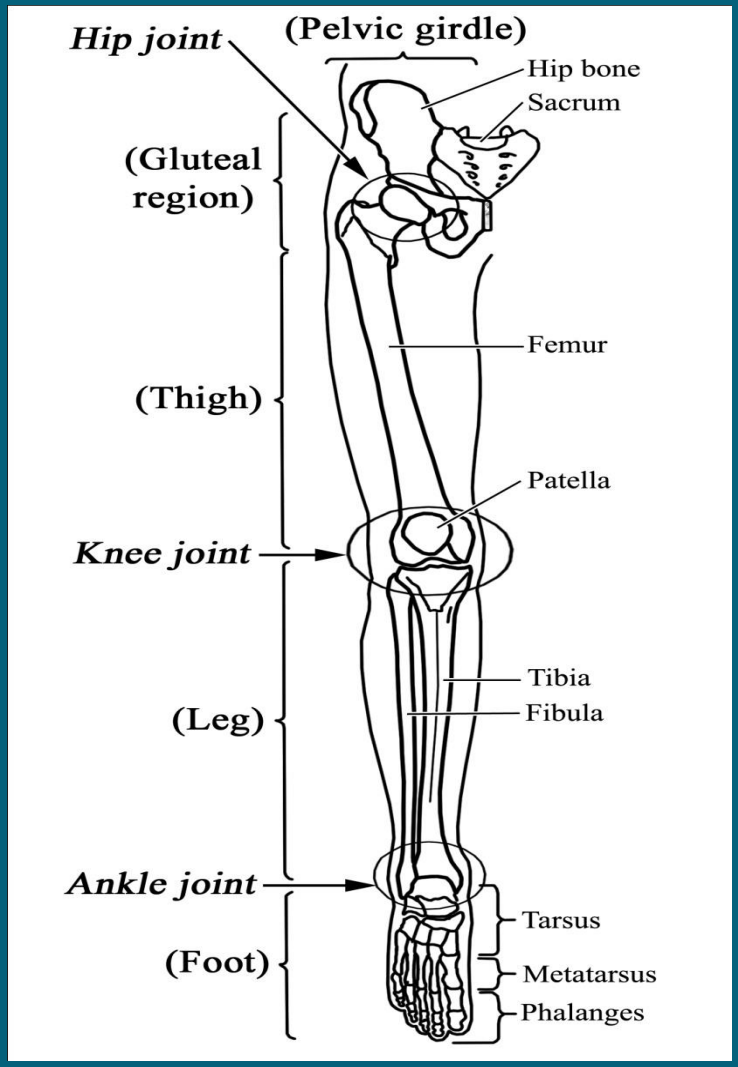
B. Metacarpus (intermediate, **5** metacarpal bone

C. Phalanges

B. Bones of the lower limb:

Bones of the lower limb





I. Pelvic girdle - two Hip bones and the sacrum.

II. thigh is formed of:

- Femur.

III. Skeleton of the leg is formed of:

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

IV. Skeleton of the foot (three regions):

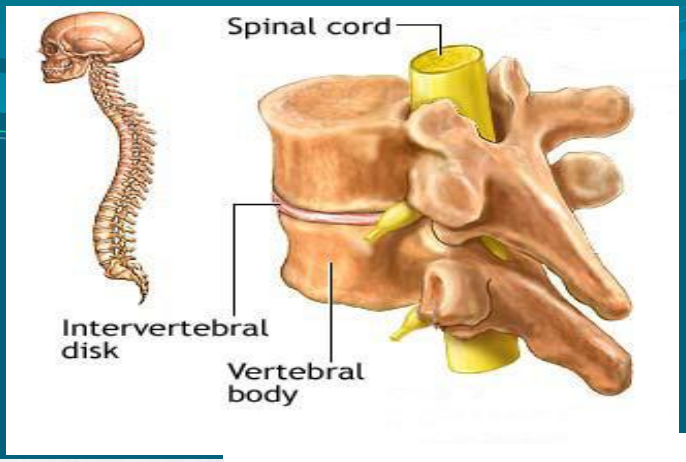
A. Tarsus (7 tarsal bones).

B. Metatarsus (5 metatarsal bones).

C. Phalanges

Types of bones

according to its shape



I- Long bones

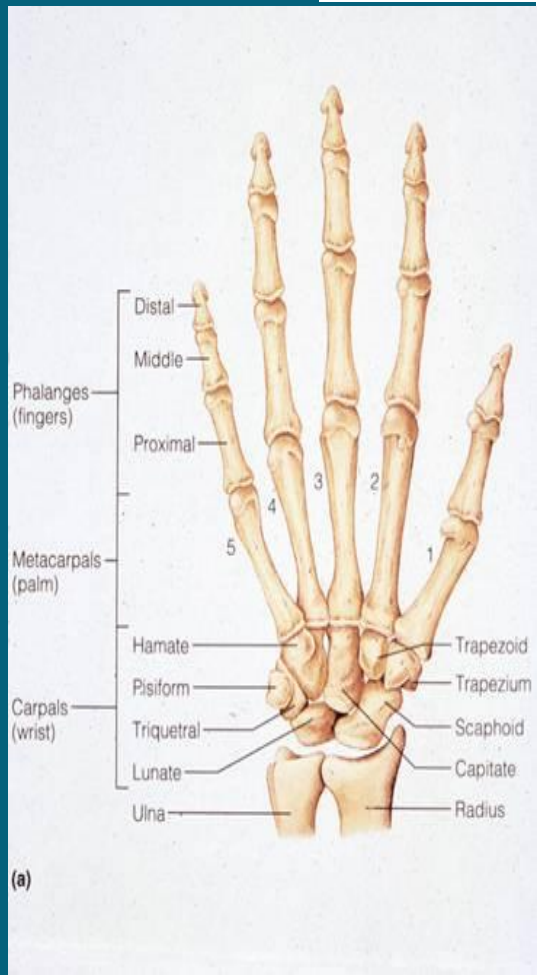
Example: Humerus

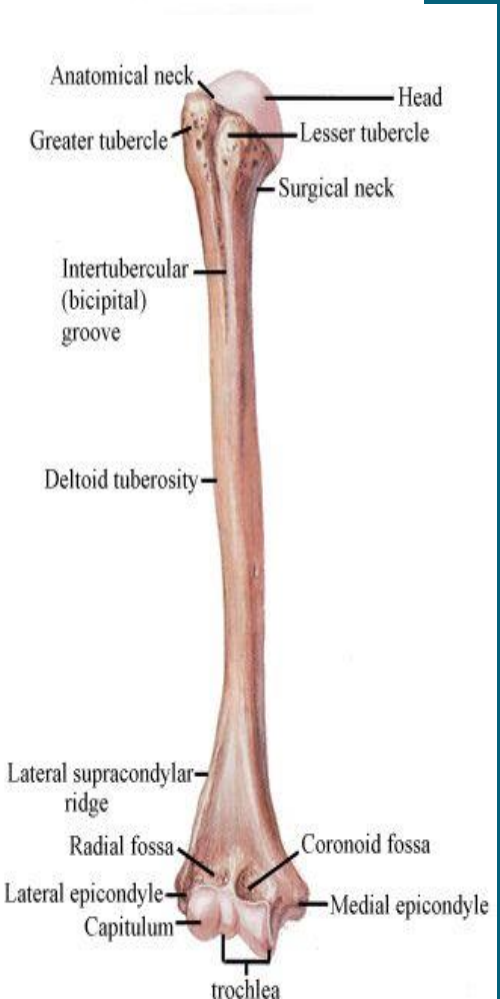
II. Short bones

Example: Phalanges

III. Irregular bones

Example: Vertebrae





IV. Flat bones

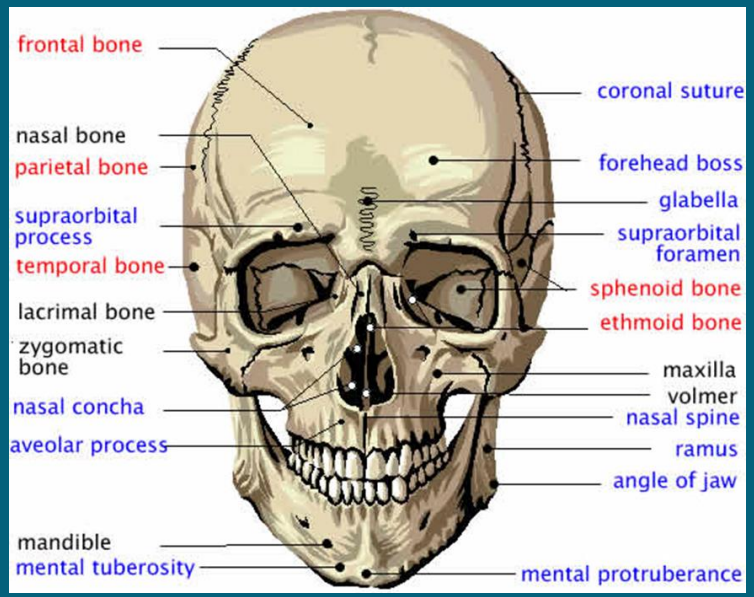
Example: Scapula

V. Pneumatic bones

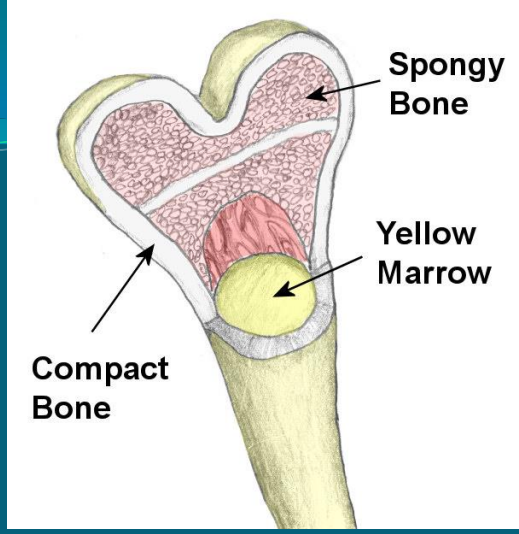
Example: Skull

V. Sesamoid bones(inside tendons)

Example: Patella



according to its structure:

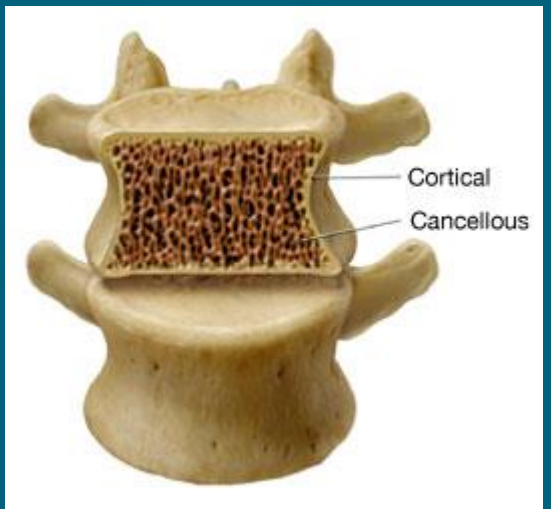


I. Compact bone

- It is firm and forms the outer layer of the bone.

II. Cancellous bone

- It is formed of interlacing trabeculae .
- it is present at the ends of the bones.



Types of Ossification:

1)Cartilagenous ossification e.g. humerus and other long bones.

If bone is formed in a model of cartilage,

Most of the bones of the body are developed by cartilagenous ossification.

2) Membranous ossification e.g. skull or clavicle

the bone is formed in a membrane,

Stages of Cartilagenous Ossification:

1) In the embryo, each bone is represented by a small mould of cartilage.

2) Primary centre of ossification appears in the shaft during intra-uterine life.

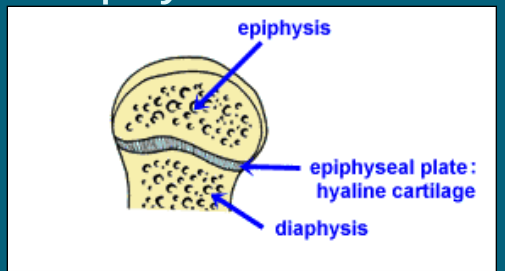
3) Secondary centres appear at the ends of long bones just before or after birth.

These centres act as foci around which bone is deposited.

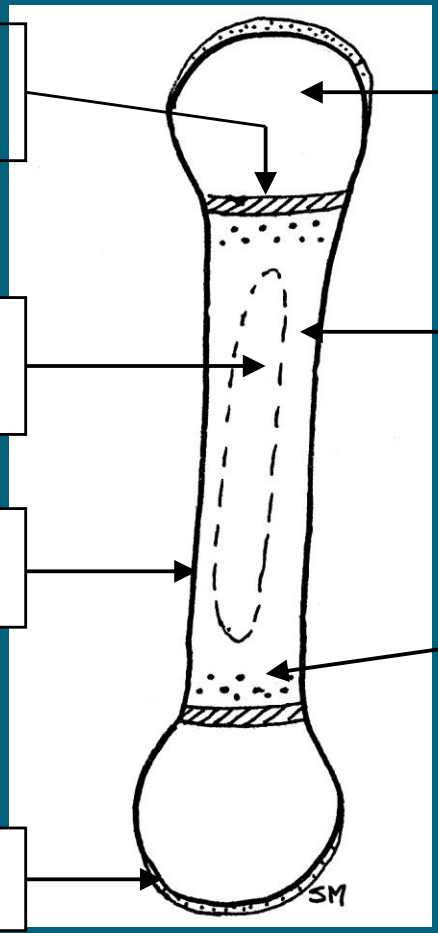
4) Bone occupies the whole mould except at the epiphyseal plates.
At this stage, the bone is formed of two ends (epiphysis) and a shaft (diaphysis) which are separated by epiphyseal plates (epiphyseal cartilage).
•the growing ends of the tibia and the fibula are the upper ends.

•The **bone grows** rapidly **in length** by ossification at the metaphysis

• (the metaphysis is the part of the diaphysis immediately adjacent to the epiphyseal cartilage).



Growth of bone



Epiphyseal cartilage

Epiphysis

Medullary cavity

Diaphysis

Periosteum

Metaphysis

Articular Cartilage

Nutrient Artery:

each bone receives its nutrient artery.

The nutrient artery in the long bones is directed towards the non-growing end.

in the humerus it runs towards the lower end of the bone or the elbow.

To know the direction of the nutrient artery, we say:

"To elbow I go,
from knee I flee"

Functions of the skeletal system.

1. It provides a **supporting framework**

2. It **supports** the body weight (such as the bones of the lower limb).

3. **Protection** of certain structures (such as the skull protects the brain).

4. **Formation** of the blood cells (by the red bone marrow) mainly in flat bones. long bones contain yellow inactive bone marrow.

5. **Storage** of calcium and phosphorus.

❖ **Osteoporosis :**

It is the most common bone disease. It affects more the elderly white women. The bones lose their mass and become brittle and subject to fracture. Milk and other calcium sources and moderate exercise can slow the progress of osteoporosis.

Thank You

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