Musculoskeletal System

Lab :1

Stage: 1 st

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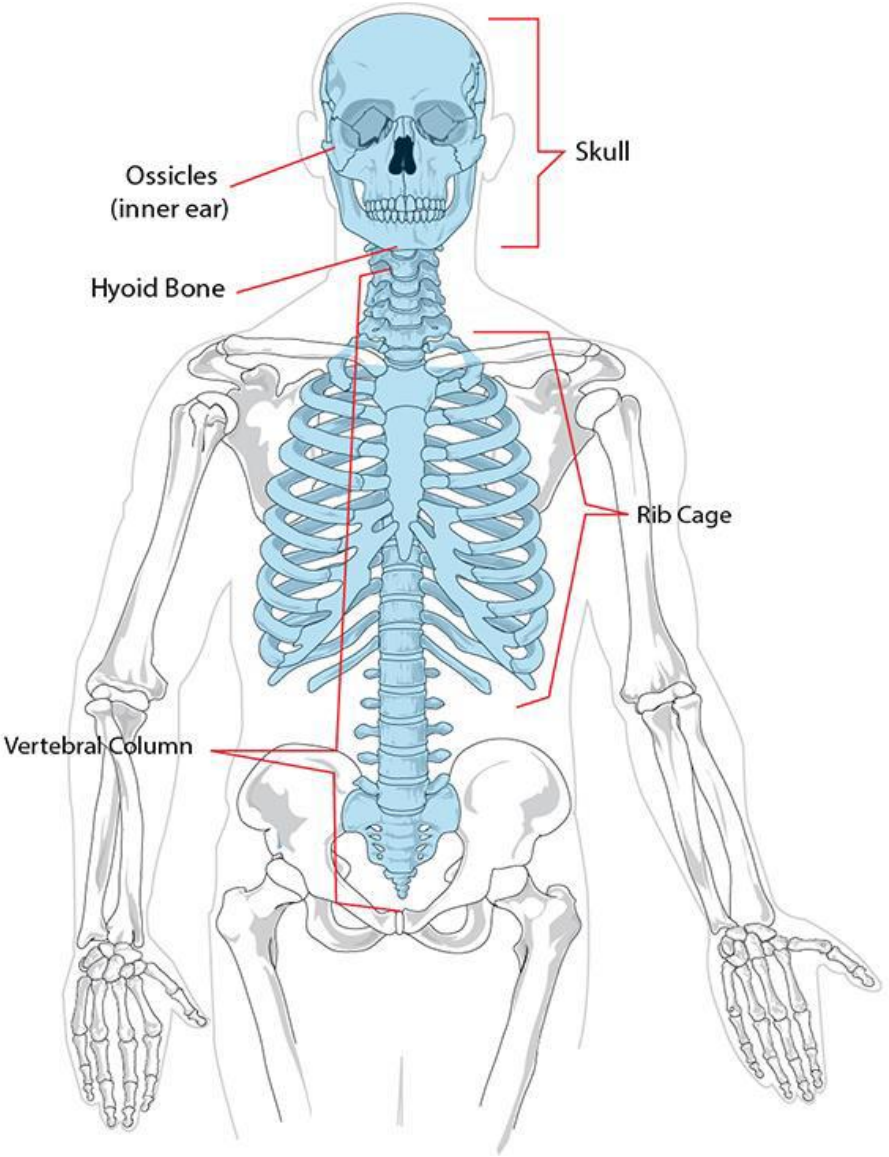
Musculoskeletal System

- The musculoskeletal system (locomotor system) is a human body system that provides body movement, stability, shape, and support
- Muscular system, which includes all types of muscles in the body. Skeletal muscles, in particular, are the ones that act on the body joints to produce movements
- Skeletal system, whose main component is the bone. Bones articulate with each other and form the joints, providing the bodies with a hard-core, yet mobile, skeleton

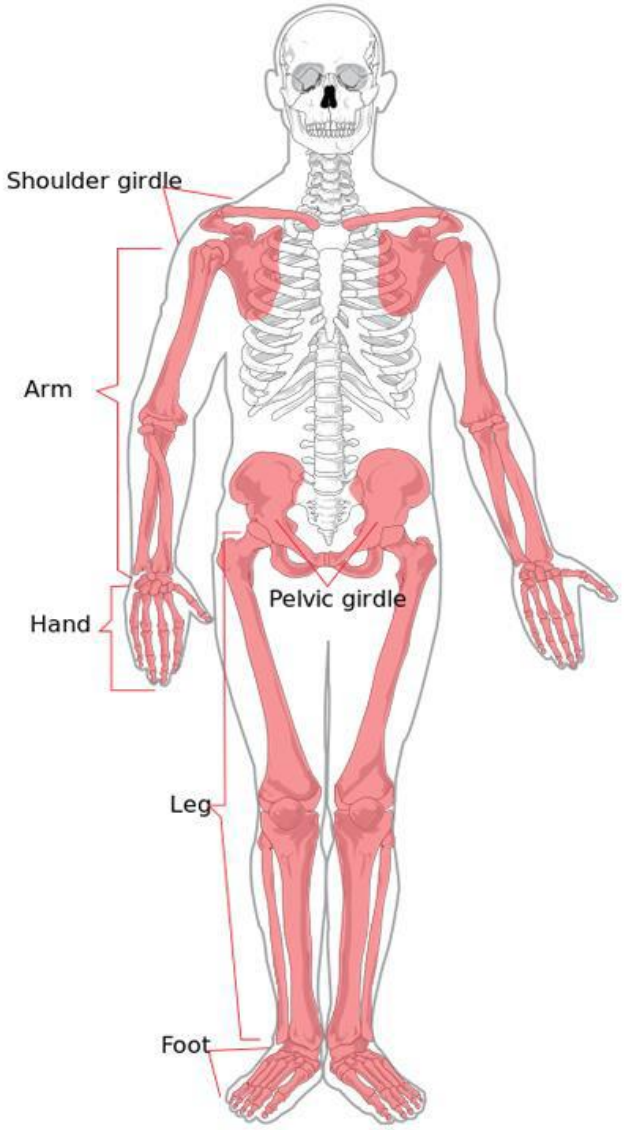
The skeletal system

- The adult human skeleton is composed of **206** bones and their associated cartilages. The bones are supported by ligaments, tendons, bursae, and muscles. They are 2 types:
- **Axial skeleton**, that includes the bones along the long axis of the body. The axial skeleton consists of the vertebral column, bones of the head and bones of the thoracic cage
- **Appendicular skeleton**, that involves the bones of the shoulder and pelvic girdle, as well as the bones of the upper and lower extremities

AXIAL SKELETON DIAGRAM

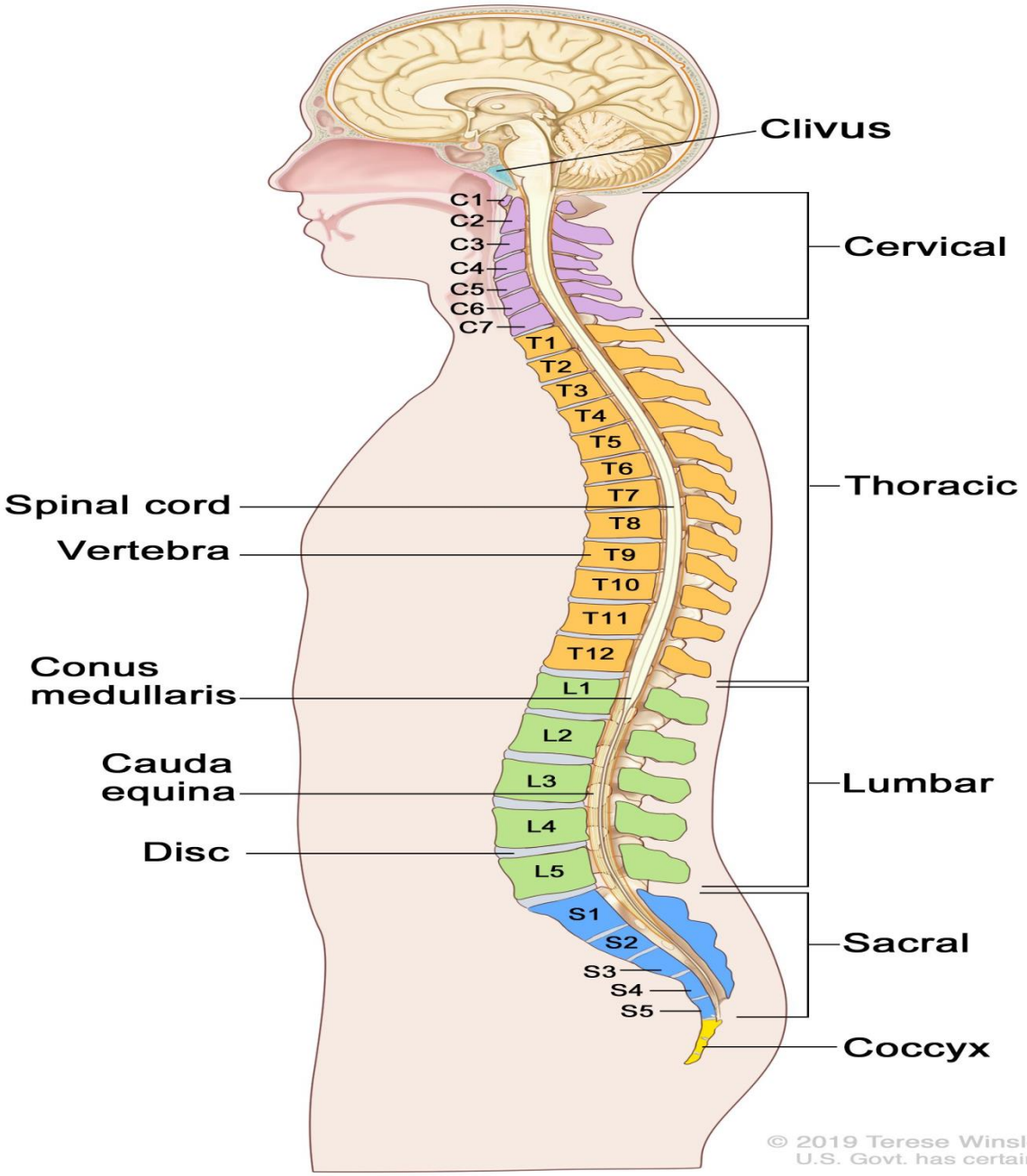


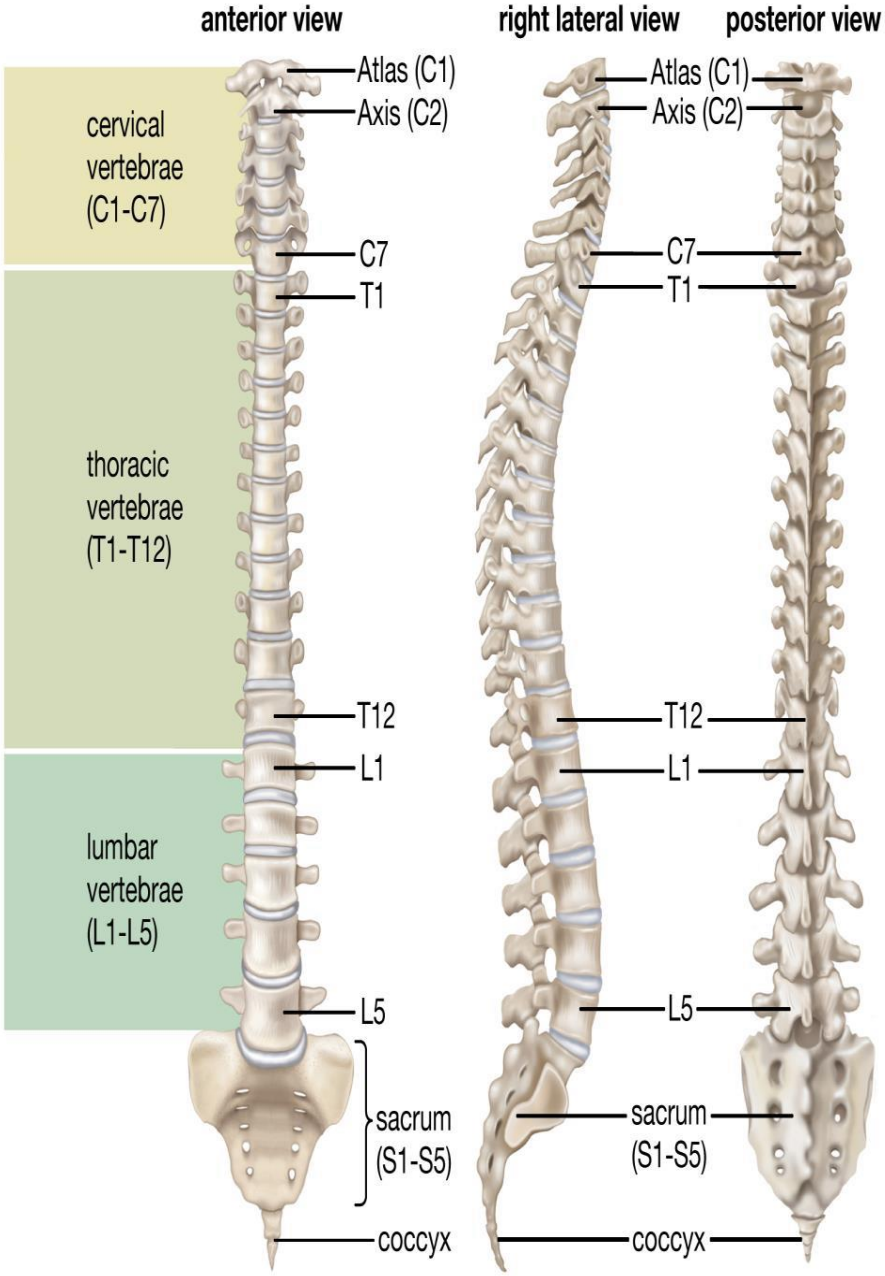
APPENDICULAR SKELETON DIAGRAM



Vertebral column

- vertebral column, also called spinal column, spine, or backbone,. The major function of the vertebral column is protection of the spinal cord; it also provides stiffening for the body and attachment for the pectoral and pelvic girdles and many muscles. In humans an additional function is to transmit body weight in walking and standing.





Cervical region: in the neck, made of 7 vertebrae

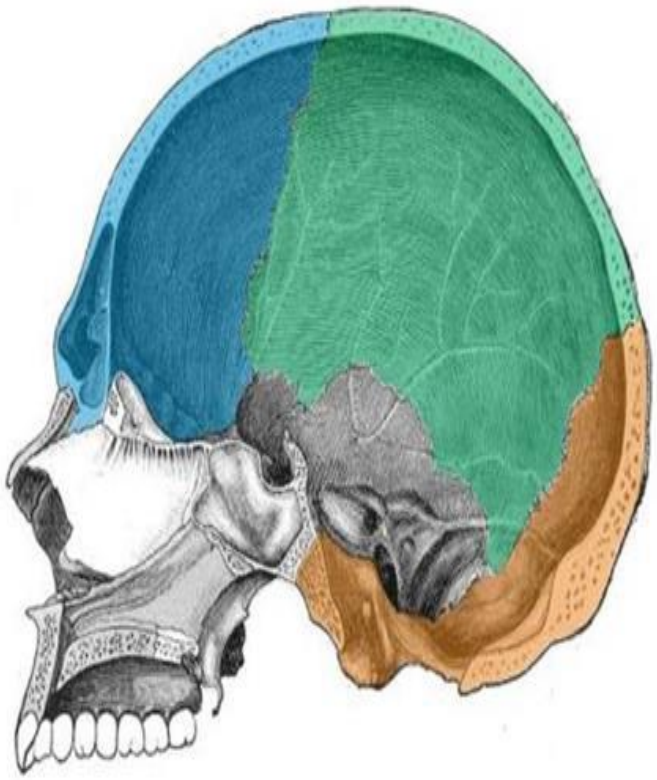
- **Thoracic region**: in the thorax, made of 12 vertebrae, connected to the 12 pairs of ribs
- **Lumbar region**: in the lower back, made of 5 vertebrae
- **Sacral region** (sacrum): 5 fused vertebrae that make the posterior part of the pelvis
- **Coccygeal region** (coccyx): 3-4 small fused vertebra at the lower tip of the column.

The skull

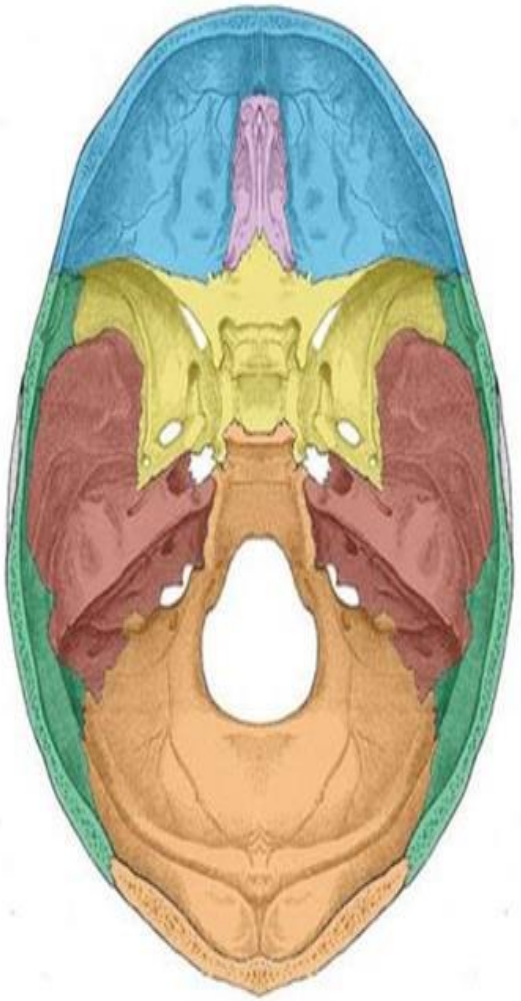
- **The skull** is a bony structure that supports the face and forms a protective cavity for the brain
- Cranium Anatomically, the cranium can be subdivided into a roof and a base:

- **Cranial roof –** comprised of the frontal, occipital and two parietal bones. It is also known as the calvarium.
- **Cranial base** – comprised of six bones: frontal, sphenoid, ethmoid, occipital, parietal and temporal. These bones articulate with the 1st cervical vertebra (atlas), the facial bones, and the mandible (jaw).

- https://youtu.be/WRmNC_yPQZ8



a) Bones of the calvarium

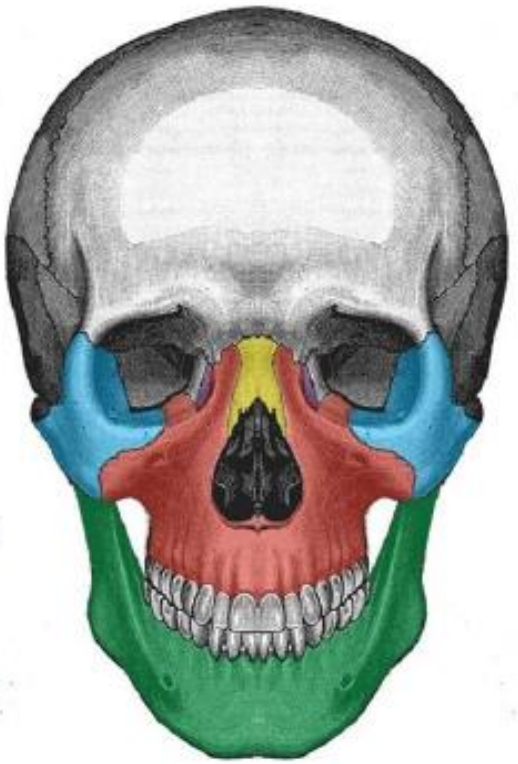


b) Bones of the cranial base

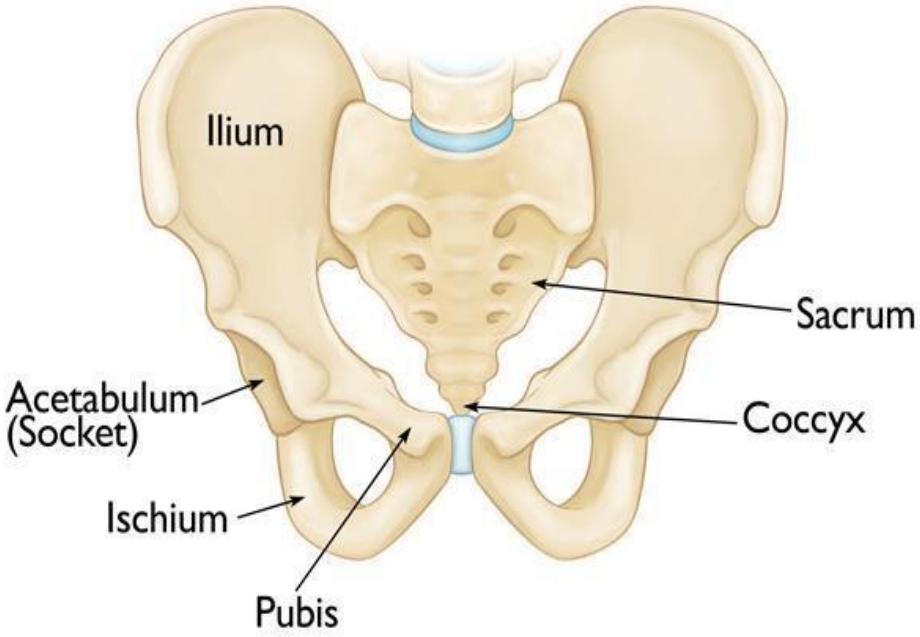
Face

The facial skeleton (also known as the viscerocranium) supports the soft tissues of the face.

It consists of 14 bones,
Zygomatic (2) – forms the cheek bones of the face
Lacrimal (2) – the smallest bones of the face. They form part of the medial wall of the orbit.
Nasal (2) – two slender bones that are located at the bridge of the nose.
Inferior nasal conchae (2) – located within the nasal cavity, these bones increase the surface area of the nasal cavity,
Palatine (2) – situated at the rear of oral cavity and forms part of the hard palate.
Maxilla (2) – comprises part of the upper jaw and hard palate.
Vomer – forms the posterior aspect of the nasal septum



Appendicular skeleton

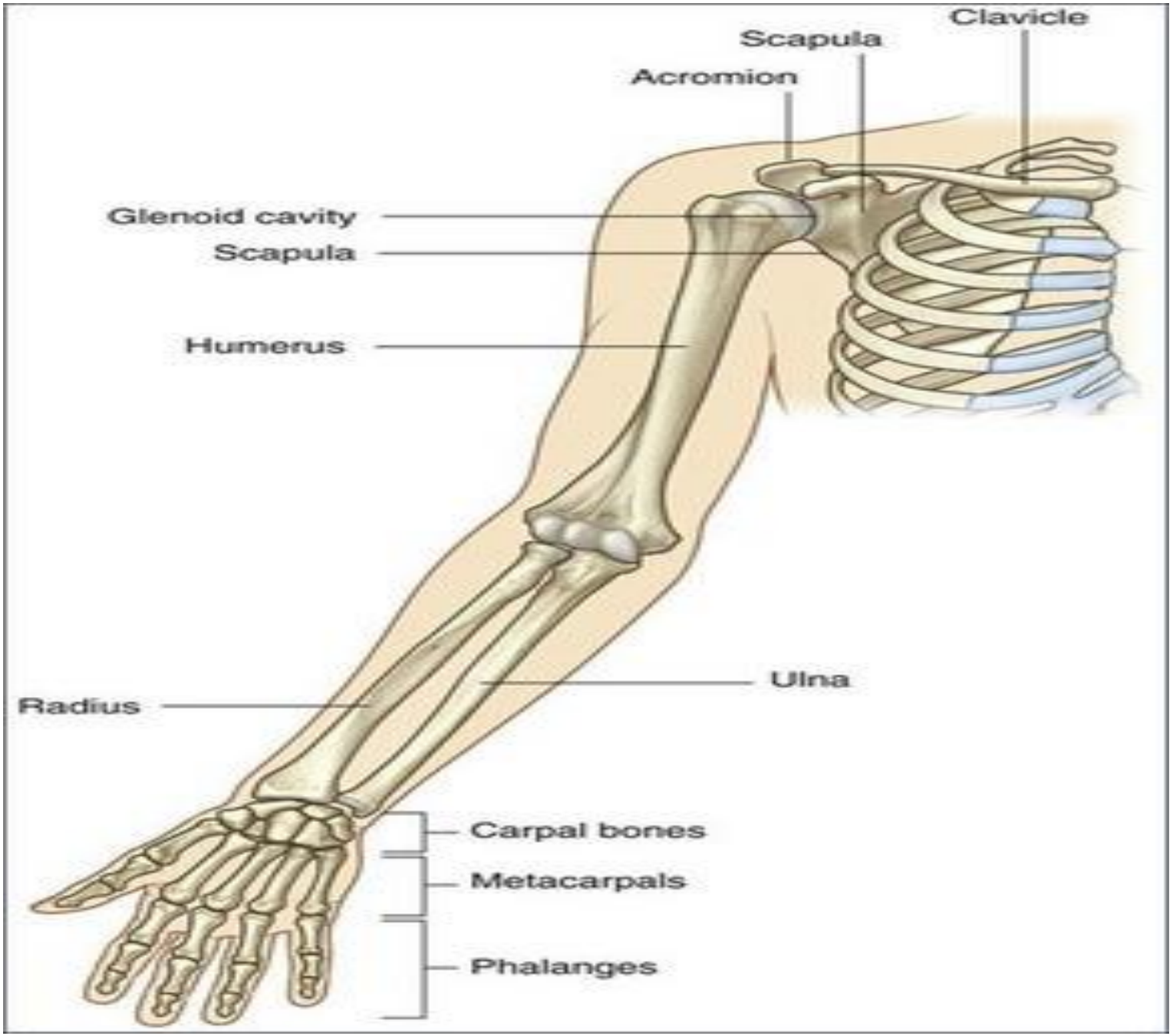


The pelvic skeleton is formed in the area of the back, by the sacrum and the coccyx and anteriorly and to the left and right sides, by a pair of hip bones

Skeleton and muscles of upper limbs

- The upper limb is divided into three regions
- These consist of the arm, located between the shoulder and elbow joints;
- The forearm, which is between the elbow and wrist joints;
- And the hand, which is located distal to the wrist. There are 30 bones in each upper limb

- **Contents**
- 1.Shoulder
- 2.. Arm
- 3.Elbow
- 4.Forearm
- 5.Hand
- The shoulder is where the upper limb attaches to the trunk. It’s most important part is the glenohumeral joint; formed by the humerus, scapula and clavicle


Clavicle
Scapula
Acromion
Glenoid cavity
Scapula
Humerus
Ulna
Radius
Carpal bones
Metacarpals
Phalanges

Arm

- The arm is the area between the shoulder and the elbow. There is only one bone within the arm, and that is the humerus. It is the pillar on which all the other soft tissue structures rely.
- The muscles are grouped into anterior and posterior compartments by the septa that attach to the humerus.
- The anterior compartment contains the coracobrachialis, brachialis and biceps brachii muscles. While the posterior compartment contains only one muscle, the triceps brachii
- **Elbow**
- The elbow is another “bridge” within the upper limb that attaches the arm and the forearm
- **Forearm**
- the radius is found laterally while the ulna is medially in the forearm.

Hand

The basic parts of the hand are:

- the wrist (carpus)
- the metacarpus
- the digits

Carpal bones (Proximal) – A set of eight irregularly shaped bones. These are located in the wrist area.

Metacarpals – There are five metacarpals, each one related to a digit

Phalanges (Distal) – The bones of the fingers. Each finger has three phalanges, except for the thumb, which has two.

The lower limb

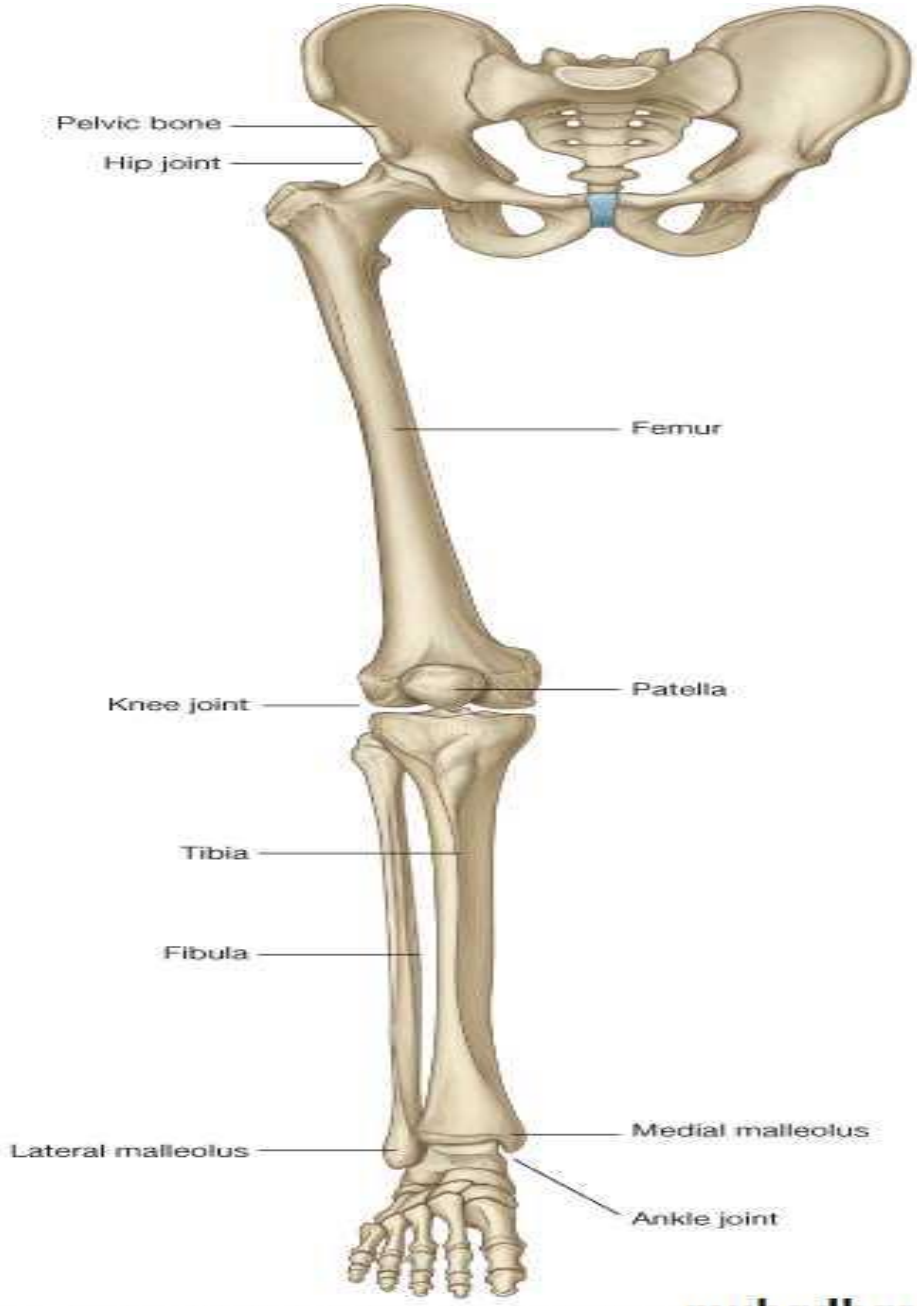
- The lower limb is divided into three regions. These are the thigh, located between the hip and knee joints; the leg, located between the knee and ankle joints; and distal to the ankle, the foot. There are 30 bones in each lower limb. These are the femur, patella, tibia, fibula, seven tarsal bones, five metatarsal bones, and 14 phalanges.

- The femur is the single bone of the thigh. Its rounded head articulates with the acetabulum of the hip bone to form the hip joint

Lower limb

- The patella is a sesamoid bone located within a muscle tendon

- The leg contains the large tibia on the medial side and the slender fibula on the lateral side. The tibia bears the weight of the body, whereas the fibula does not bear weight



Muscles of lower limb