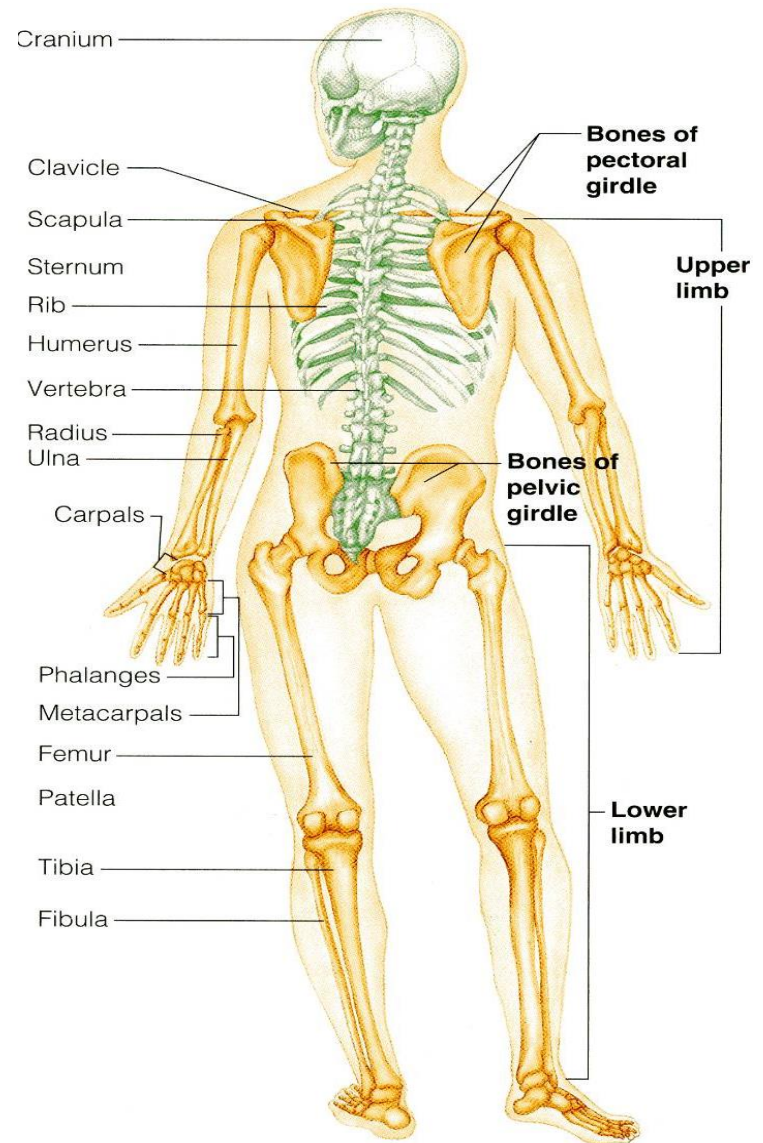


Introduction to Anatomy and Skeletal System



OBJECTIVES

By the end of the lecture, you should be able to:

- **Define** the word “Anatomy”.
- **Enumerate** the different anatomical fields.
- **Describe** the anatomical position.
- **Describe** different anatomical terms of position & movements as well different anatomical planes.
- **Classify** bones according to shape, structure & development.
- **Enumerate** different bones of both axial & appendicular skeleton.

WHAT IS ANATOMY?

The word **anatomy** is of **Greek** origin meaning cutting up (ana= up; tome= cutting).

Subdivisions:

- **Gross (macroscopic) anatomy:**
Study of human body with naked eye.
- **Microscopic anatomy; (Histology):**
Study of fine structure (cells & tissues) of the human body with the help of microscope.
- **Developmental anatomy; (Embryology).**
- **Radiological anatomy.**
- **Applied anatomy.**
- **Surface anatomy.**
- **Surgical anatomy.**

ANATOMICAL POSITION

- It is the standard position in which the body assume to describe its parts.

1. Body is erect



2. Arms hanging by the side



3. Palm facing forward



4. Feet are parallel



ANATOMICAL TERMINOLOGY

TERMS OF POSITION

□ **Superior (cranial):** near to the head.

✗ **Inferior (caudal):** away from the head.

□ **Anterior (ventral):** near to the front.

✗ **Posterior (dorsal):** near to the back.

□ **Medial:** near to the median plane.

✗ **Lateral:** away from the median plane

□ **Proximal:** near to the trunk.

✗ **Distal:** away from the trunk.

□ **Superficial:** near to the skin (surface).

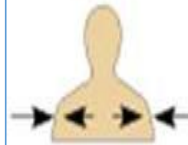
✗ **Deep:** away from the skin.



The elbow is proximal to the wrist



The knee is distal to the thigh



The skin is superficial to the skeletal muscles

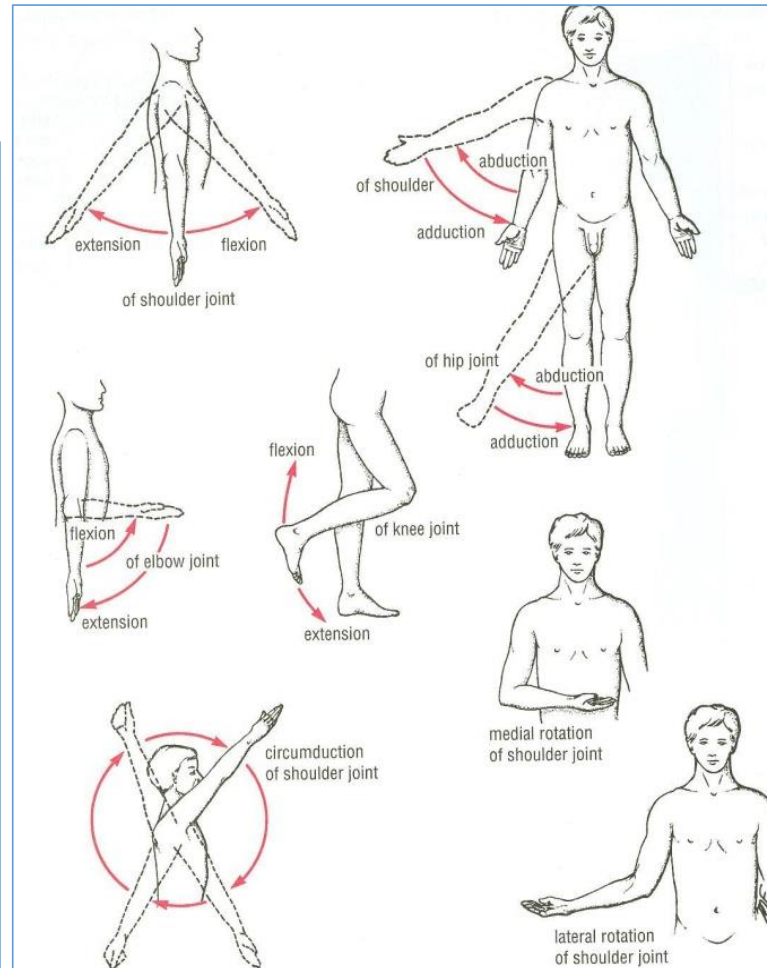


The lungs are deep to the skin

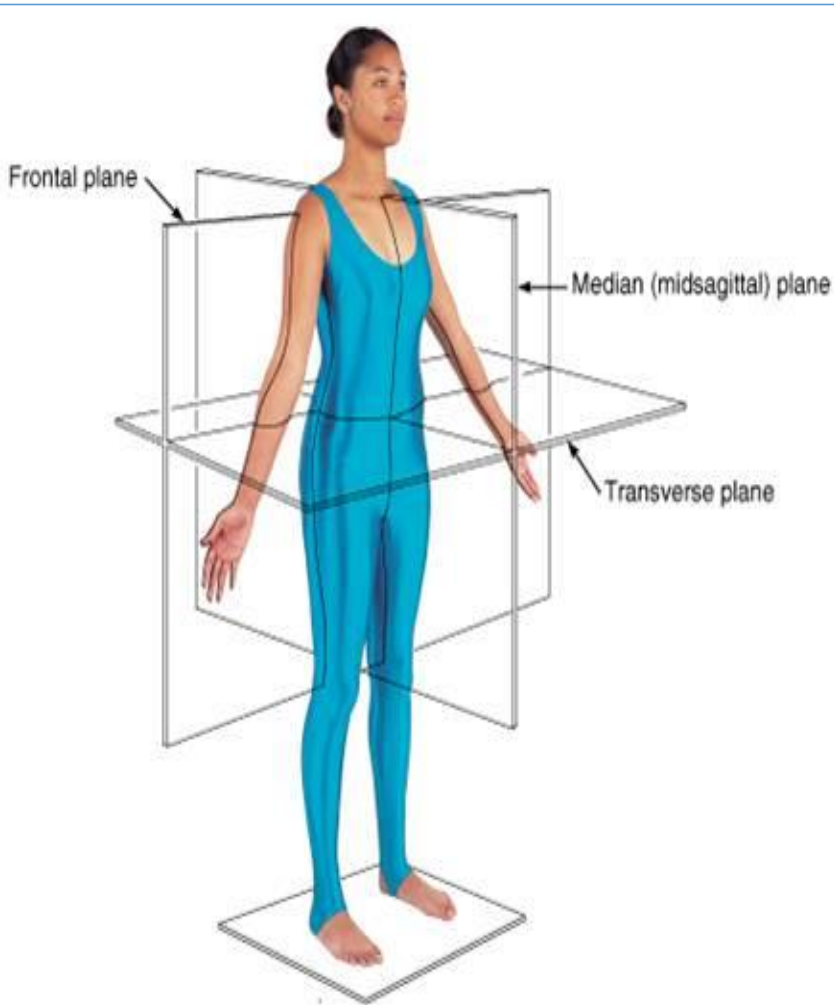
ANATOMICAL TERMINOLOGY

TERMS OF MOVEMENT

- **Flexion:** approximation of 2 parts (decreasing the angle between 2 parts).
- ✗ **Extension:** straightening (increasing the angle between 2 parts).
- **Abduction:** away from the median plane.
- ✗ **Adduction:** toward the median plane.
- **Lateral rotation:** rotation away from the median plane.
- ✗ **Medial rotation:** rotation toward the median plane.
- **Circumduction:** combined movements of flexion, extension, abduction & adduction.

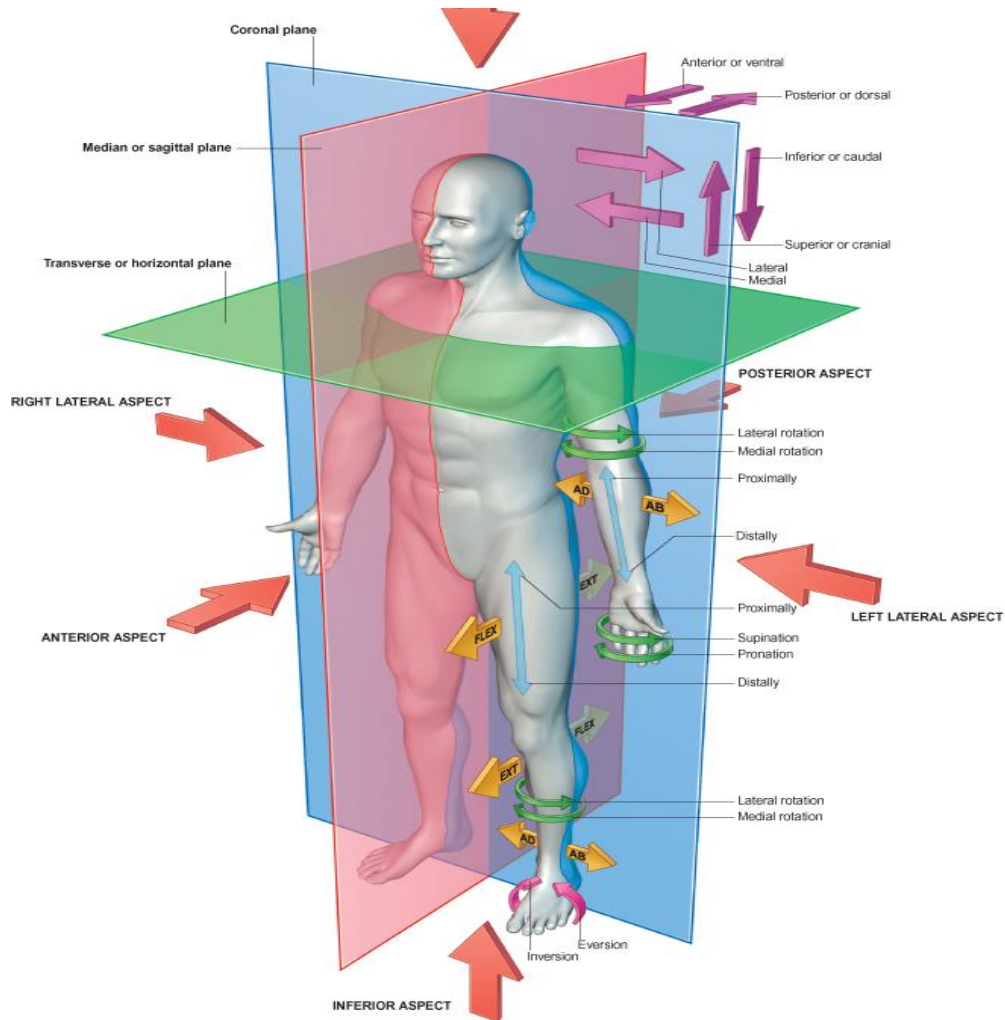


ANATOMICAL PLANES & SECTIONS

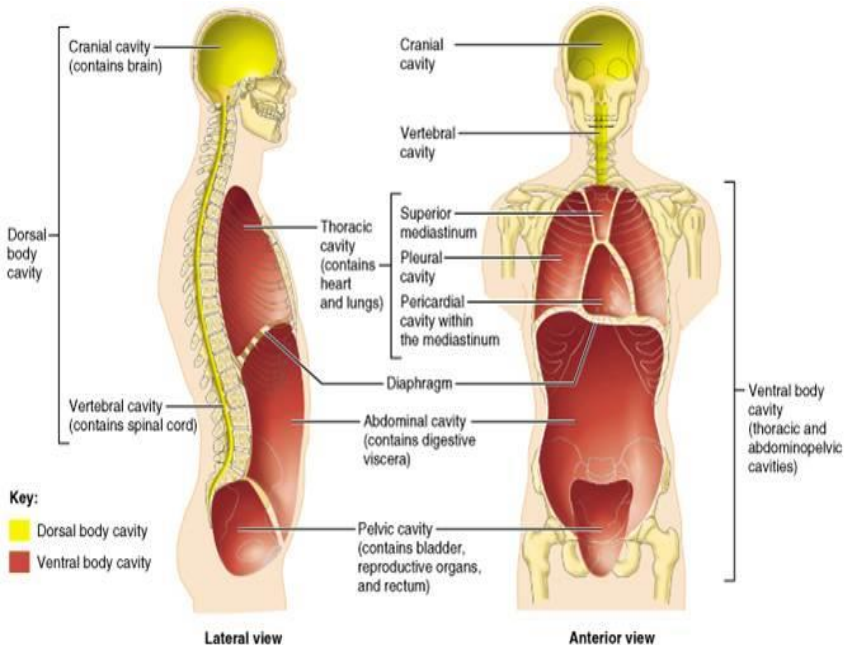


- ❑ **Sagittal (median):**
divides the body into 2 equal halves (right & left).
- ❑ **Parasagittal (paramedian):** parallel to the sagittal:
divides the body into 2 unequal parts (right & left).
- ❑ **Coronal (Frontal):**
divides the body into anterior & posterior parts.
- ❑ **Transverse (cross):**
divides the body into superior & inferior parts.

PLANES, TERMS OF POSITION & TERMS OF MOVEMENT



BODY CAVITIES



□ Ventral body cavity:

□ divided by diaphragm into:

1. **Thoracic cavity:** superior to diaphragm, contains heart & lungs.

2. **Abdominal cavity:** inferior to diaphragm, contains stomach, intestine, liver, urinary bladder, etc...

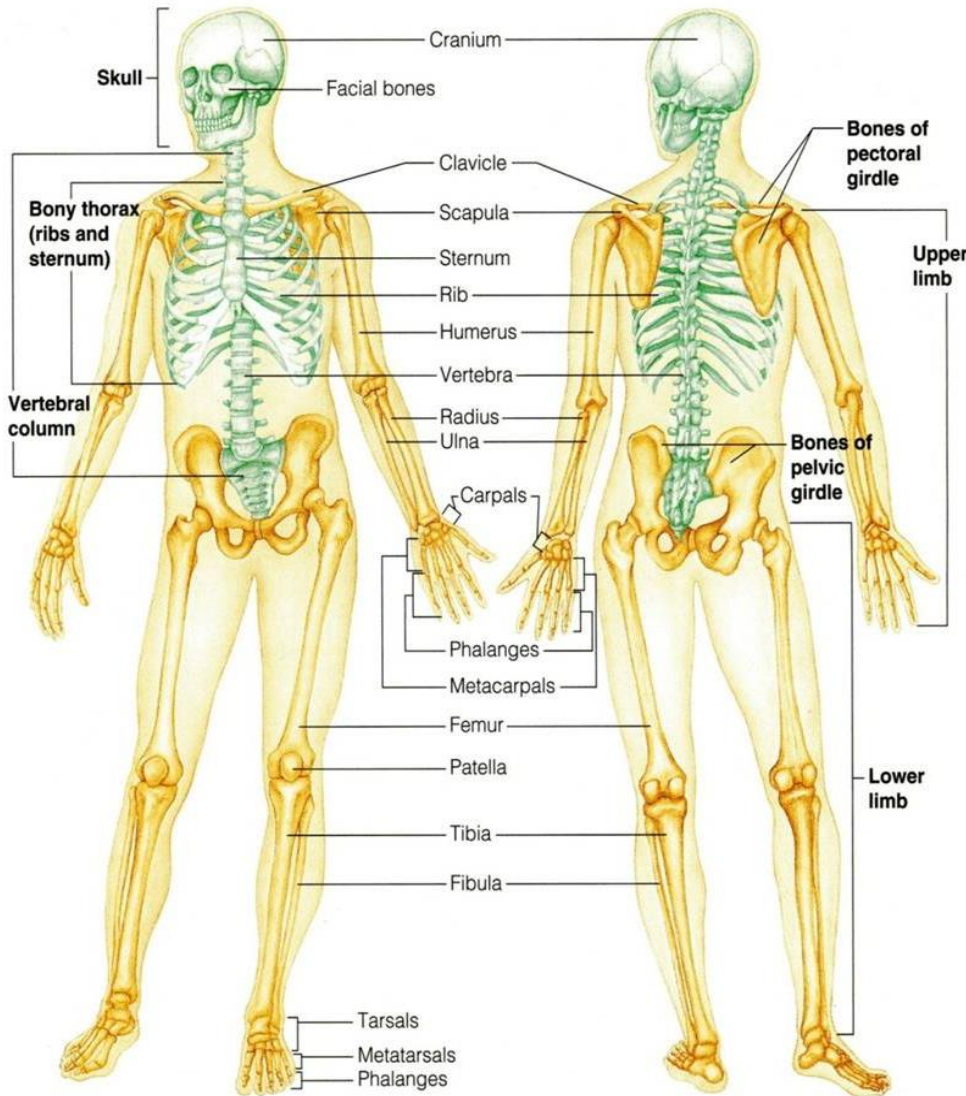
□ Dorsal body cavity:

□ divided into 2 parts
continuous with each other:

1. **Cranial cavity:** space inside skull, contains the brain.

2. **Spinal cavity:** space inside vertebral column, contains the spinal cord.

SKELETAL SYSTEM



(a) Anterior view

(b) Posterior view

Includes:

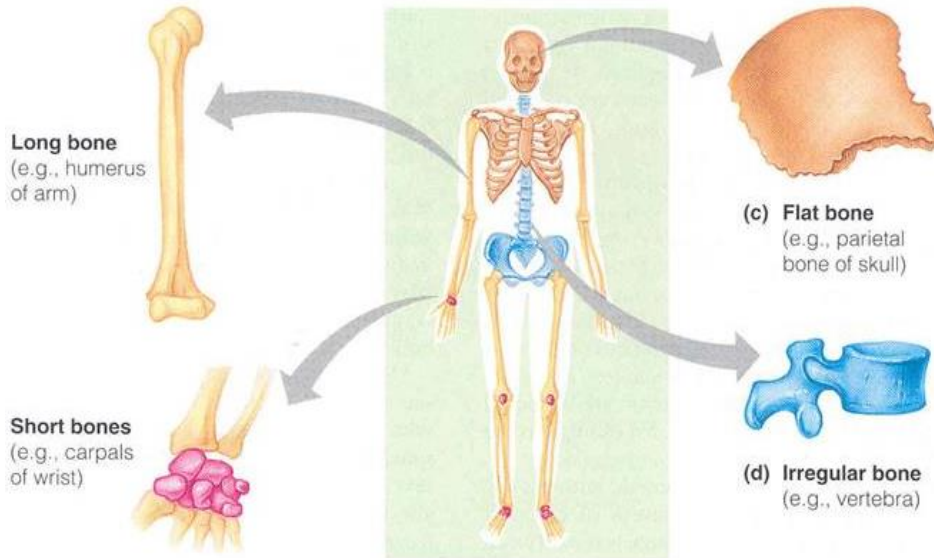
Bones.

Joints: The articulations between bones.

FUNCTIONS OF BONE

1. **Support:** of the body.
2. **Storage:** of salt and minerals e.g. calcium and phosphorus.
3. **Protection:** of soft body organs.
4. **Attachment:** of muscles.
5. **Movement:** of the body as a whole, or of the body parts.
6. **Blood cell formation.**

CLASSIFICATION OF BONE



Bones are classified on the bases of their:

- **Shape:**

- Long,
- Short,
- Flat,
- Irregular.

- **Structure:**

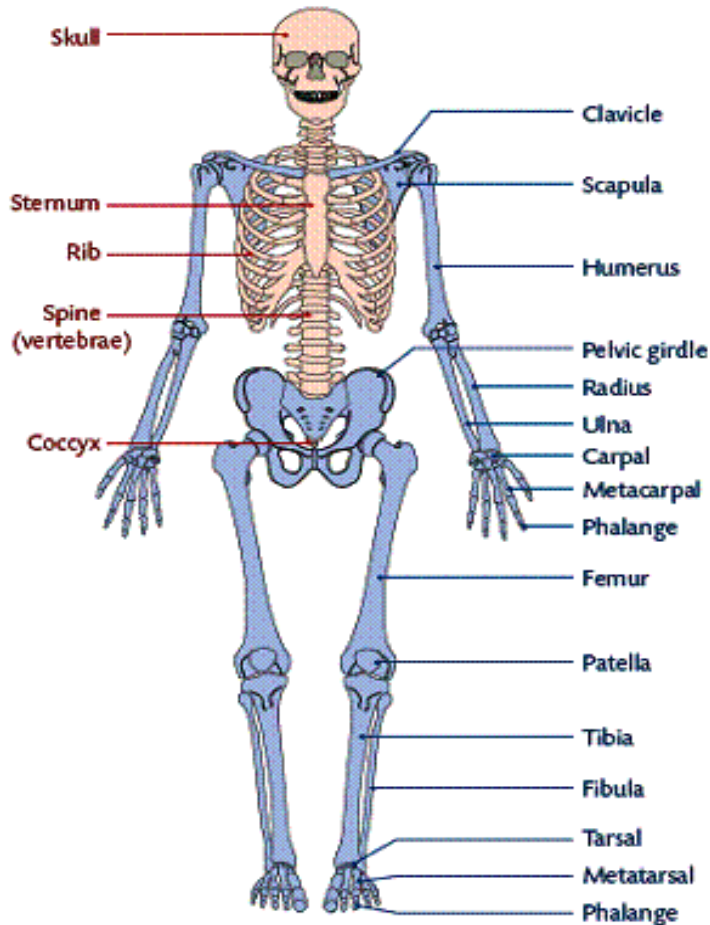
- Compact,
- Spongy.

- **Development:**

- Membrane,
- Cartilage.

THE SKELETON

THE AXIAL SKELETON THE APPENDICULAR SKELETON



□ Formed of **206** bones.

□ Divided into:

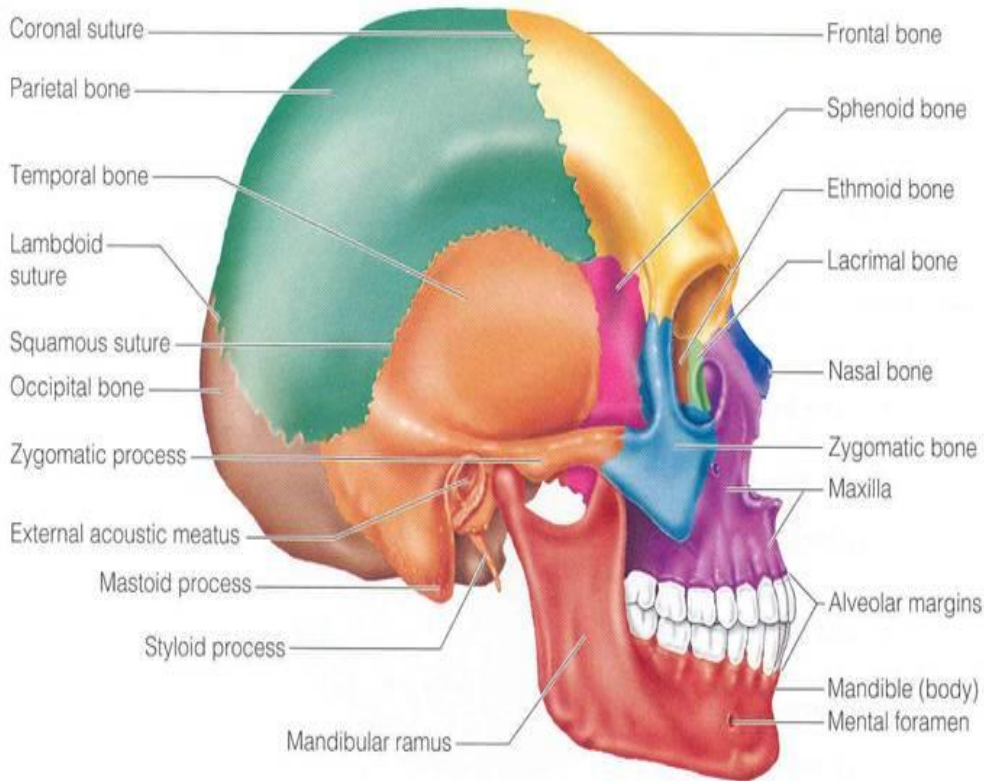
1. Axial skeleton:

Bones forming the trunk (longitudinal axis) of body.

2. Appendicular skeleton:

Bones forming the girdles & limbs.

BONES OF AXIAL SKELETON



SKULL

❑ **Consists of:**

❑ **Cranium:**

Bones enclosing brain:

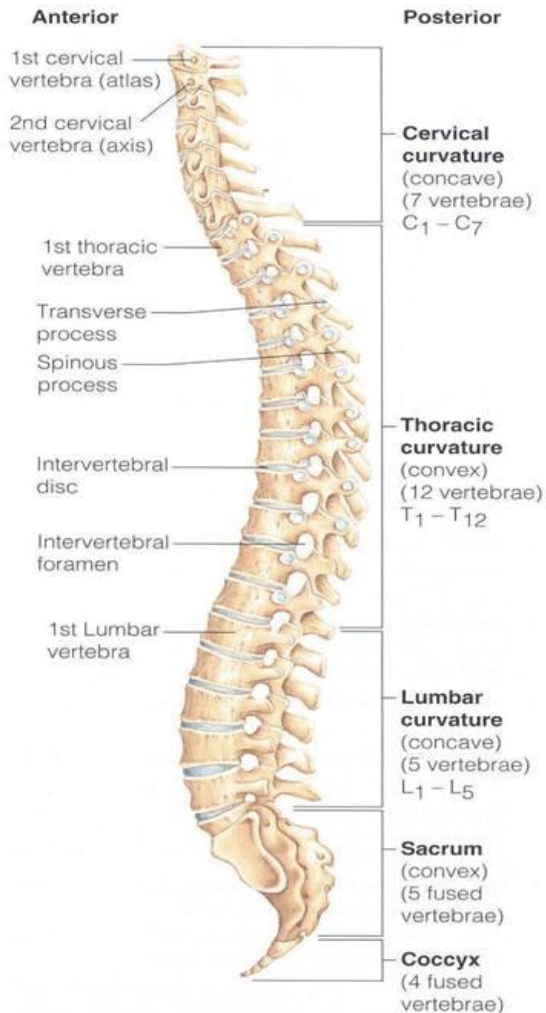
Frontal,
Occipital,
Parietal,
Temporal.

❑ **Facial bones:**

Bones of face:

Maxilla,
Nasal,
Zygomatic,
Mandible.

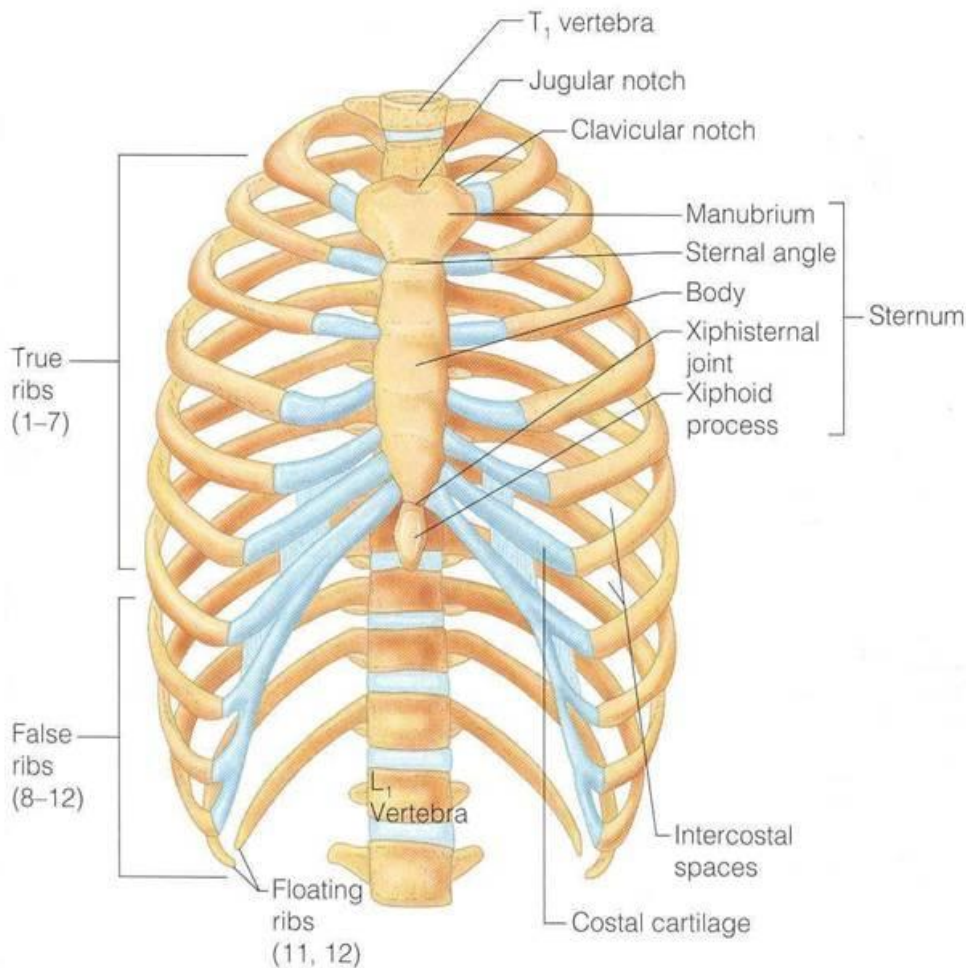
BONES OF AXIAL SKELETON



VERTEBRAL COLUMN

- ❑ **Number:** 33 vertebrae.
- ❑ **Functions:** protects the spinal cord and supports the body.
- ❑ **Formed of:**
 - ❑ 7 cervical vertebrae.
 - ❑ 12 thoracic vertebrae.
 - ❑ 5 lumbar vertebrae.
 - ❑ 5 sacral vertebrae fused to form **sacrum**.
 - ❑ 4 coccygeal vertebrae fused to form **coccyx**.

BONES OF AXIAL SKELETON



STERNUM

❑ Has 3 parts:

❑ Manubrium,

❑ Body &

❑ Xiphoid process.

RIBS

❑ 12 pairs:

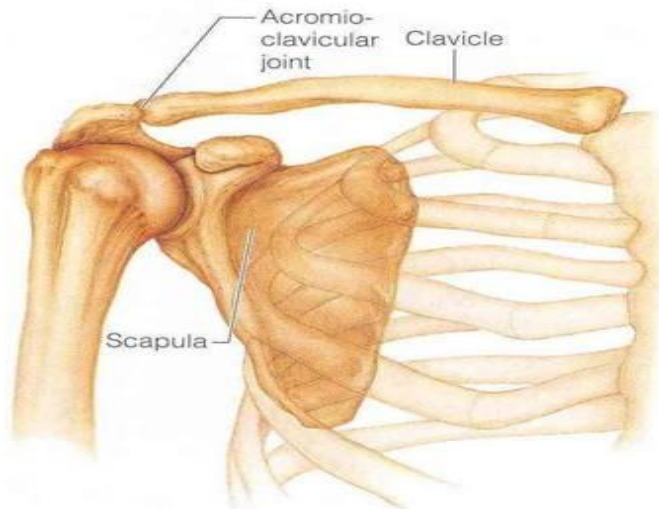
❑ All ribs articulate with vertebrae.

❑ Only upper 7 pairs articulate with sternum, (true ribs).

❑ 8th, 9th & 10th ribs are false ribs.

❑ 11th & 12th ribs are floating ribs.

BONES OF APPENDICULAR SKELETON

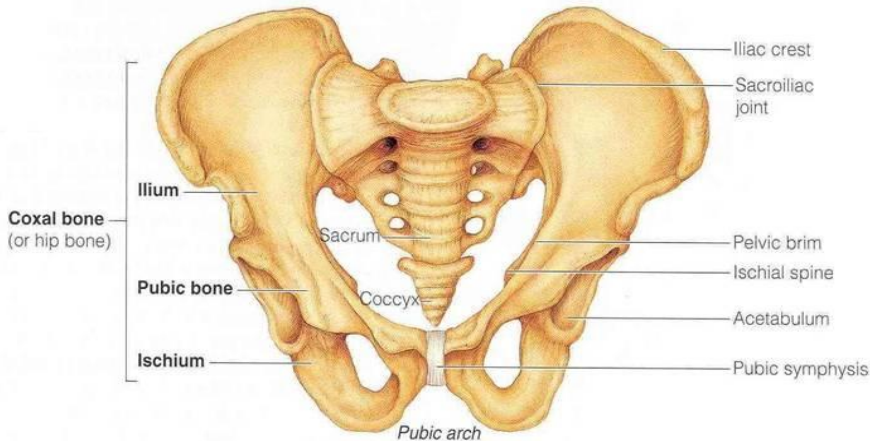


PECTORAL GIRDLE

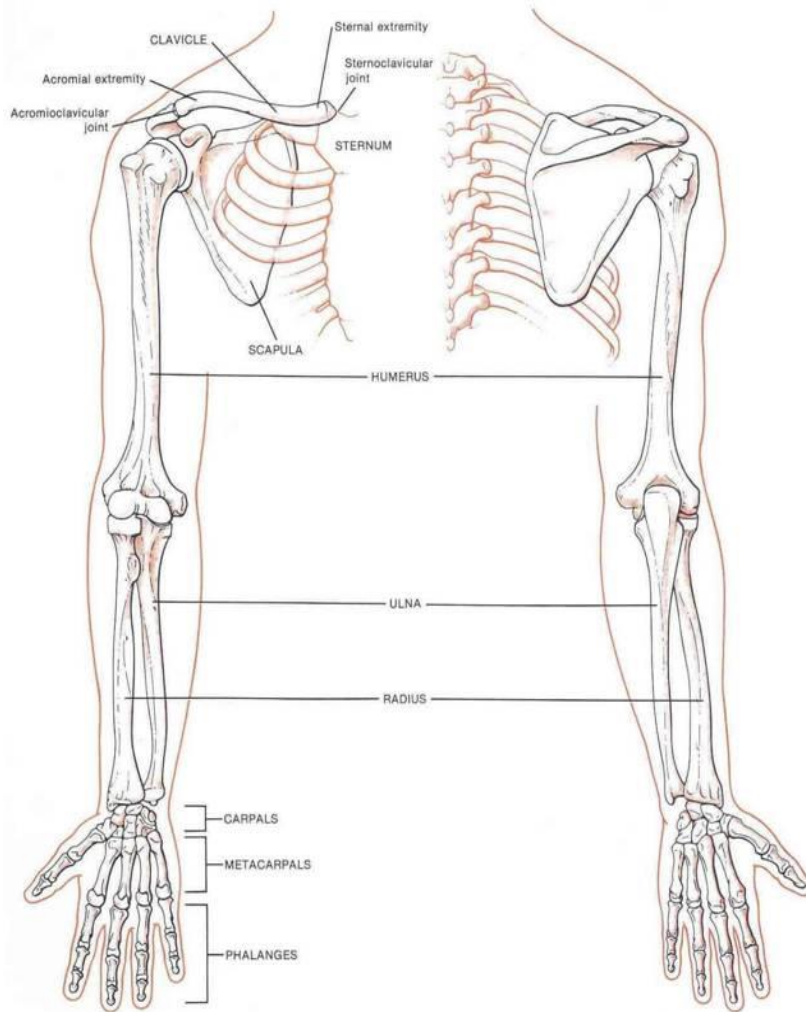
- ❑ Connects upper limb with axial skeleton.
- ❑ Formed of:
 - ❑ Clavicle &
 - ❑ Scapula.
- ❑ (2 bones on each side)

PELVIC GIRDLE

- ❑ Connects lower limb with axial skeleton.
- ❑ Formed of:
 - ❑ Hip bone,
 - ❑ (one only on each side).



BONES OF APPENDICULAR SKELETON



UPPER LIMB

□ Bone of arm:

□ Humerus.

□ Bones of forearm:

□ Radius (lateral) &

□ Ulna (medial).

□ Bones of the hand:

□ 8 Carpal bones arranged into 2 rows.

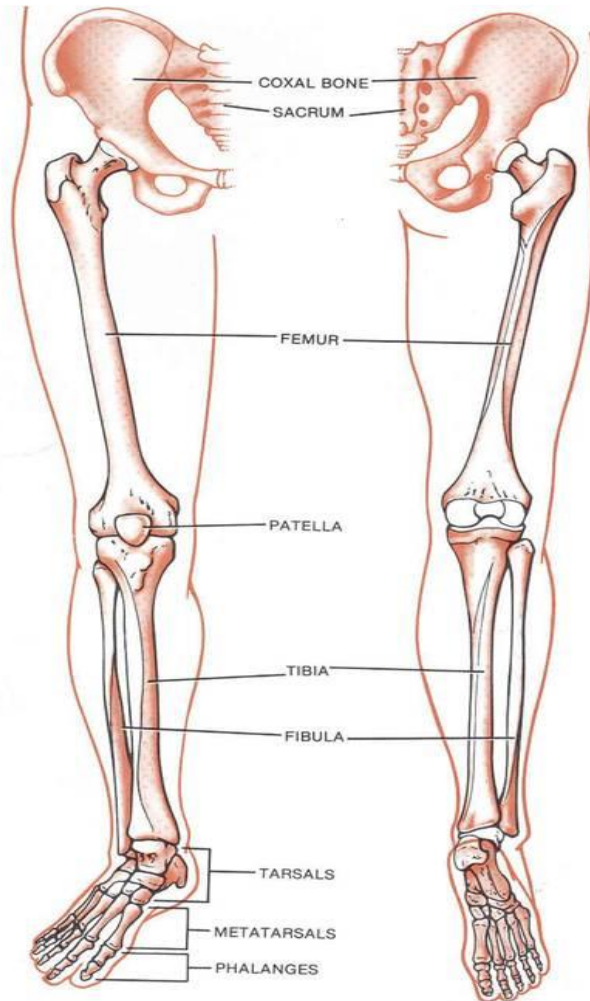
□ 5 Metacarpal bones.

□ 14 Phalanges:

□ 3 for each of the medial 4 fingers.

□ 2 for the thumb.

BONES OF APPENDICULAR SKELETON



LOWER LIMB

□ Bone of thigh:

□ Femur.

□ Bones of leg:

□ Fibula (lateral) &

□ Tibia (medial).

□ Patella, in front of the knee.

□ Bones of foot:

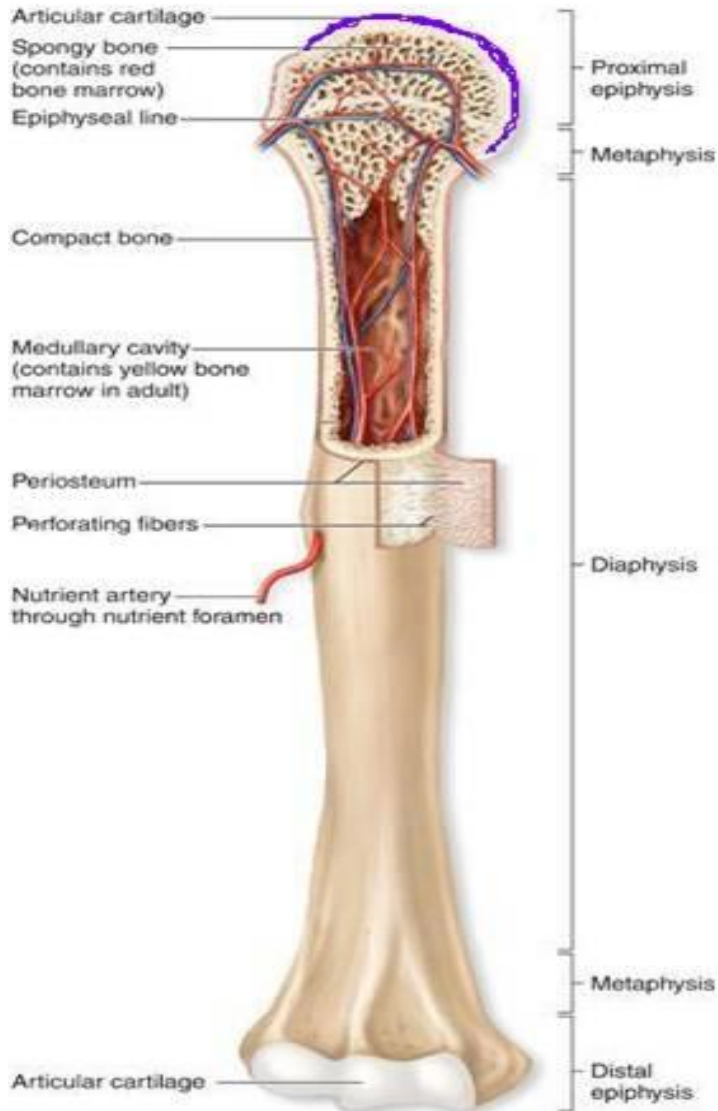
□ 7 Tarsal bones.

□ 5 Metatarsal bones.

□ 14 Phalanges:

□ 2 for the big toe & 3 for each of the lateral 4 toes.

LONG BONES



Formed of:

- ❑ **A shaft (diaphysis):** composed of compact bone.
- ❑ **Two ends (epiphysis):** composed of spongy or cancellous bone.
- ❑ **Metaphysis:** This is the region of contact between epiphysis & diaphysis.
- ❑ **The metaphysis** contains *epiphyseal plate of cartilage* responsible for *linear bone growth*.

TEST YOURSELF!

QUESTION 1

- Which one of the following bones is a bone of the axial skeleton?
 1. Femur.
 2. Humerus.
 3. Scapula.
 4. Sternum.

QUESTION 2

• Which one of the following bones is an irregular bone?

1. Femur.
2. Vertebra.
3. Scapula.
4. Sternum.

QUESTION 3

- Which one of the following planes divides the body into superior & inferior parts?
 1. Frontal (coronal) plane.
 2. Sagittal (median) plane.
 3. Parasagittal (Paramedian) plane
 4. Transverse plane.

**THANK YOU
AND GOOD
LUCK**