

# OSTEOLOGY

## Function of skeleton

- 1) Protection
- 2) Support
- 3) A mechanical basis for movement
- 4) Formation of blood cells
- 5) Storage of salts

## Basic structure of bones

Bone as a connective tissue consists of **bone cells** (*osteocytes*), **ground substance** + **collagenous fibrils** (form *osteoid*) and *different salts*.

## Two types of bone on the basis of the arrangement of its fibrils :

- 1) woven bone
- 2) lamellar bone
  - a) compact bone (*substantia compacta*)
  - b) spongy bone (*substantia spongiosa*)

## Periosteum

### Architecture of bones

### Shape of bones

depends on their function and their position in the body

- a) long bones (*ossa longa*)
- b) short bones (*ossa brevia*)
- c) flat bones (*ossa plana*)
- d) sesamoid bones (*ossa sesamoidea*)
- e) pneumatic bones (*ossa pneumatica*)
- f) irregular bones (*ossa irregularia*)

**Growth plate = epiphysial disk**

## Systematic Anatomy of the Locomotor Apparatus

Trunk:

**Vertebral column (*columna vertebralis*) + ribs (*costae*) + breast bone (*sternum*)**

- 7 cervical vertebrae (*vertebrae cervicales*)
- 12 thoracic vertebrae (*vertebrae thoracicae*)
- 5 lumbar vertebrae (*vertebrae lumbales*)
- 5 sacral vertebrae (*vertebrae sacrales*) – sacral bone (*os sacrum*)
- 4–5 coccygeal vertebrae (*vertebrae coccygeae*) – coccyx (*os coccygis*)

### Vertebra – general features

body (*corpus*) – upper and lower terminal facets (*facies terminalis superior et inferior*)

vertebral arch (*arcus vertebrae*); pedicle – (*pediculus arcus vertebrae*); vertebral foramen (*foramen vertebrale*); vertebral notch (*incisura vertebrae superior and inferior*); intervertebral foramen (*foramen intervertebrale*)

7 processes:

- 4 articular processes (*processus articularis superior dexter and sinister, processus articularis inferior dexter and sinister*)
- 2 transversal processes (*processus transversus dexter and sinister*)
- 1 spinous process (*processus spinosus*)

special features:

#### **Cervical vertebrae**

Foramen transversarium – (*foramen processus transversi*)

Groove for spinal nerve (*sulcus nervi spinalis*)

Position of articular processes (*processus articulares*)

The uncal process (*uncus corporis vertebrae*)

*Anterior and posterior tubercle (tuberculum anterius and posterius)* of the transverse process (*processus transversus*) (C6 has carotid tubercle – *tuberculum caroticum*)

#### **C1 - atlas**

Anterior and posterior arches (*arcus anterior and posterior atlantis, fovea dentis*, anterior and posterior tubercle of atlas – *tuberculum anterius and posterius atlantis*, vertebral foramen – *foramen vertebrae*)

Lateral masses – *massae laterales (facies articularis superior and inferior, sulcus arteriae vertebralis)*

Transverse processes (*Processus transversi with foramen processus transversi*)

#### **Axis (C2)**

Body of axis – *corpus vertebrae + dens axis (facies articularis anterior and posterior dentis, apex dentis) processus articulares superiores and inferiores*

Spinal process of axis – *processus spinosus axis*

#### **Thoracic vertebrae**

##### **costal facets – (foveae costales)**

costal facets on the transverse processes (*facies costales transversales*)

Position of articular processes (*processus articulares*) – in the frontal plane

#### **Lumbar Vertebrae**

costal processes (*processus costarii*)

mammilar processes (*processus mammillares*)

accessory processes (*processus accessorii*)

Position of articular processes (*processus articulares*) – in sagittal plane

#### **Sacral vertebrae (S1 – S5) - sacral bone (os sacrum)**

basis – superior terminal facet (*facies terminalis superior*), apex inferior terminal facet (*facies terminalis inferior*)

facies pelvina (transversal lines (*lineae transversales*), *foramina sacralia pelvina, promontorium*)

facies dorsalis – median sacral crest (*crista sacralis mediana*), intermediate sacral crests (*cristae sacrales intermediae*), lateral sacral crests (*cristae sacrales laterales*), dorsal sacral foramina (*foramina sacralia dorsalia*), sacral tuberosity (*tuberositas sacralis*)  
lateral parts (*partes laterales*) with auricular facets (*facies auriculares*)  
sacral canal (*canalis sacralis*) with *hiatus canalis sacralis* and *cornua sacralia*

### **Coccygeal vertebrae – vertebrae coccygeae, coccyx (os coccygis) Co1 – Co 4-5**

basis – superior terminal facet (*facies terminalis superior*)  
horns of coccygeal bone (*cornua ossis coccygis*)  
apex

### **Ribs – costae**

true ribs – *costae verae* (1-7)  
false ribs – *costae spuriae* (8-10)  
floating ribs – *costae fluctuantes* (11, 12)

Structure of rib (*costa*)

Bony part (*os costae*) + costal cartilage (*cartilago costae*)

Head of rib (*caput costae*) with articular facet (*facies articularis*)

2nd –10th ribs with crest – *crista capitis costae*

Neck of rib (*collum costae*) with costal tubercle (*tuberculum costae*) and articular facet (*facies articularis tuberculi costae*)

Body of rib (*corpus costae*) with costal angle (*angulus costae*),  
costal crest (*crista costae*) and costal groove (*sulcus costae*)

#### **The 1st rib is small and flattened.**

Cranial surface – the scalene tubercle – (*tuberculum m. scaleni*)  
the sulcus of the subclavian artery – (*sulcus a. subclaviae*)

**The 2nd rib** – on its cranial surface has the tuberosity for the serratus muscle  
(*tuberositas m. serrati anterioris*)

**The 11th and 12th ribs** – the costal tubercle (*tuberculum costae*) and the costal groove (*sulcus costae*) are absent

### **Breast bone – sternum**

*Manubrium sterni*

clavicular notch (*incisura clavicularis*), jugular notch (*incisura jugularis*), costal notches (*incisurae costales 1.,2.*)

*sternal angle (angulus sterni)*

body of sternum (*corpus sterni*) with costal notches (*incisurae costales 3.-7.*)

*xiphoid process (processus xiphoideus)*