

Skeletal system:

Skeleton, cartilage, ligaments, connective tissue

Functions

1. Structural support & framework
2. Storage of minerals & lipids
 - a. Ca & phosphate ions
 - b. Lipids → yellow bone marrow
3. Blood cell production
4. Protection
5. Leverage

Contain:

Osseous tissue, connective tissue, smooth muscle and neural tissue

→ Cartilages - Review

(Cartilage)

Structure:

Matrix & specialized cells

1. Matrix → calcium phosphate 2/3, collagen fibers 1/3
 - a. Collagen form frame work for mineral crystals
2. Cells
 - a. Osteocytes → mature bone cells (osteon)
Lacunae of osteocytes found in matrix & lamellae
Canaliculi → channels that connect lacunae
 - b. Osteoblast → responsible for production of new bone = osteogenesis; are cuboidal cells
- Responsible for synthesis matrix compounds
 - c. Osteoclasts → responsible for osteolysis - dissolves; giants cells
 - d. Osteoprogenitor cells → Mesenchymal cells that differentiate into osteoblast; that are responsible for bone repair.

2a. Types of osseous tissue:

1. Compact - dense solid, forms nails
2. Spongy bone → forms internal layer
 - Bone marrow - loose connective tissue
 1. Yellow marrow - Adipocytes
 2. Red marrow - immature RBC's & WBC's & stem cells

Structural Differences:

1. Compact
 - Basic functional unit = osteon
 - Osteocytes in concentric layers around central canal
2. Spongy
 - No osteons
 - Concentric lamellar from trabeculae - plates that branch. Ex. forms an open network.

Fundamental differences:

Long bone - compact bone surrounds the marrow cavity; medullary cavity

Shaft - diaphysis

Head - epiphysis

Region bone - metaphysis

Periosteum - outer surface of the bone

1. Isolates bone from surrounding tissue
2. Provides route for nervous & blood supply
3. Participates in bone growth & repair

Blood vessels

Bone development

Medullary cavity

Endosteum- lines bone marrow cavity

1. Active during growth and repair
2. Incomplete epithelial layer

*******KNOW 2 TYPES OF OSSIFICATION*******

Note to Bone Dev

1. **Intramembranous** → bone development from Mesenchymal cells without an intervening cartilage stage
2. **Endochondral** → within cartilage or cartilaginous tissue

Classification of Bones:

1. Long bones – diaphysis, epiphysis with marrow cavity; upper & lower arms, upper & lower leg, palms, soles, fingers, toes
2. Short bone- box like in appearance; exterior is compact bone and interior is spongy; carpals, tarsals,
3. Flat bones – thin parallel surface of compact bone, strong but light, roof of skull, sternum, ribs, scapula
4. Irregular – complex shape with short or flat or notched or rigid surface; vertebrae, some skull bones
5. Sesamoid - small round & flat; e. patella; develop inside tendons near joints
6. Surface bones (wormiac) small flat odd shaped on skull (page 128 know names of table 5-1)

Skeletal system (chapter 6)

2 divisions

1. Appendicular
2. Axial – skull (22), thorax (25), vertebral column (26); form longitudinal axis of the body

Function

1. Creates framework that supports the organs of the dorsal & ventral cavity
2. Houses sense organs for taste, smell, hearing
3. Provides surface area for attaching muscle

Cranium- 8 bones

- 1-frontal
- 2-temporal
- 1-occipital
- 2-paroetal
- 1-sphenoid
- 1-ethmoid

Facial bones-14 bones

- 2-maxilla
- 2-palatine
- 2-nasal
- 2- inferior nasal conchae
- 2- zygomatic
- 2- lacrimal
- 1-vomer
- 1- mandible

Nasal Complex → bone & cartilage enclose nasal cavities & Para nasal cavities

Orbital complex → body recess of bones that house the eyes

Auditory ossicles → 3 tiny ear bones in the tympanic cavity of the temporal bone

Hyoid bone → suspended by stylohyoid ligaments; greater & lesser cornua body; responsible for movements of tongue and the larynx

Vertebral column (26 bones):

Functions

- Column of support, bears weight of the head, neck, trunk; transferring it to appendicular skeleton

Cervical- 7; c1-c7; C1=atlas, holds head; C2=axis; dens odontoid process forms pivot for rotation

Thoracic – 12; T1-T12

Lumbar- 5; L1-L5

Sacral- originates as 5 bones

Coccygeal- originates as 3-5 bones

Ribs (12 Pairs):

- 1-7 are true ribs
- 8-10 are false ribs
- 11-12 are floating ribs

Sternum:

1. Manubrium
2. Body
3. Xyphoid

Chapter 7 appendicular skeleton

- includes bones of the upper & lower limbs
- supporting elements = girdles connect them to the trunk
- markings are attached sites for the muscles or opening for the nerve or blood vessels

Pectoral girdle & upper limb:

Pectoral girdle→ clavicle-collar bone, s-shaped; scapula-broad flat shoulder blade

Upper limb→ humerus, radius, ulna, carpal, metacarpal, phalanges

Pelvis girdle & lower limb:

- supports & protects lower viscera, reproductive organs
- bears weight of body
- locomotion

consists of:

paired or fused coxae (coxae)

pelvis

- coxae of append. 7& sacrum & coccyx of axial skeleton

each coxae

- 3 parts ilium, ischium, pubis

pelvis subdivided into:

- false/greater pelvis→ blades & ilium
- true/ lesser pelvis→ pubic bone, ischium, sacrum

lower limbs:

femur

patella

tibia

fibula

tarsal

metatarsal

phalanges