

Ch.7 – The Skeleton

Parts of the Skeleton

Axial Skeleton – skull, vertebral column, thoracic cage; protects by enclosure

Appendicular Skeleton – pectoral and pelvic girdles and the limbs; allows mobility

The Axial Skeleton

The Skull

22 bones

Cranium forms vault and base of skull to protect brain

8 bones: paired parietal & temporal bones, frontal, occipital, ethmoid, & sphenoid

Facial bones provide openings for respiration & ingestion and attachment sites for facial muscles

14 bones: paired maxillae, zygomatics, nasals, lacrimals, palatines, and inferior nasal conchi; single mandible and vomer bones

Orbits and *nasal cavity* - complicated bony regions

Paranasal sinuses – occur in the frontal, ethmoid, sphenoid, and maxillary bones

Hyoid bone – supported by ligaments, point of attachment for tongue and neck muscles

The Vertebral Column

24 movable vertebrae (7 cervical, 12 thoracic, 5 lumbar), sacrum, and coccyx

Fibrocartilage intervertebral discs

Curvatures for increased flexibility

Primary curvatures: thoracic and sacral (convex on dorsal side)

Secondary curvatures: cervical and lumbar (concave on dorsal side)

General Structure of Vertebrae (does not apply to C1 and C2)

A body, two transverse processes, 2 superior & 2 inferior articular processes, a spinous process, and a vertebral arch

Regional vertebrae have special features

The Thoracic Cage

12 rib pairs, the sternum, and the thoracic vertebrae

Ribs: first 7 are *true ribs*, rest are *false ribs*, ribs 11 and 12 are *floating ribs*

Sternum: consists of fused manubrium, body, and xiphoid process

The Appendicular Skeleton

The Pectoral Girdle (shoulder girdle)

One clavicle and one scapula per girdle; girdles attach upper limbs to axial skeleton

Clavicles

Hold scapulas away from thorax (laterally)

Attach to scapulas at sternoclavicular joints

Scapulae

Articulate with clavicles and humeri (of arm)

The Upper Limb(s)

Consists of 30 bones; specialized for mobility

Arm: humerus

Forearm: radius and ulna

Hand: Carpals, metacarpals, phalanges

The Pelvic Girdle (hip girdle)

Consists of 2 hip bones; connects lower limbs to axial skeleton

Hip bones + sacrum + coccyx = the pelvis

Ilium/ischium/pubis: -ilium articulates with sacrum posteriorly

-ischium is a curved bar; we sit on ischial tuberosities

-pubic bones articulate anteriorly at pubic symphysis

Pelvic Structure and Childbearing: male pelvis: deep & narrow w/ long, heavy bones

female pelvis: shallow & wide to allow passage of baby

The Lower Limb(s)

Consists of thigh (femur), leg (tibia and fibia), and foot (tarsals, metatarsals, and phalanges)

Allows weight-support and movement

Important tarsals: calcaneus, tallus

Arches of the foot: lateral, medial, and transverse arches (distribute weight to heel and ball)

Developmental Aspects of the Skeleton

Infancy:

Fontanelles – “little fountains” (soft spots); allow skull compression during birth & brain growth

Childhood: Brain Growth and Growth of cranium

Late childhood: facial bones protrude to allow sinus growth

Vertebral column: C shaped at birth, S shaped for most of life, may be C shaped again in old age

Head and torso = 1.5x length of legs at birth. Head and torso = length of legs at 10 yo.

Late middle age:

intervertebral discs and costal cartilage calcify somewhat

osteoporosis can occur (loss in height, higher risk of disc herniation)

risk of fractures goes up

ability to repair goes down

breathing becomes more difficult