
SKELETAL
SYSTEM
IN
3D
LOCOMOTION AND MOVEMENT

Mega Test - Locomotion and Movement

Mega Test - Locomotion and Movement

13 November, 2023

6:00 PM - 7:30 PM

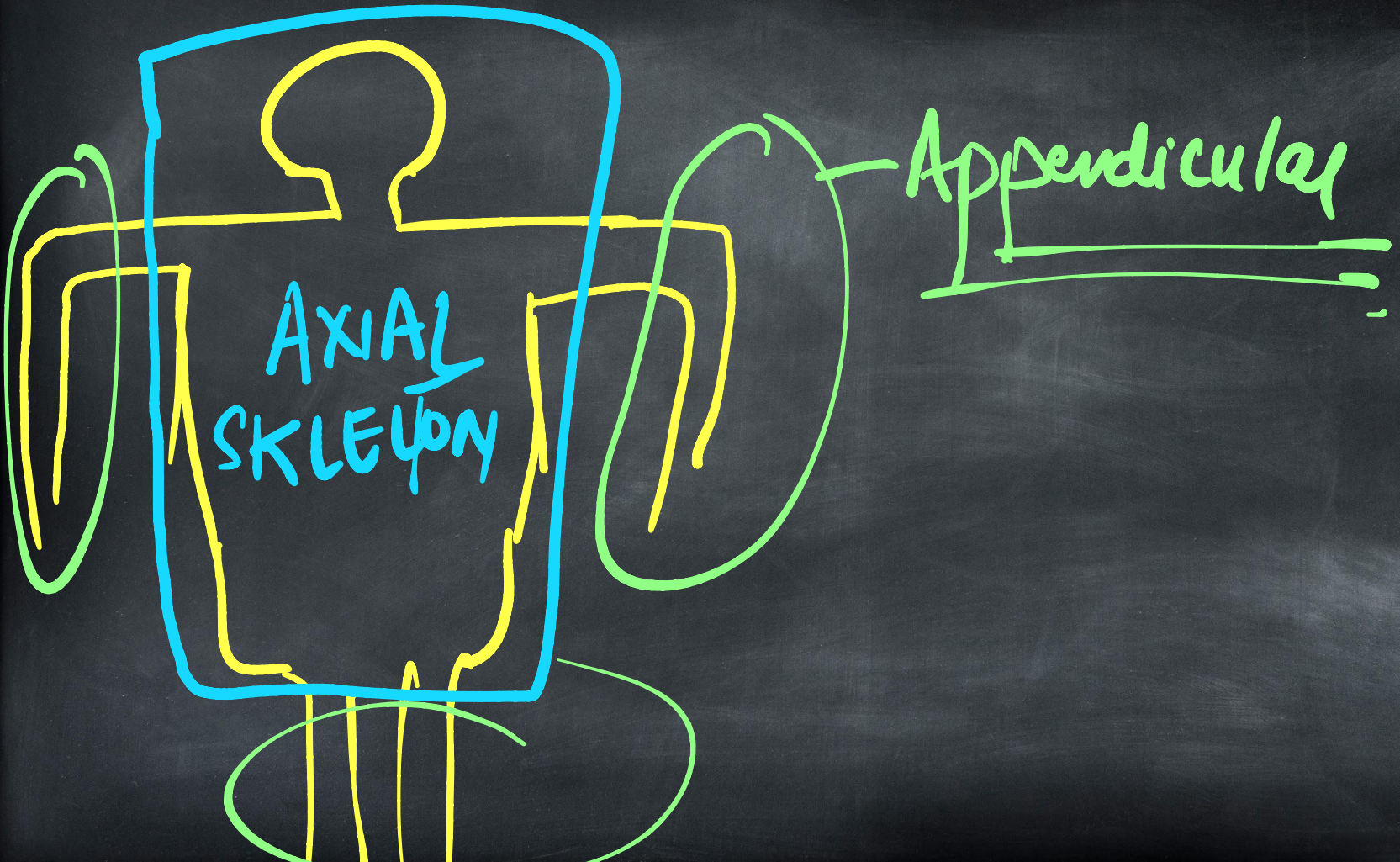
Skeletal System (206)

Axial (80)

- Skull - 8 + 14 (22).
- Vertebral Column
- Sternum
- Ribs.
- Hyoid
- Ear ossicles

Appendicular Skeleton (126)

- Girdles
- Limbs


AXIAL SKELETON
Appendicular

Cranium - Brain Box

8- bones

- 2 paired
  - Parietal (2)
  - Temporal (2)
- Rest unpaired
  - FRONTAL (1)
  - Occipital (1) → opening → foramen magnum
    - Spinal cord
    - Occipital Condylic
  - Sphenoid (1)
    - → Pituitary gland
    - Sella Turcica
    - articulates with all Cranial Bones.
    - Key Stone
  - Ethamoid (1).

FAST PATH TO SUCCESS IS EDUCATION

Facial Bones (14)

- Nasal (2)
- Infraorbital (2)
- Zygomatic (2)
- Lacrymals (2)
- Vomer (1)
- Maxilla (2)
- Mandiblele (1)
- Palatine (2)

Only movable Bone in Skull → Mandibles

Hyoid (1) → Single

Tongue Bone

↓

does not articulate with any other Bone

Ear Ossicle - Malleus, Incus, Stapes

- Hammer, Anvil, Smallest Stroup

# Vertebral Column → Adult = 26
Infant = 33.

Ribs = 24 (12 pair)

- True
  - Vertebrosternal
  - 1st 7 pair of Ribs.
  - 1st to 7th
- False
  - Vertebro-chondral Ribs
  - 8th, 9th, 10th
  - Vertebral Ribs
  - 11th & 12th
    - Floating Ribs
    - ↓
    - Kidney protection.

Vertebral Column → Adult = 26
Infant = 33.

Ribs

True

Vertebrosternal
1st 7 pairs of Ribs.
1st to 7th

False

Vertebro-chondral Ribs
8th, 9th, 10th

Vertebral Ribs
11th & 12th

Floating Ribs
↓
kidney protection.

Acromion process
↓
articulate with
Clavicle

Glenoid Cavity
↓
articulate with head of
humerus.

Vertebral Column

C_1 → Atlas
C_2 → Axis
C_7 → prominence

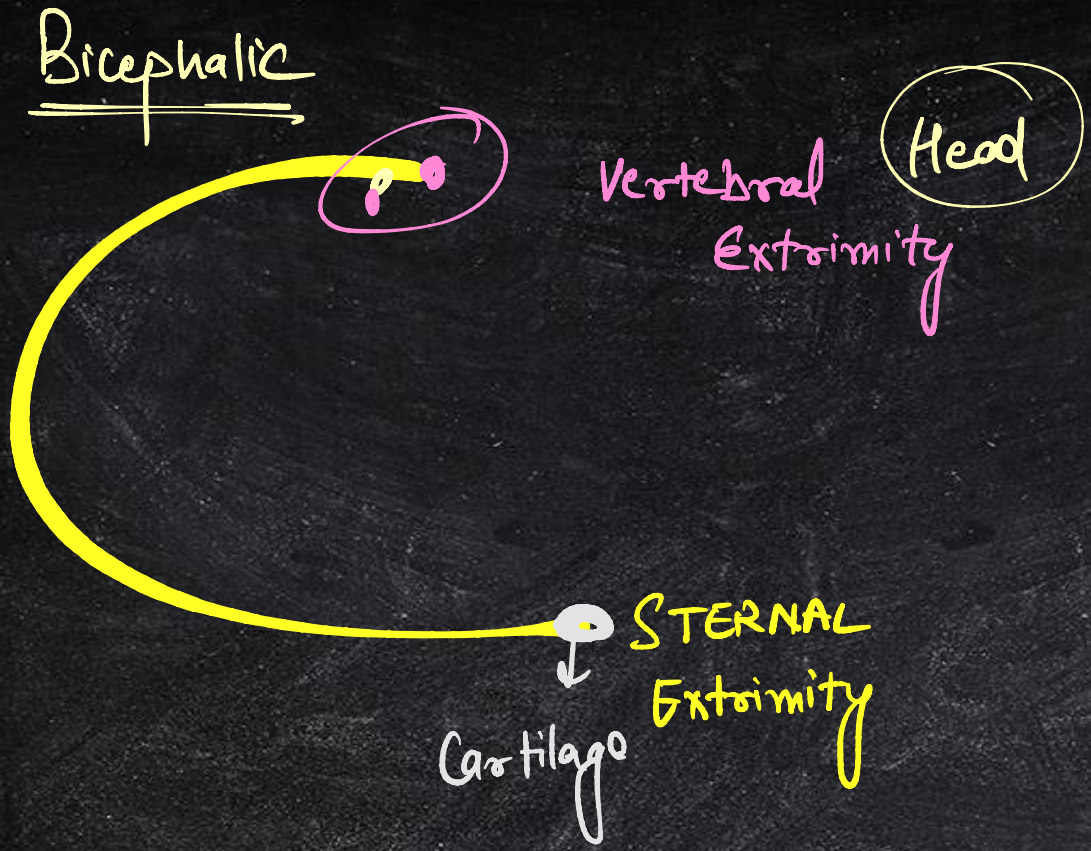
C T L S Co
7 12 5 (5) (4) = 26 Adults

Stoongest = Lumbar

$C_7 T_{12} L_5 S_5 Co_4$ = 33. Children

Ribs → Thoracic

- → Cervical Curve. (2°)
- Thoracic Curve. (1°)
- Lumbar Curve (2°)
- Pelvic Curve (1°)


Bicephalic
Head
Vertebral
Extremity
STERNAL
Extremity
Cartilage

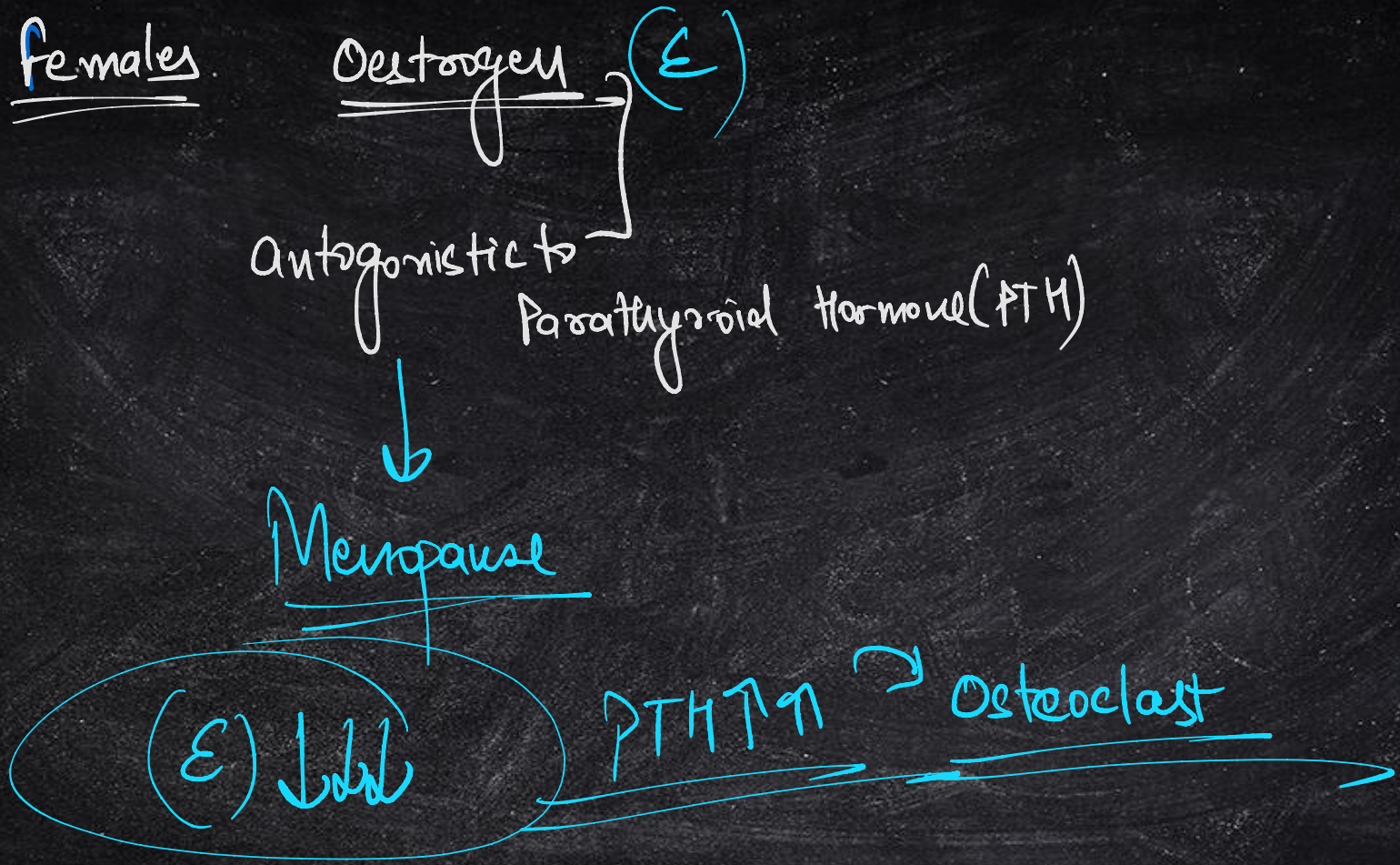
Joints → Arthrology

- Immovable / fibrous / Synarthroses
  - Sutures
  - Gomphoses

- Slightly movable Joint / Cartilaginous / Amphiarthroses
  - Intervertebral disc
  - Pubic Symphyses
  - Sternum & Rib Costal cartilage

- Freely Movable / Synovial / Diarthroses


ACh


females
Oestrogen
(E)
antagonistic to
Parathyroid Hormone(PTH)
Menopause
(E) ↓↓↓
PTH ↑↑↑
Osteoclast

Ilium- Bone

Ileum- Intestine

Locomotion and Movement

There are 12 pairs of **ribs.** Each rib is a thin flat bone connected dorsally to the vertebral column and ventrally to the sternum. It has two articulation surfaces on its dorsal end and is hence called bicephalic. First seven pairs of ribs are called true ribs. Dorsally, they are attached to the thoracic vertebrae and ventrally connected to the sternum with the help of hyaline cartilage. The 8^{th}, 9^{th} and 10^{th} pairs of ribs do not articulate directly with the sternum but join the seventh rib with the help of hyaline cartilage. These are called vertebrochondral (false) ribs. Last 2 pairs (11^{th} and 12^{th}) of ribs are not connected ventrally and are therefore, called floating ribs. Thoracic vertebrae, ribs and sternum together form the rib cage (Figure 20.8).

Pelvic girdle consists of two coxal bones (Figure 20.10). Each coxal bone is formed by the fusion of three bones – ilium, ischium and pubis. At the point of fusion of the above bones is a cavity called acetabulum to which the thigh bone articulates. The two halves of the pelvic girdle meet ventrally to form the pubic symphysis containing fibrous cartilage.

20.4 Joints

Joints are essential for all types of movements involving the bony parts of the body. Locomotory movements are no exception to

Locomotion and Movement

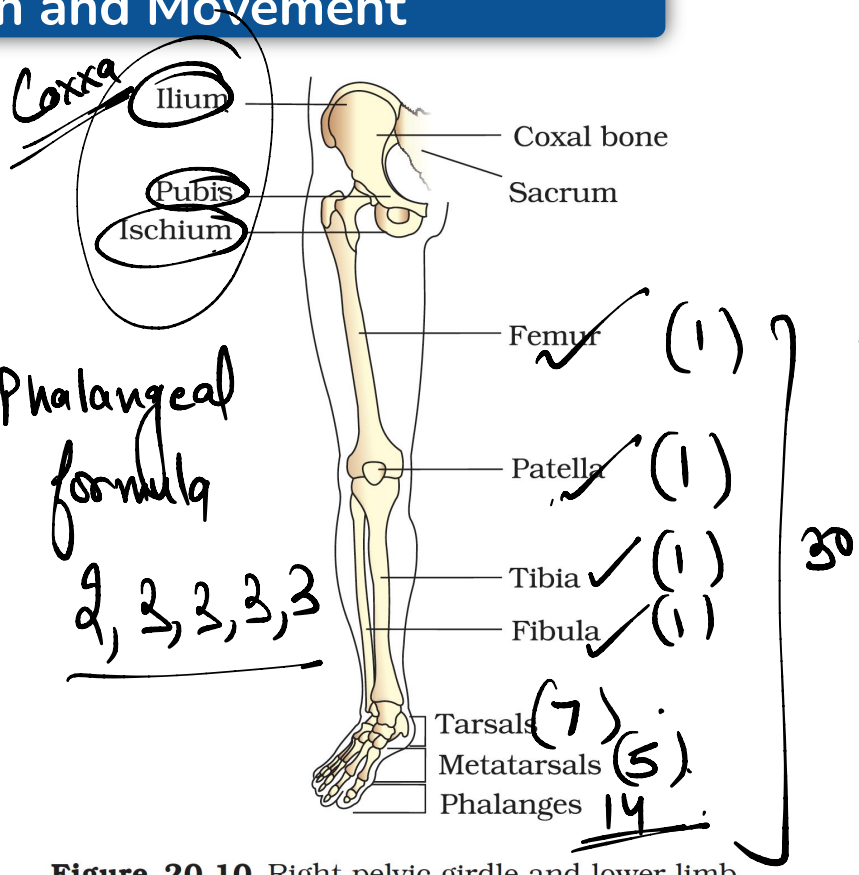


Figure 20.10 Right pelvic girdle and lower limb bones (frontal view)

Locomotion and Movement

Synovial joints are characterised by the presence of a fluid filled synovial cavity between the articulating surfaces of the two bones. Such an arragement allows considerable movement. These joints help in locomotion and many other movements. Ball and socket joint (between humerus and pectoral girdle), hinge joint (knee joint), pivot joint (between atlas and axis), gliding joint (between the carpals) and saddle joint (between carpal and metacarpal of thumb) are some examples.

Locomotion and Movement

20.5 Disorders of Muscular and Skeletal System

Myasthenia gravis: Auto immune disorder affecting neuromuscular junction leading to fatigue, weakening and paralysis of skeletal muscle.

Muscular dystrophy: Progressive degeneration of skeletal muscle mostly due to genetic disorder.

Tetany: Rapid spasms (wild contractions) in muscle due to low Ca^{++} in body fluid.

Arthritis: Inflammation of joints.

Osteoporosis: Age-related disorder characterised by decreased bone mass and increased chances of fractures. Decreased levels of estrogen is a common cause.

Gout: Inflammation of joints due to accumulation of uric acid crystals.