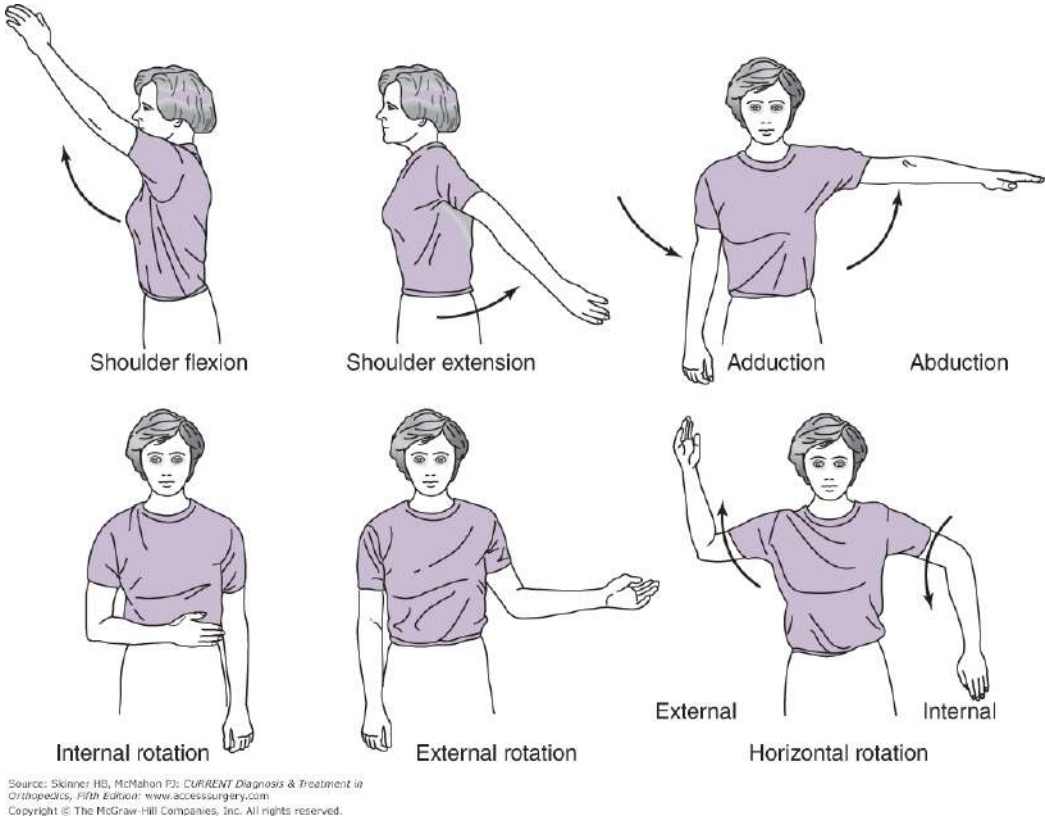
Joints

- Where two bones articulate (meet)



Source: Skinner HB, McMahon PJ: CURRENT Diagnosis & Treatment in Orthopedics, Fifth Edition: www.accesssurgery.com
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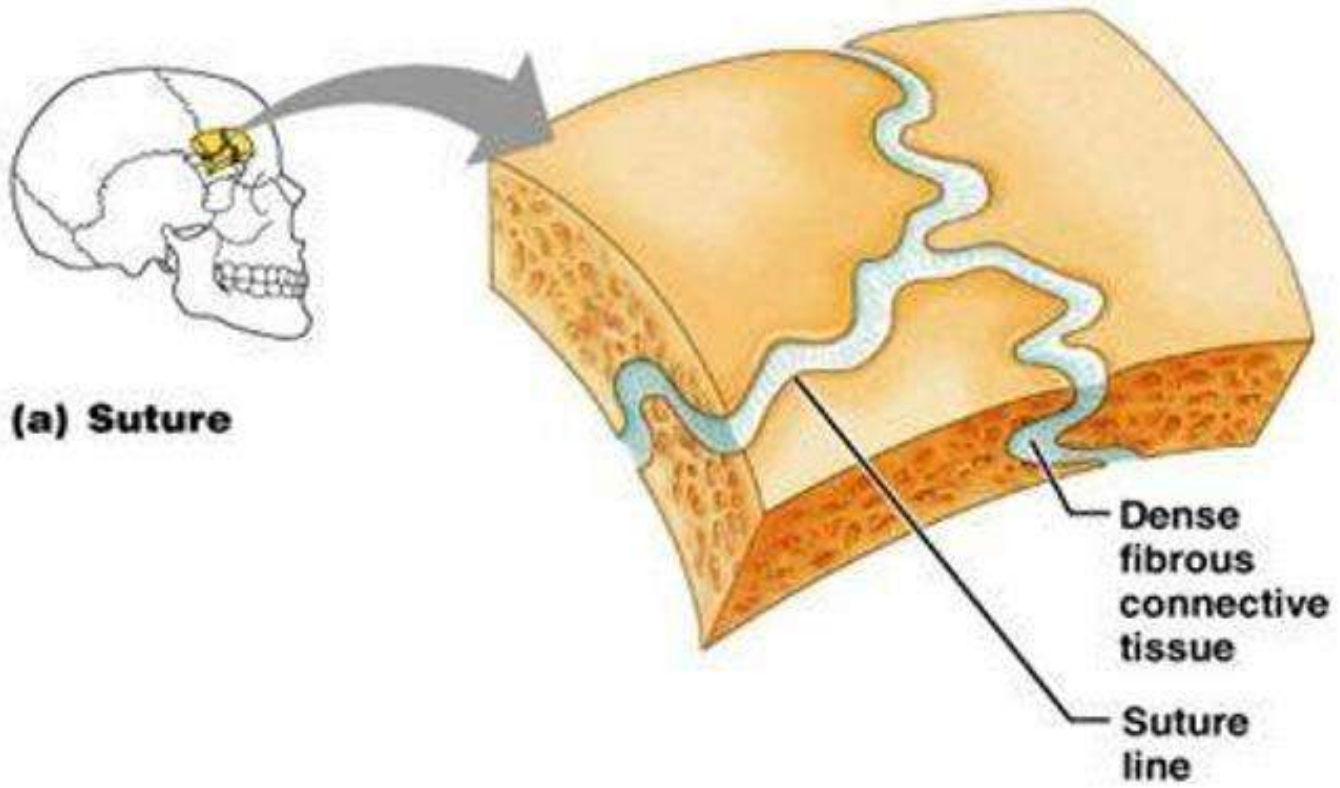
Types:

1. Freely moveable (**Diarthrosis**)– **Synovial**
   (e.g. shoulder, ankle, knee)
2. Somewhat moveable (**Amphiarthrosis)**– Cartilaginous
   (e.g. pubic symphysis)
3. Not very moveable (**Synarthrosis)**- Fixed /fibrous
   (e.g. skull)



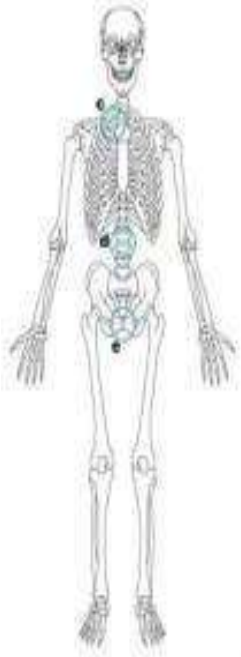
Fibrous (fixed joints)

Generally immovable –
e.g. skull sutures



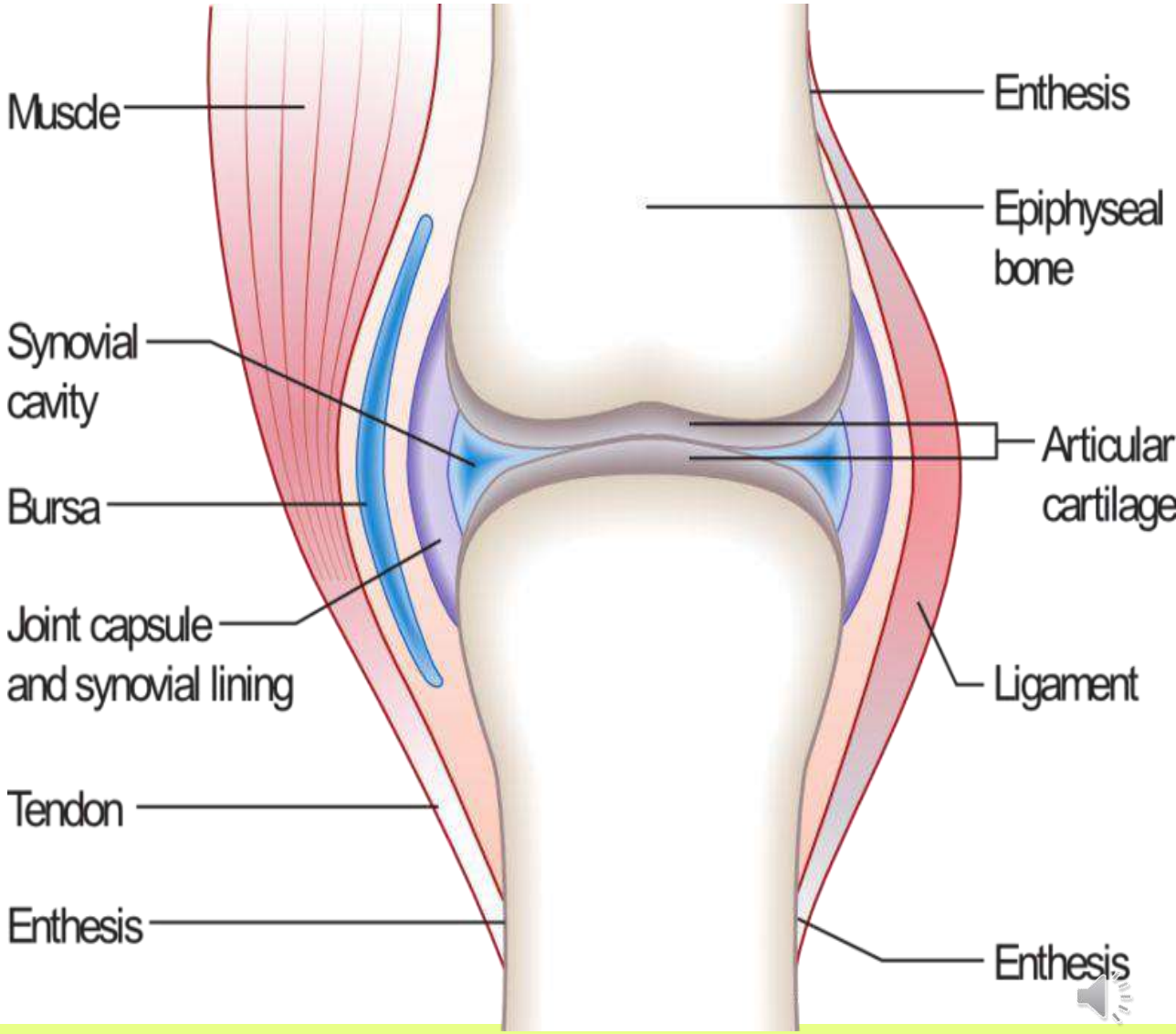
Cartilaginous joints

Immovable or slightly moveable



Synovial Joints

- Freely moveable
- Joint capsule surrounds the joint
- Articular cartilage (hyaline cartilage) covers the ends of bones
- Have a joint cavity containing small sacs called bursae filled with synovial fluid
- Held together with fibrous connective tissue called ligaments



Types of Synovial Joints

1. **Ball & socket**: A ball-like surface of one bone that fits into a cup-like depression of another bone. Movement in many directions, e.g. hip / shoulder joints
2. **Gliding joint**: Bone surfaces slide over one another. Least movement, e.g. carpal / tarsal bones
3. **Hinge joint**: Permits movement in one direction like the hinge on a door e.g. elbow
4. **Pivot joint:** Rotation around one axis, e.g. Radioulnar joint rotates forearm, C1/C2
5. **Saddle:** One part of the bone in the joint looks like a saddle and another part that fits into this shape, e.g thumb. Movement around 2 axes, flexion/extension; adduction/abduction
6. **Condyloid (ellipsoidal) :** Oval-shaped end of one bone fits into a similarly oval-shaped hollow of another bone. Allows angular movement along two axes (e.g. wrist and fingers, which can move both side to side and up and down).

A. C1/C2 - **Pivot joint**

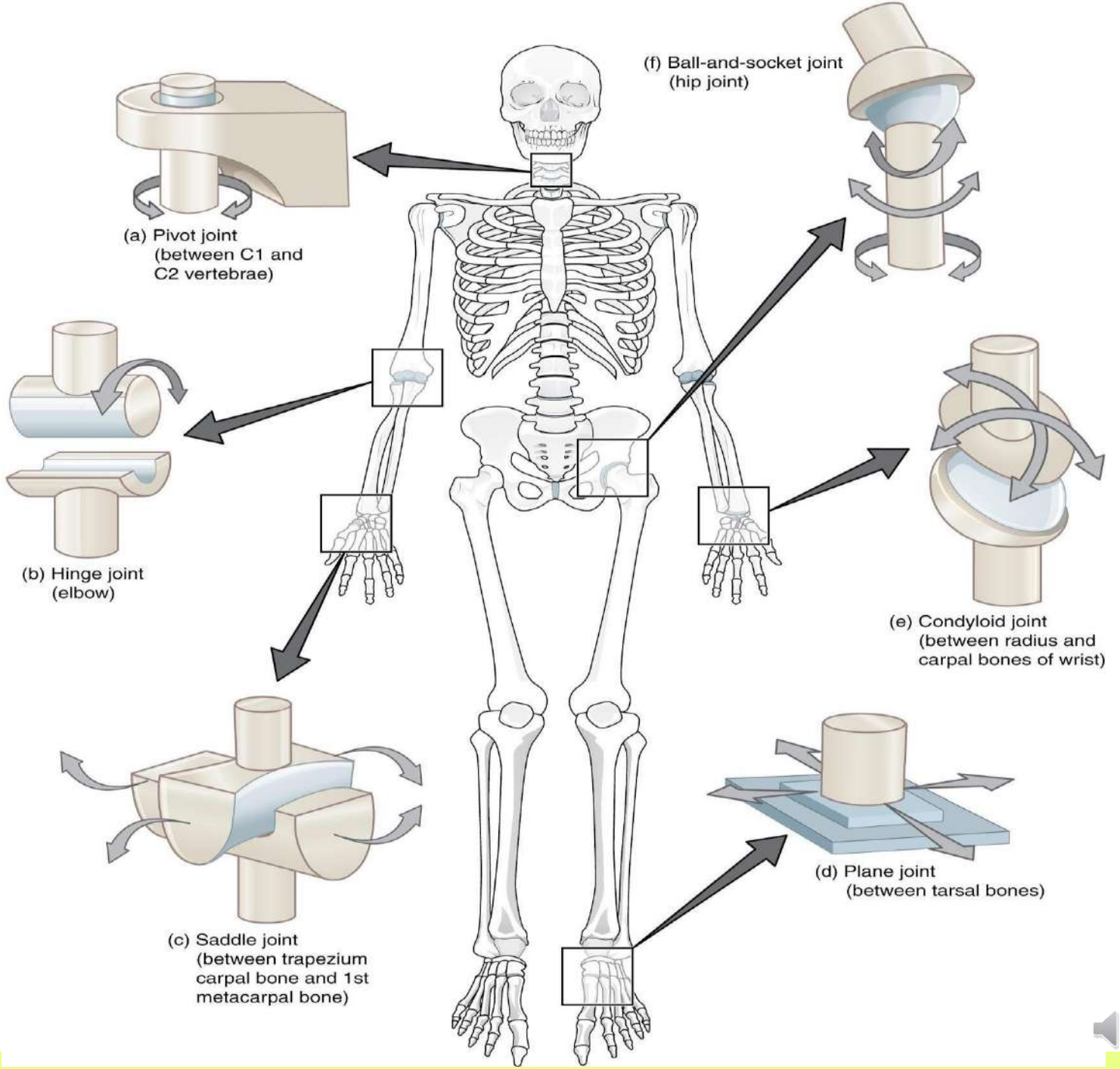
B. Elbow - **Hinge joint**

C. Thumb – **Saddle joint**

D. Tarsals – **Gliding Joint**

E. Radio-carpal - **Condyloid**

F. Hip – **Ball & Socket joint**



•**Cartilage.** This is a type of tissue that covers the surface of a bone at a joint. Cartilage helps reduce the friction of movement within a joint.
•**Synovial membrane.** A tissue called the synovial membrane lines the joint and seals it into a joint capsule. The synovial membrane secretes a clear, sticky fluid (synovial fluid) around the joint to lubricate it.
•**Ligaments.** Strong ligaments (tough, elastic bands of connective tissue) surround the joint to give support and limit the joint's movement. Ligaments connect bones together.
•**Tendons.** Tendons (another type of tough connective tissue) on each side of a joint attach to muscles that control movement of the joint. Tendons connect muscles to bones.
•**Bursas.** Fluid-filled sacs, called bursas, between bones, ligaments, or other nearby structures. They help cushion the friction in a joint.
•**Synovial fluid.** A clear, sticky fluid secreted by the synovial membrane.

Test your knowledge

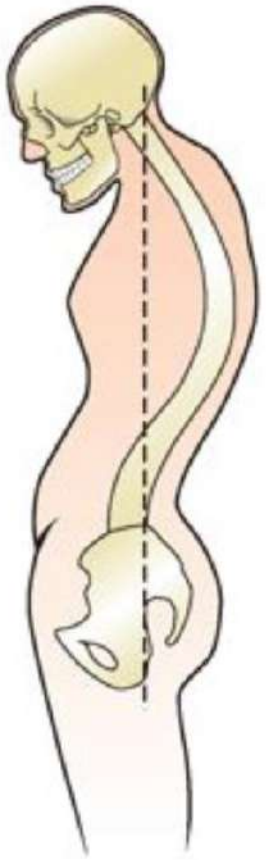


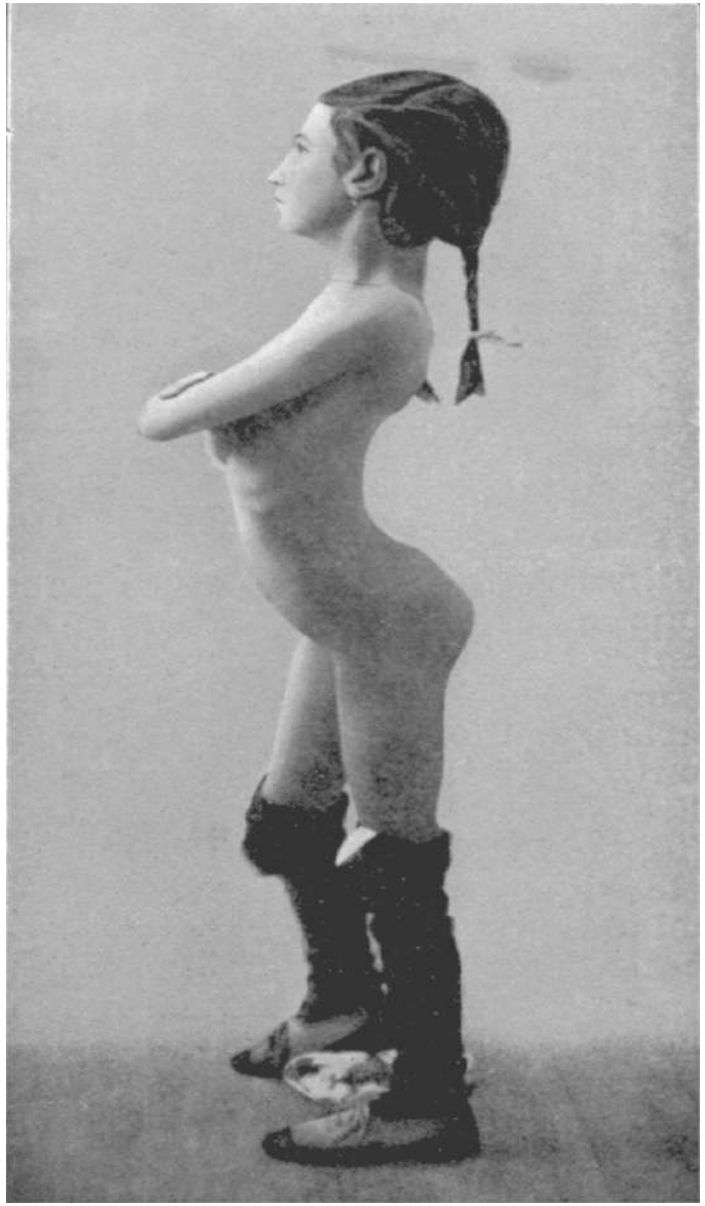
- Give an example of a fixed / fibrous joint
- What is a characteristic of a cartilaginous joint, and where would you find one?
- Describe a synovial joint
- List 5 types of synovial joints and where you might find them

Disorders of the skeletal system

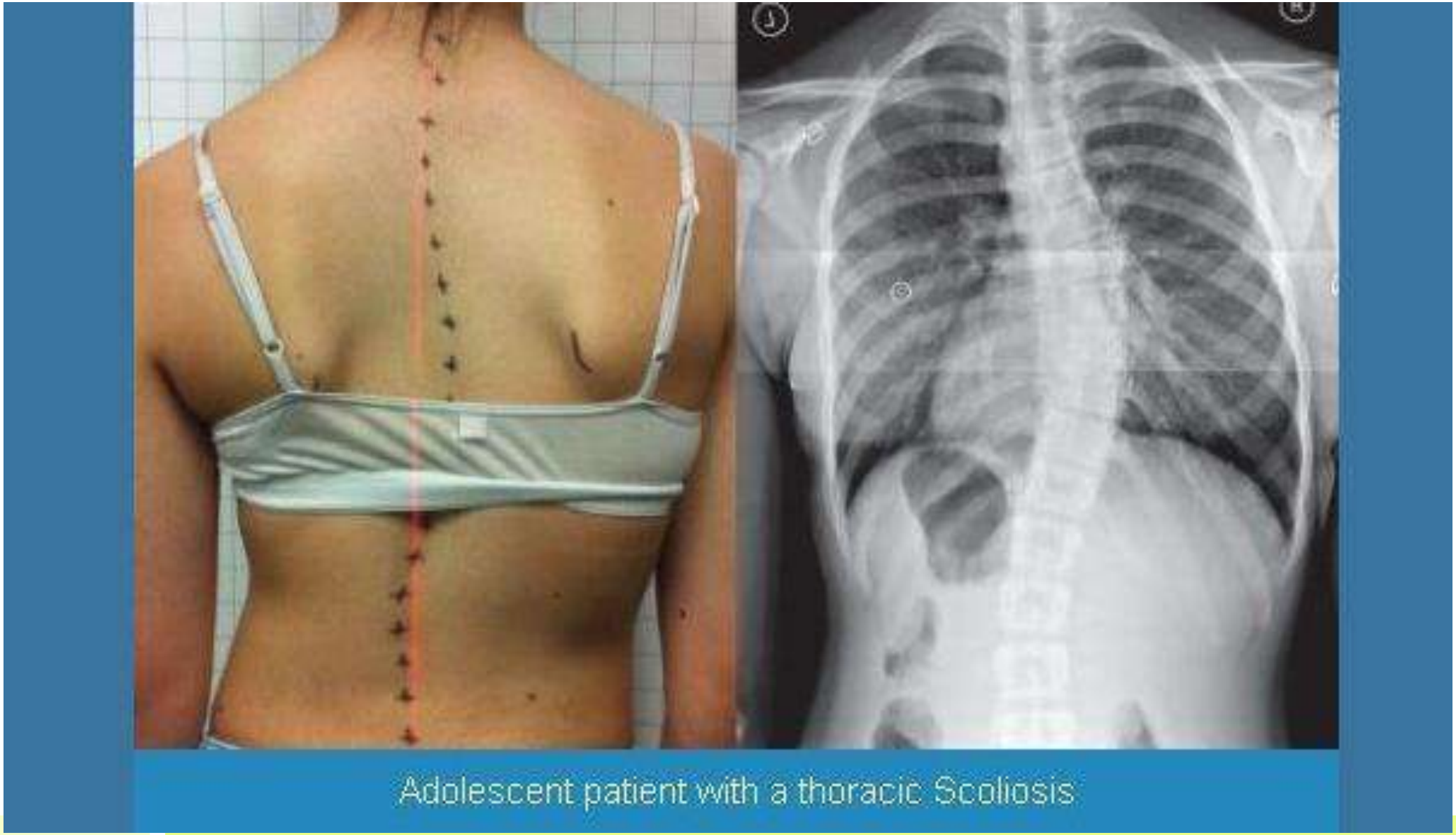
Postural deformities

- Congenital
- Environmental
- Traumatic





Scoliosis



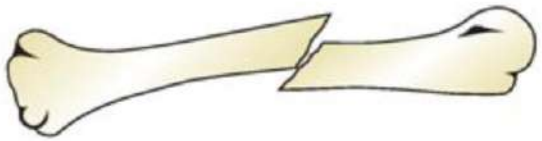
Adolescent patient with a thoracic Scoliosis

Fracture

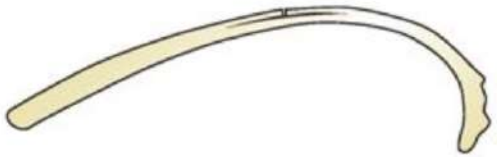
1. Simple / closed
2. Compound
3. Comminuted
4. Greenstick
5. Impacted
6. Complex / complicated



Simple



Compound



Greenstick



Comminuted



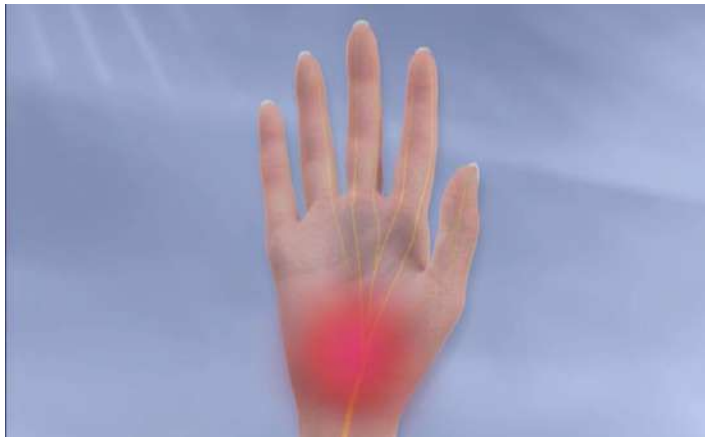
Impacted



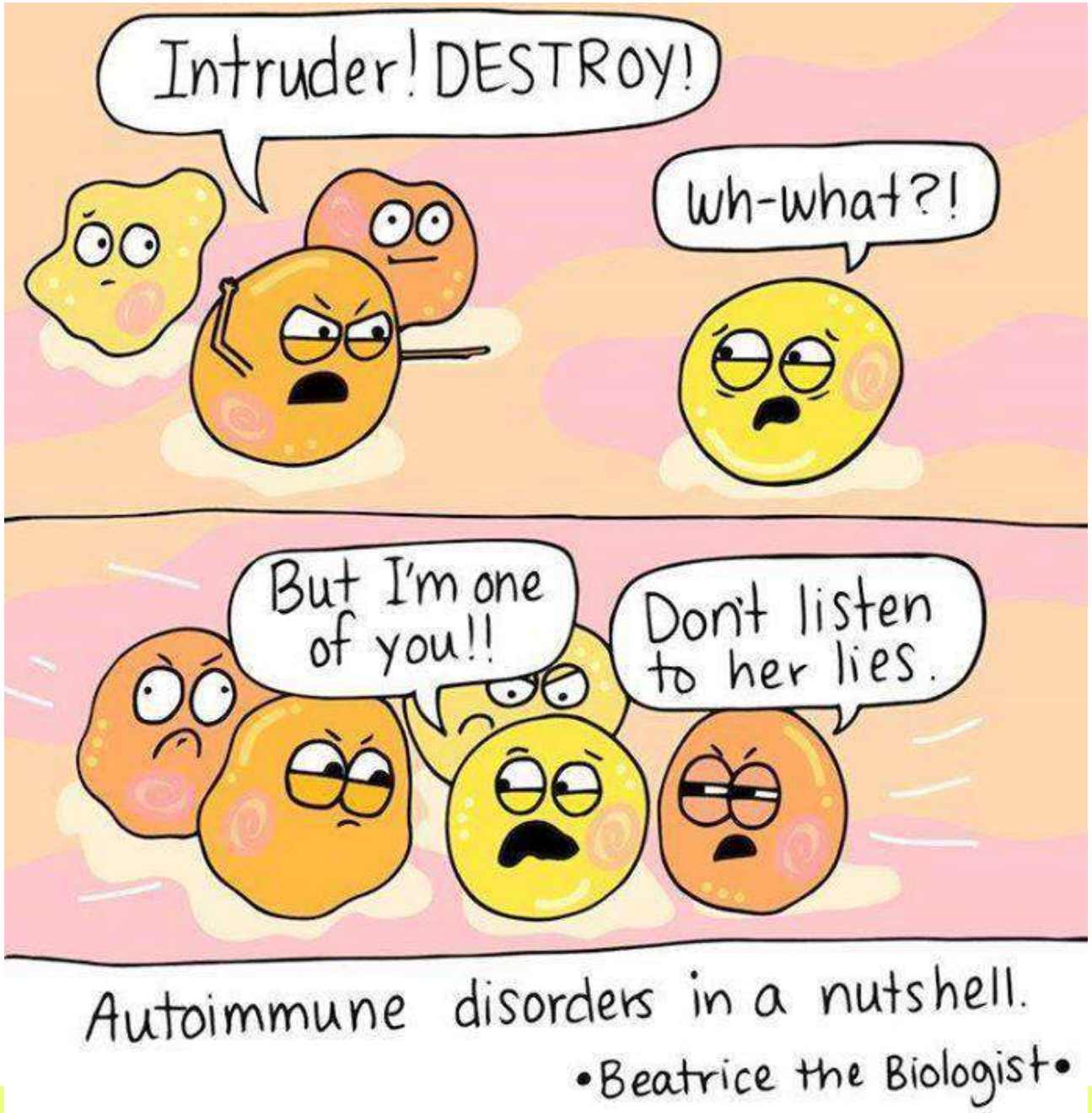











Intruder! DESTROY!
wh-what?!
But I'm one of you!!
Don't listen to her lies.
Autoimmune disorders in a nutshell.
•Beatrice the Biologist•

Rheumatoid Arthritis



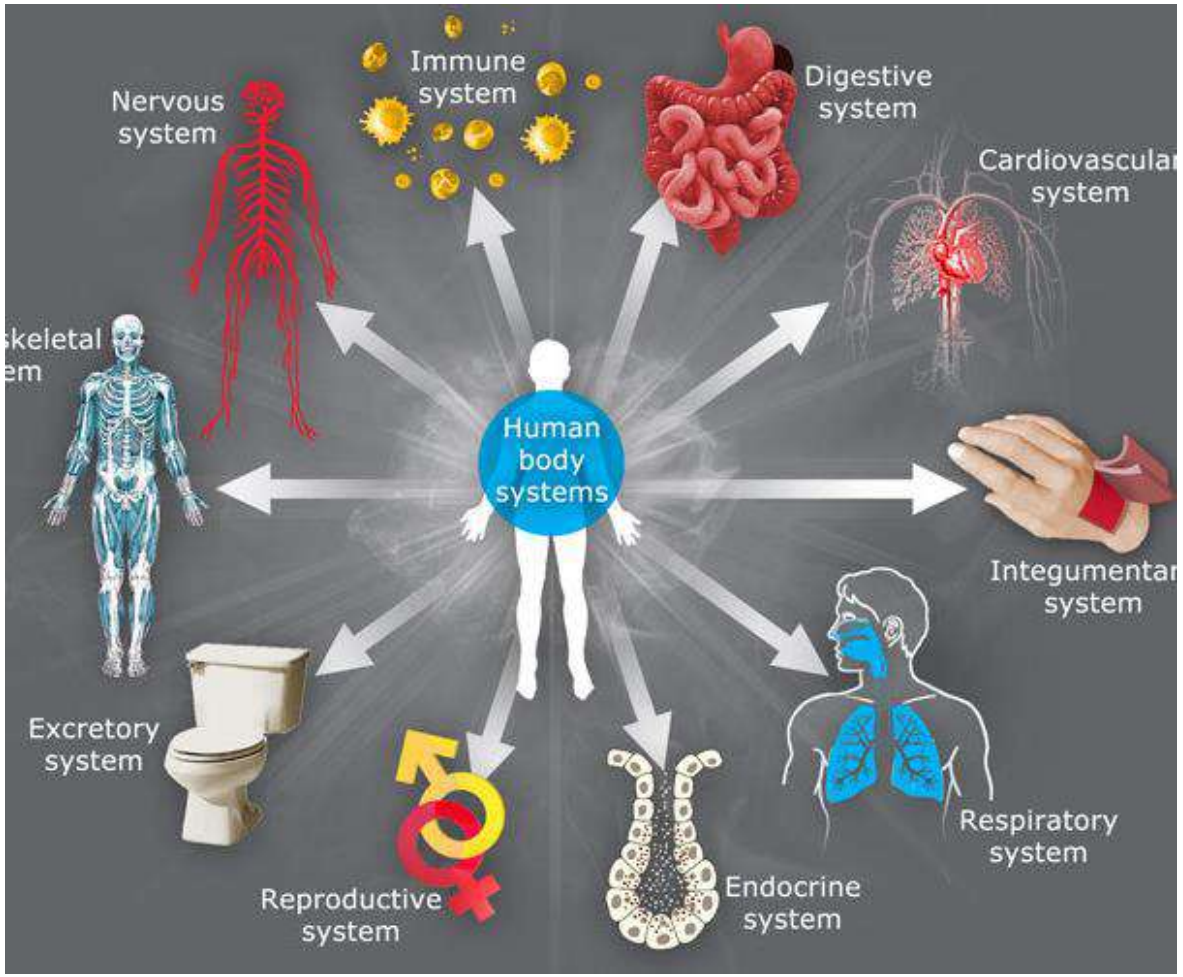
Pathologies of the skeletal system

- Arthritis
- Spondylitis
- Stenosis
- Gout
- Osteoporosis
- Osteomalacia
- Herniated disc
- Whiplash
- Stress
- Carpal tunnel syndrome

Autoimmune:

- RA (Rheumatoid Arthritis)
- Lupus
- Synovitis
- Psoriatic arthritis
- Scelerodoma

No system exists in isolation!



Links to:

- Muscular system
- Circulatory system
- Nervous system
- Digestive system
- Urinary system

Skeletal system – what you need to know!

- **Bone tissue** – osteoblasts / osteoclasts; compact / cancellous
- **Types of bones** – long, short, flat, irregular, sesamoid
- **Axial** – skull, vertebra, sternum
- **Appendicular** – shoulder and pelvic girdles, upper and lower limbs
- **Functions**
  - Support, protection, movement, muscle attachment, produce blood cells, store minerals, store lipids
- **Names and location of the main bones**
- **Deformities** can be postural, congenital, environmental (e.g. lordosis, kyphosis, scoliosis)
- **Pathologies** – structural, hereditary, overuse, autoimmune

Questions?







Appendix



Coxarthrosis



Key terms

Abdominal

Acromial

Antebrachial

Antecubital

Axillary

Brachial

Buccal

Calcaneal

Carpal

Cephalic

Cervical

Deltoid

Digital

Dorsum

Femoral

Frontal

Gluteal

Hallux

Inguinal

Lumbar

Mammary

Mental

Nasal

Occipital

Olecranal

Oral

Orbital

Otic

Palmar

Patellar

Pedal

Pelvic

Perineal

Plantar

Pollex

Popliteal

Pubic

Sacral

Scapular

Tarsal

Thorax

Vertebral

Bone structure

Long bones:

- make up most of the arms and legs
- long shaft called the **diaphysis** (contains compact bone)
- irregular ends are called **epiphysis** (cancellous bone)
- **metaphysis** where DP joins EP
- **epiphyseal plate** is responsible for longitudinal growth
- Covered by **periosteum**

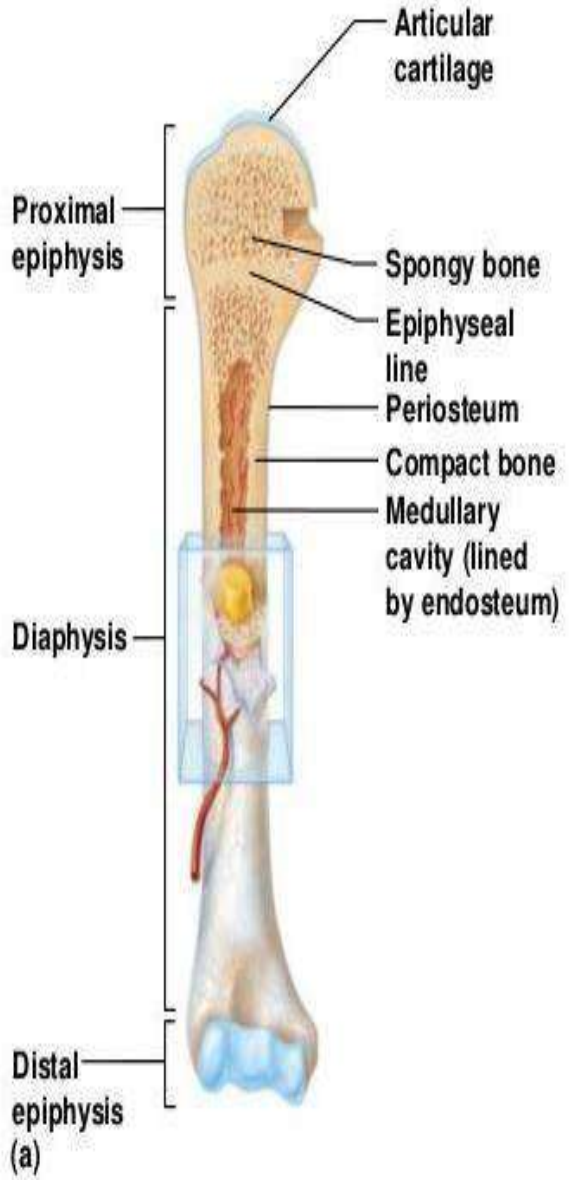
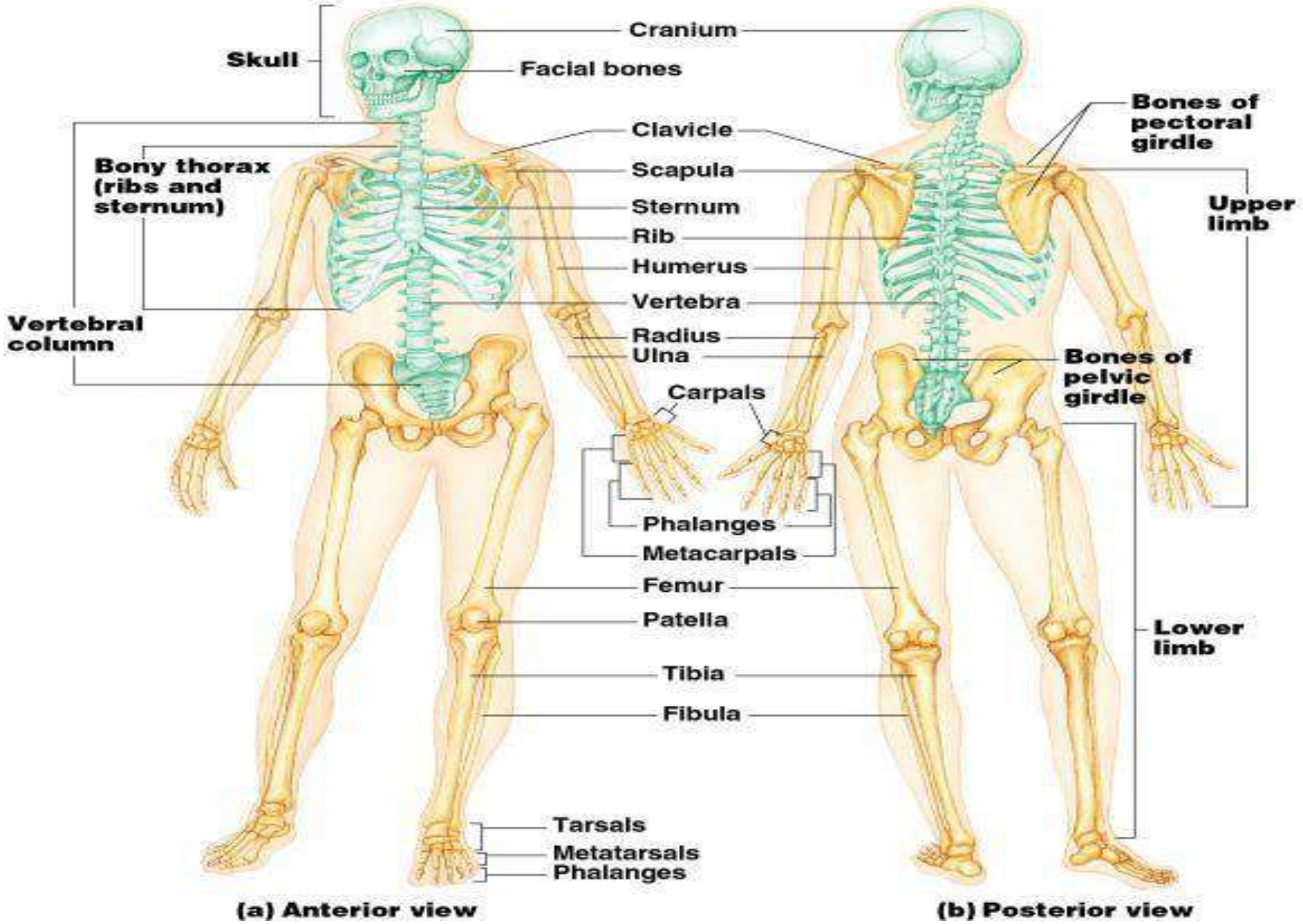
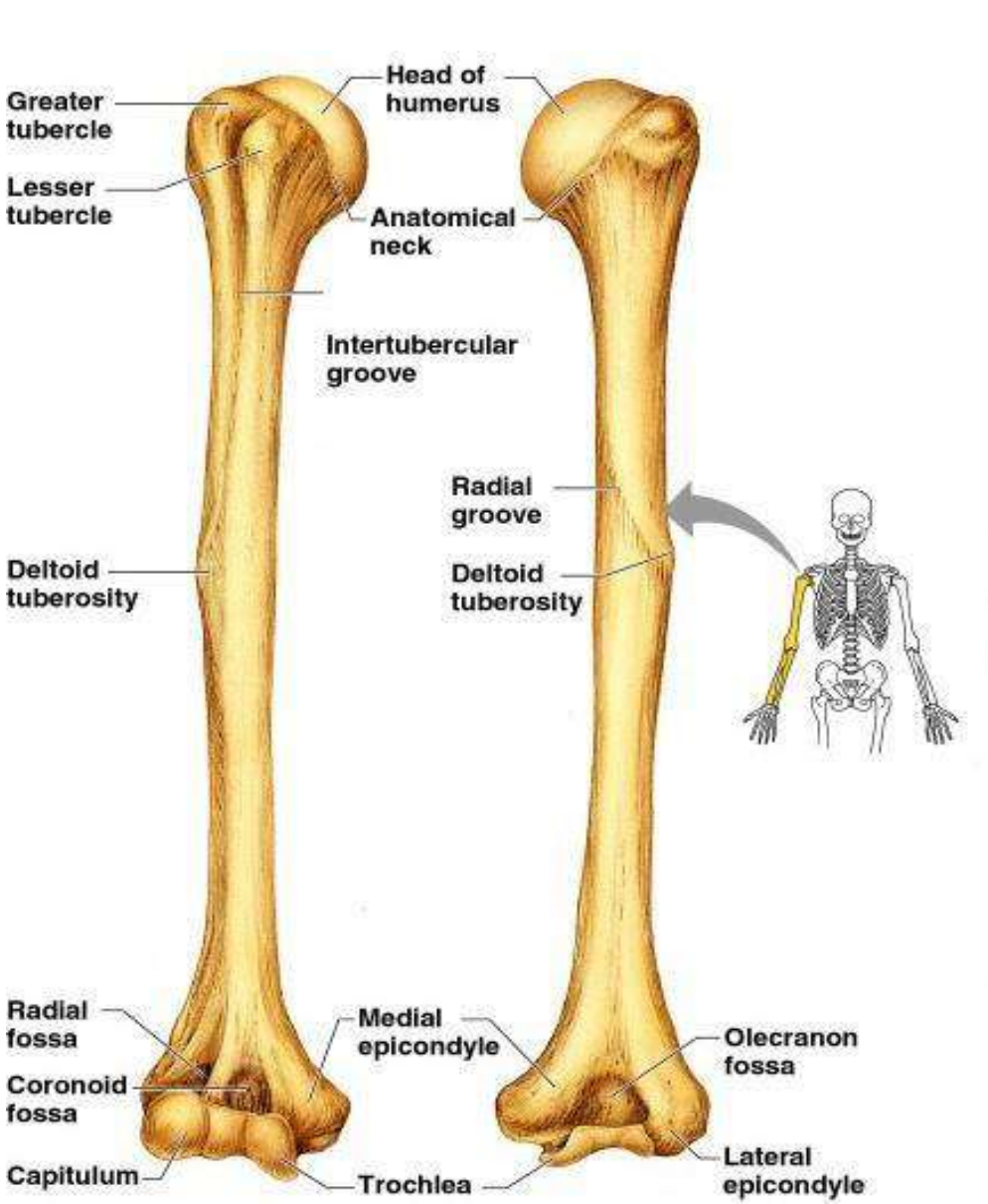
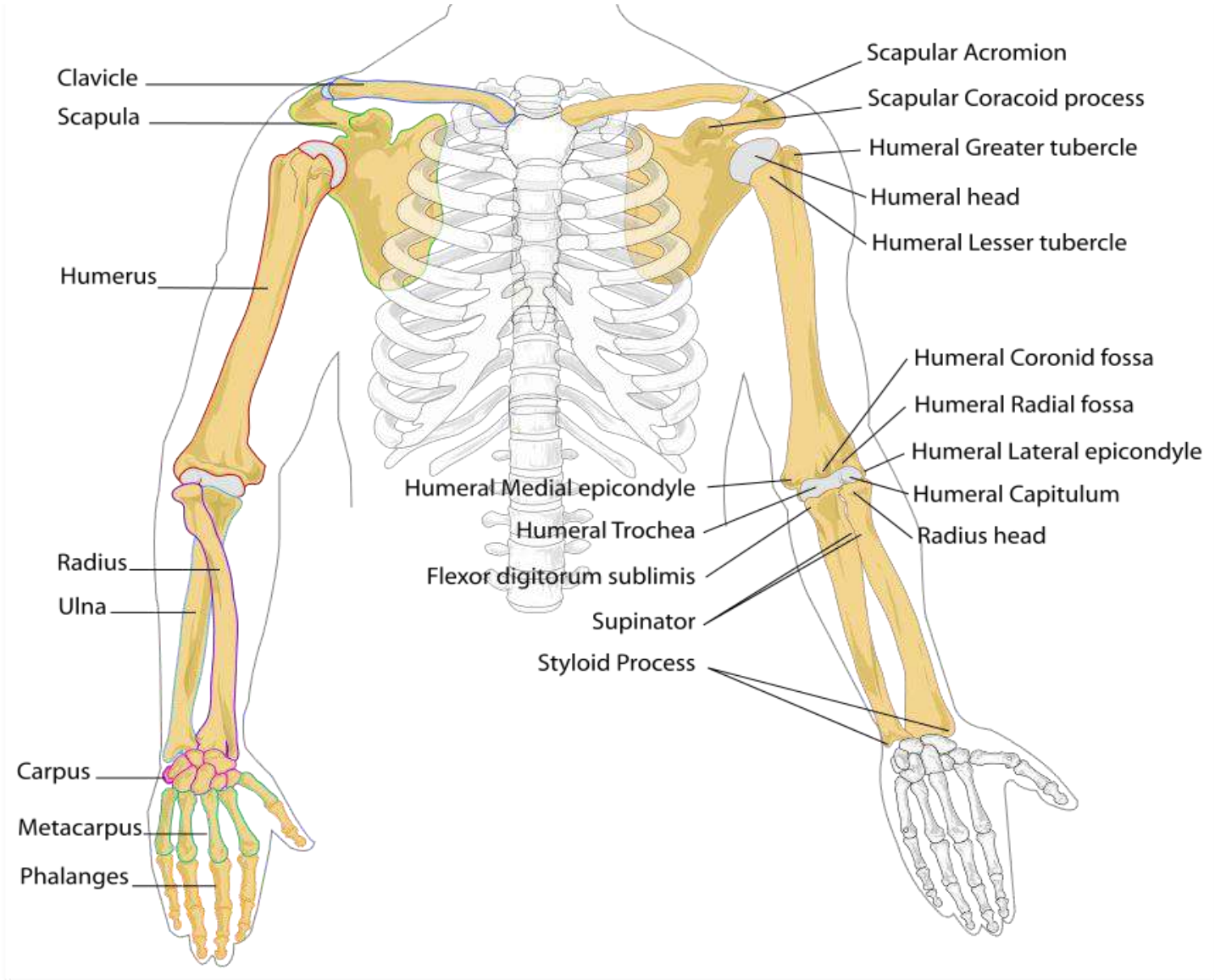


Figure 5

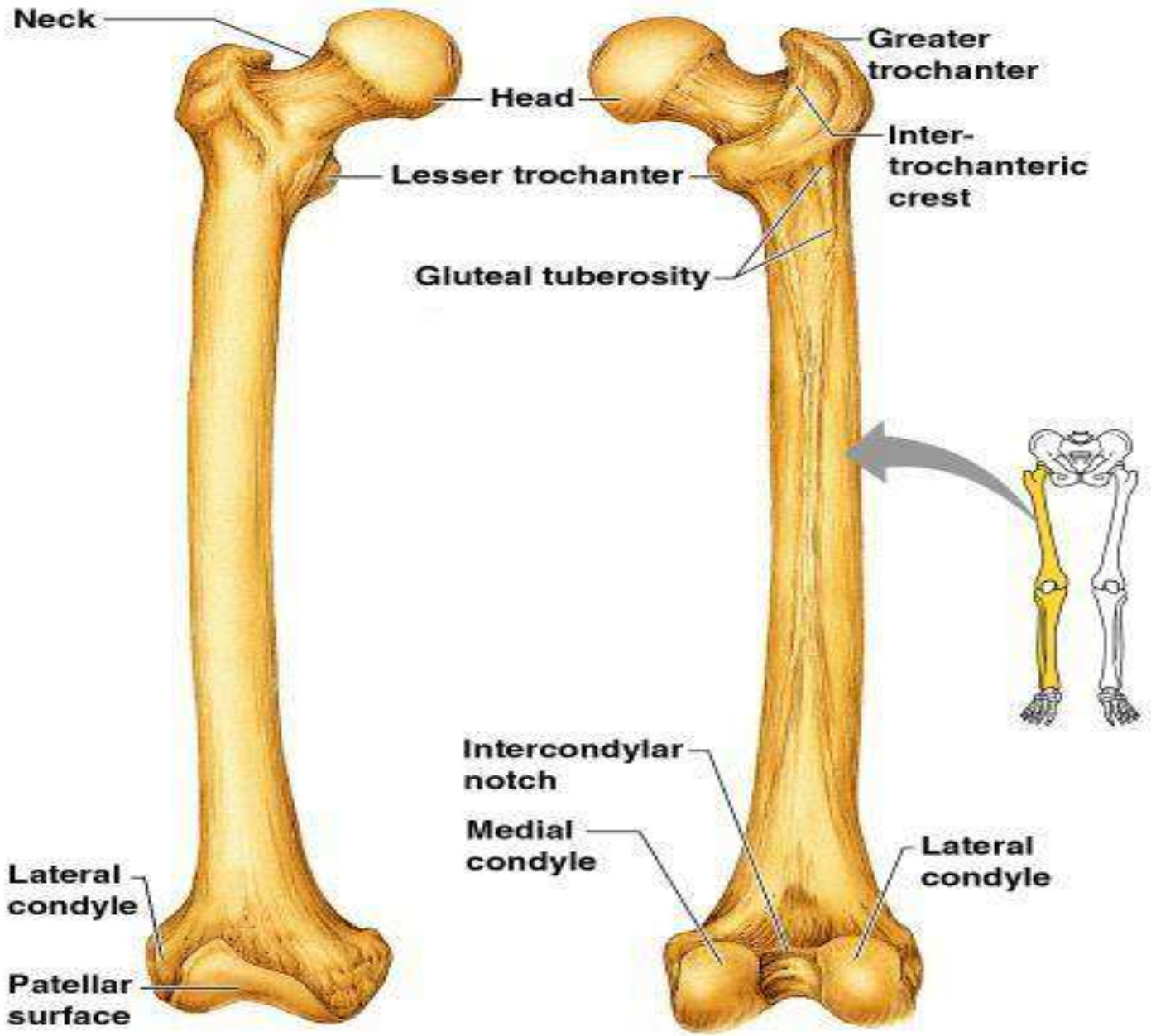

Skull
Cranium
Facial bones
Clavicle
Scapula
Sternum
Rib
Humerus
Vertebra
Radius
Ulna
Carpals
Phalanges
Metacarpals
Femur
Patella
Tibia
Fibula
Tarsals
Metatarsals
Phalanges
Bony thorax (ribs and sternum)
Vertebral column
Bones of pectoral girdle
Upper limb
Bones of pelvic girdle
Lower limb
(a) Anterior view
(b) Posterior view

Humerus, Radius and Ulna

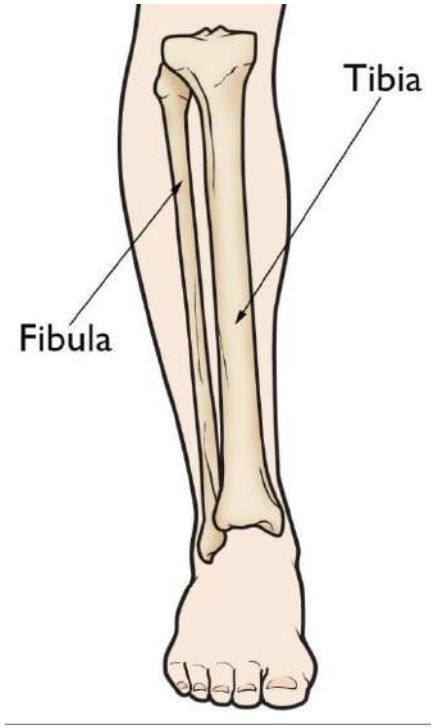


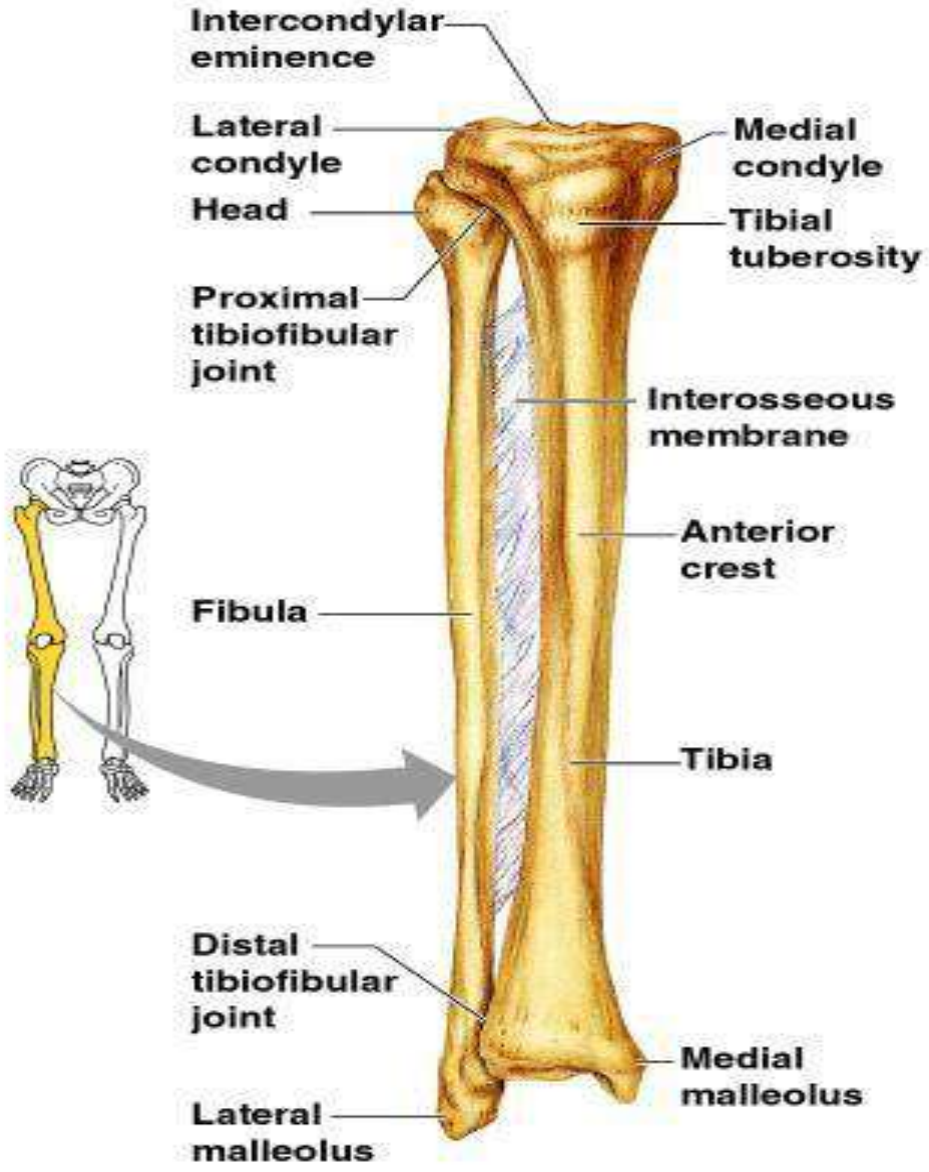


Femur


Neck
Head
Lesser trochanter
Greater trochanter
Inter-trochanteric crest
Gluteal tuberosity
Intercondylar notch
Medial condyle
Lateral condyle
Lateral condyle
Patellar surface

Tibia, Fibula, Patella





Patella:

Triangular shaped sesamoid bone known as the kneecap



Arches of the foot

- Sling that supports the weight of the body
- Provides leverage whilst walking
- Shock absorber
- Distributes body weight across feet

