Osteology

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FIGURE 1.15 *The Anatomy Lesson of Dr. Tulp*, a famous Rembrandt painting completed in 1632, depicts one of the public anatomies that were popular during this period. Dr. Nicholas Tulp was a famous Dutch anatomist who described the congenital defect in the spinal column known as spinal bifida aperta.

Objectives

Bones

How normal bones grow , structural, mechanical , physiological , homeostatic functions of the bone , fractures mechanisms of repair and healing following fracture

The Skeleton – General Points

- Adult skeleton made up of 206 bones

8 (cranial),
6 (auditory ossicles),
14 (facial) ,
34 (vertebral column),
26 (hyoid, sternum & ribs),
64 (upper limb)
62 (lower limb)}

Bone Structure

- Bones – vary in shape and size
- Each bone links with others to form a sturdy, flexible framework
- Structure of the skeleton designed to
  - give shape to the individual
  - support the soft tissues of the body
  - protection for vital organs

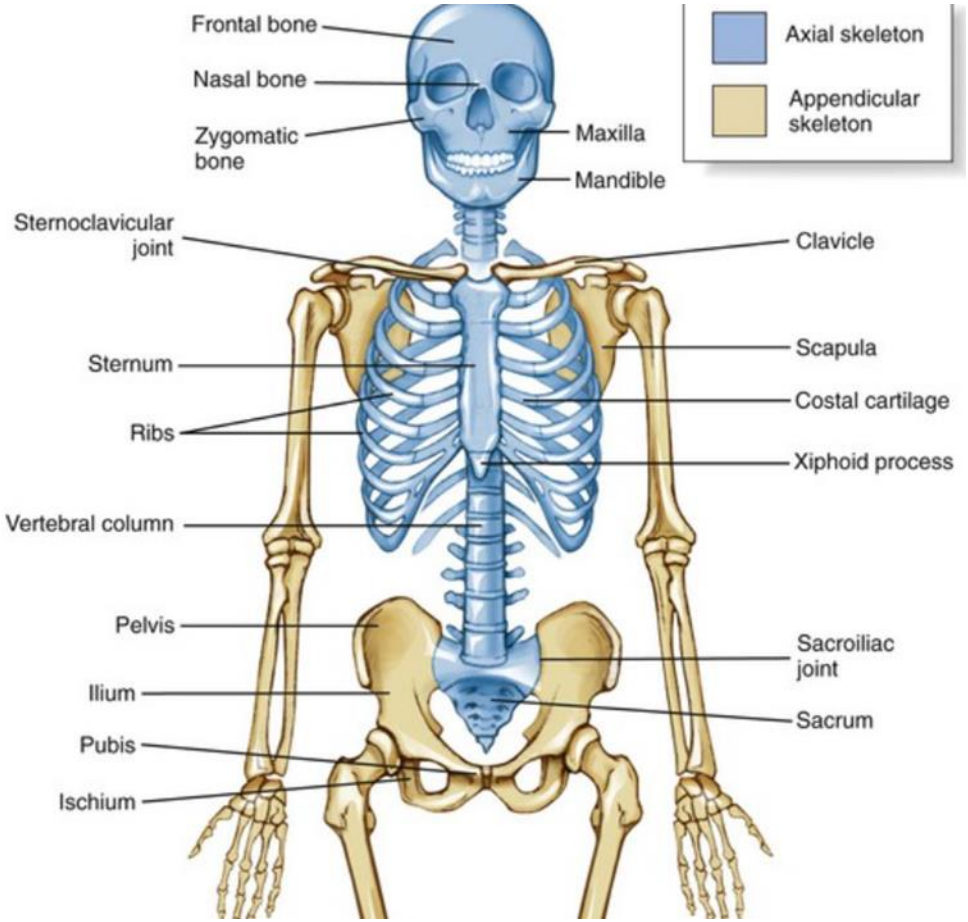
The Skeleton - Divisions

Two main division

- Axial skeleton (mainly protective role for some of the body's vulnerable and vital parts

- Appendicular skeleton (main role is to provide the body with mobility)

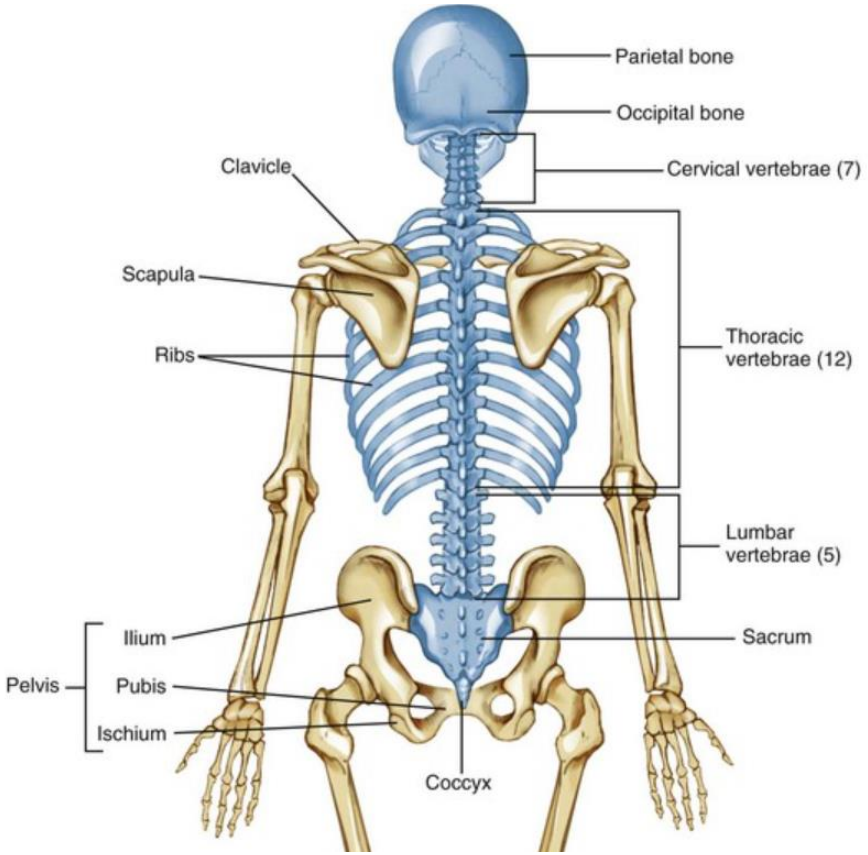
The Axial Skeleton



Bones of the central part of the body

- Skull – encases brain
- Vertebral column – encases the spinal cord
- Ribs – cage around the heart & lungs

The Appendicular Skeleton



- Bones include those of the upper and lower limbs
- Include the scapulae and pelvis –> linking structures between limbs and the axial skeleton

Functions of Bone

A. Mechanical

- Support – rigid framework
- Protection – enclose vital structures & viscera
- Body movement – anchoring attachments to the muscles

B. Physiological

- Haemopoiesis – in red marrow
- Mineral storage – in bone matrix (ca++,ph- .....)

Types of Bones – General Shape

- Long bones

length greater than width, tubular shaft (**diaphysis) and** usually an (**epiphysis)** at each end

(clavicle, humerus, femur, metacarpals, metatarsals & phalanges)

form a system of levers which sustain the weight of the trunk & enable locomotion

- Short bones

roughly cuboidal in shape & mainly spongy with a thin compact crust

1. hand (scaphoid, lunate)
2. feet (talus, calcaneum)

for strength & compactness & slight/limited movement

Types of Bones – General Shape

- **Flat bones**

Composed of two thin layers of compact bone enclosing a layer of spongy bone (diploe)

- Skull (e.g. frontal, parietal bone)
- Scapula

either protection &/or provision of broad surface for muscle attachment

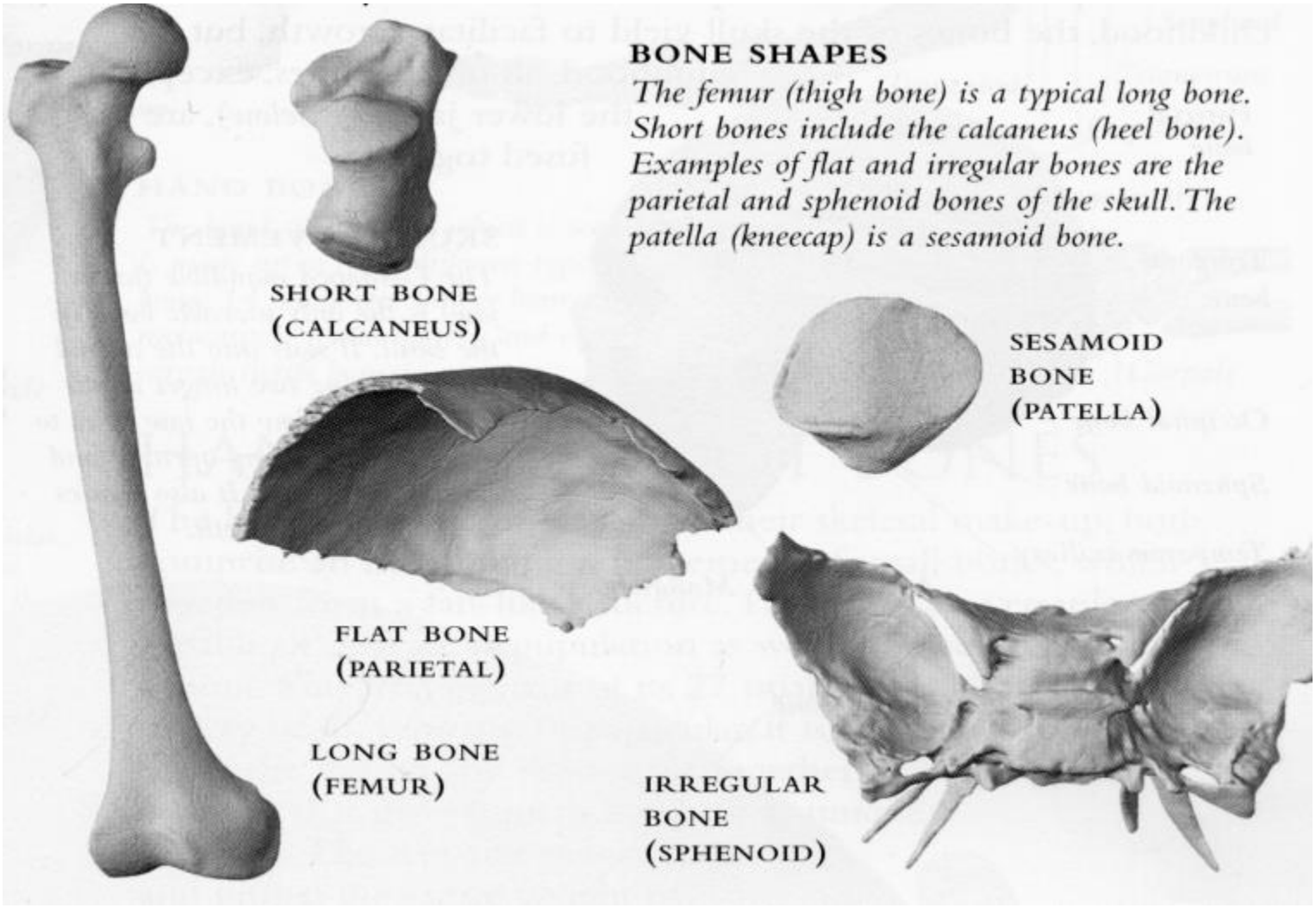
- **Irregular bones**

Bones of the facial skeleton, vertebrae and pelvic bones

- **Sesamoid bones**

Found in tendons where they rub over bony surfaces

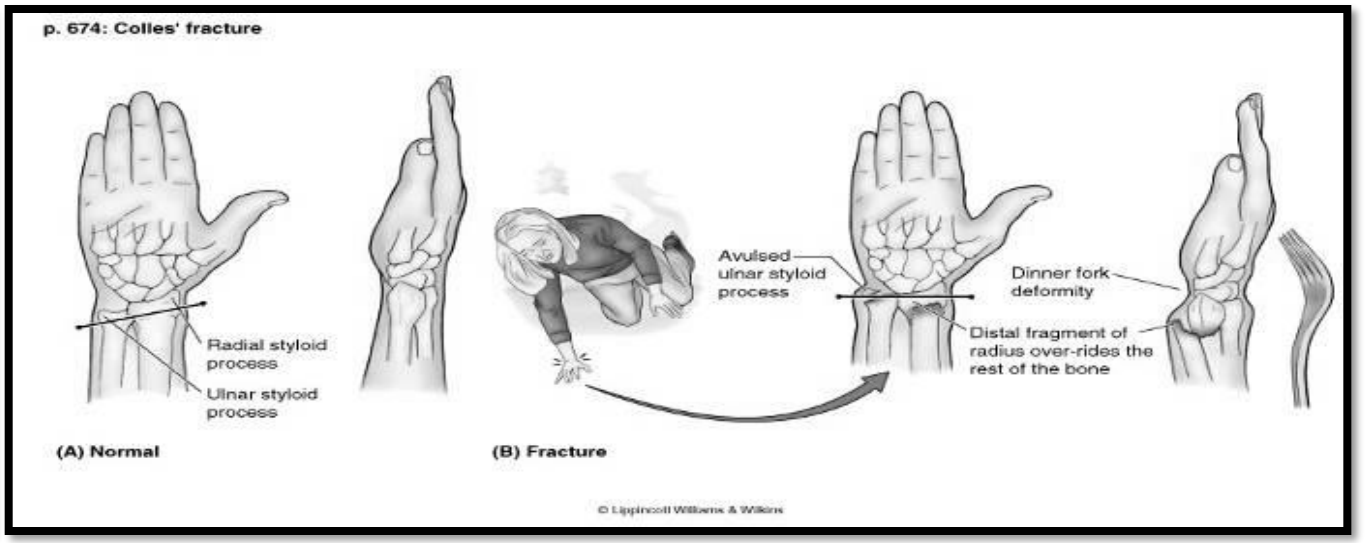
Types of Bone – General shape

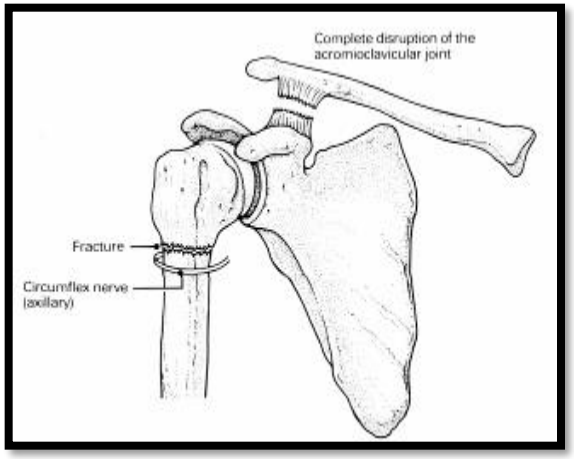


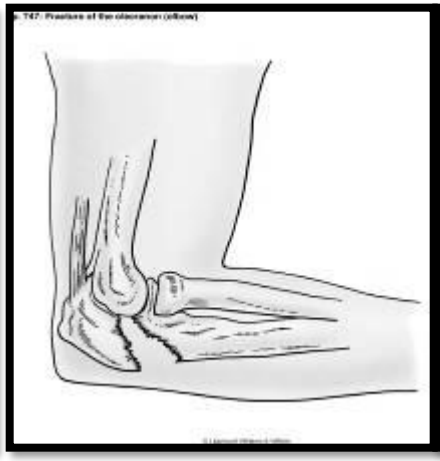
Injuries to Bone – Common Fractures (Upper Limb)

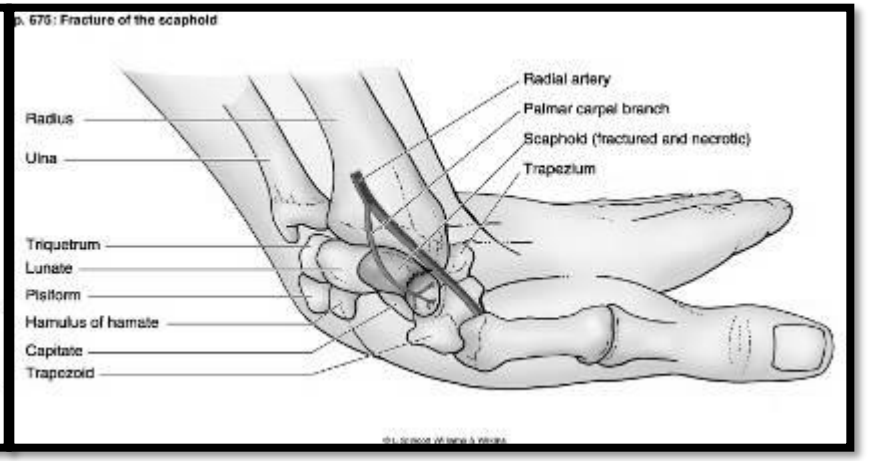
- Clavicular fracture
- Fracture of the surgical neck of humerus
- Fracture of the shaft of the humerus
- Supracondylar fracture of the humerus
- Fracture of the olecranon process
- Fracture of the distal end of the radius (Colles' fracture)
- Fracture of the scaphoid bone

Injuries to Bone – Common Fractures (Upper Limb)









Injuries to Bone – Common Fractures (Lower Limb)

- Fracture of the femoral neck (intracapsular)
- Intertrochanteric / pertrochanteric fracture (extracapsular)
- Fracture of the femoral shaft
- Tibial shaft fracture
- Fracture of the fibular neck & shaft
- Fracture of the lower end of the tibia and fibula

Injuries to Bone – Common Fractures (Lower Limb)