

# **Surgical Anatomy**

**Anatomia  
Chirurgica**

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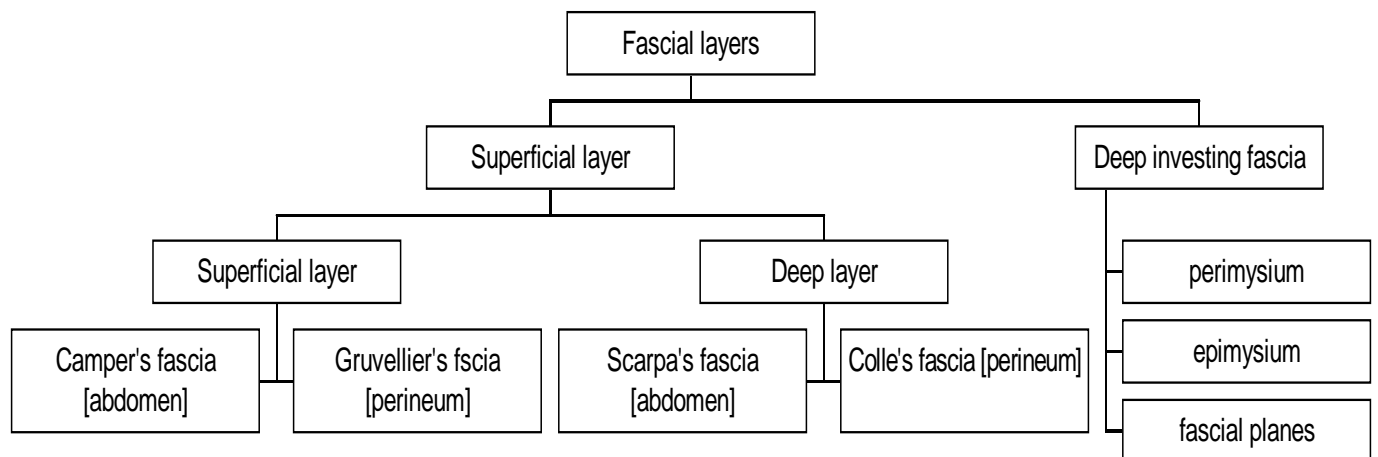
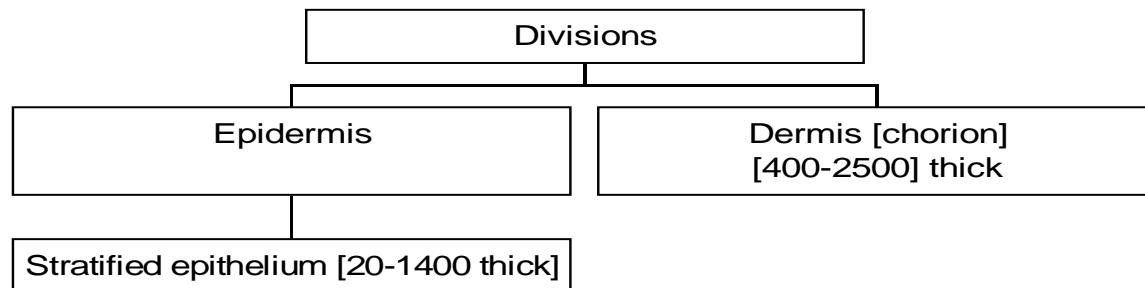


# **SYSTEMS OF ORGANISATION**

# INTEGUMENT [SKIN AND SUBCUTANEOUS TISSUES]

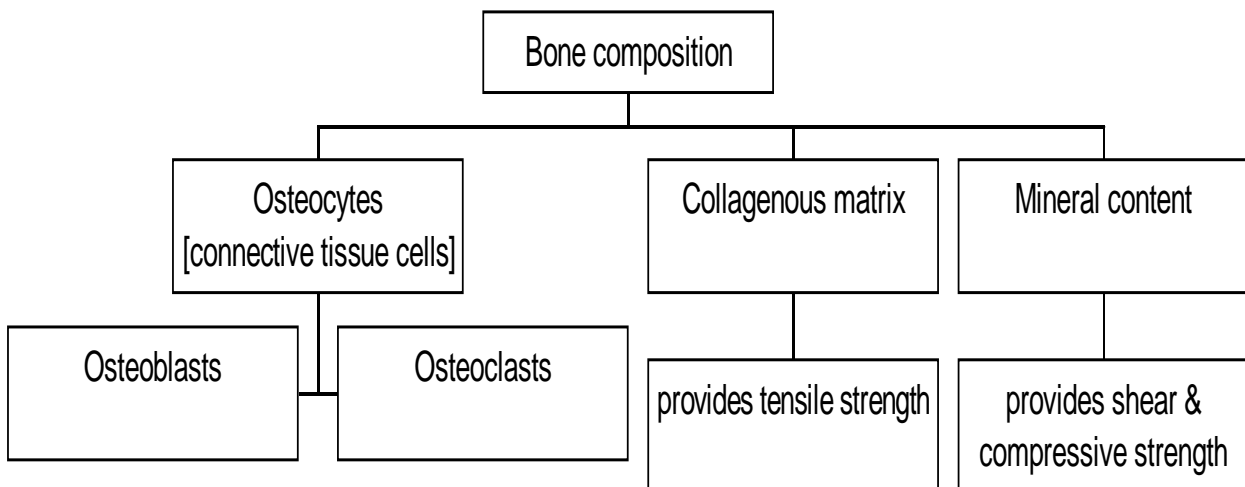
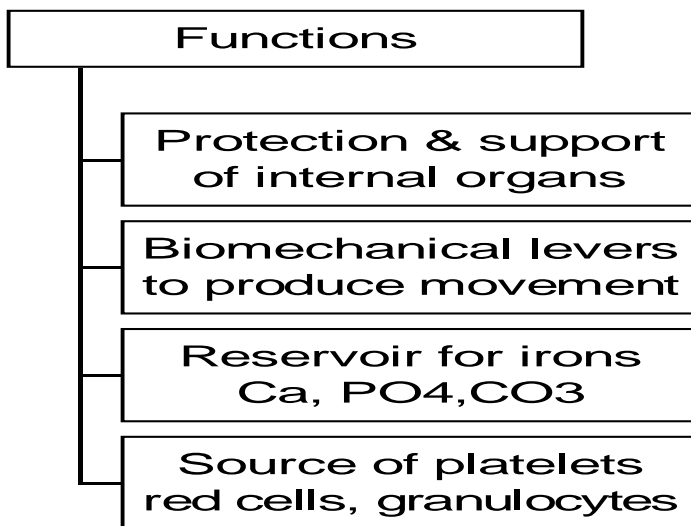
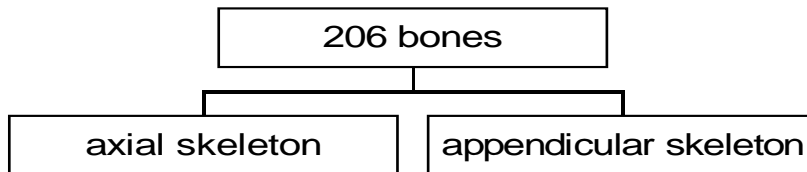
Surface area=  $\geq 2\text{m}^2$

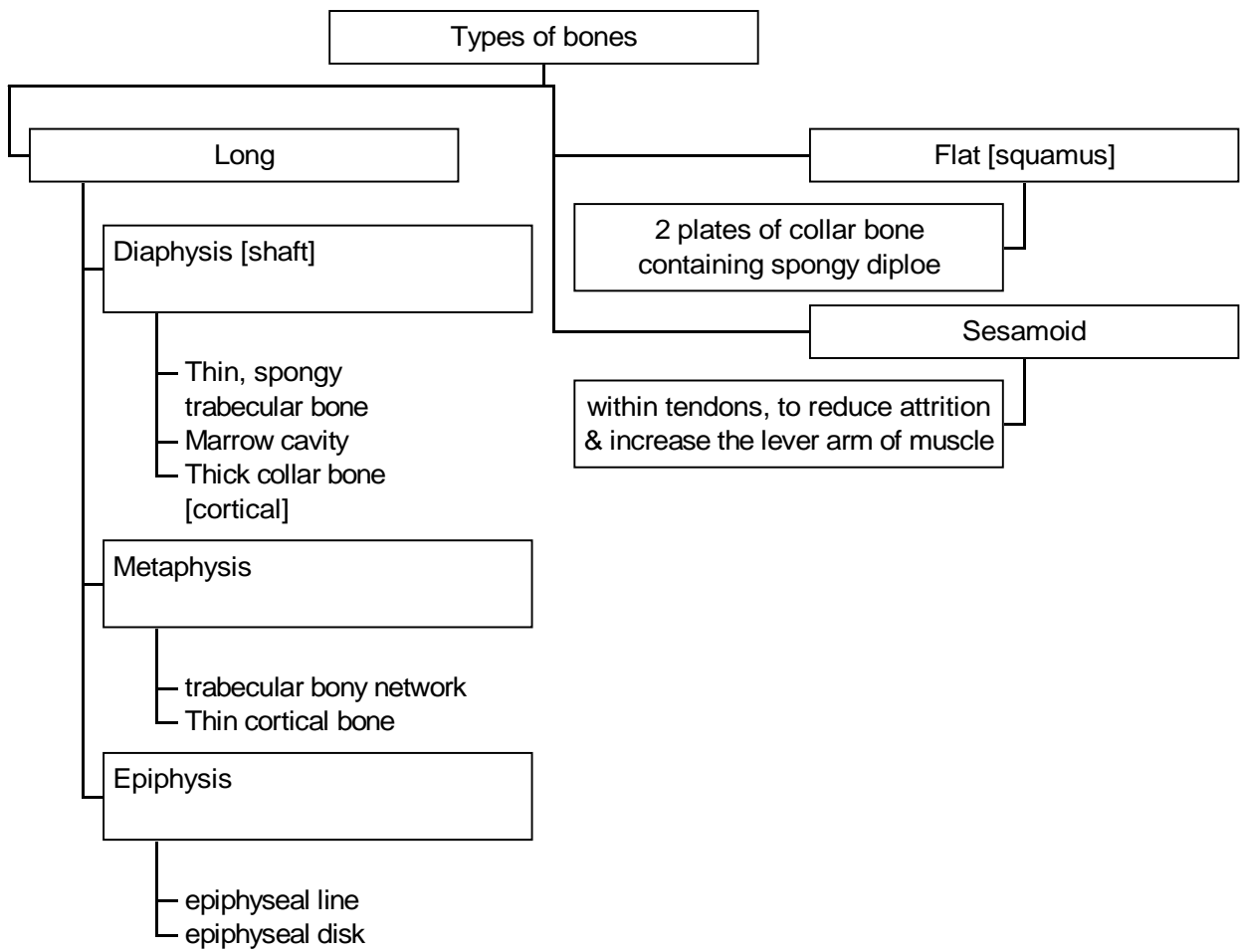
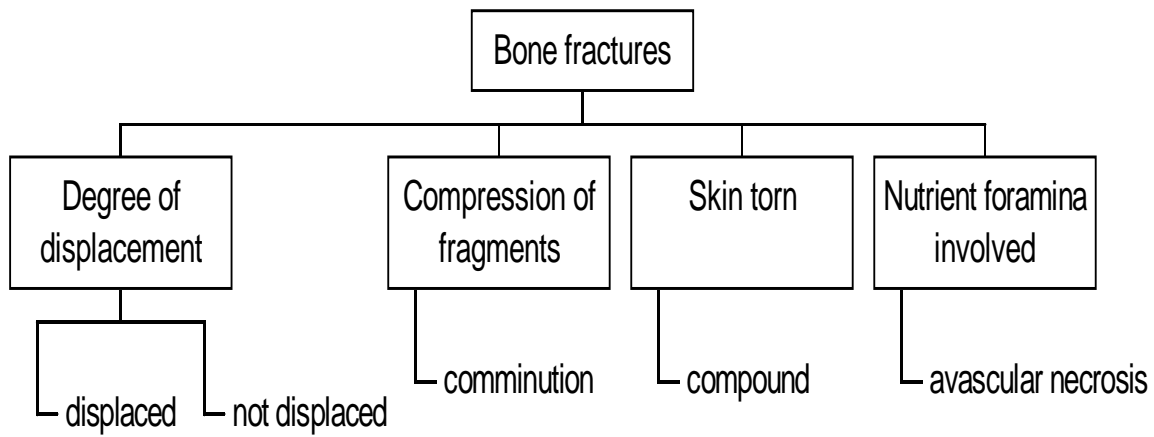
Cleavage [crease] lines of Langer

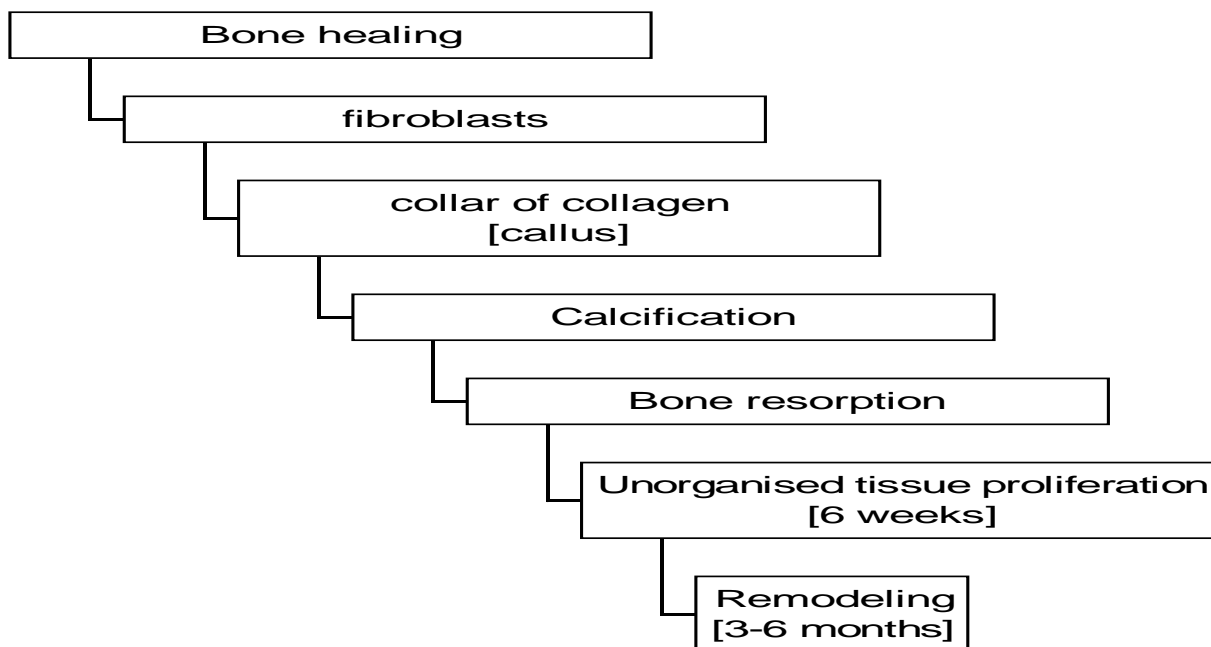


# MUSCULOSKELETAL SYSTEM

## BONES







## CARTILAGE

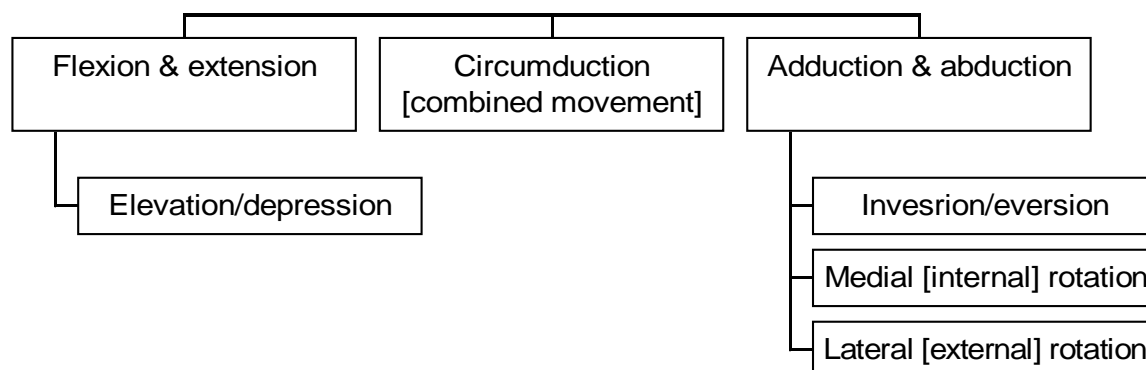
Dense, irregular connective tissue, almost avascular, with a few living cells.

1. **Hyaline** [hyaluronic acid, mucopolysaccharides]: **anterior portions of ribs** and the **articular cartilage**.
2. **Fibrocartilage** [mucopolysaccharides, collagen, high content of water]: most **symphyses**.
3. Elastic [mucopolysaccharides & elastic fibres]: ear, tip of nose

## ARTICULATIONS

1. **Synarthroses**: Not or only barely movable joints
  - a. suture type
  - b. syndesmosis
  - c. gomphosis
2. **Amphiarthrosis**: limited motion [pubis, intervertebral joints]
3. **Diarthroses** [synovial joints]
  - a. synovial capsule
  - b. synovial fluid [hyaluronic acid]
  - c. articular cartilage [hyaline]
  - d. articular surfaces [facets]
  - e. synovial membrane
  - f. ligaments [articular capsule]

## MOVEMENTS



## MUSCLES

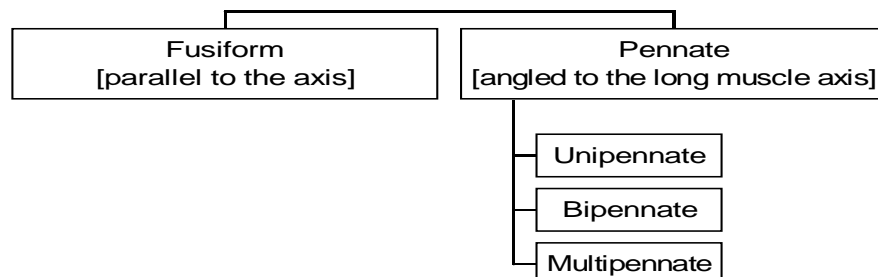
48% of body is **lean muscle mass**.

The skeletal muscle has its points of **origin** and **insertion** to bones via a **tendon** or **aponeurosis**.

**Lever arm of muscle:** A line perpendicular to the line of action that crosses the joint. [it gives a mechanical advantage]. The muscle is stronger when its lever arm is least.

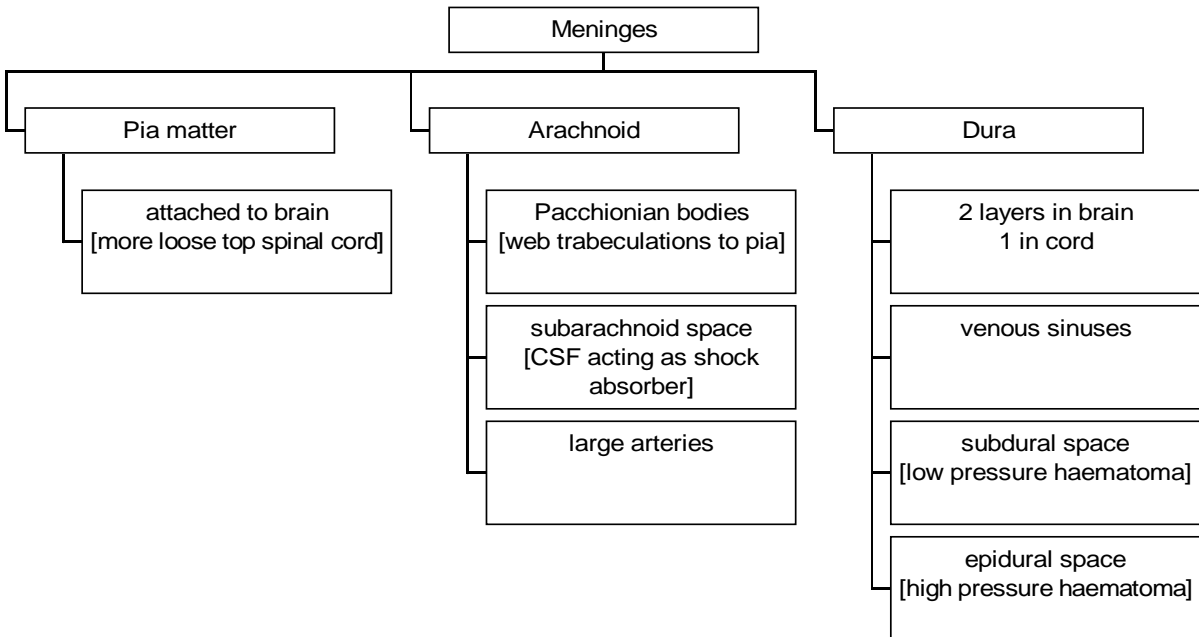
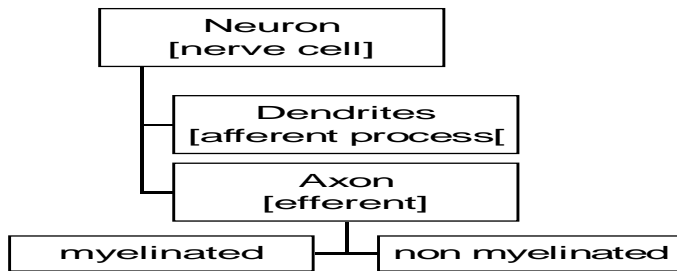
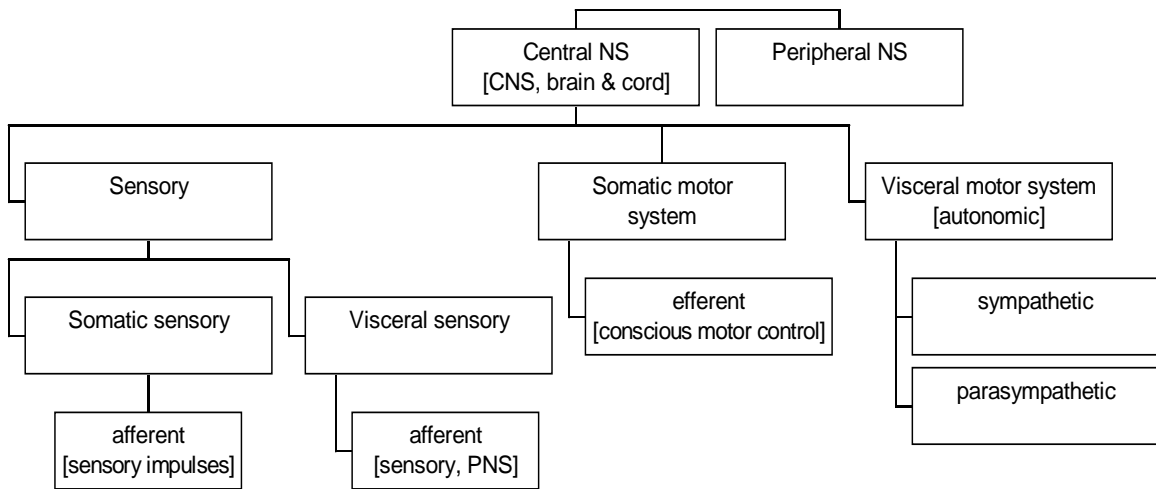
**Strength of muscle:** a. lever arm [mechanical advantage]  
b. cross sectional area [exerts 4kgr/cm<sup>2</sup>]

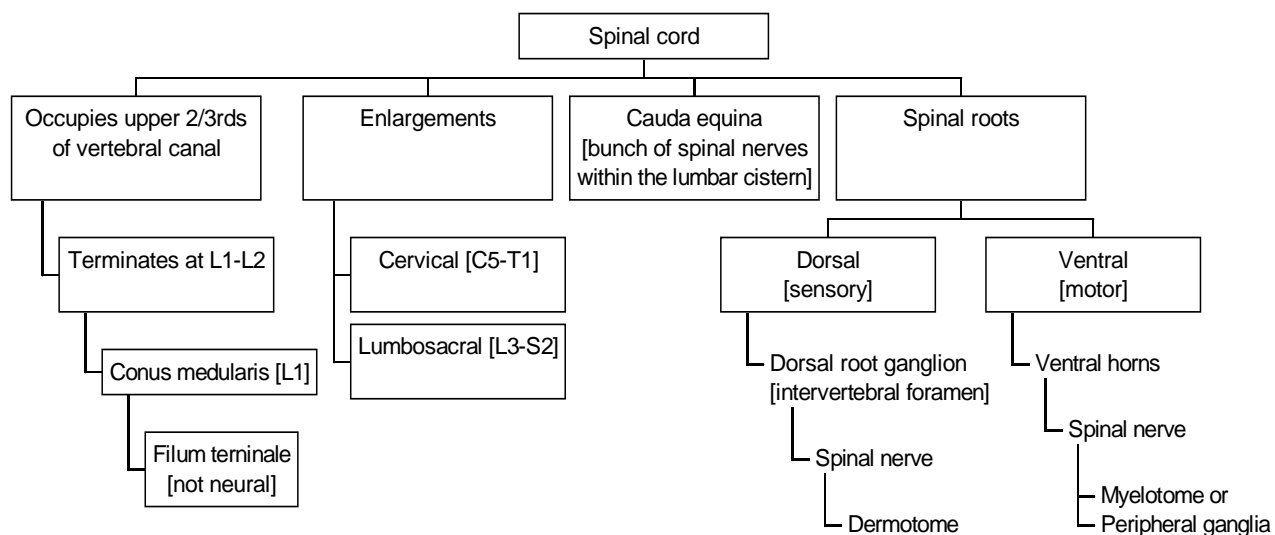
**Arrangement of fascicles:**





# THE NERVOUS SYSTEM



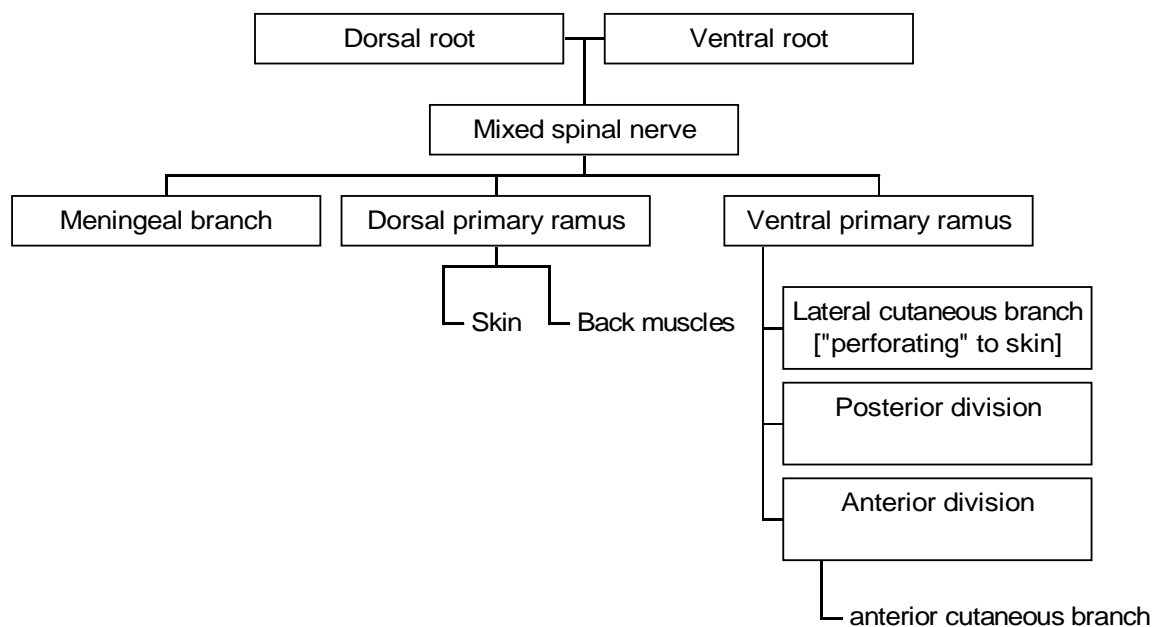


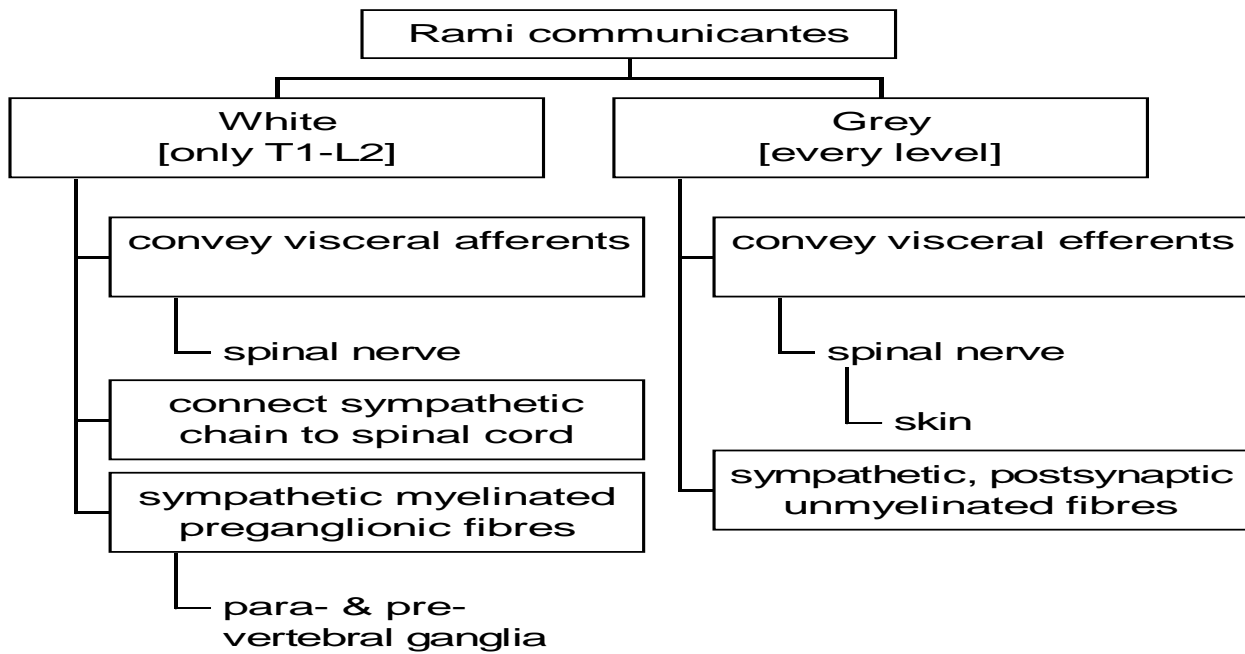
## SPINAL NERVES

**31 pairs:**

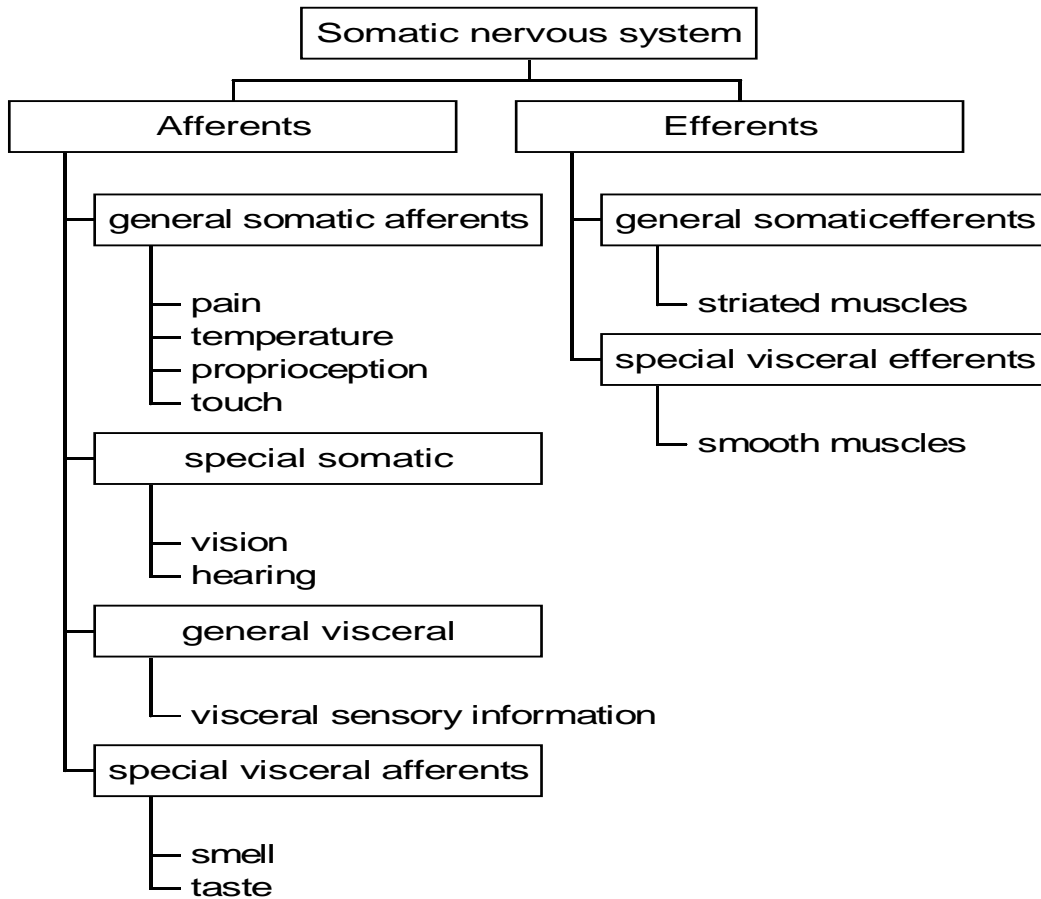
- C<sub>1-8</sub> cervical
- T<sub>1-12</sub> thoracic
- L<sub>1-5</sub> lumbar
- S<sub>1-5</sub> sacral
- Co<sub>0-1</sub> coccygeal

C<sub>1</sub> and Co<sub>1</sub> are only motor, arising from ventral root only





## SOMATIC NERVOUS SYSTEM



## UPPER & LOWER MOTOR NEURONS

Cells located in the **grey matter** & nuclei of the brain stem.

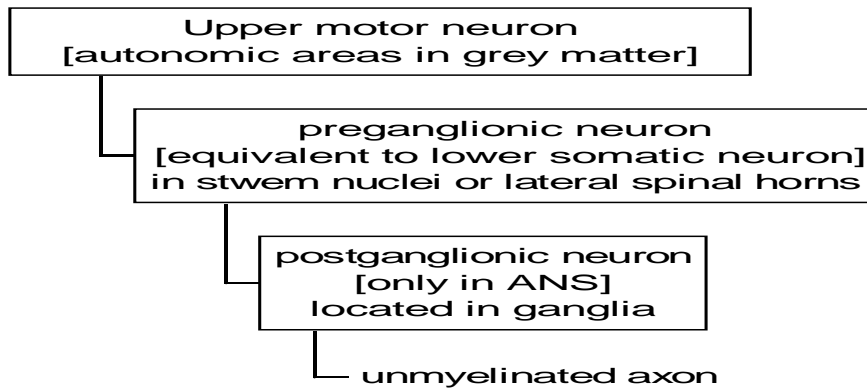
Their axons enter the cerebrum, the brain stem and then the white matter of the spinal cord, reaching the cells in the grey matter of the spinal cord which [and their axons] represent the **lower motor neurons**.

**Reflex area:**

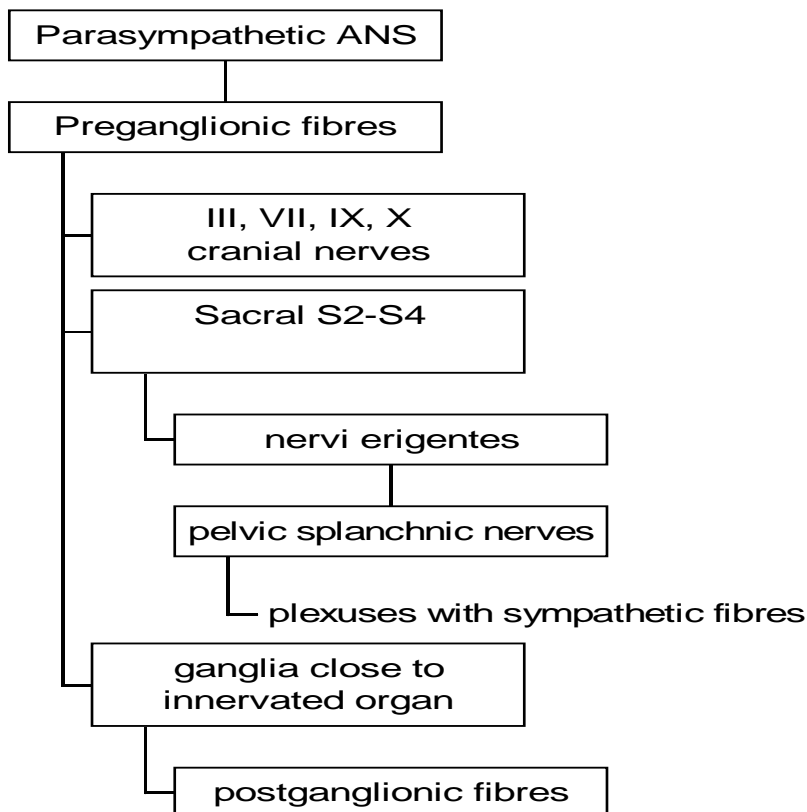
1. **Simple:** one sensory and one motor neuron
2. **Complex:** more interneural connections are involved

## AUTONOMIC NERVOUS SYSTEM

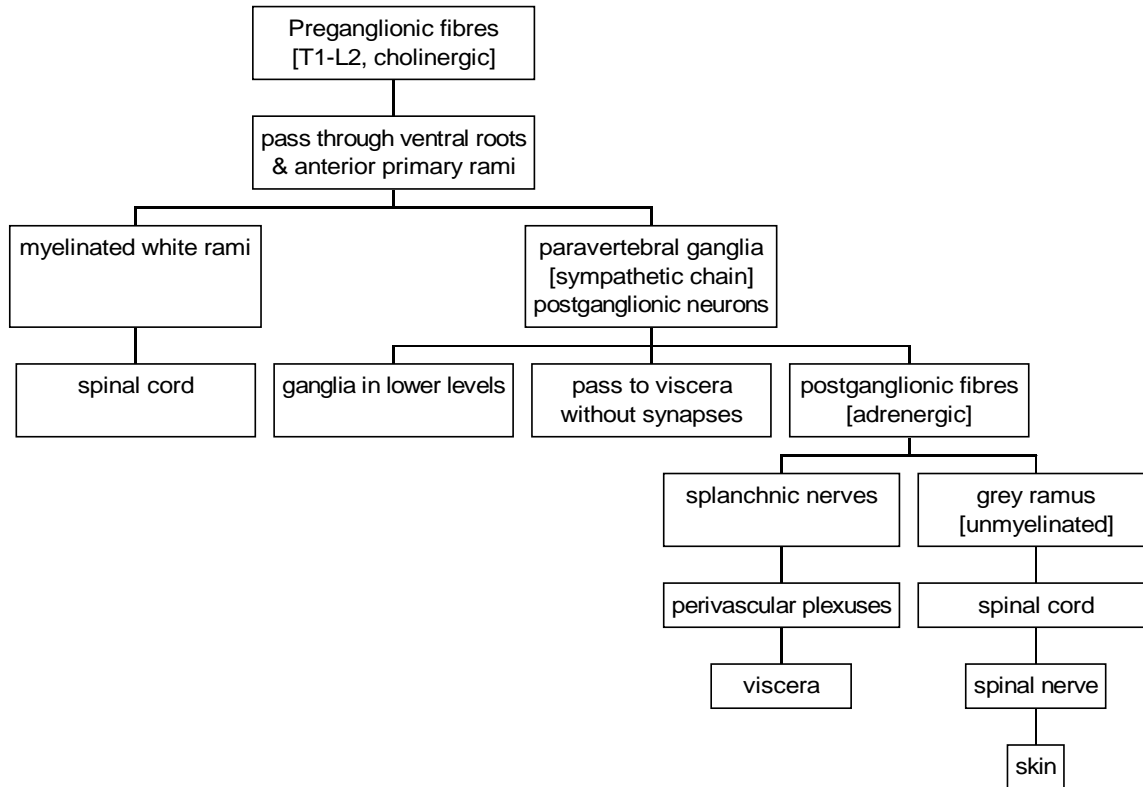
[general visceral efferent, visceral or vegetative system]



**Parasympathetic division** [craniosacral, cholinergic]

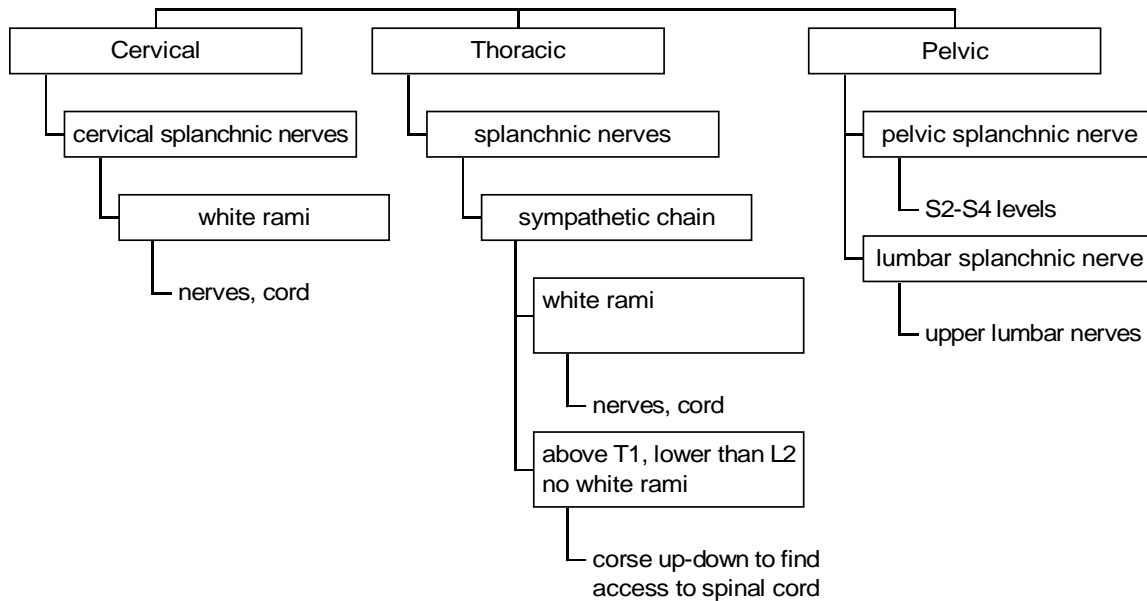


## Sympathetic division [thoracolumbar, adrenergic]

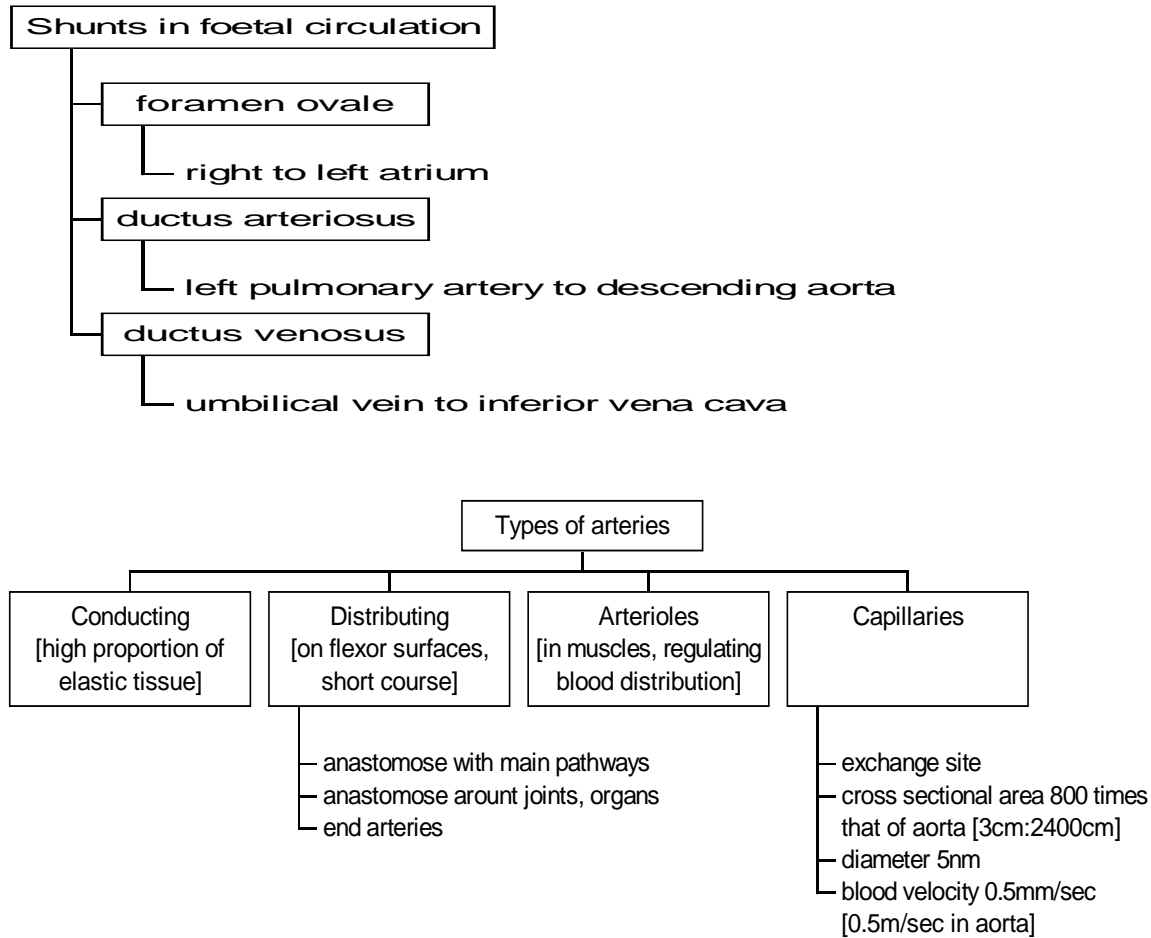


## Visceral afferents

Are not part of ANS but are the anatomic bases for referred pain.



# CIRCULATORY SYSTEM



## DIFFERENCES BETWEEN VEINS & ARTERIES

1. Veins have lower pressure, although the same amount of blood is conveyed
2. Veins are large with irregular lumen and thin wall, relatively compressible
3. The muscle fibres are arranged in a loop format around the origin of a tributary
4. They contain valves [not in cava veins and brain veins]
5. Large veins are single while medium sized are usually double [venae committantes]
6. The angulation of tributaries does not depend on haemodynamics
7. The elastic and muscular content of venous wall is less than in the arterial

## VENOUS HAEMODYNAMICS

- a. **Pressure gradient** between the periphery and the right side of the heart
- b. **End arterial pressure** [10mmHg] through the capillaries
- c. **Sucking action** of the heart during diastole
- d. **Negative intrathoracic** pressure during inspiration
- e. Muscle contraction [**muscle pump**] milks blood proximally

## LYMPHATICS

