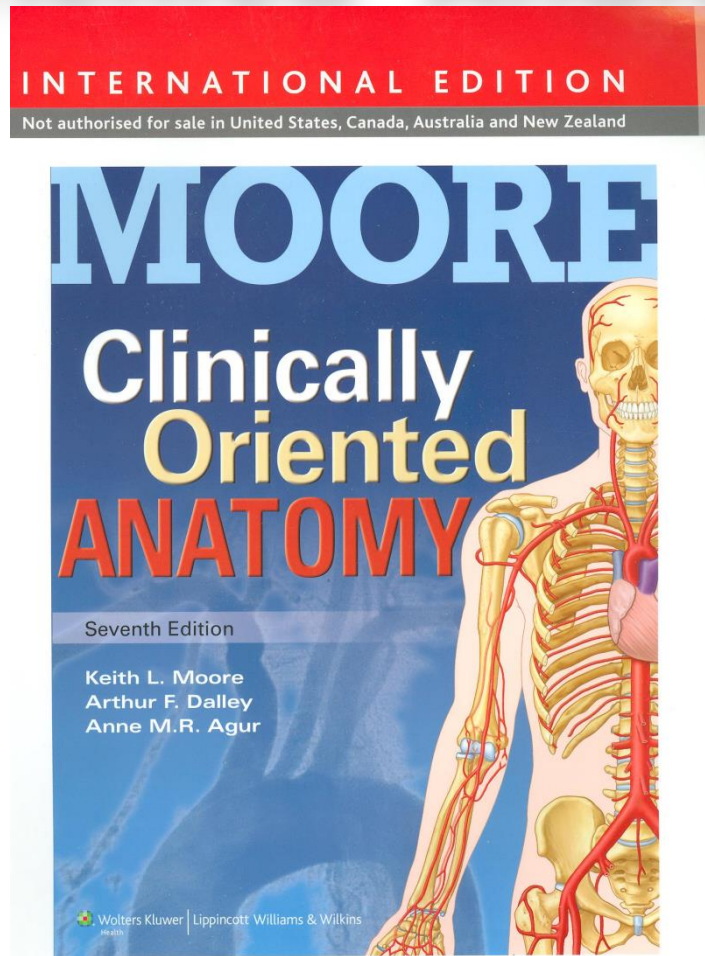


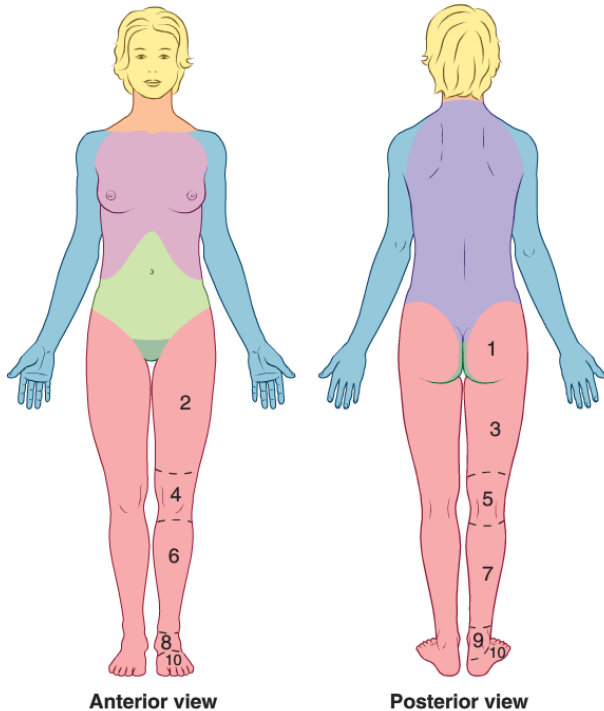
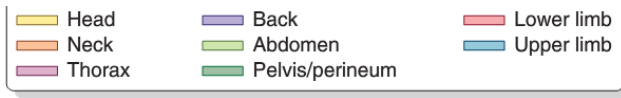
# Introduction to the Clinically Oriented Anatomy



**Dr. Mohammad Saeed Vohra**

# APPROACHES TO STUDYING ANATOMY

## Regional Anatomy



## Systemic Anatomy

study of the body's organ systems that work together to carry out complex functions.

Integumentary system (dermatology)

The skeletal system (osteology)

Articular system (arthrology)

Muscular system (myology)

Nervous system (neurology)

Circulatory system (angiology)

Cardiovascular system

Lymphatic system

Alimentary or digestive system

Respiratory system

Urinary system

Genital (reproductive) system

Endocrine system

## Clinical Anatomy

It incorporates the regional and systemic approaches to studying anatomy and stresses clinical application.

Clinical anatomy often involves inverting or reversing the thought process. For example, instead of thinking, "The . . . nerve provides innervation to this area of skin," clinical anatomy asks, "Numbness in this area indicates a lesion of which nerve?"

Surface Anatomy Radiographic Anatomy Endoscopic Anatomy Sectional Anatomy

# The Bottom Line

## STUDYING ANATOMY

Anatomy is the study of the structure of the human body.

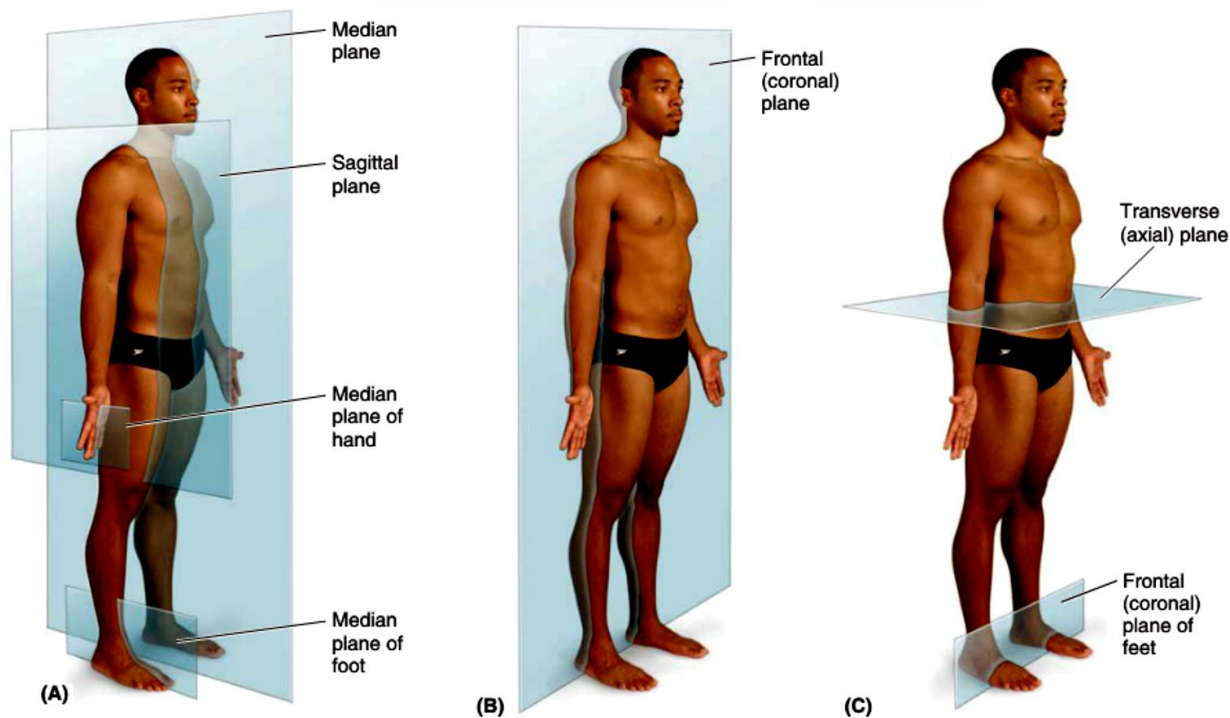
- ◆ Regional anatomy considers the body as organized into segments or parts.
- ◆ Systemic anatomy sees the body as organized into organ systems.
- ◆ Surface anatomy provides information about structures that may be observed or palpated beneath the skin.
- ◆ Radiographic, sectional, and endoscopic anatomy allows appreciation of structures in living people, as they are affected by muscle tone, body fluids, pressures, and gravity.
- ◆ Clinical anatomy emphasizes application of anatomical knowledge to the practice of medicine

# ANATOMICOMEDICAL TERMINOLOGY

Express yourself clearly, using the proper terms in the correct way specially during your presentations in PBLs

For example use axillary fossa instead of armpit and clavicle instead of collarbone or beauty bone  
Enables precise communication among healthcare professionals

## Anatomical Planes



# Terms of Relationship and Comparison

Superior	Inferior	Cranial	Caudal
Anterior	Posterior	Medial	Lateral

## Terms of Laterality

### Bilateral

Both sides



### Unilateral

one side only  
unilateral  
exophthalmos



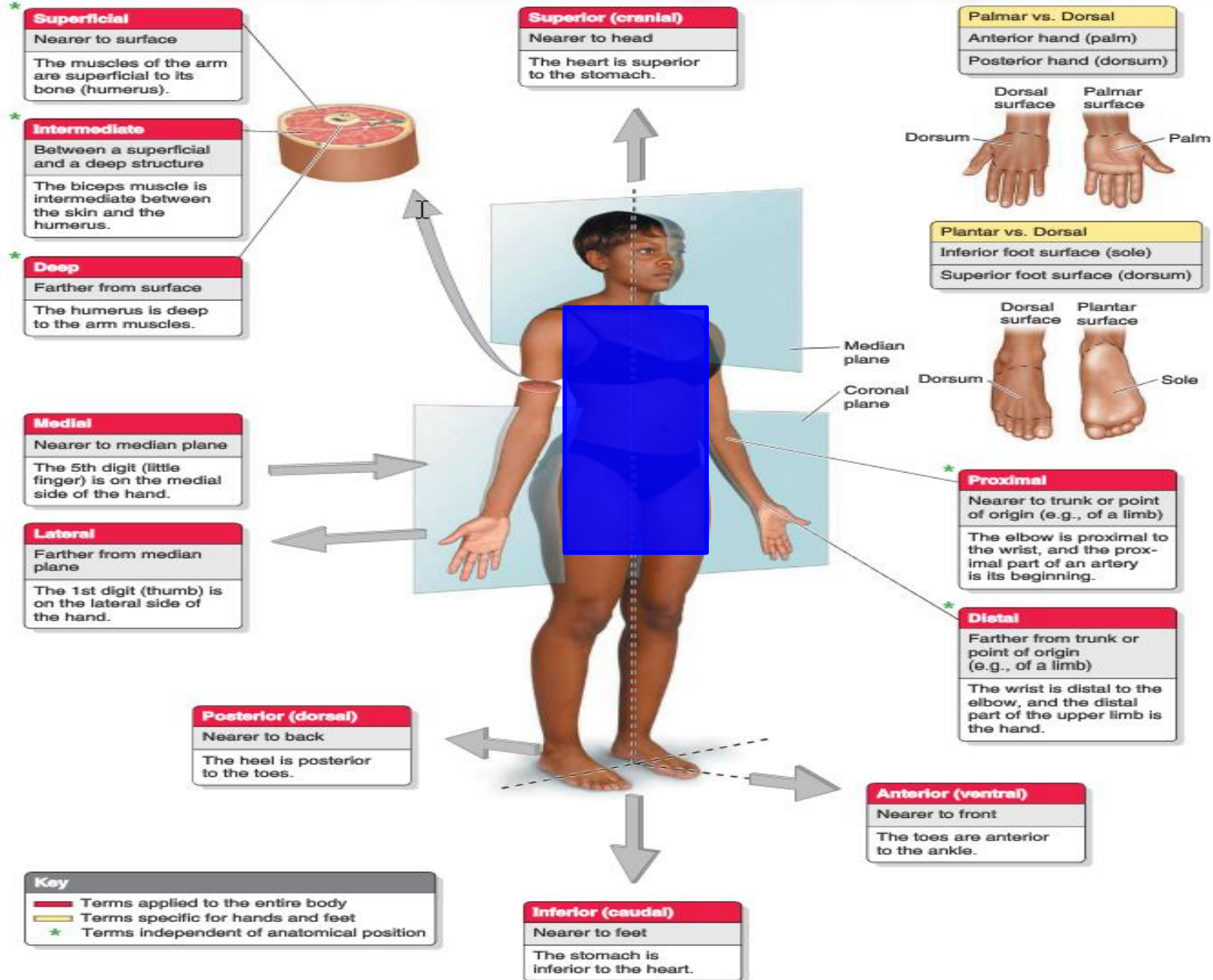
### Ipsilateral

two parts that  
are on the same  
For example left  
arm and left leg  
are ipsilateral to  
one another

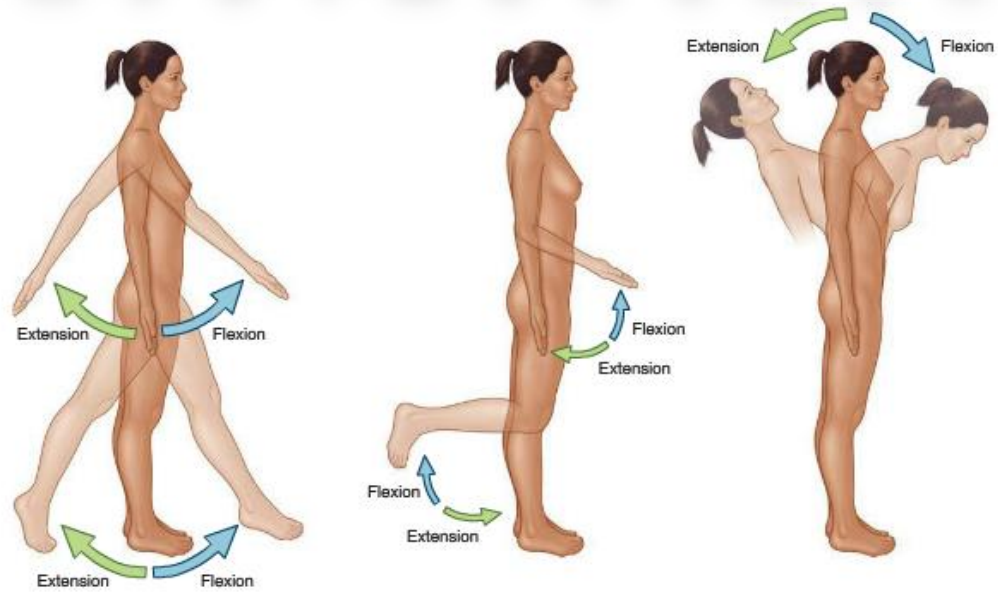
### Contralateral

opposite side  
For example  
left arm and  
right leg are  
contralateral  
to one another

# Terms of Relationship and Comparison



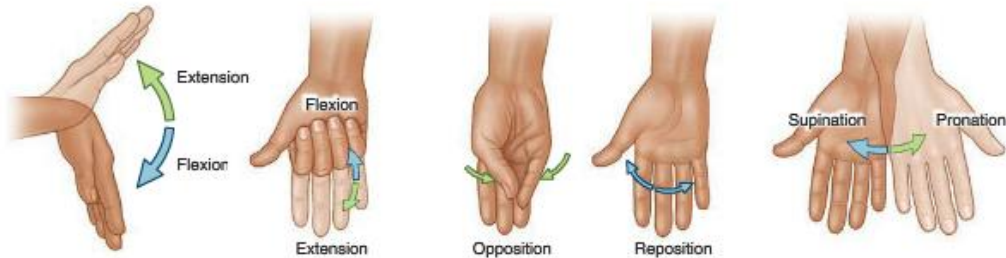
# T e r m s o f M o v e m e n t



(A) Flexion and extension of upper limb at shoulder joint and lower limb at hip joint

Flexion and extension of forearm at elbow joint and of leg at knee joint

Flexion and extension of vertebral column at intervertebral joints

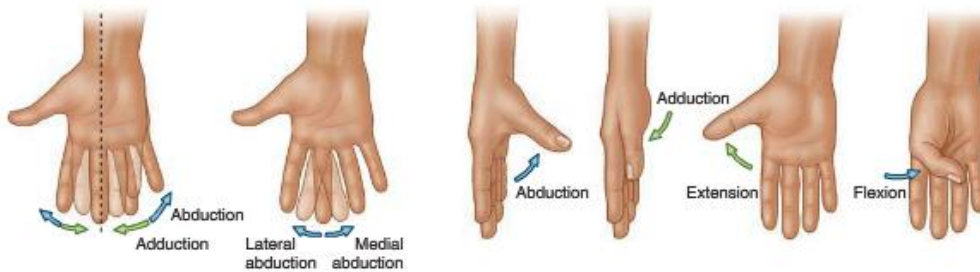


(B) Flexion and extension of hand at wrist joint

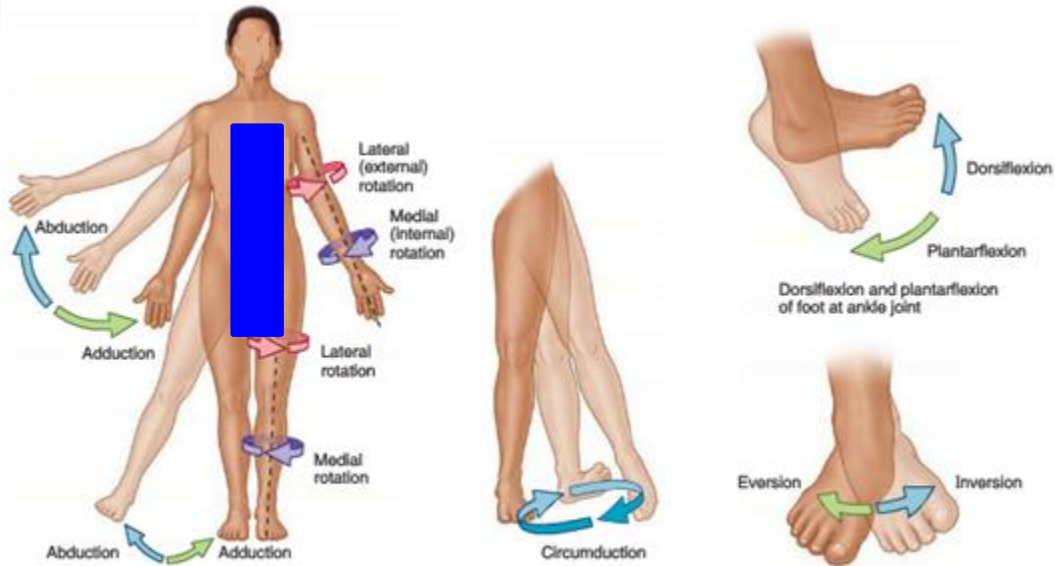
Flexion and extension of digits (fingers) at metacarpophalangeal and interphalangeal joints

(C) Opposition and reposition of thumb and little finger at carpometacarpal joint of thumb combined with flexion at metacarpophalangeal joints

(D) Pronation and supination of forearm at radio-ulnar joints



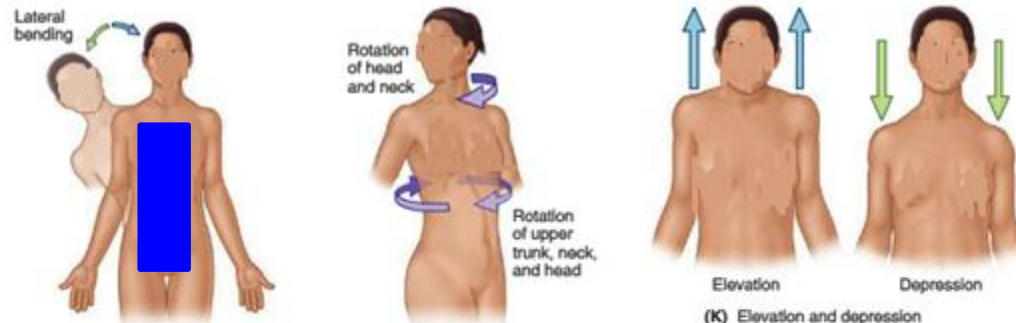
# T e r m s o f M o v e m e n t



(G) Abduction and adduction of right limbs and rotation of left limbs at glenohumeral and hip joints, respectively

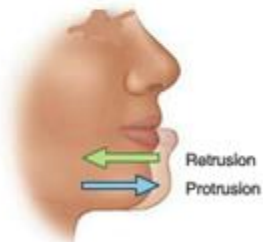
(H) Circumduction (circular movement) of lower limb at hip joint

(I) Inversion and eversion of foot at subtalar and transverse tarsal joints



(J) Lateral bending (lateral flexion) of trunk and rotation of upper trunk, neck, and head

(K) Elevation and depression of shoulders



(L) Protrusion and retrusion of jaw at temporomandibular joints

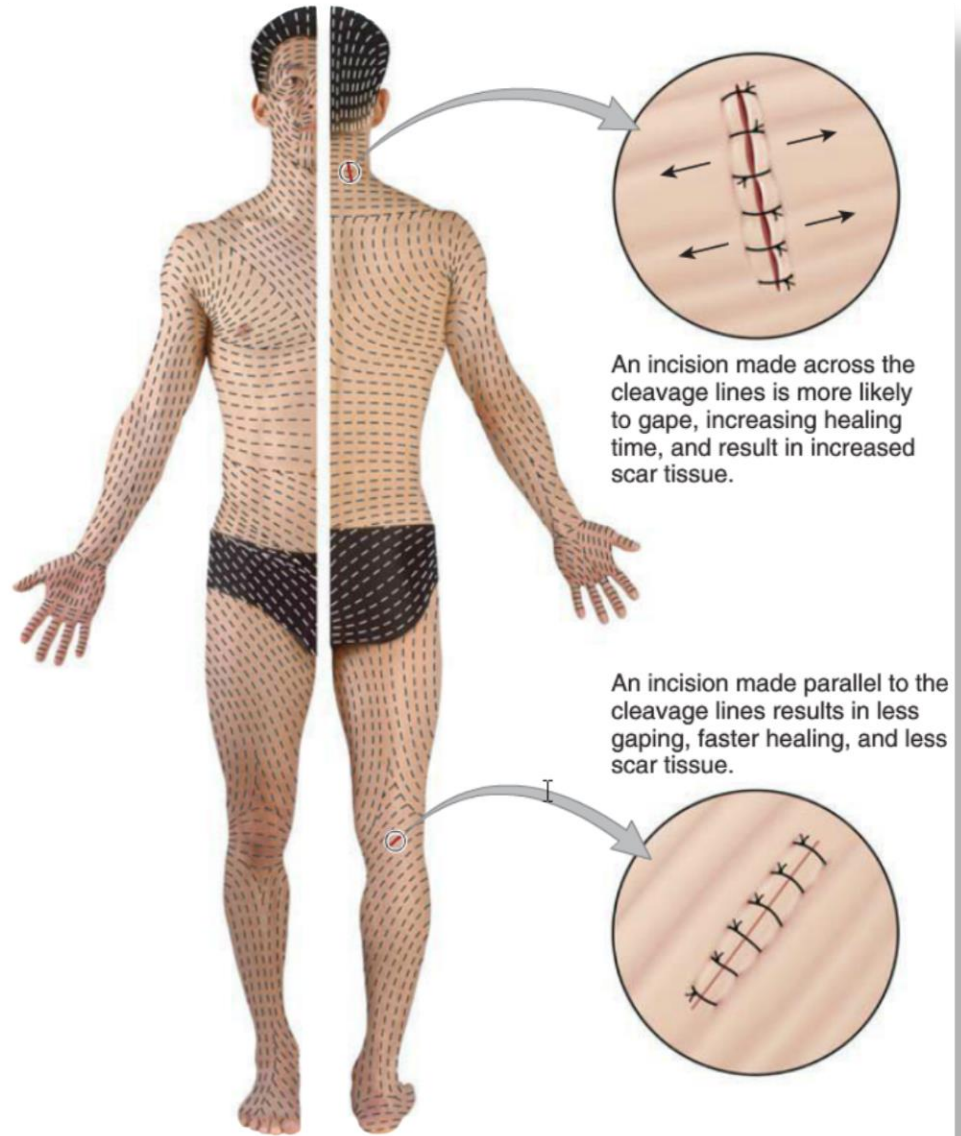


(M) Protraction and retraction of scapula on thoracic wall

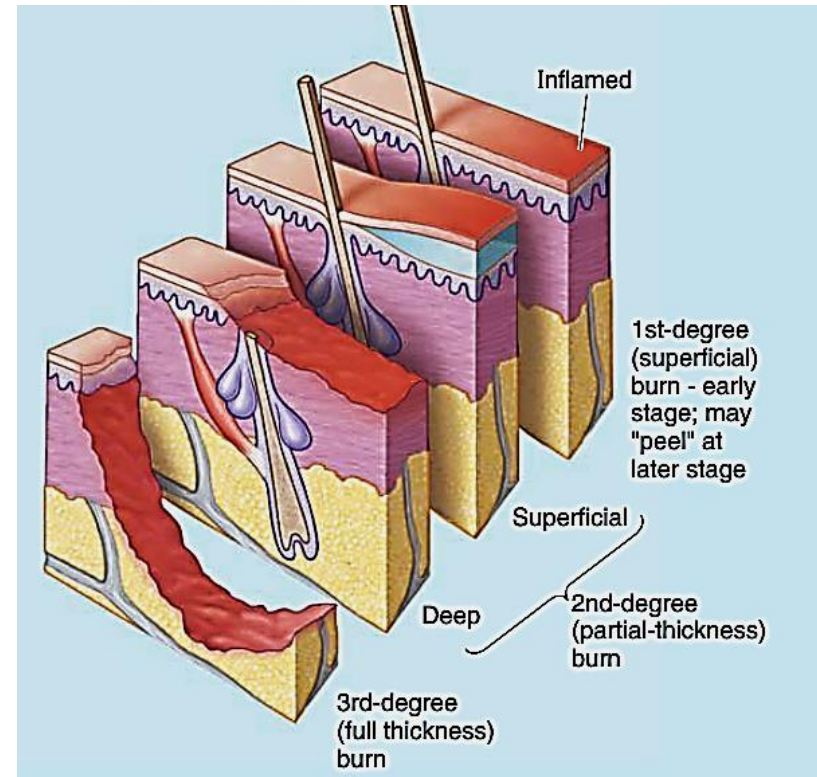
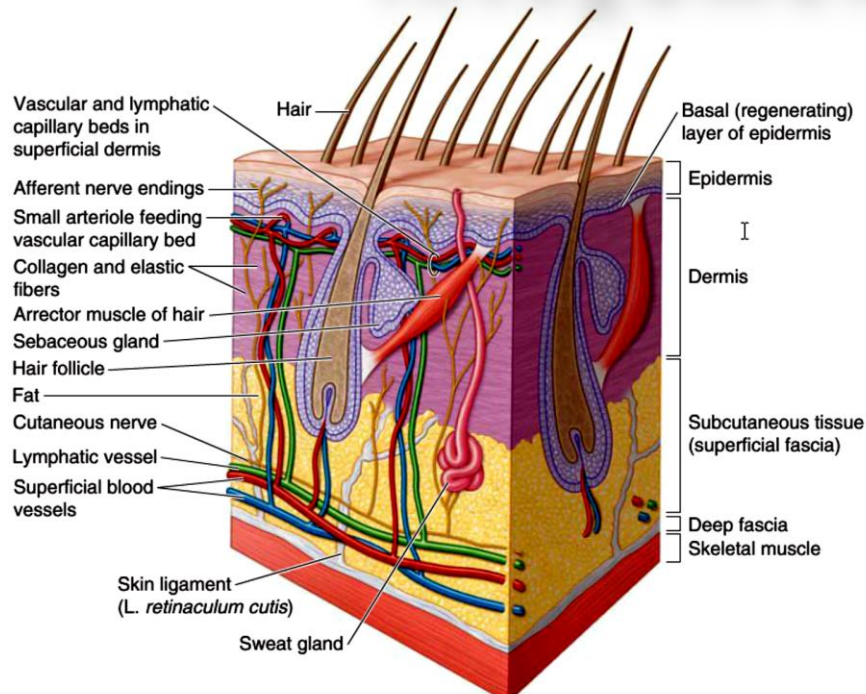


# The tension lines

The tension lines (also called cleavage lines or Langer lines) tend to spiral longitudinally in the limbs and run transversely in the neck and trunk. Tension lines at the elbows, knees, ankles, and wrists are parallel to the transverse creases that appear when the limbs are flexed. The elastic fibers of the dermis deteriorate with age and are not replaced; consequently, in older people, the skin wrinkles and drops as it loses its elasticity.



# Integumentary System

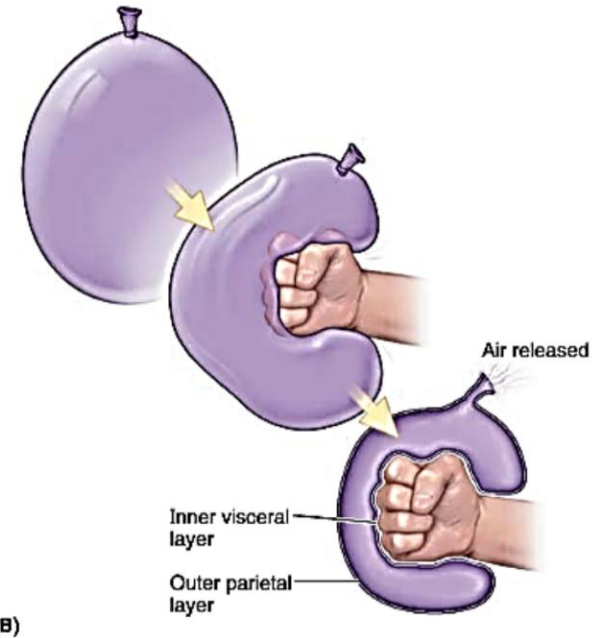
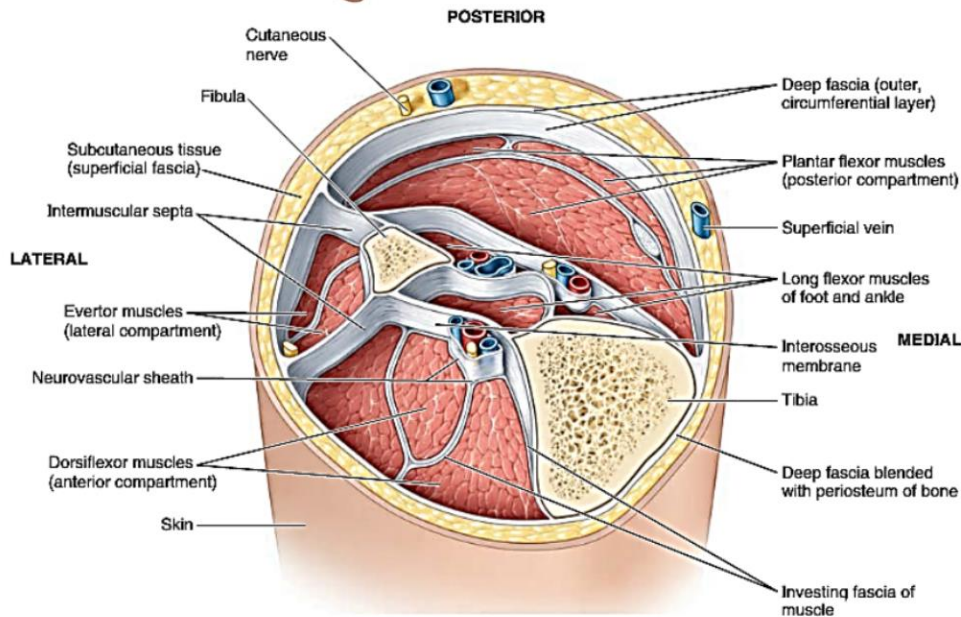
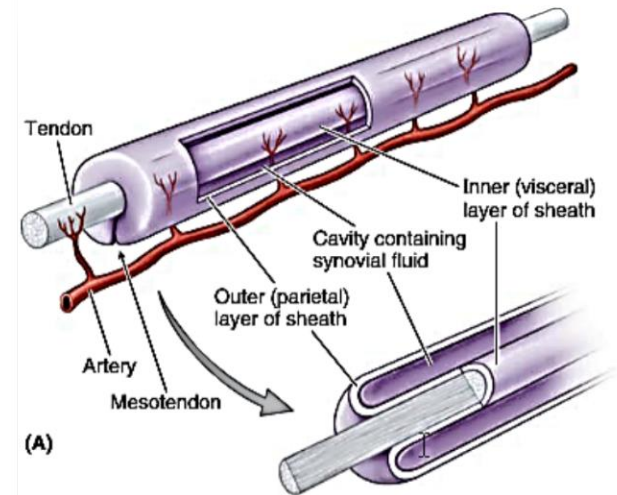
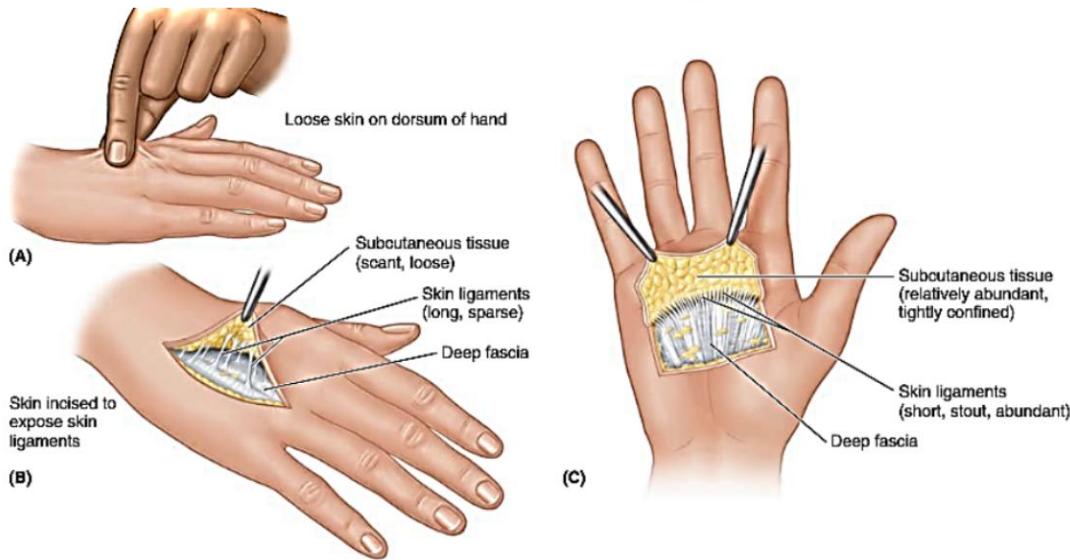


1st-degree burn (e.g., sunburn): damage is limited to the epidermis

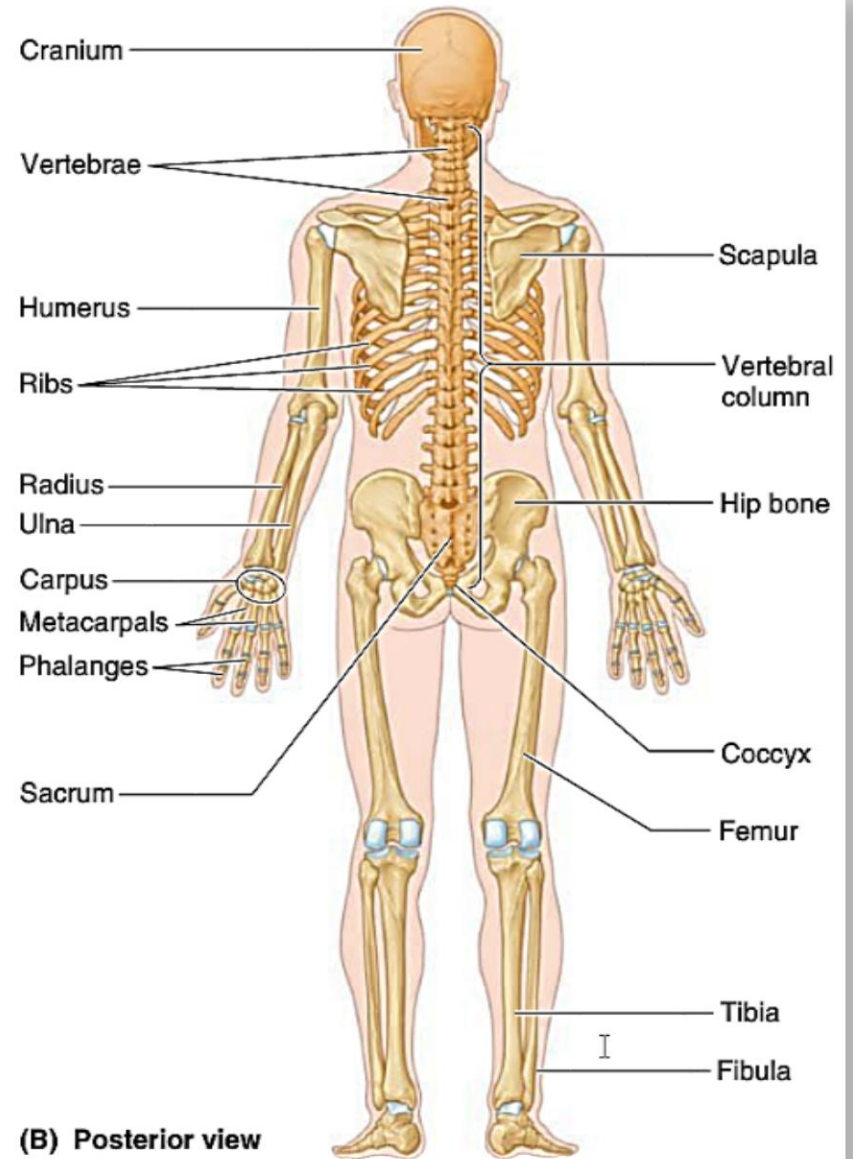
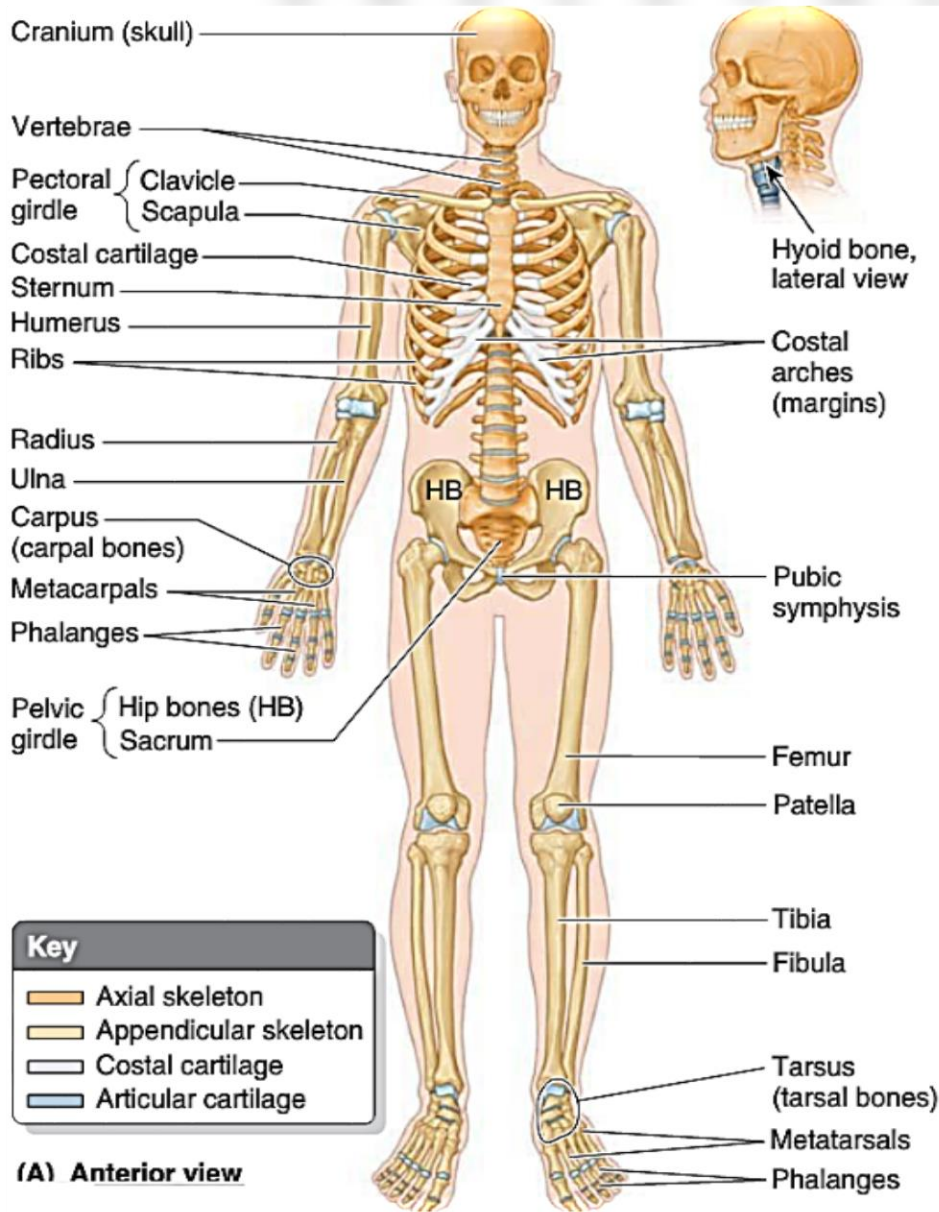
2nd-degree burn: epidermis & superficial dermis are damaged, nerve endings are damaged, making this variety the most painful

3rd-degree burn: the entire skin is damaged and perhaps underlying muscle. Burned area is numb since sensory endings are destroyed.

# Fascias, Fascial Compartments, Bursae, & Potential Spaces

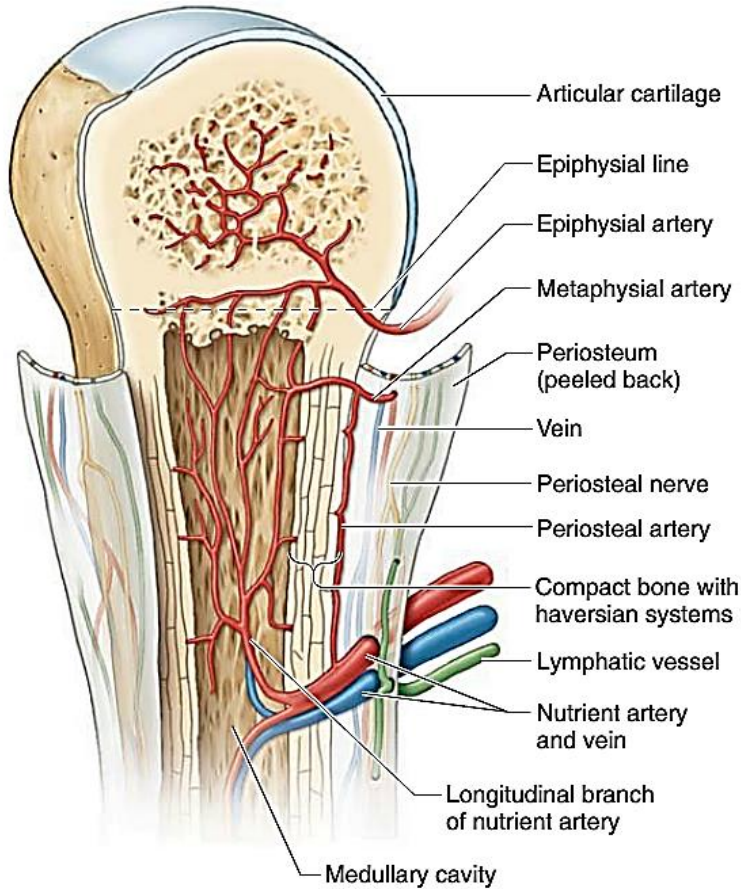


# S K E L E T A L S Y S T E M



# S K E L E T A L S Y S T E M

## ASCULATURE AND INNERVATION OF BONES

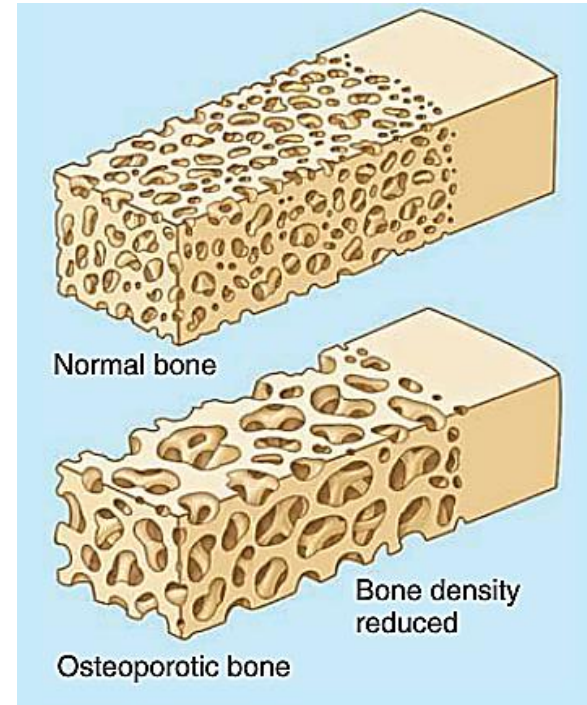


nutrient  
arteries

divides in the  
medullary cavity

branches from the  
periosteal arteries

a bone from which  
the periosteum has  
been removed dies



# S K E L E T A L S Y S T E M

## The Bottom Line

### CARTILAGE AND BONES

The skeletal system can be divided into:

The axial (bones of the head, neck, and trunk)

The appendicular skeletons (bones of the limbs).

The skeleton is composed:

- ◆ Cartilage, a semirigid CT
- ◆ Bone, a hard form of CT that provides support, protection, movement, storage (of certain electrolytes), and synthesis of blood cells;
- ◆ Periosteum, which surrounds bones,
- ◆ Perichondrium, which surrounds cartilage, provide nourishment

#### **Types**

Spongy & Compact,

#### **Classification**

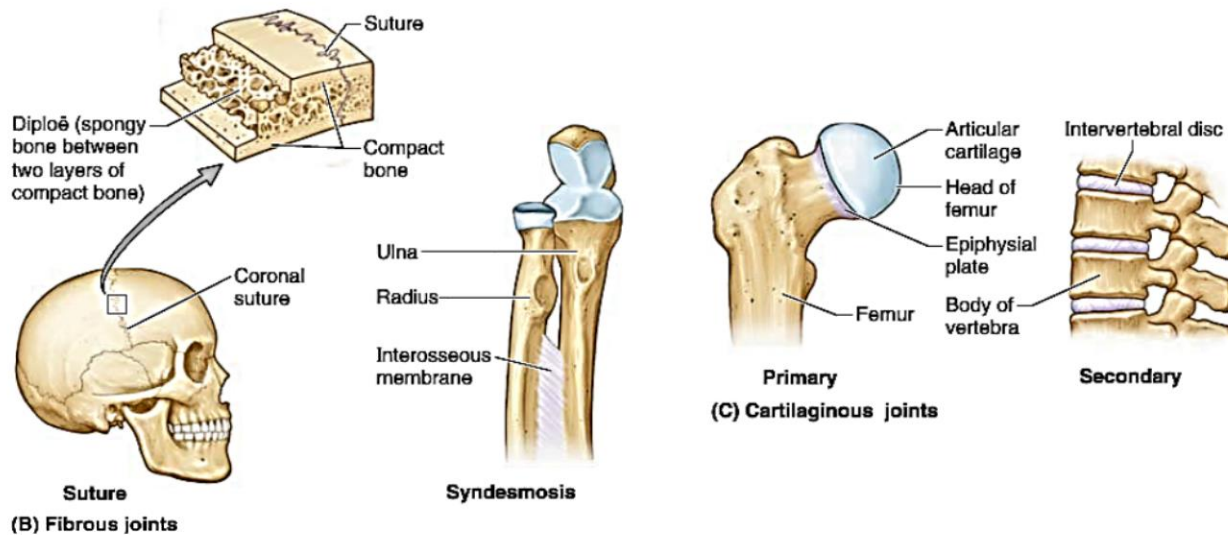
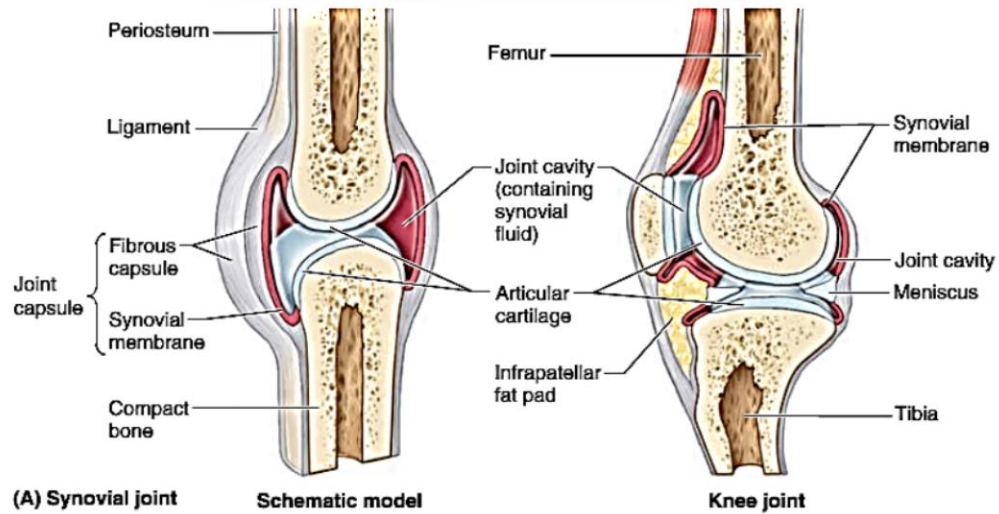
Long, Short, Flat, Irregular, or Sesamoid.

Bones grow through the processes of

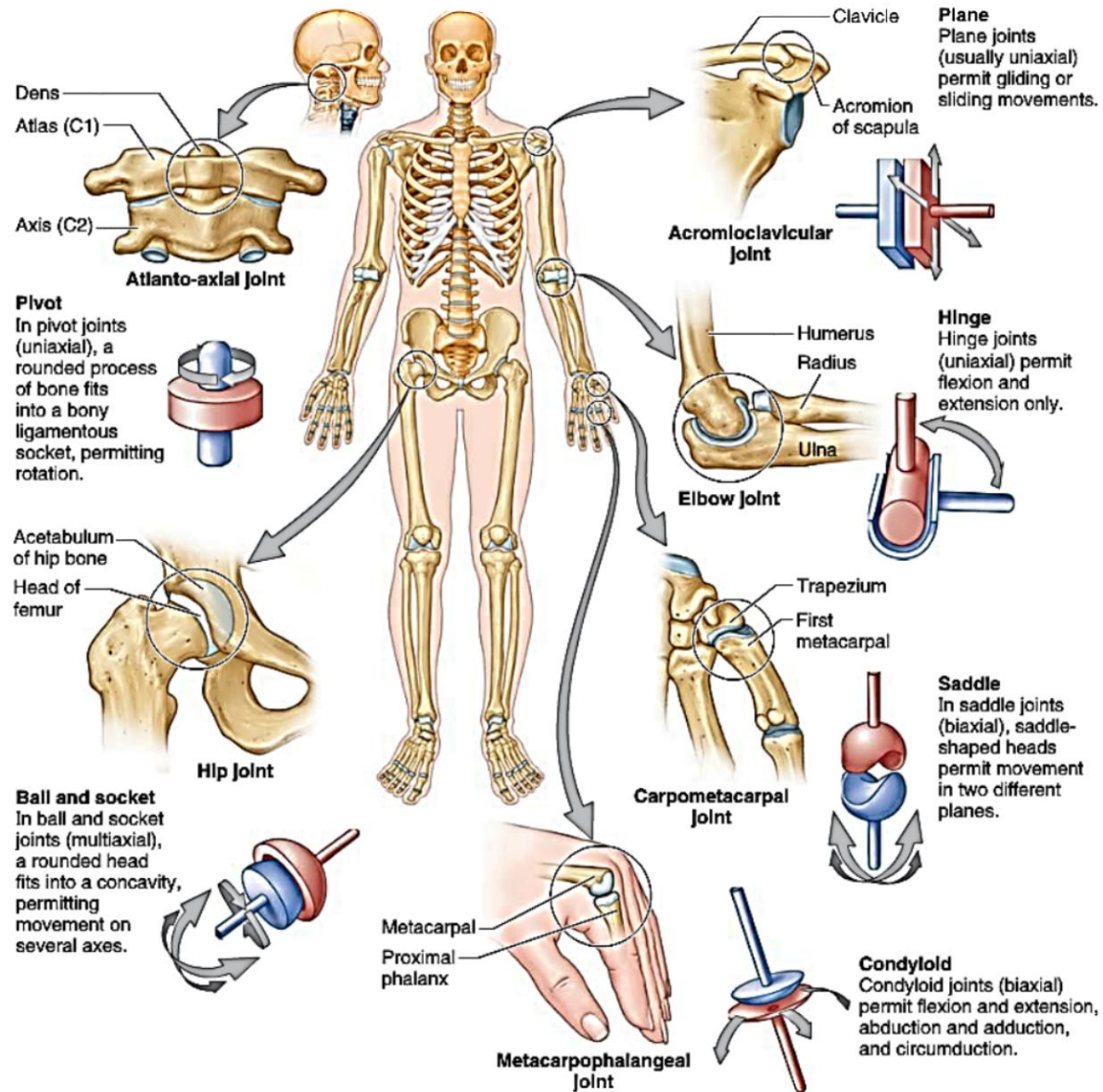
- ◆ intramembraneous ossification
- ◆ endochondral ossification

# S K E L E T A L S Y S T E M

## Joints (articulations)



# Synovial joints





# M U S C U L A R S Y S T E M

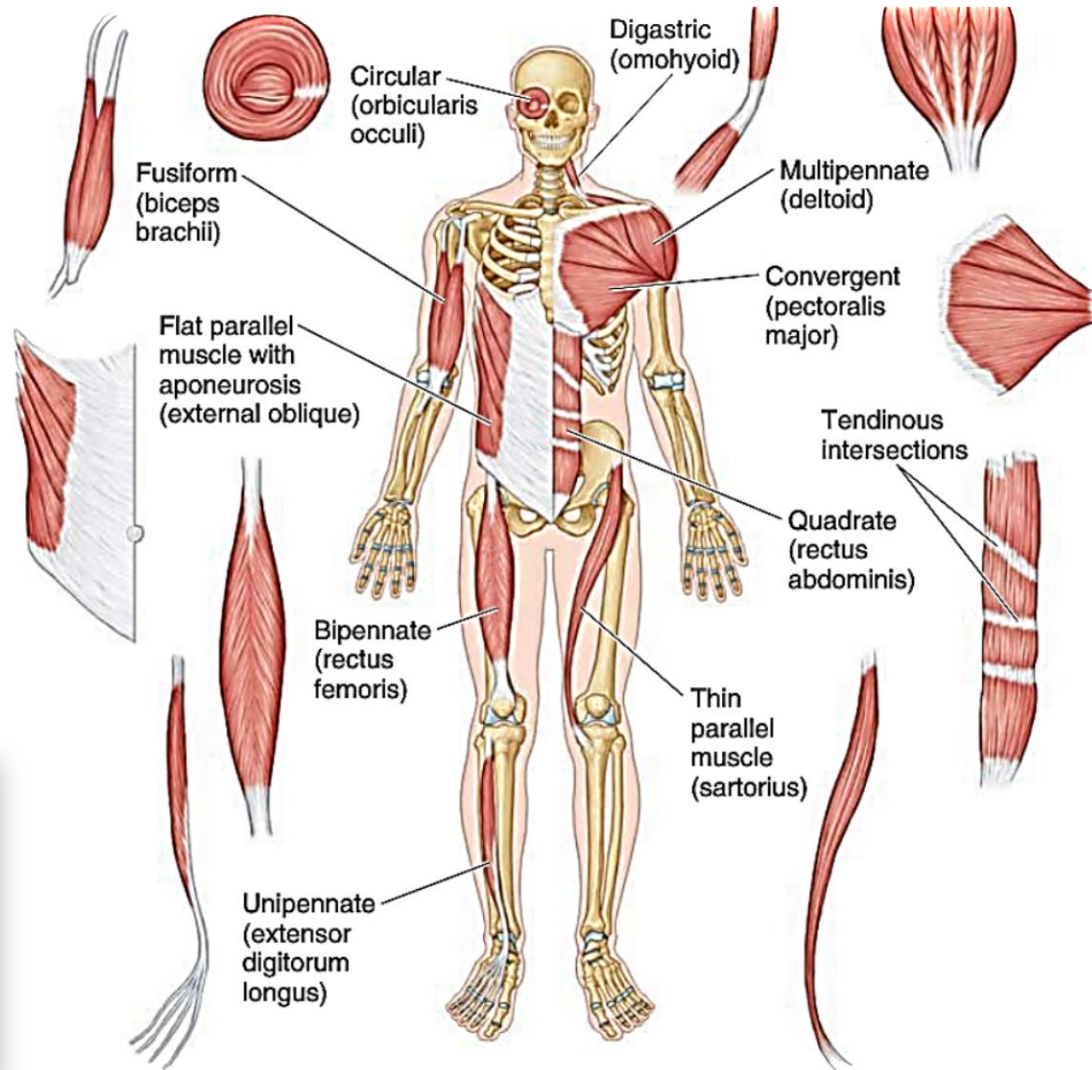
## Types of Muscle

Skeletal striated  
Cardiac striated  
Smooth muscle

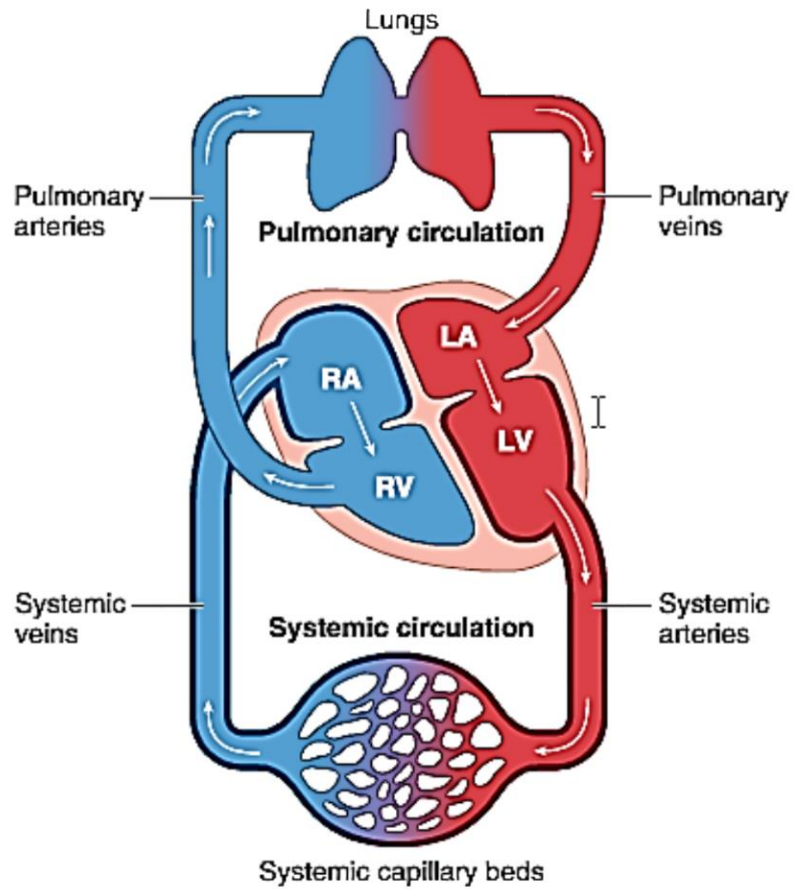
FORM  
FEATURES  
NAMING OF  
MUSCLES

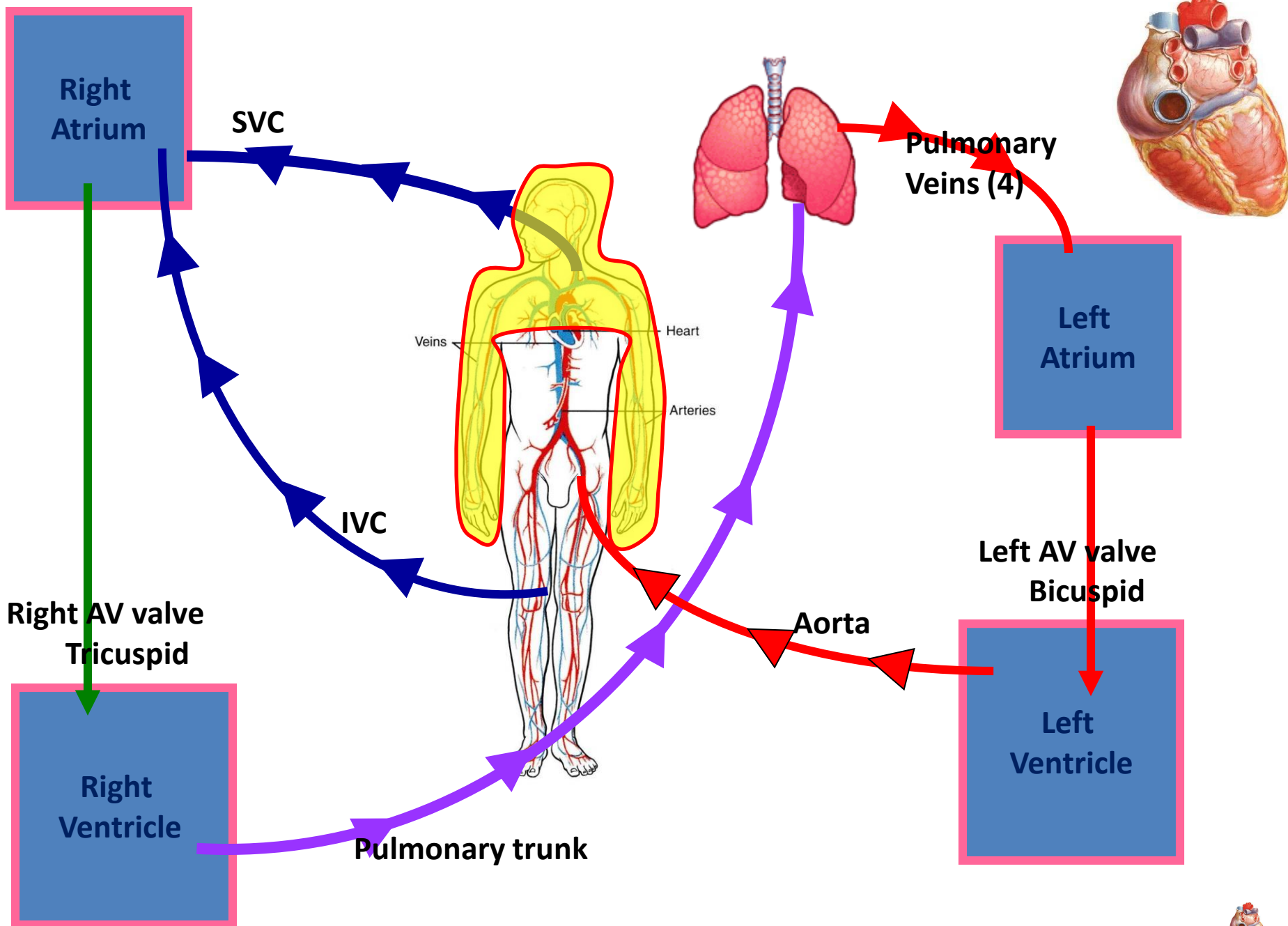
## FUNCTIONS OF MUSCLES

A prime mover  
A Fixator  
A synergist  
An antagonist

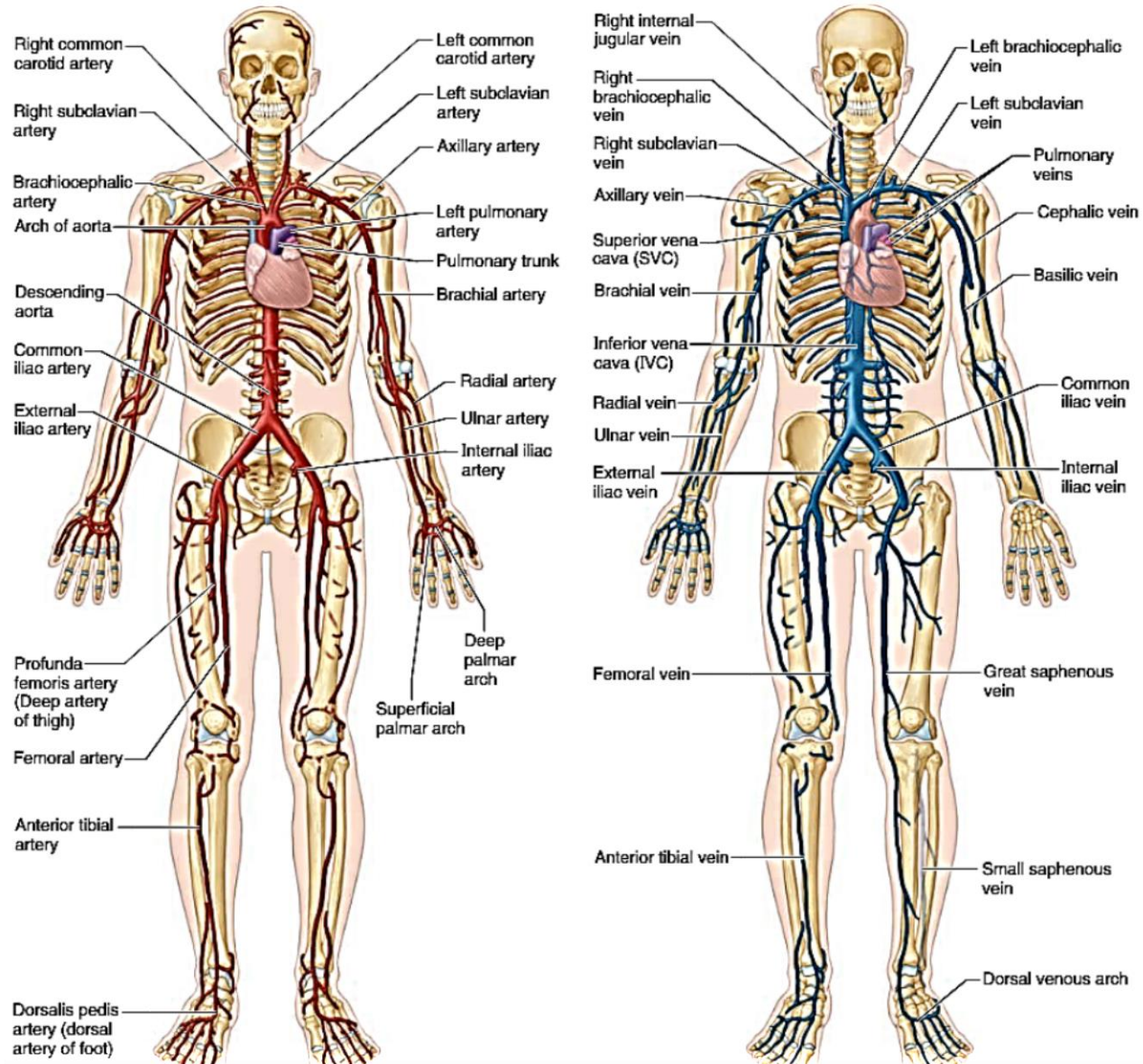


# C A R D I O V A S C U L A R   S Y S T E M

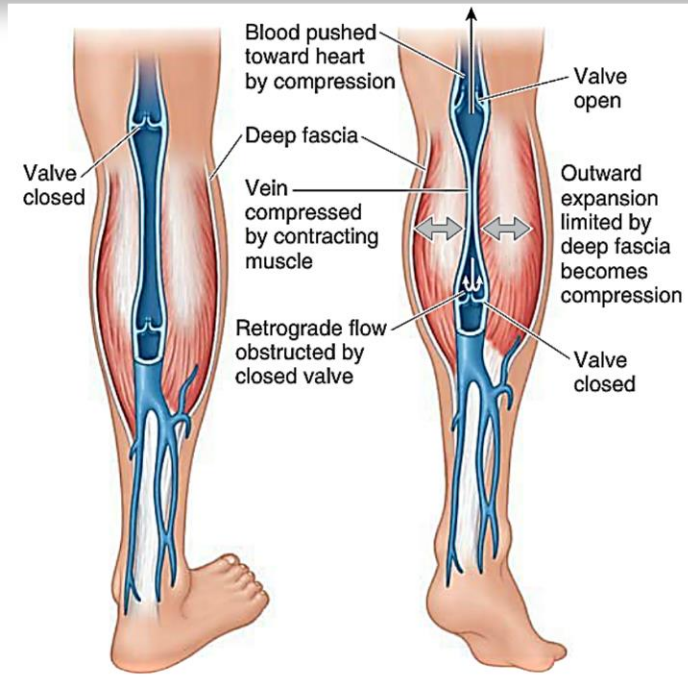
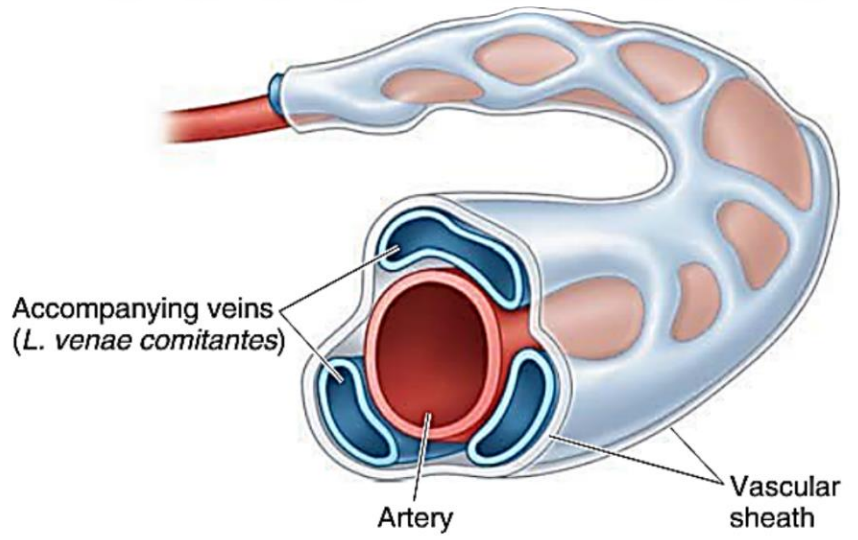




# C A R D I O V A S C U L A R   S Y S T E M



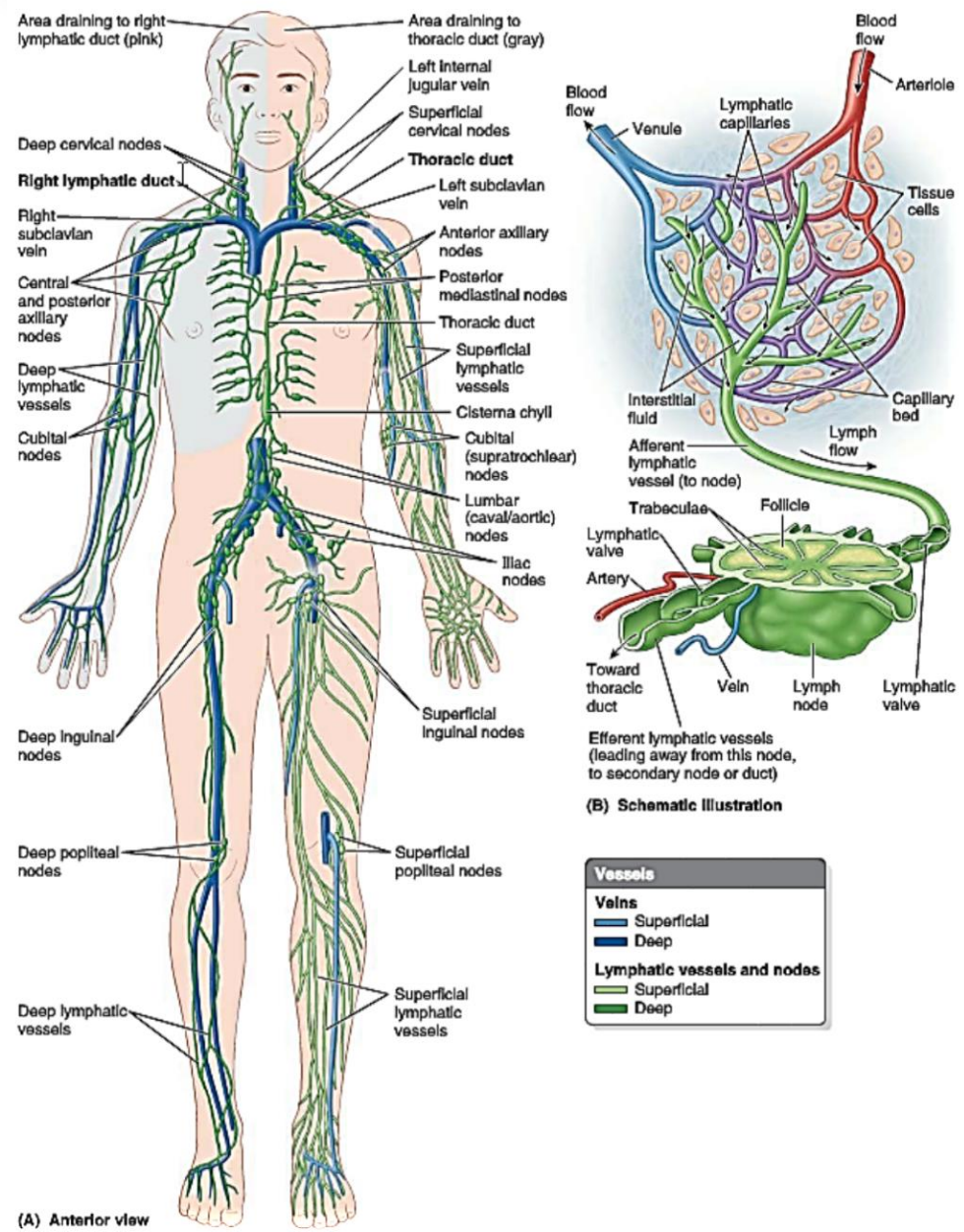
# C A R D I O V A S C U L A R   S Y S T E M



When venous valves malfunction or the calf muscle-pump is not providing effective pumping blood pools-down in the legs causing increased pressure & distention of the vessels

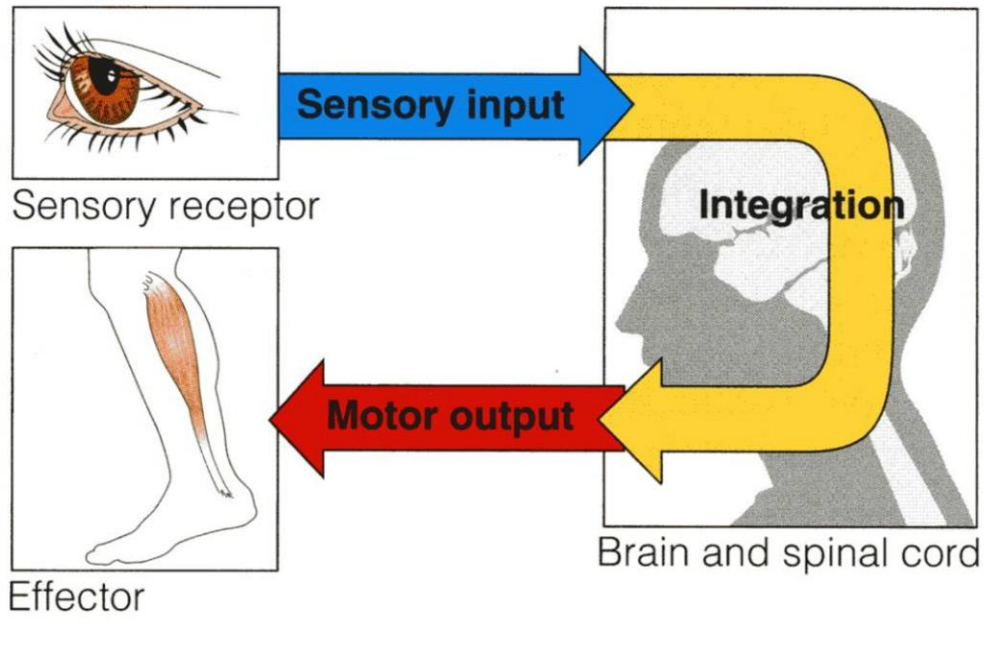
# L Y M P H O I D S Y S T E M

The lymphoid system provides for the drainage of surplus tissue fluid and leaked plasma proteins to the bloodstream, as well as for the removal of debris from cellular decomposition and infection.



# N E R V O U S   S Y S T E M

## FUNCTIONS



- collection of sensory input
- integration
- motor output

# N E R V O U S   S Y S T E M

## Classification

### Nervous System (NS)

#### Functional Division

#### Structural Division

Autonomic NS

Somatic NS

Sympathetic NS

Parasympathetic NS

Central NS

Peripheral NS

Brain

Spinal Cord

12 pairs of Cranial nerves  
&  
31 pairs of spinal nerves



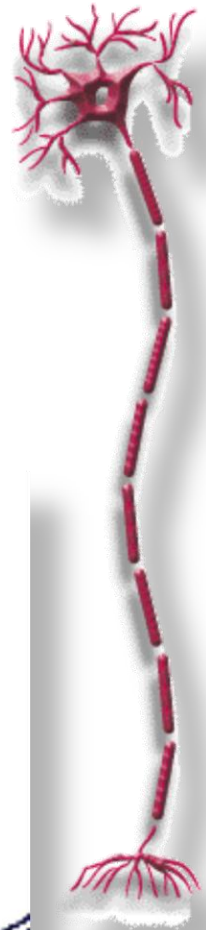
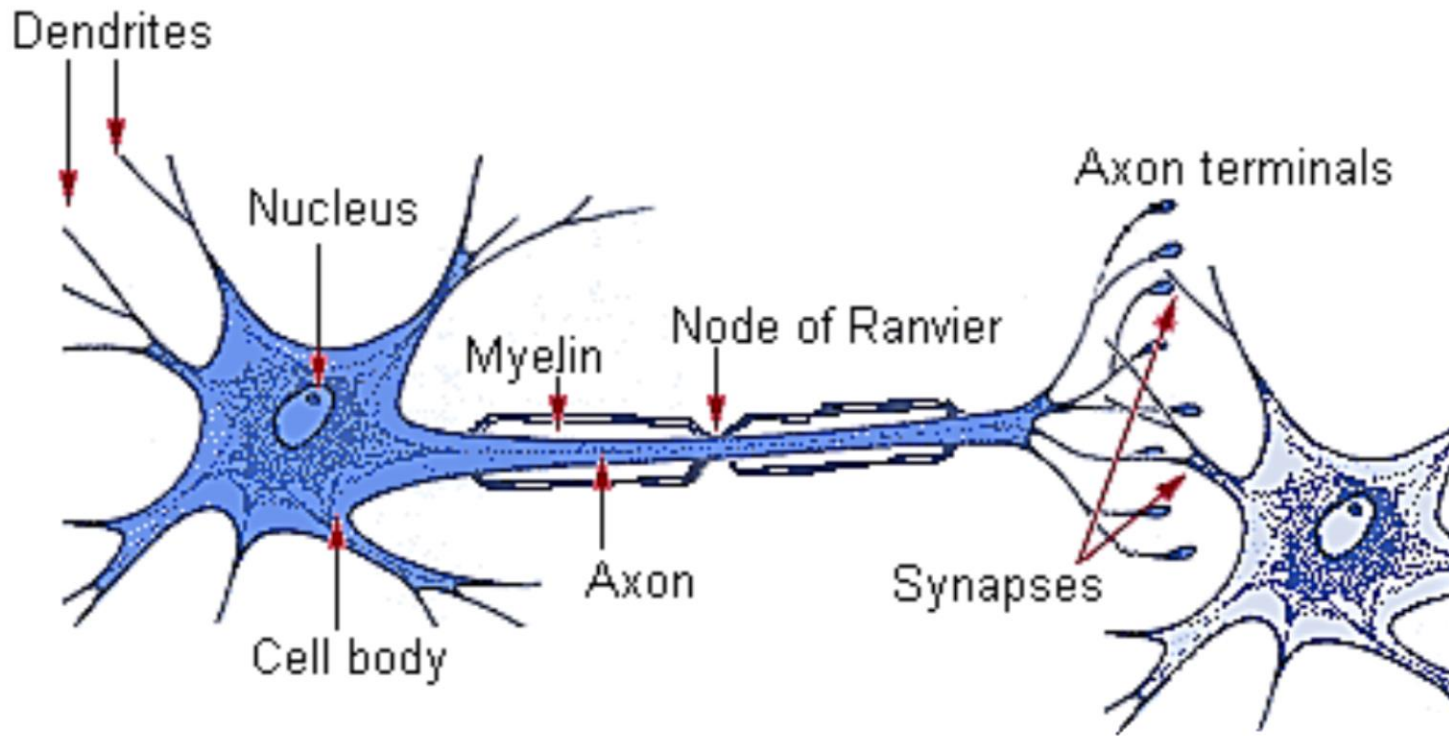
# N E R V O U S   S Y S T E M

**Nervous system consists of two main cell type**

- a. Neurons**
- b. Neuroglia/Non neuronal cells/Supporting cells**

## **Neuron**

**Neuron is a functional structural unit of nervous system**



**What is a NERVE**

**Its is a bundle of axons**

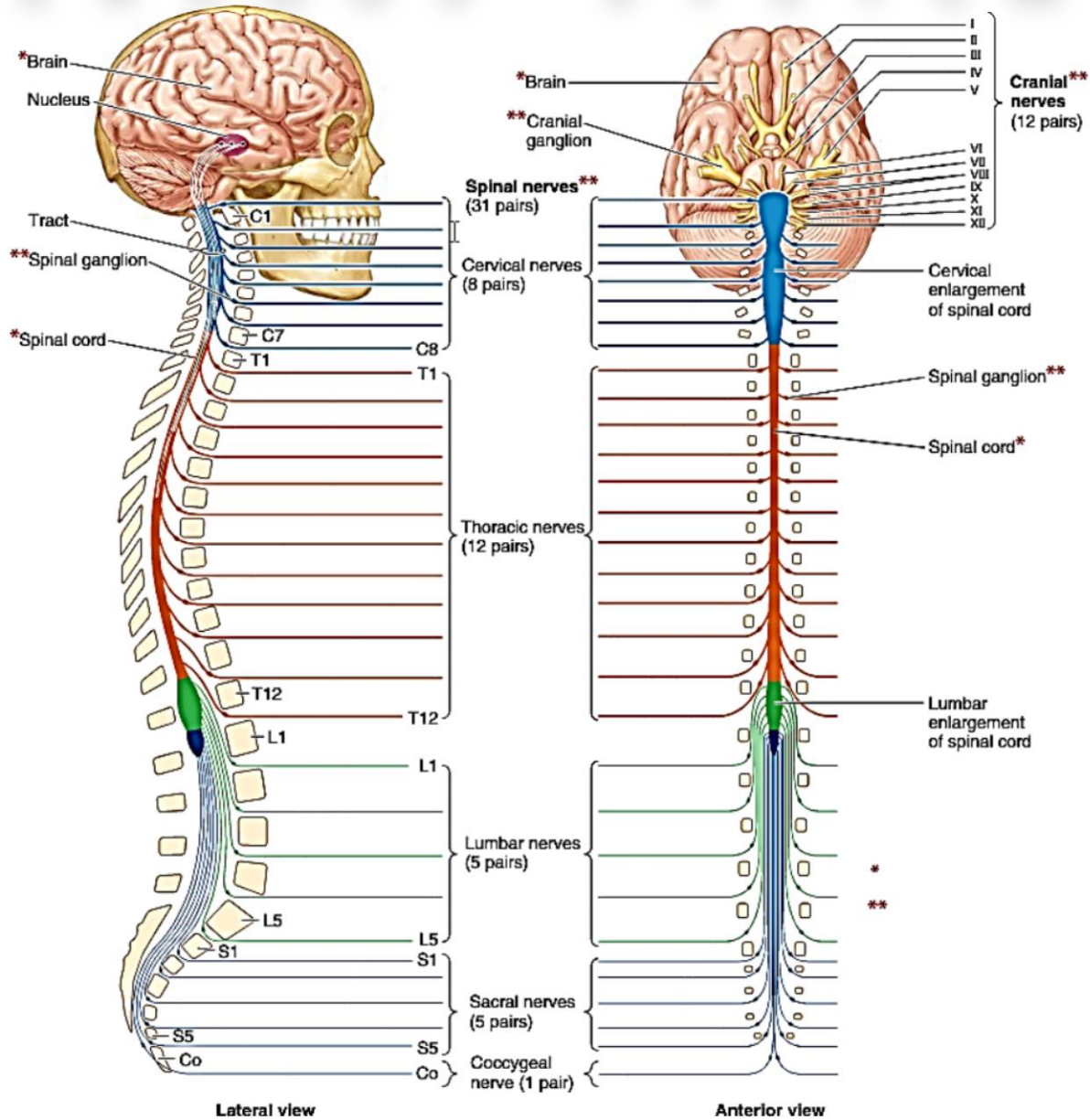
**What is a NUCLEUS**

**It is the collection of nerve cell bodies in the CNS**

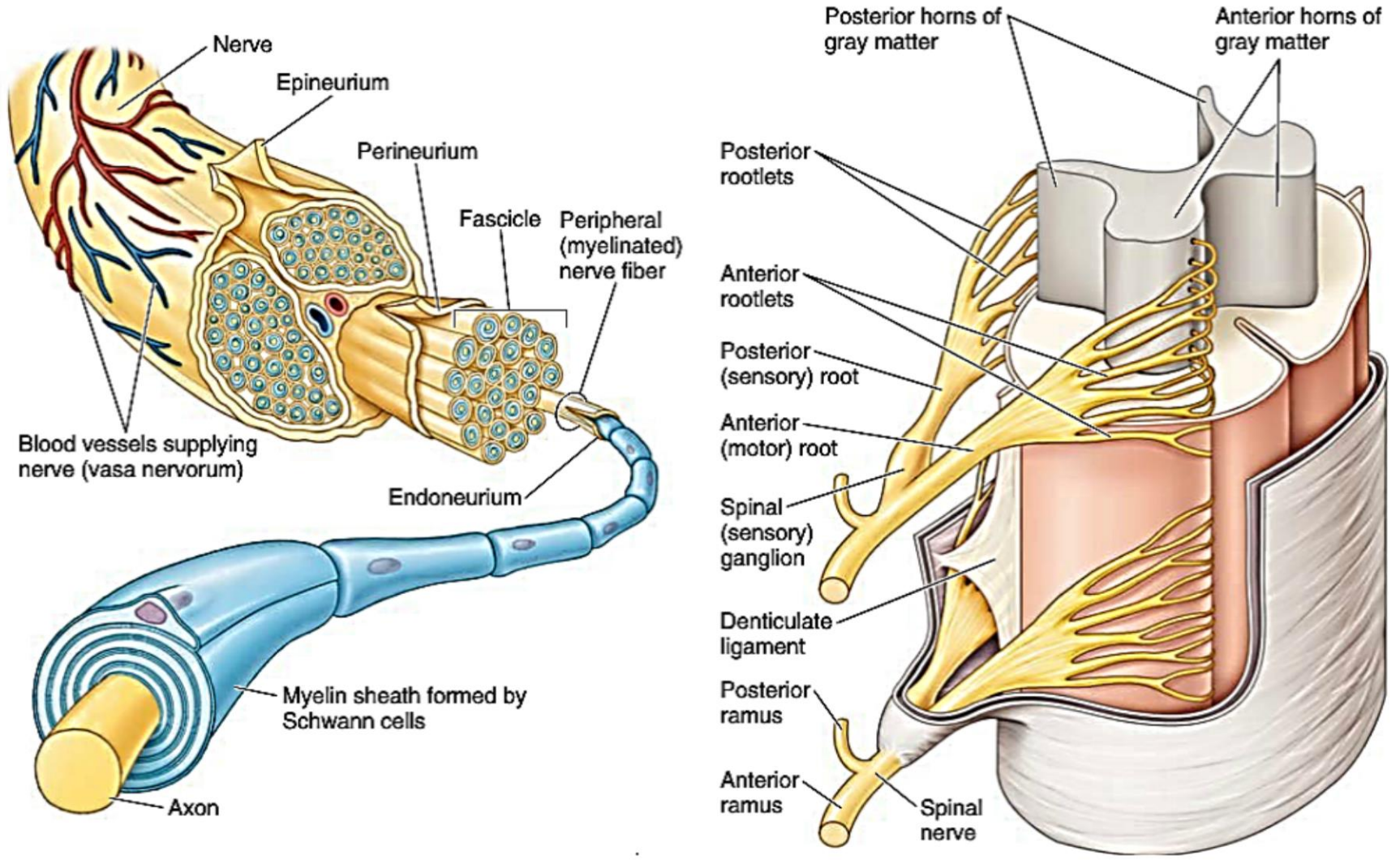
**What is a GANGLION**

**It is a Collection of nerve cell bodies in the PNS**

# N E R V O U S S Y S T E M



# N E R V O U S   S Y S T E M



# N E R V O U S      S Y S T E M

## Cervical plexus (C1–C5)

- Lesser occipital nerve (C2,3)
- Great auricular nerve (C2,3)
- Transverse cervical nerve (C2,3)
- Supraclavicular nerve (C3,4)
- Phrenic nerve (C3–5)
- Suprascapular nerve (C5,6)

## Brachial plexus (C5–T1)

- Axillary nerve
- Musculocutaneous nerve
- Radial nerve
- Median nerve
- Ulnar nerve

## Intercostal nerves (T1–T12)

## Lumbar plexus (L1–4)

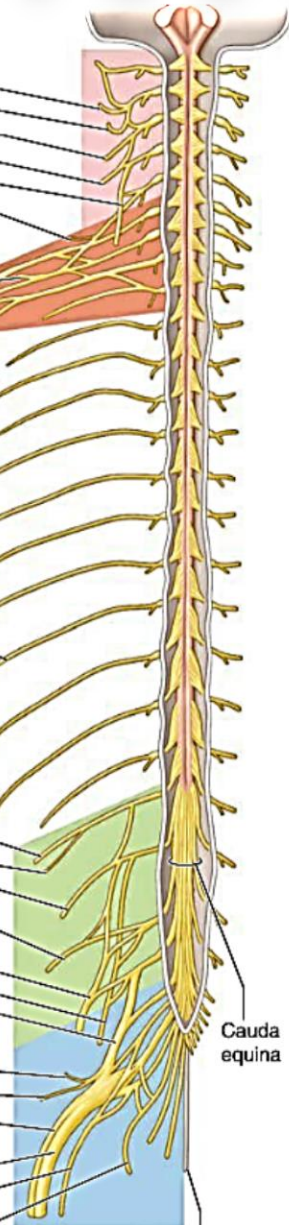
- Iliohypogastric nerve (L1)
- Ilio-inguinal nerve (L1)
- Genitofemoral nerve (L1,2)
- Lateral cutaneous nerve of thigh (L2,3)
- Femoral nerve (L2–4)
- Obturator nerve (L2–4)
- Lumbosacral trunk (L4–5)

## Sacral plexus

- Superior gluteal nerve (L4–S1)
- Inferior gluteal nerve (L5–S2)
- Sciatic nerve (L4–S3)
  - Common fibular nerve
  - Tibial nerve
- Posterior cutaneous nerve of the thigh (S1–3)
- Pudendal nerve (S2–4)

Cauda equina

Filum terminale



Posterior horns of gray matter

Anterior horns of gray matter

Posterior rootlets

Anterior rootlets

Posterior (sensory) root

Anterior (motor) root

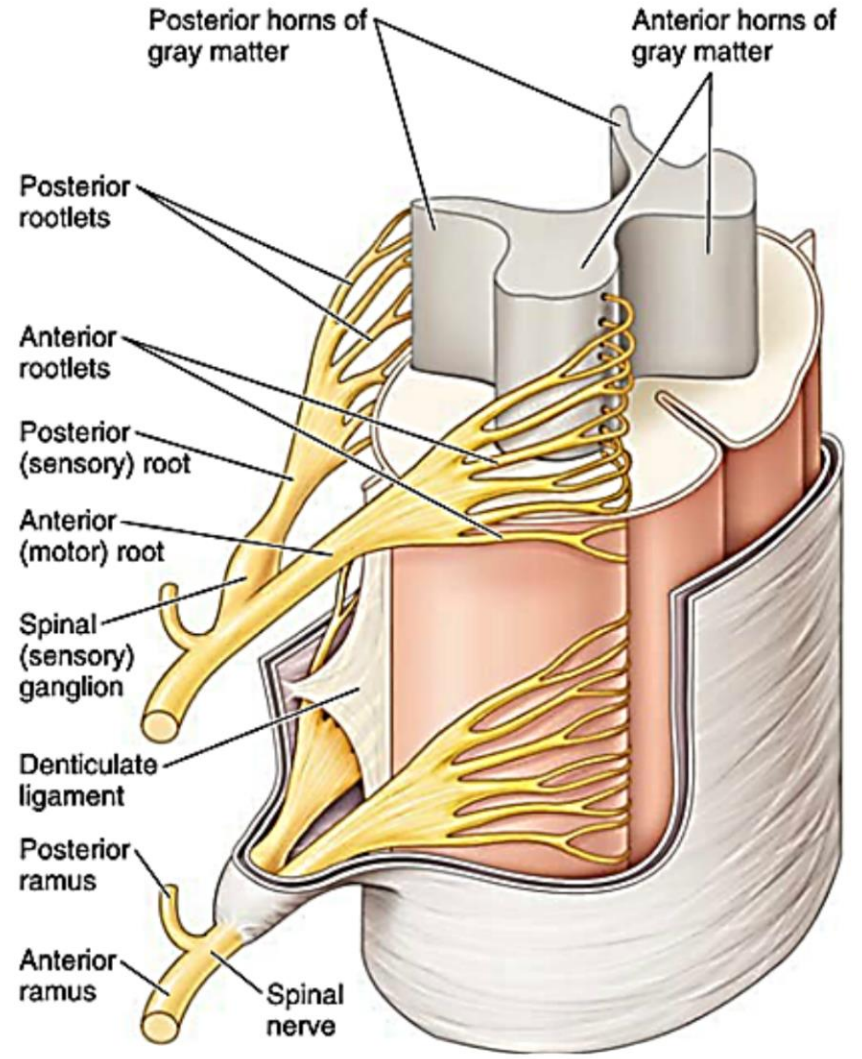
Spinal (sensory) ganglion

Denticulate ligament

Posterior ramus

Anterior ramus

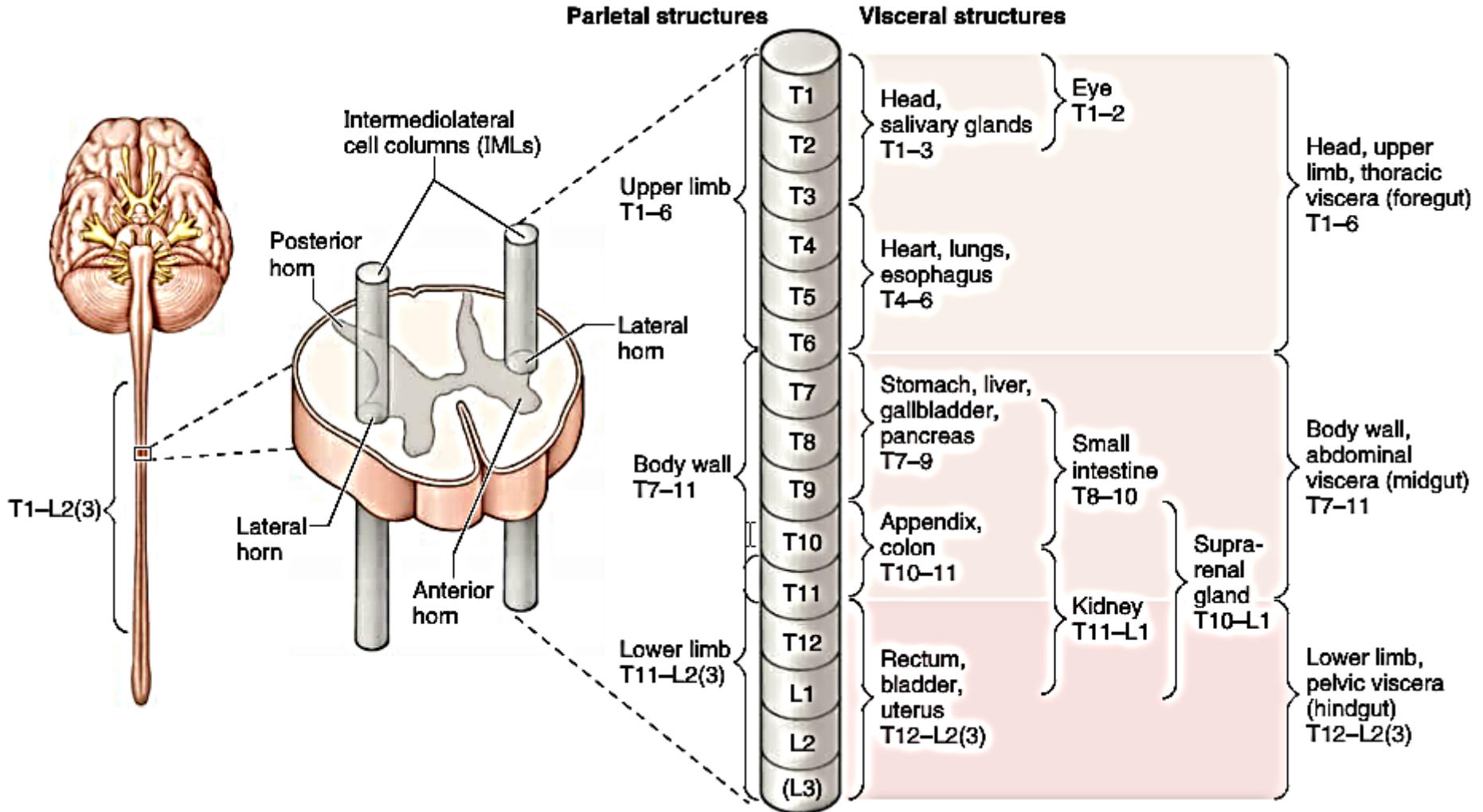
Spinal nerve

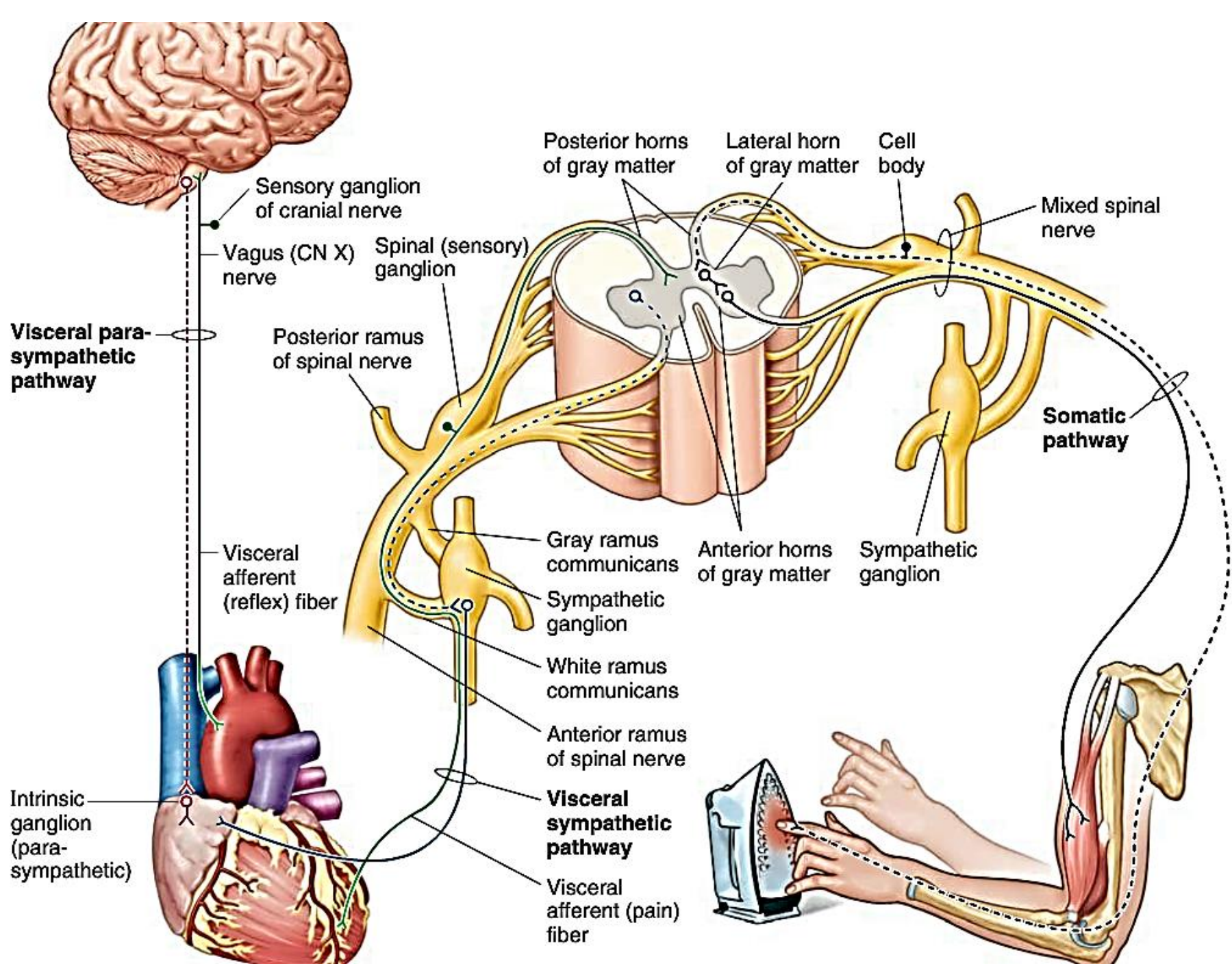


# N E R V O U S   S Y S T E M

## Autonomic Nervous System (ANS)

### SYMPATHETIC (THORACOLUMBAR) DIVISION OF ANS

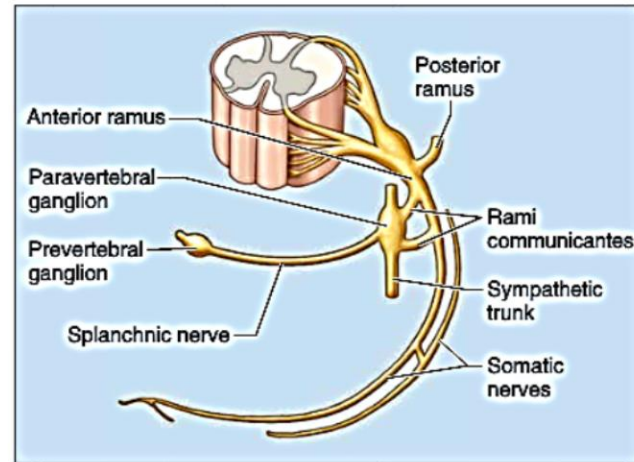
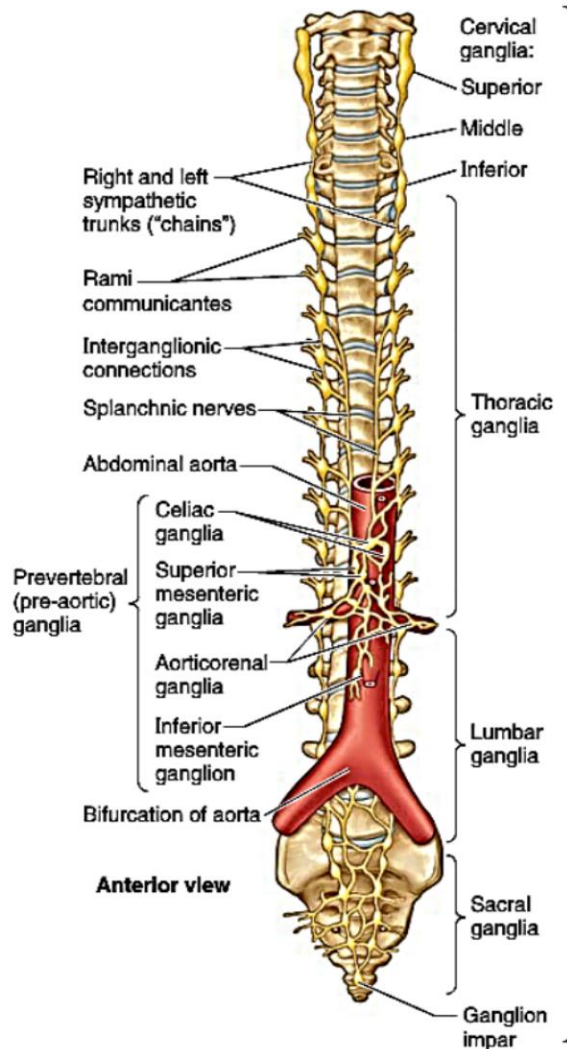




# N E R V O U S   S Y S T E M

## Autonomic Nervous System (ANS)

### SYMPATHETIC (THORACOLUMBAR) DIVISION OF ANS



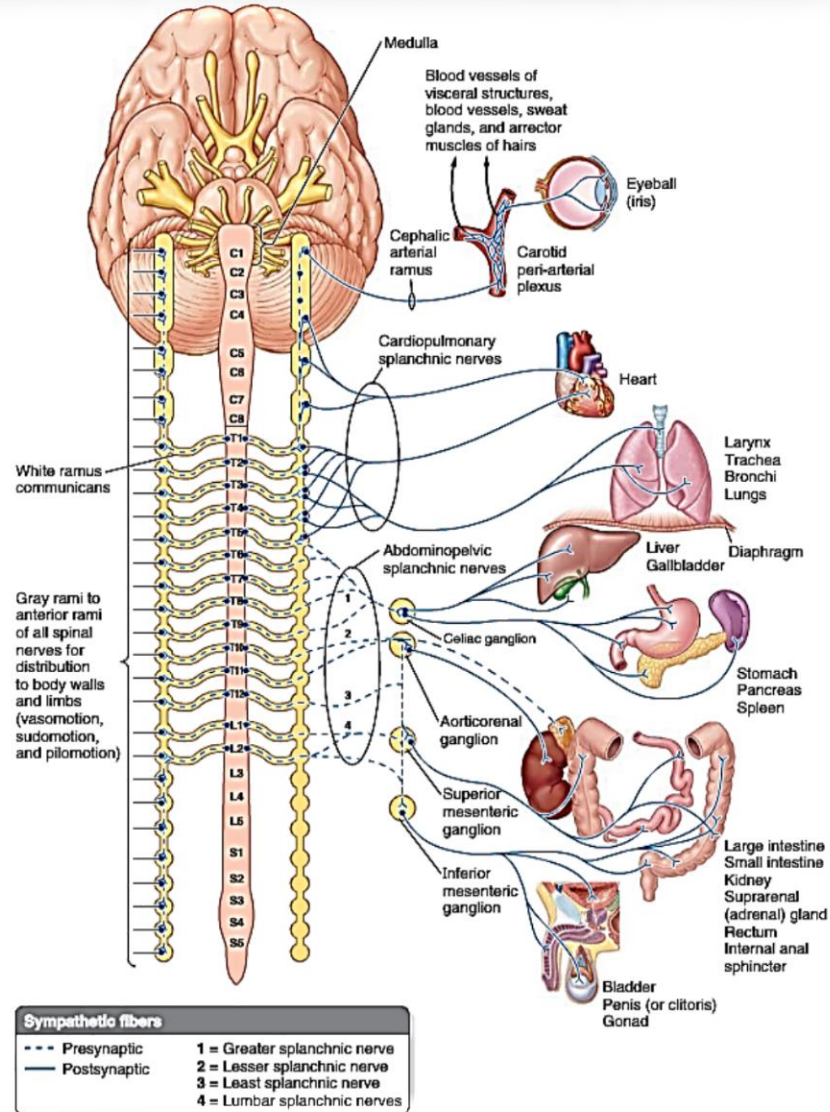
Anterior oblique view



# N E R V O U S   S Y S T E M

## Autonomic Nervous System (ANS)

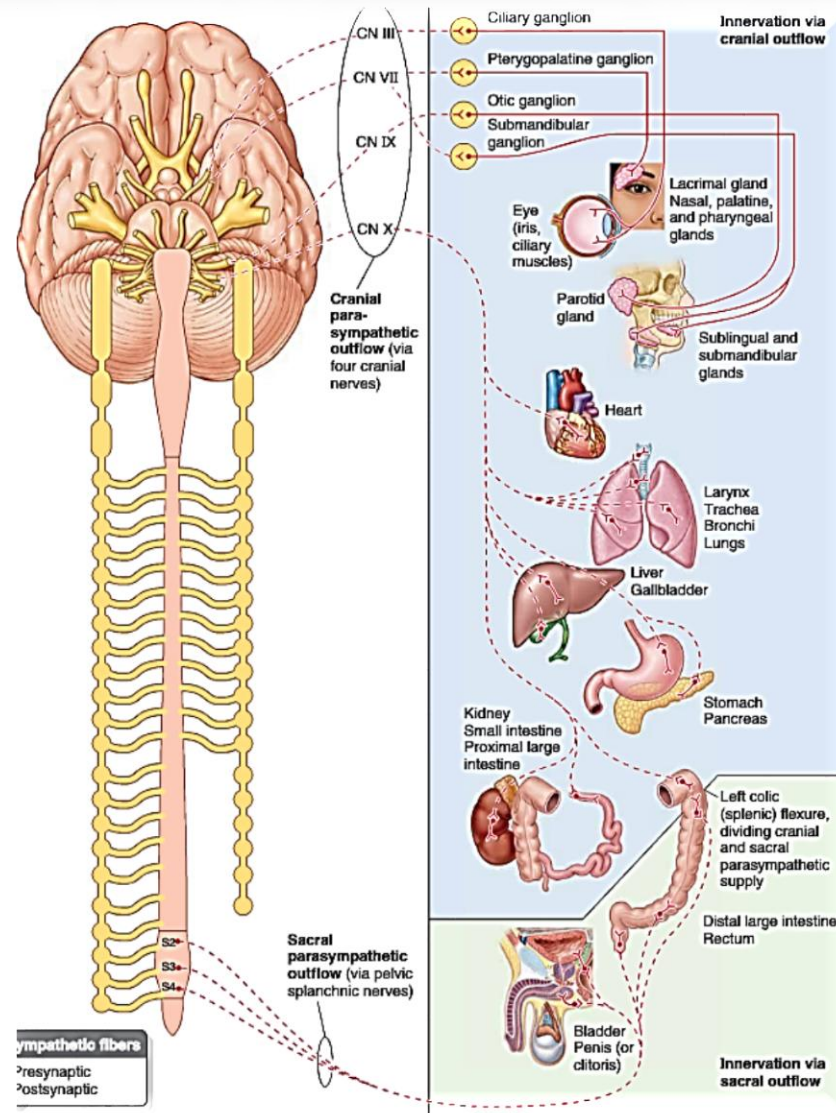
### SYMPATHETIC (THORACOLUMBAR) DIVISION OF ANS



# N E R V O U S   S Y S T E M

## Autonomic Nervous System (ANS)

### PARASYMPATHETIC (CRANIOSACRAL) DIVISION OF ANS



mpathetic fibers  
presynaptic  
postsynaptic

**Thank you**

**&**

**Happy Holidays**