

Peripheral Nervous System

Nervous system consists of:

1- **CNS** = brain and spinal cord 2- **PNS** = Cranial nerves and spinal **nerves**

PNS consists of 43 pairs of nerves branching from the CNS:

12 pairs of cranial nerves

31 pairs of spinal nerves

Cranial Nerves : 12 pairs of cranial nerves originate from:

cerebrum : I, II

midbrain : III, IV

pons : V, VI, VII, VIII (pons/medulla border)

medulla: IX, X, XI, XII

a. sensory cranial nerves

I. **Olfactory** [sense of smell]

II. **Optic** [sense of sight]

VIII. **Vestibulocochlear** [senses of hearing and balance]

b. motor cranial nerves

III. **Oculomotor**

IV. **Trochlear** [eye movements]

VI. **Abducens** -injury to VI causes eye to turn inward

c. mixed cranial nerves : contain a large number of both sensory and motor neurons

IX. **Glossopharyngeal** [sense of taste, swallowing]

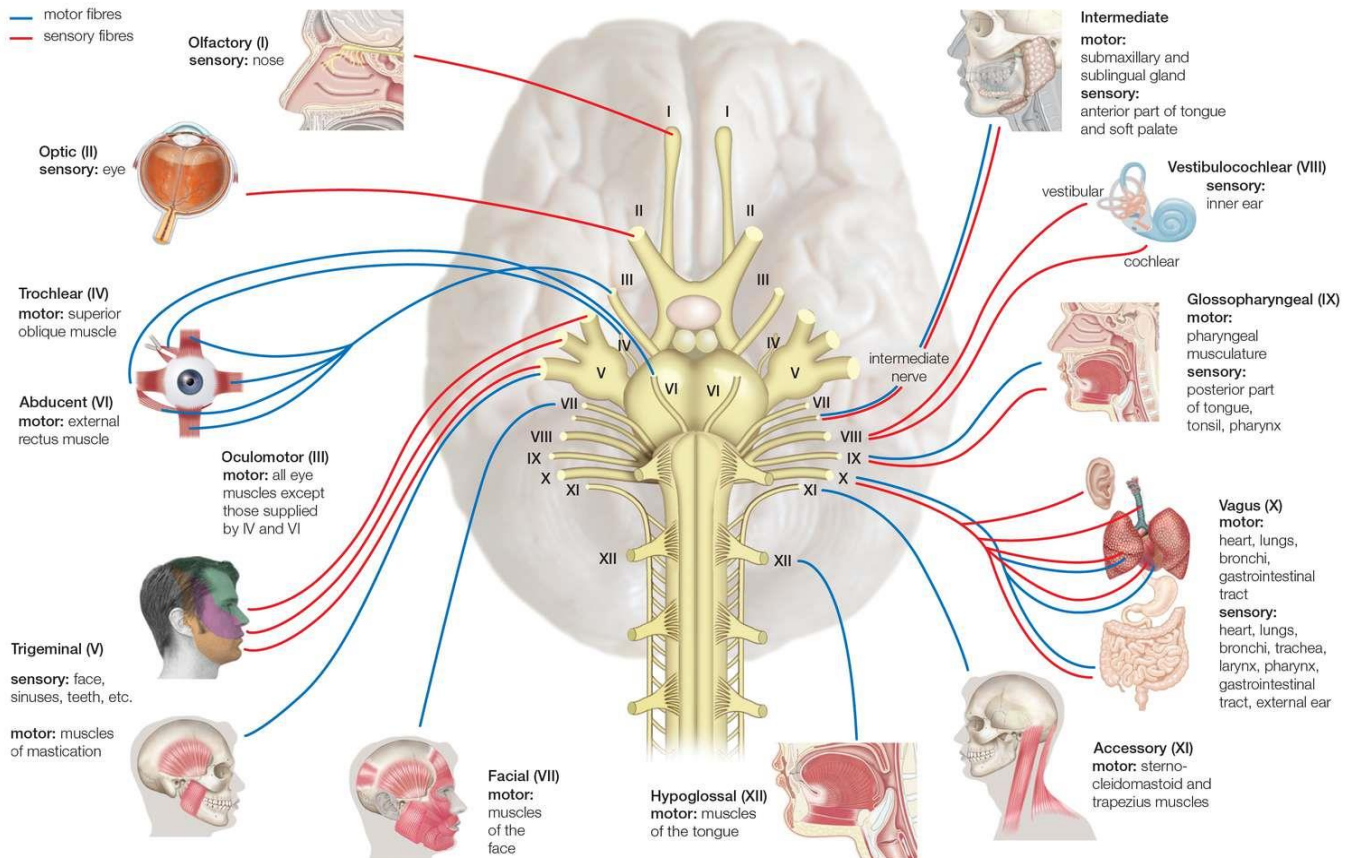
XII. **Hypoglossal** [tongue]

V. **Trigeminal** [cutaneous senses of head and face, chewing muscles]

VII. **Facial** [sense of taste, facial expression]

X. **Vagus** [sensory and motor to larynx, heart, lungs, digestive system]

XI. **Accessory** [shoulder and head]



functional classification of cranial nerves

Spinal Nerves

31 pairs , **all** are mixed nerves ,
they are named and numbered according to
the level of the vertebral column
from which they arise:

8 cervical

12 thoracic

5 lumbar

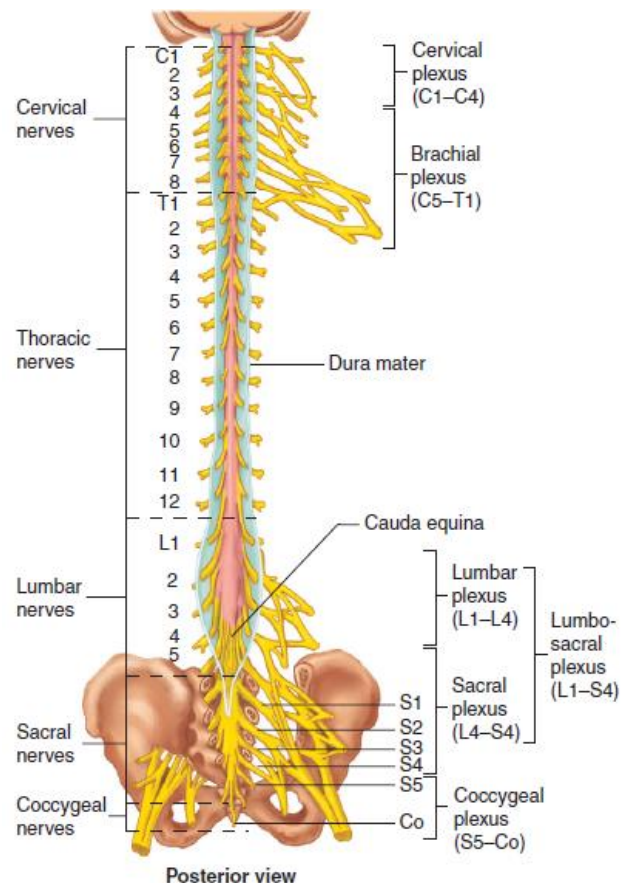
5 sacral

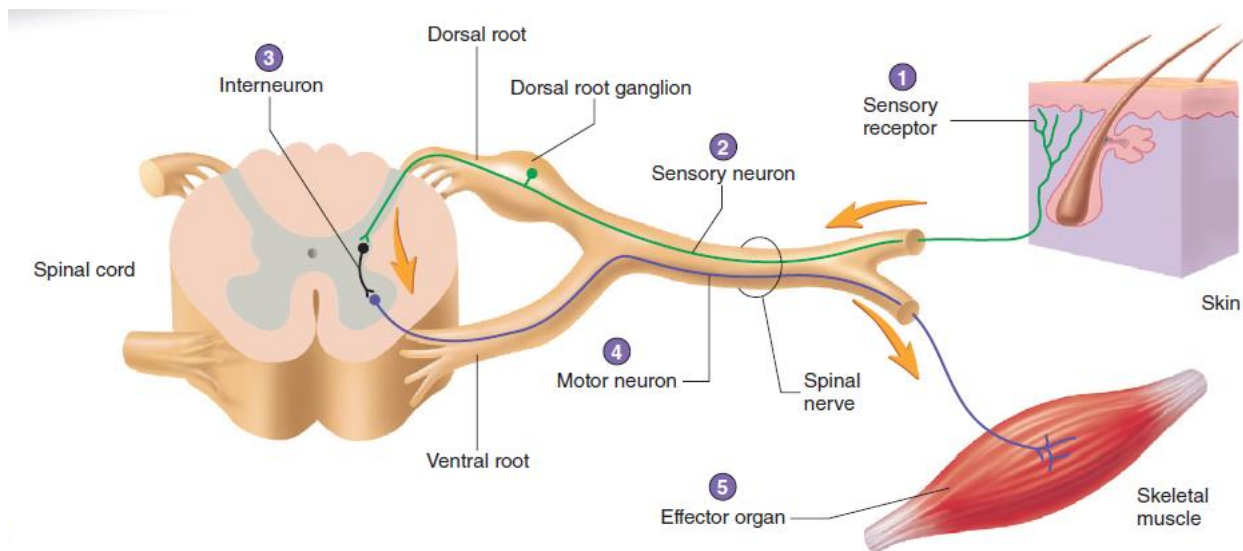
1 coccygeal

each spinal nerve is attached to spinal cord by
two roots:

dorsal (posterior) **root** : sensory neurons and a
ganglion

ventral (anterior) **root** : motor neurons





Spinal Nerve Plexuses

after the spinal nerves exit the intervertebral foramina they branch and interconnect to form **plexuses** from these plexuses new nerves emerge that contain a mixture of fibers from various spinal nerves

1- Cervical Plexus : formed from C1 – C4,5

supplies sensory and motor neurons to head, neck and upper shoulders

2- Brachial Plexus : formed from fibers in C5 to C8, & T1

innervates shoulders and upper limbs

3- Lumbar Plexus : formed from fibers in L1 to L4

innervates abdominal wall, genitals, parts of leg

4- Sacral Plexus : formed from fibers in L4 & 5, S1 to S4

supplies nerves to buttocks, perineum, leg

Peripheral Nervous System

somatic - innervate skeletal (voluntary) muscles

autonomic – innervate smooth and cardiac (involuntary) muscles and glands

ANS is divided into 2 branches: **Sympathetic & parasympathetic**

Sympathetic

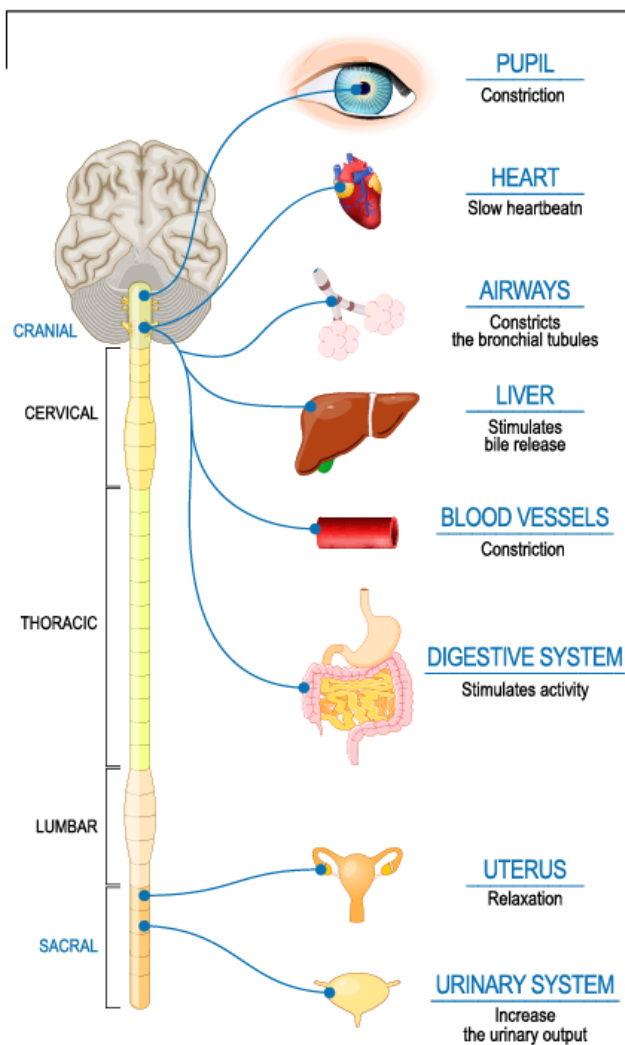
adapts body for intense physical activities: increases alertness, blood pressure, air flow, blood sugar concentrations, blood flow to heart and skeletal muscles acts as an **emergency system** emergency or stress that threatens homeostasis **“fight or flight”**

Parasympathetic

most active in non-stressful, non-emergency situations **“resting and digesting”** tends to have a calming effect on body:

- 1- GI tract works to process food
- increase glandular secretions
- increase peristalsis
- 2- blood pressure, heart rate, respiratory rates maintained at low levels

Parasympathetic



Sympathetic

