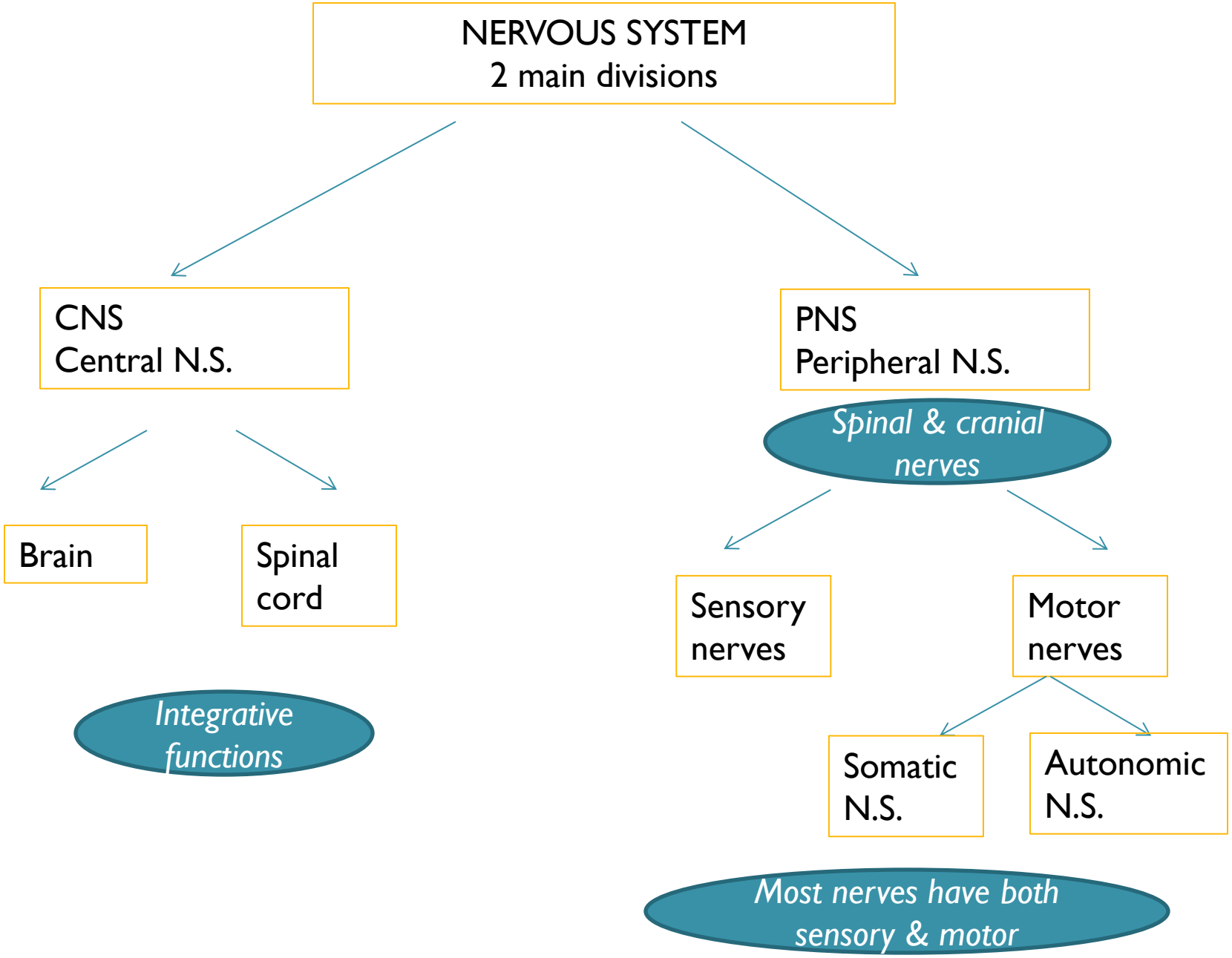
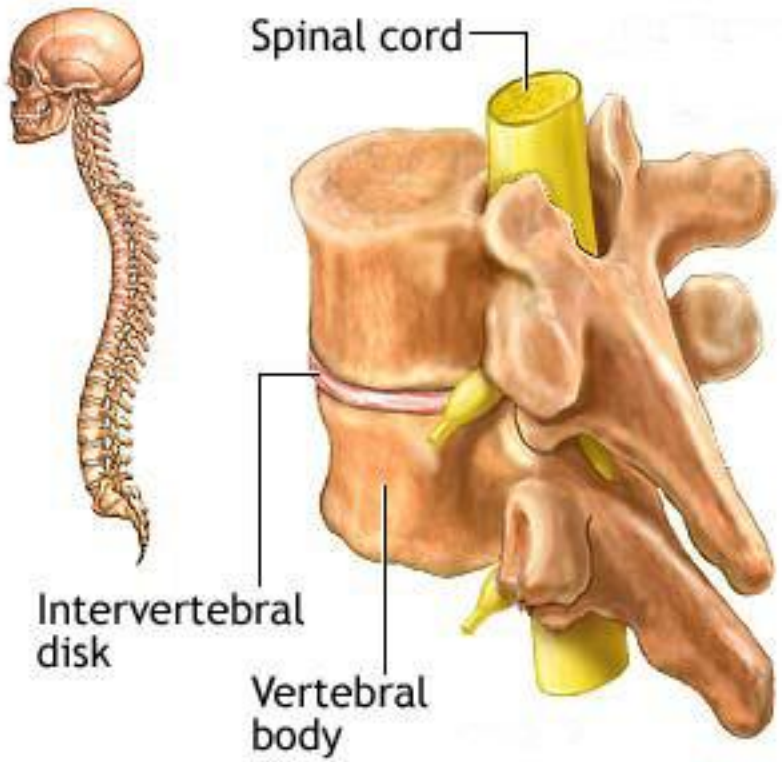

NERVOUS SYSTEM
2 main divisions
CNS
Central N.S.
PNS
Peripheral N.S.
Spinal & cranial nerves
Brain
Spinal cord
Sensory nerves
Motor nerves
Integrative functions
Somatic N.S.
Autonomic N.S.
Most nerves have both sensory & motor

Spinal Cord

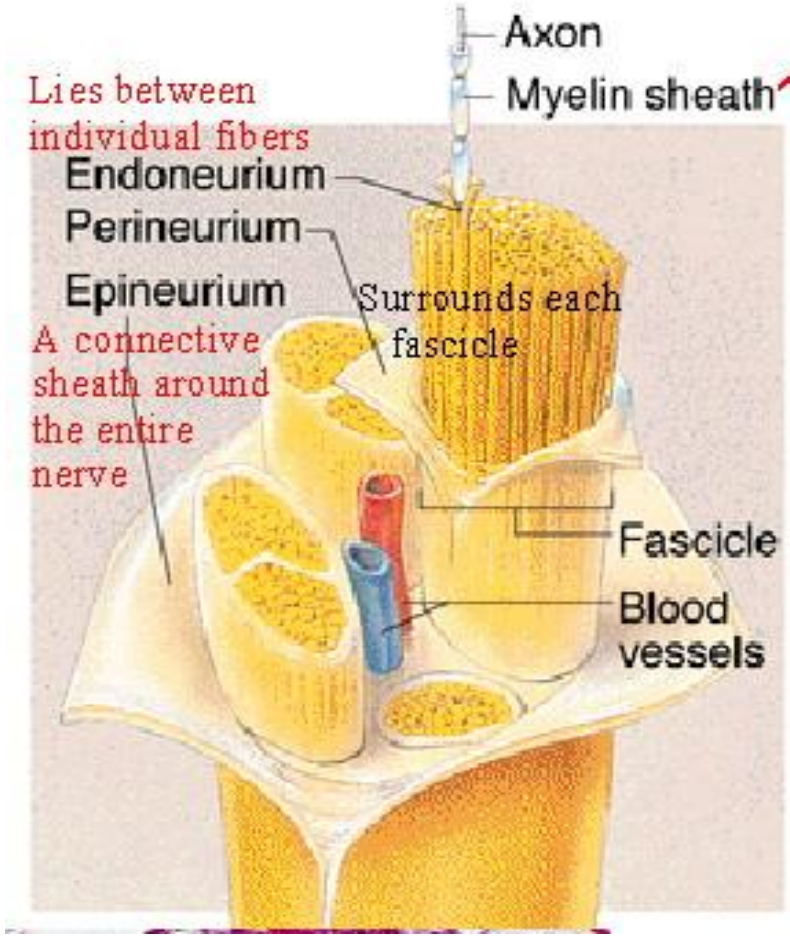
- Column of nerve tissue
- Functions
  - Conduct nerve impulses
  - Center for spinal reflexes



Nerves= bundles of axons

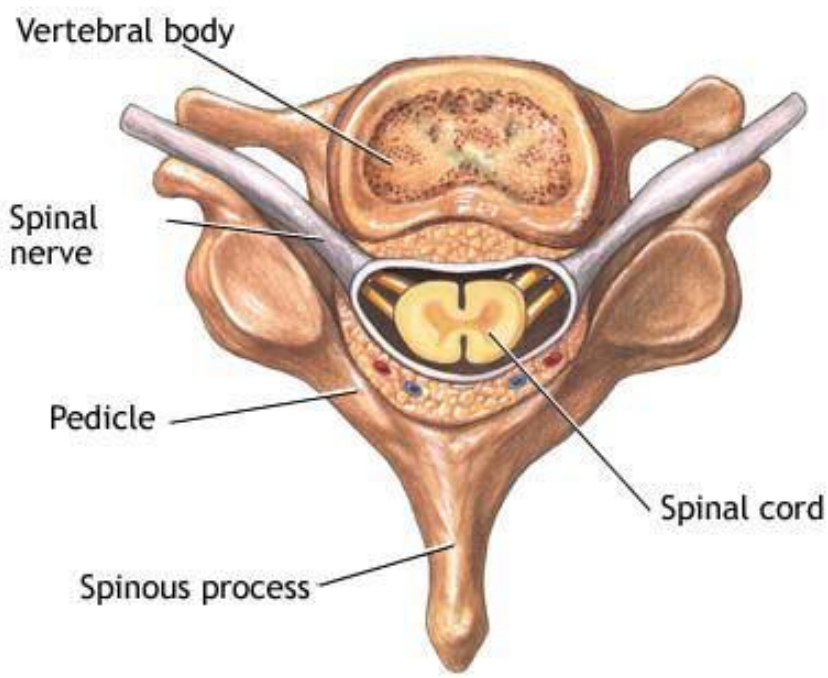
- 12 pairs cranial & 31 pairs spinal nerves make up PNS
- Mixed nerves (PNS)- include both sensory & motor fibers
- Nerve tracts (CNS only)- carry information up or down the spinal cord, to or from the brain.

Structure of a Nerve



Consists of a continuous series of Schwann cells wrapped around the fiber.

A nerve is a group of axons (nerve fibers) outside the CNS. These fibers are bundled together with connective layers. Many of the fibers are myelinated, which means they have a covering made from successive wrappings of Schwann cells.



- See p. 225 in book
- White matter
  - Axons of neurons
  - Myelinated
- Gray matter
  - Cell bodies of neurons
  - Synapses occur here

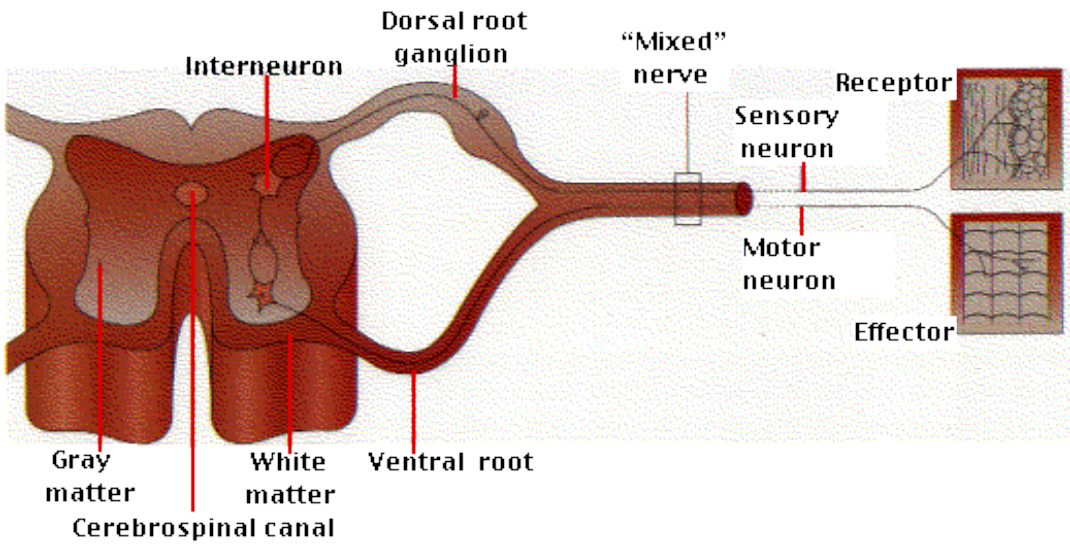
31 PAIRS- SPINAL NERVES

DORSAL ROOT
Carries signals into CNS

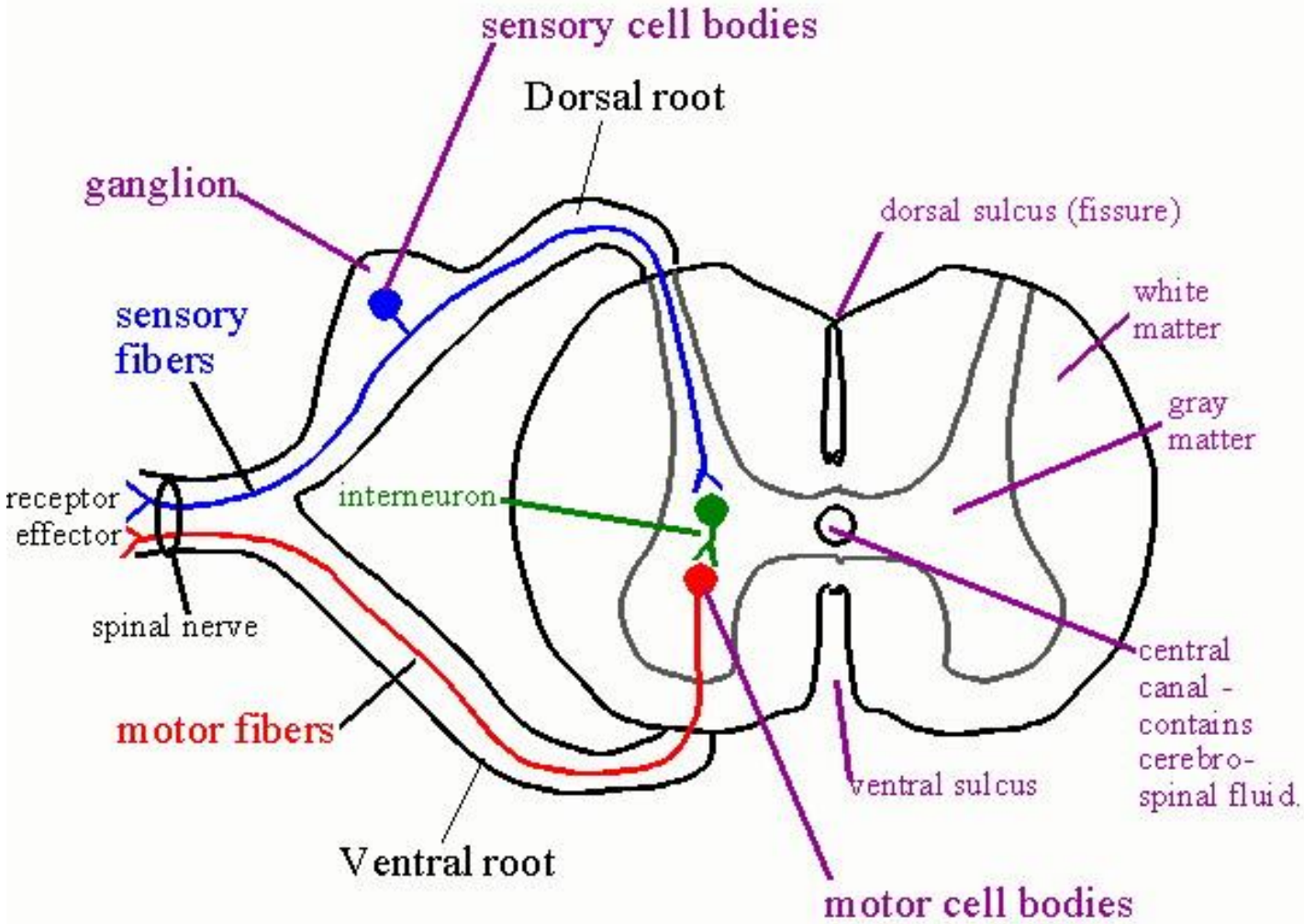
SENSORY

VENTRAL ROOT
Carries signals out to muscles & glands

MOTOR

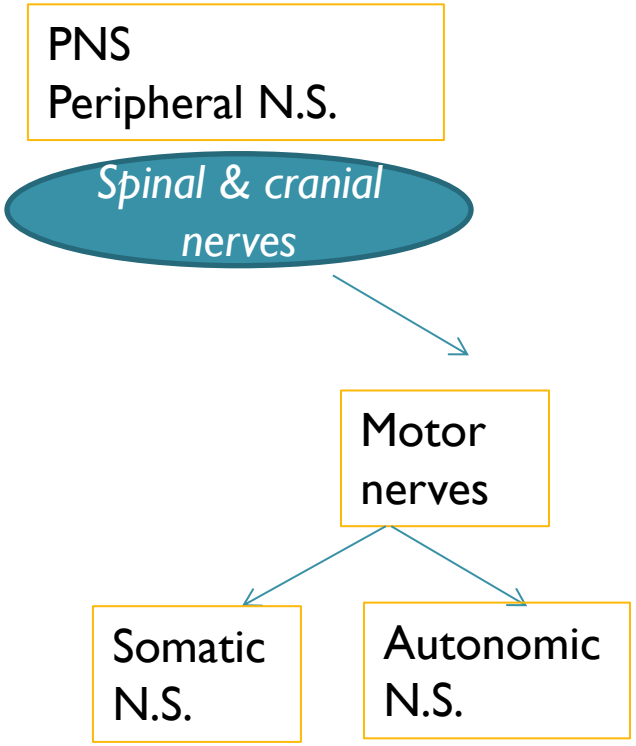


Spinal Cord - Neuron Relationships

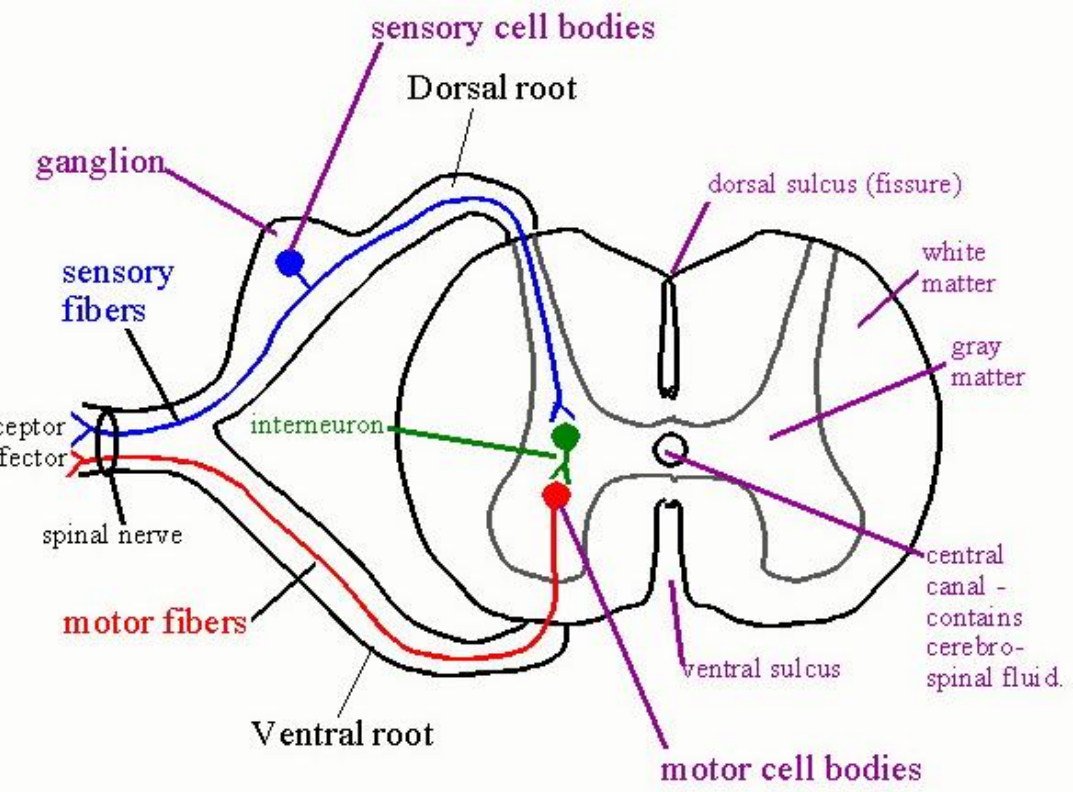


Somatic Nervous System

- Controls movement of skeletal muscles
- Generally voluntary, conscious
- Relays signals of reflexes



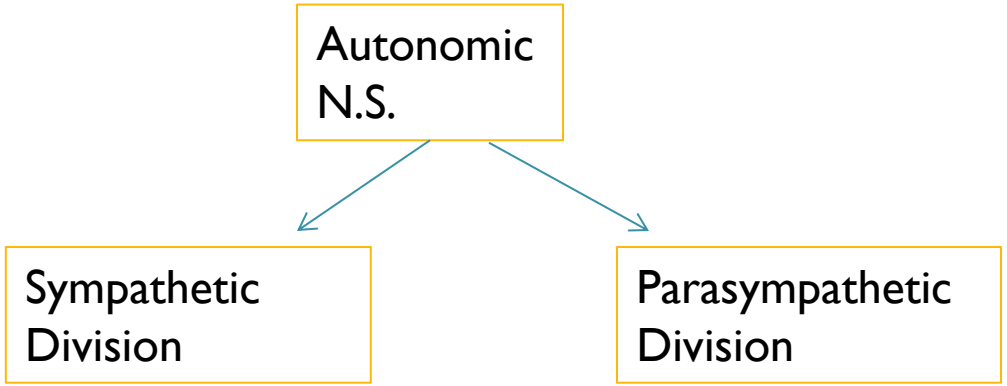
Reflexes *self-protective movements



- Involuntary, automatic response to changes outside or within body
- Reflex arc- 2 or 3 neurons only
- Knee-jerk reflex p. 221
- Withdrawal reflex p.222

Autonomic Nervous System

- Control body's internal conditions by controlling smooth muscle (also cardiac & glands)
- Operates without conscious control
- Main function is control of respiration, heart rate & homeostasis (BP, body temp, etc)



SYMPATHETIC DIVISION	PARASYMPATHETIC DIVISION
• "Fight or Flight" response • Shunts blood from one part of body to another • Activated by conditions of physical or emotional stress	• "Rest-repose" Response • Controls internal environment, ordinarily • Routine conditions
4 min. video Play-by-play	• *Induces body to conserve energy* • *Restores body after sympathetic response*

Each division can activate some effectors & inhibit others

SYMPATHETIC STIMULATION	PARASYMPATHETIC STIMULATION
HEART RATE- increases	Decreases
BRONCHIOLES-dilates	Constricts
SALIVARY GLAND-decreases	Increases
BLOOD FLOW- more to skeletal, less to digestive	More to digestive organs, less to skeletal muscle
INTESTINES-slows action	Speeds up action
INT. GLAND SECRETION-decreases	Increases

AUTONOMIC DIVISION

Functions of the Cerebral Cortex