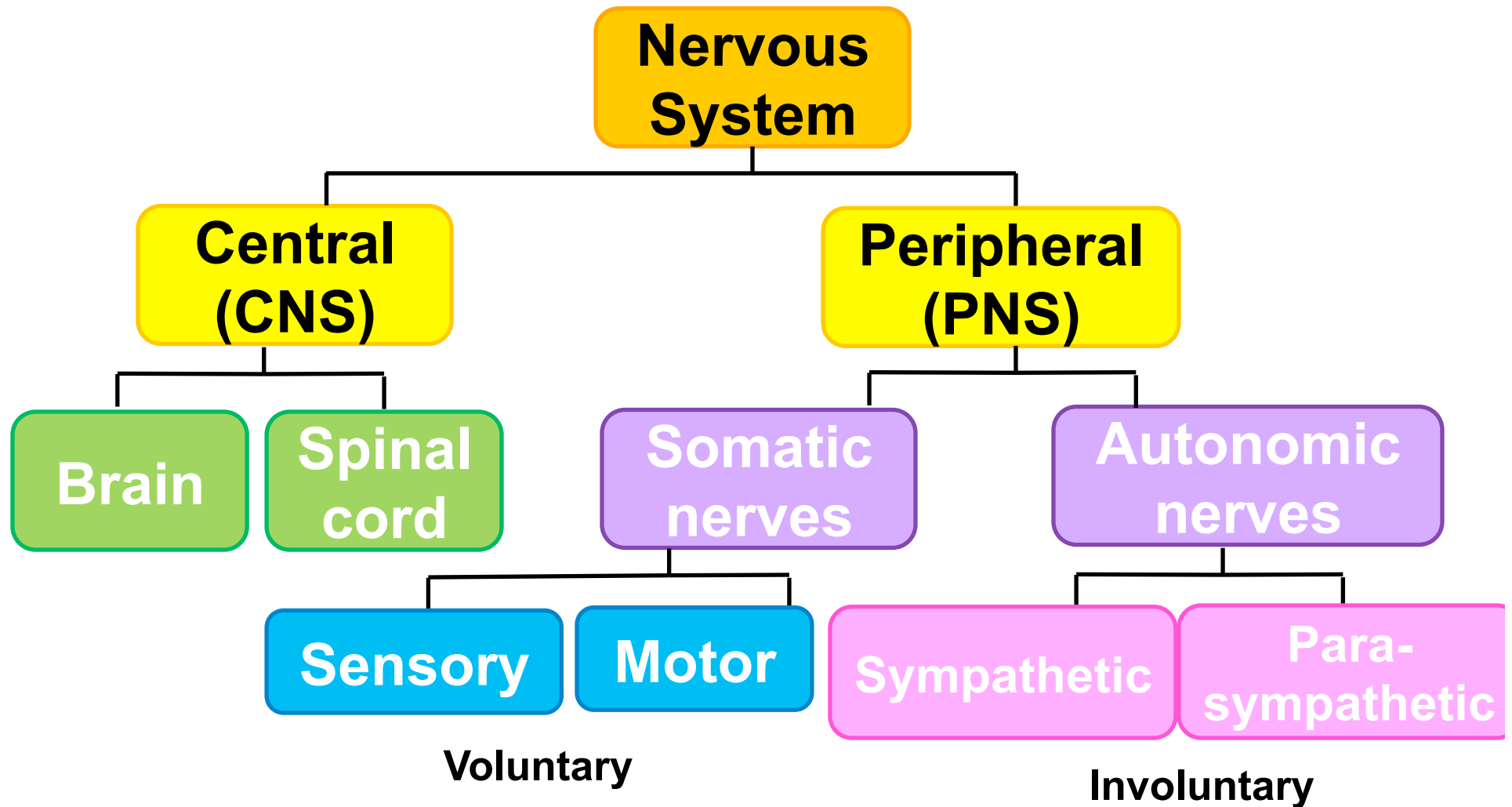
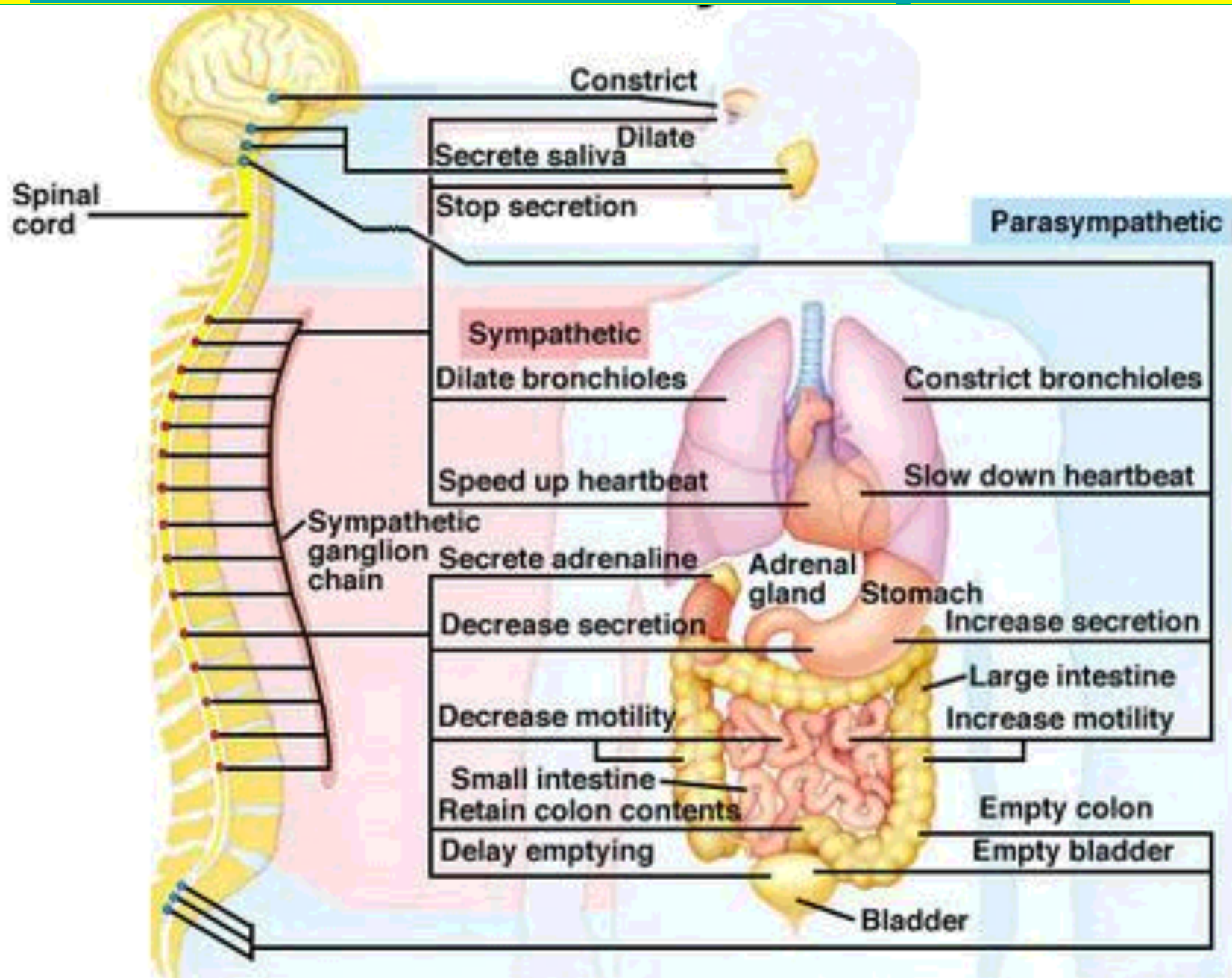


Divisions of the Nervous System



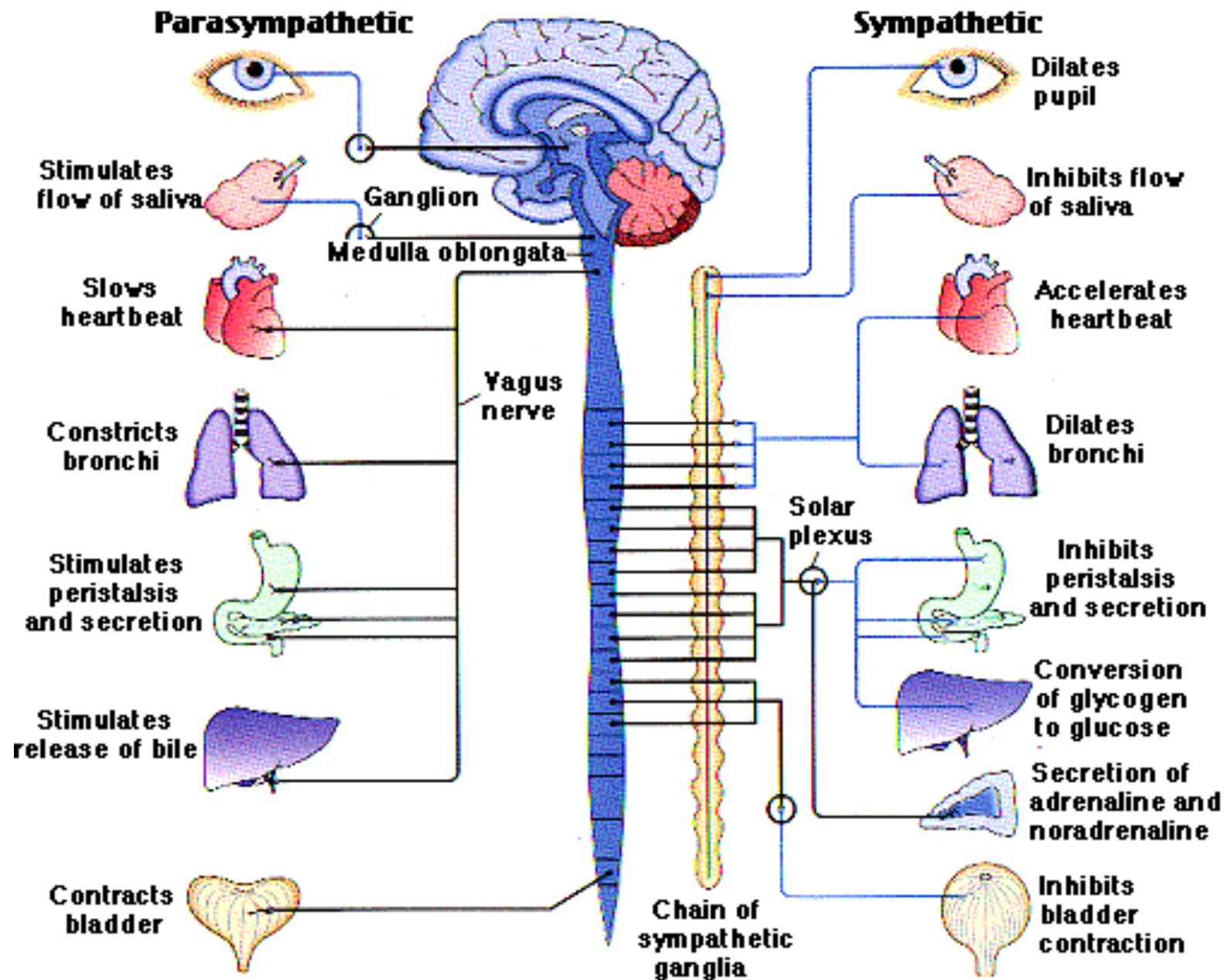
Autonomic Nervous System



The Autonomic Nervous System

- Part of the _____
- Mainly made of _____
- I _____ control
- Important in maintaining homeostasis
 - Ex. Breathing (O_2 and CO_2)
 - Maintaining Blood sugar levels
 - Hormones

Autonomic Nervous System



Divisions of the Autonomic System

Parasympathetic

- Returns the body to normal levels

Sympathetic (Stress)

- Prepares the body for stress (flight-or-fight response)

Parasympathetic	Sympathetic
↓ _____	↑ _____
↑ Peristalsis	↓ Peristalsis
↑ Glucose to glycogen	↑ Glycogen to glucose
_____ pupils	_____ pupils
Contracts sphincter	Relaxes sphincter (bladder)
↑ Blood flow to skin	↓ Blood flow to skin

These 2 systems balance each other out!

HOW DID I DO IT? I DUNNO, I GUESS THE
FIGHT-OR-FLIGHT MECHANISM KICKED IN AND,
WELL... IN CASE YOU HAVEN'T HEARD, BOB, I'M
A PENGUIN... WE DON'T FLY.

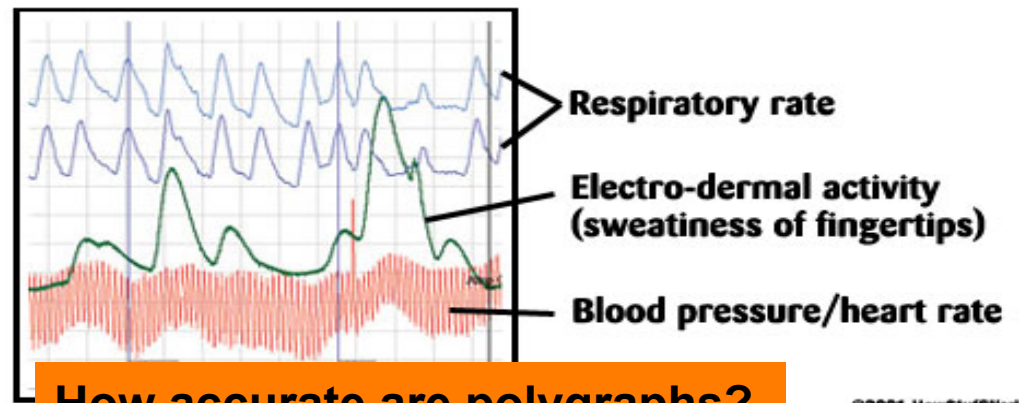
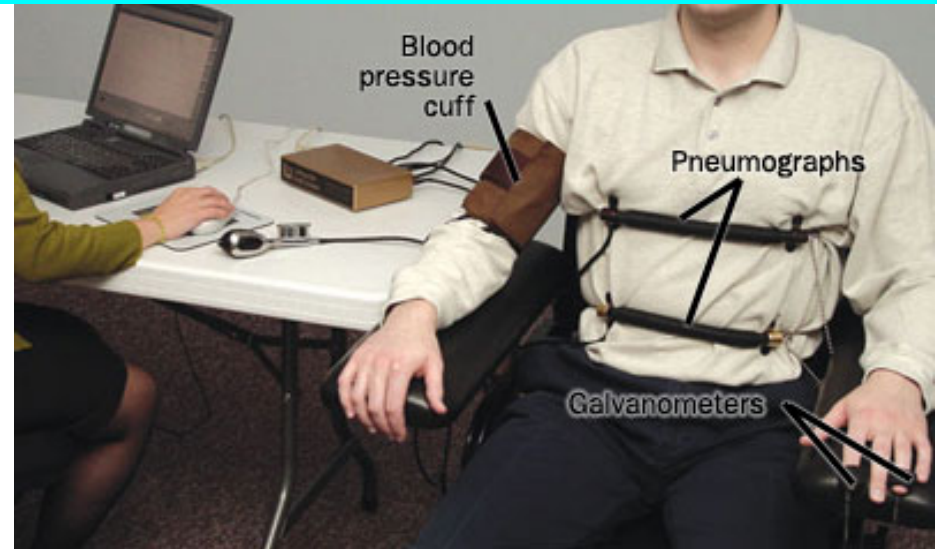


Lie Detector



How do lie detectors work?

- **Polygraph**
- Monitors changes in the sympathetic system
- Monitors changes in perspiration (sweating)
- Why? Sweat contains salt = \uparrow in current flow
- It also monitors breathing and pulse rate



How accurate are polygraphs?

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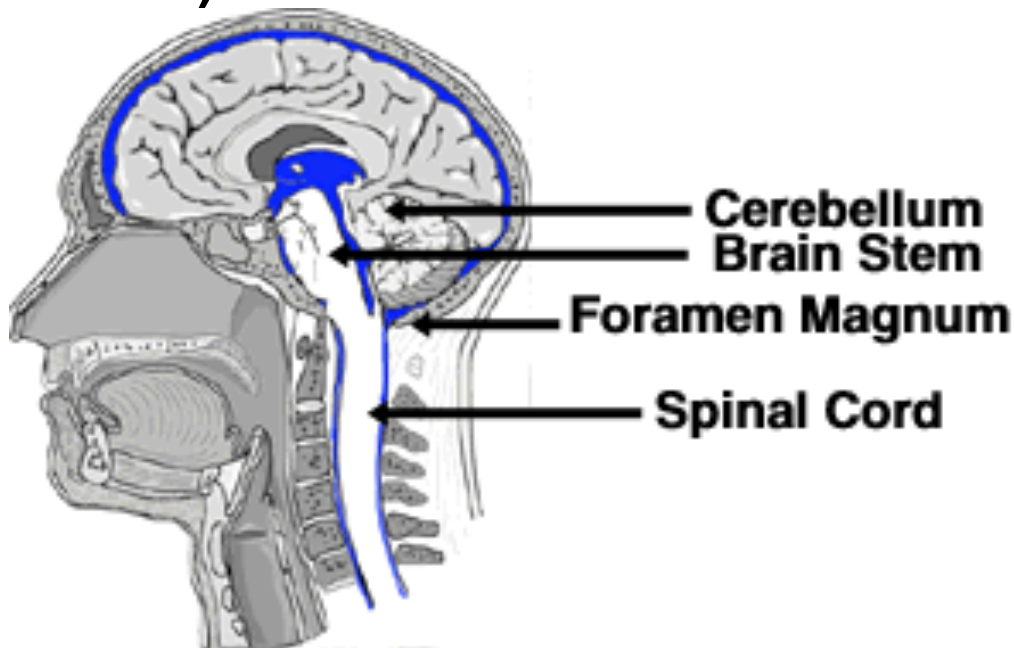
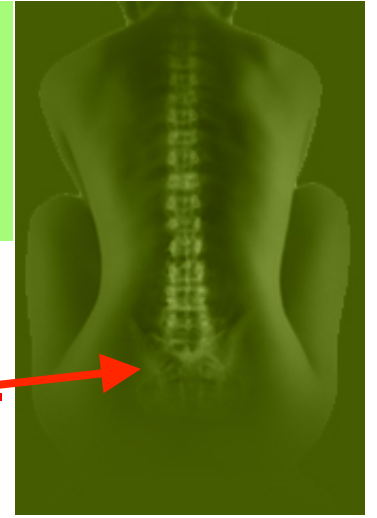
70 – 87.5 % accurate

The Spinal Cord



Spinal Cord and the brain

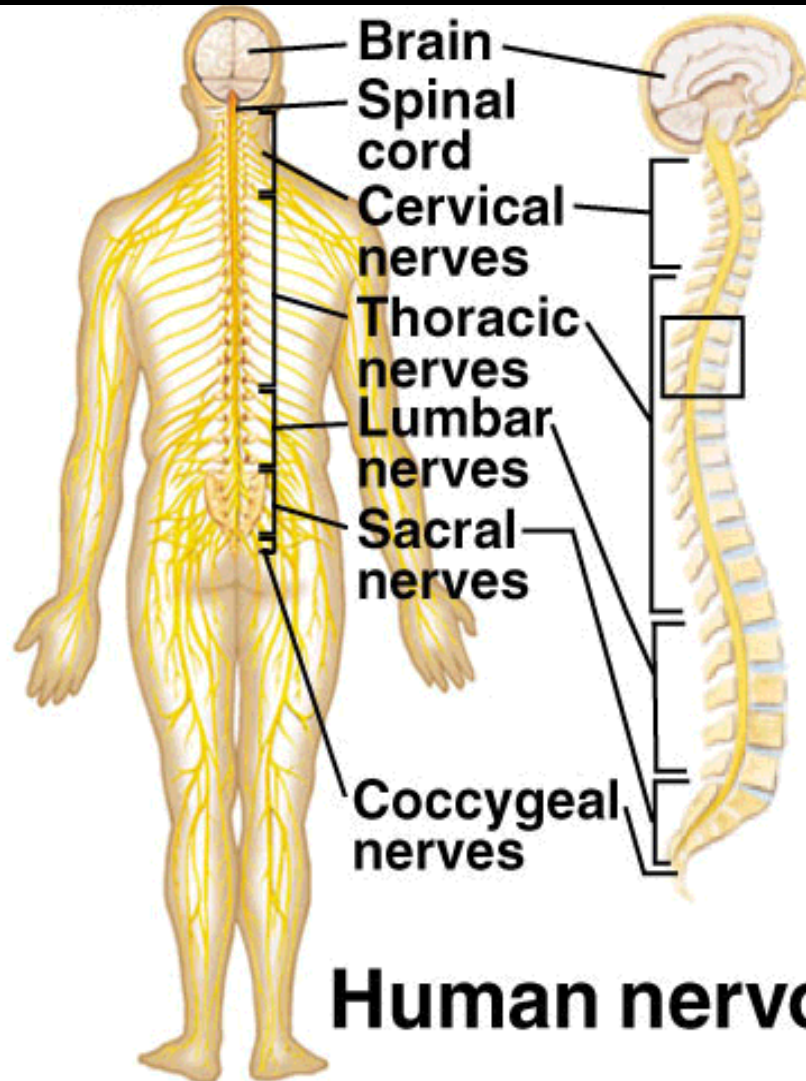
- Runs from the base of the _____ into the brain through the _____ (hole in the bottom of the skull)



Foramen magnum = hole

Functions

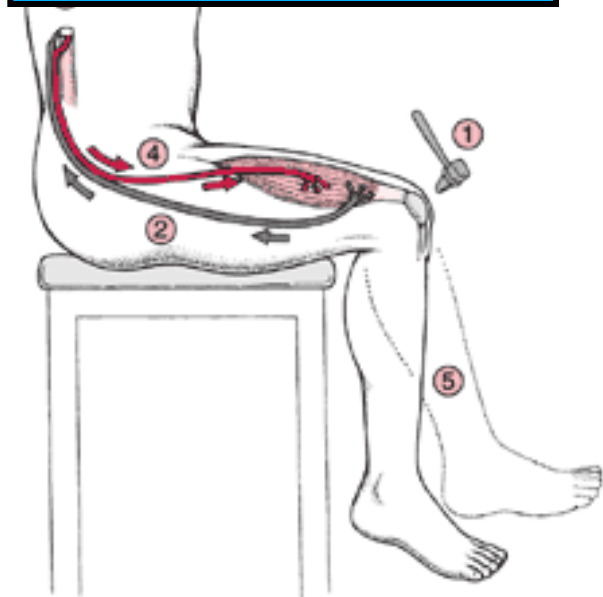
1. Connects the brain and the PNS



A

Human nervous system

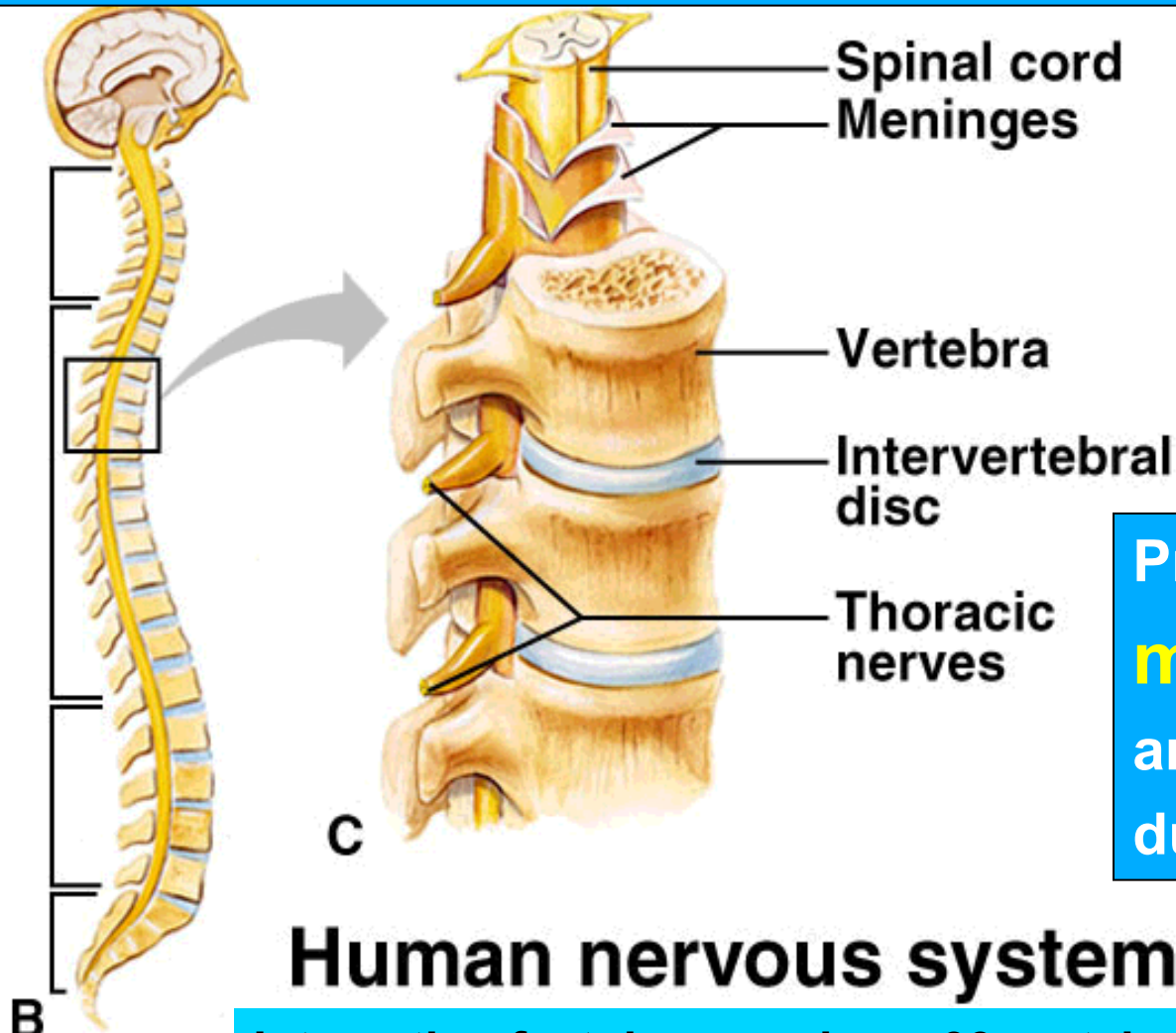
2. Reflex arc



B

Location

Inside the **vertebral** column (bone = **protection**)



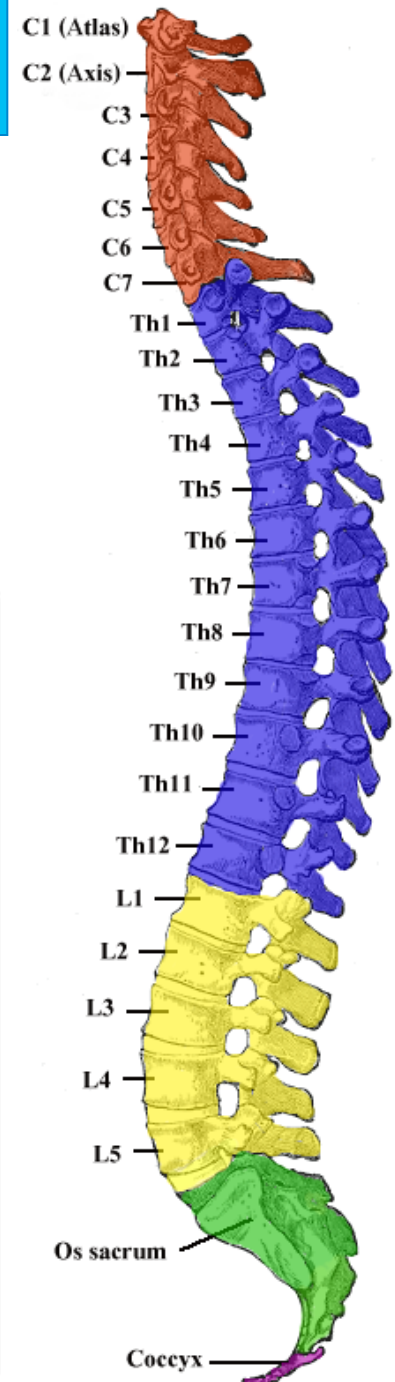
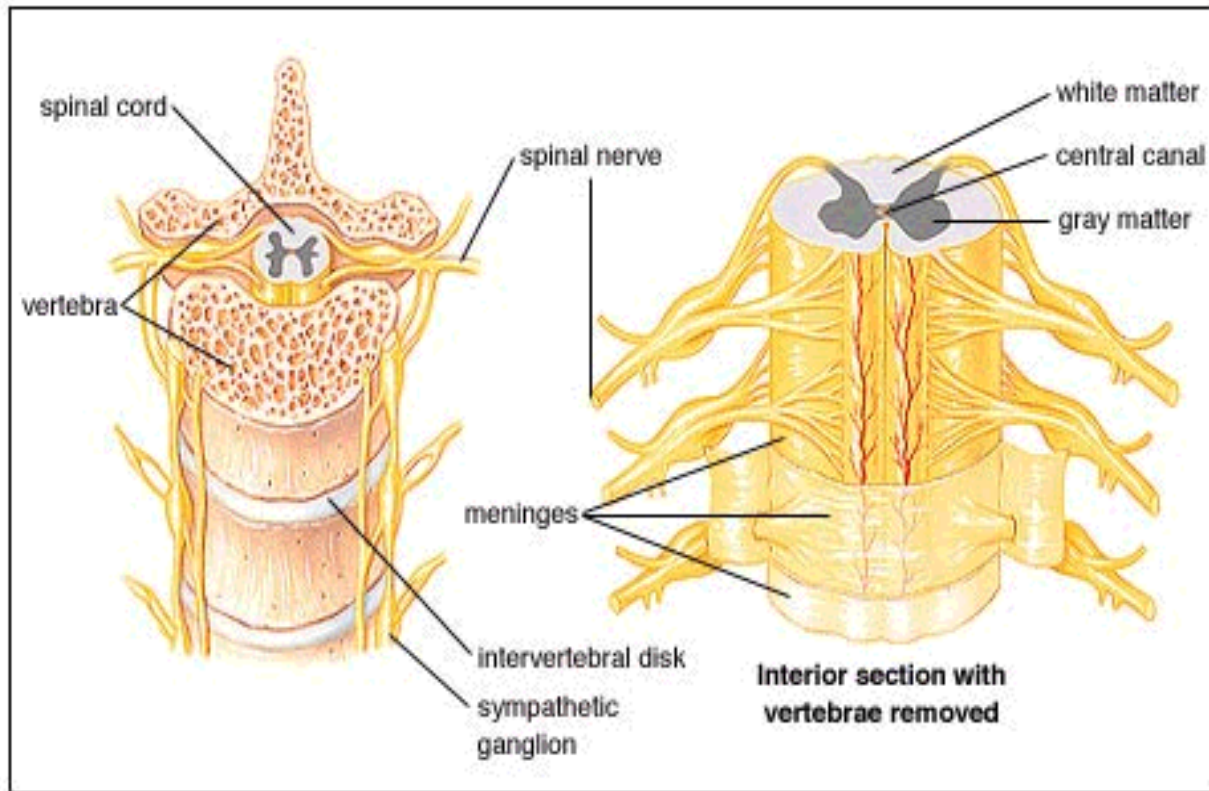
Protected by the **meninges** (pia mater, arachnoid and dura mater)

Human nervous system

Interesting fact: humans have 33 vertebrae

How big is the spinal cord?

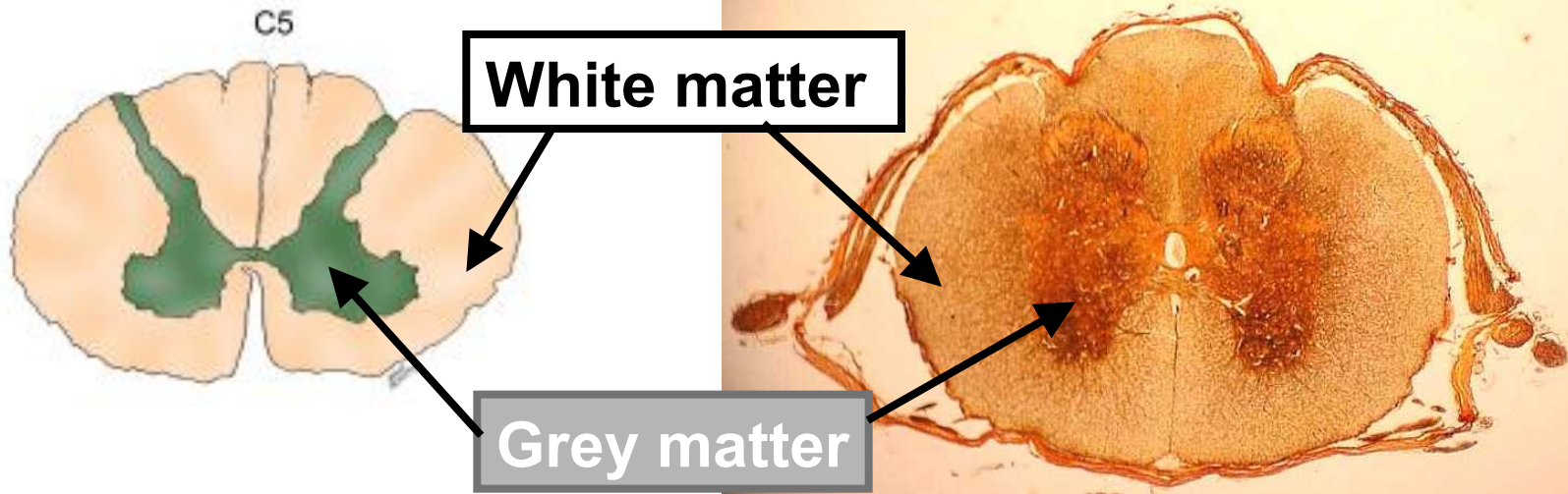
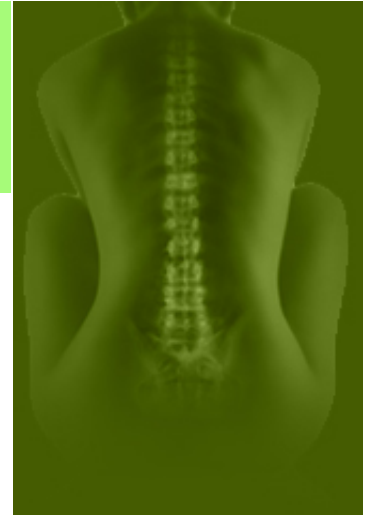
The length of the spinal cord is about **45 cm** in men and **43 cm** in women. The spinal cord has a varying width, ranging from 13 mm ($\frac{1}{2}$ in) thick in the cervical and lumbar regions to 6.4 mm ($\frac{1}{4}$ in) thick in the thoracic area.



White and Grey matter

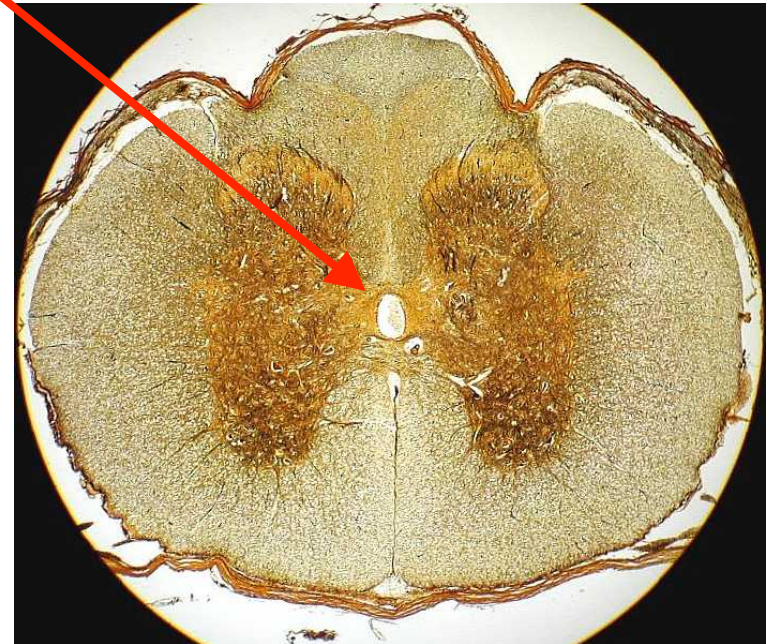
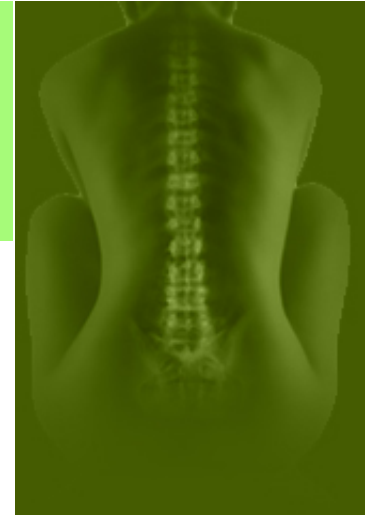
The spinal cord contains 2 types of tissue:

- White matter = outer portion
 - _____
- Grey matter = H-shaped center portion
 - _____



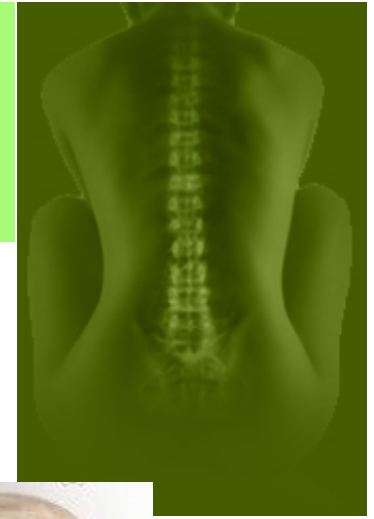
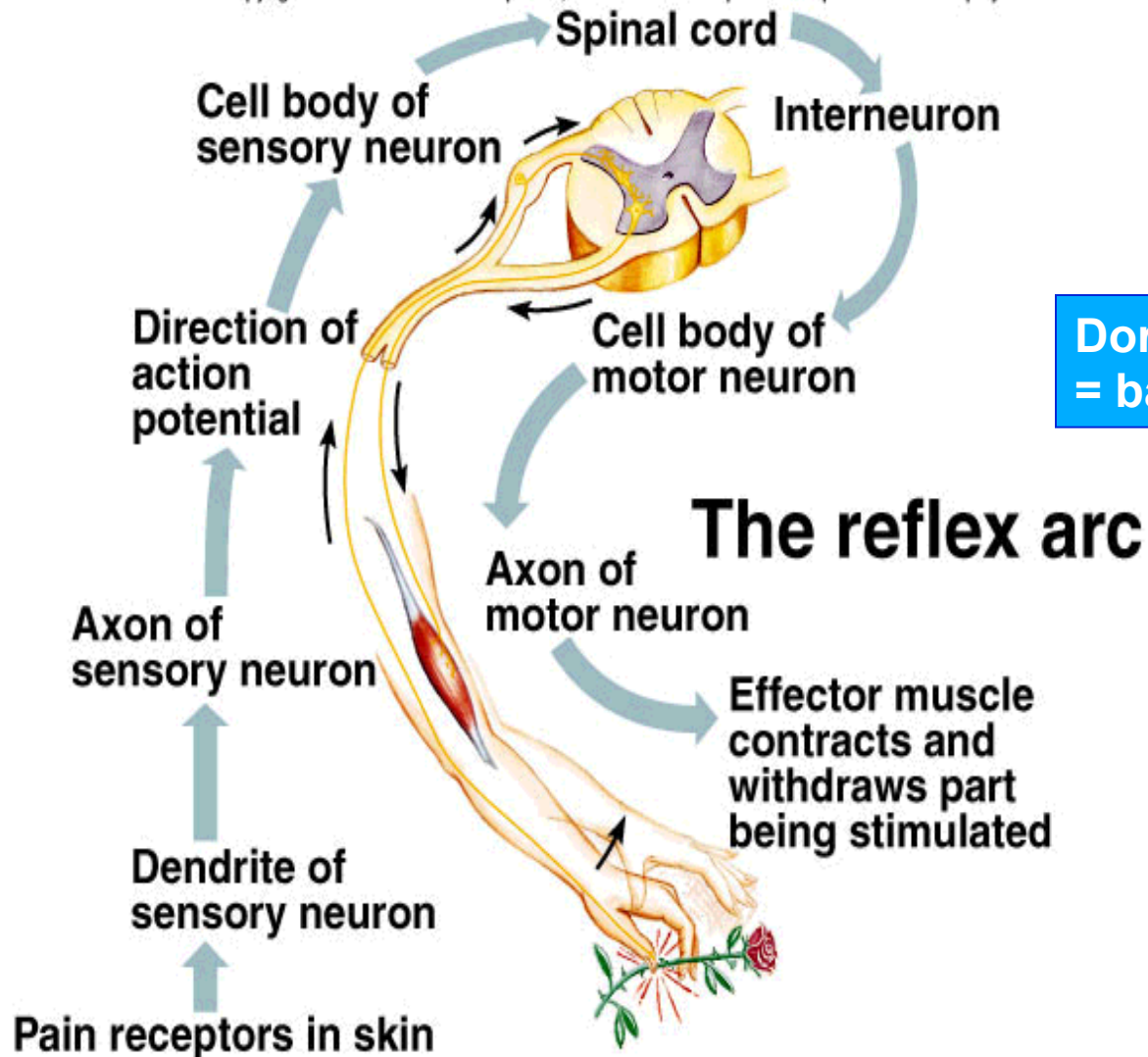
Did you notice the small hole?

- The small hole is called the **cerebrospinal canal** or **central canal**
- Filled with _____
- It _____ and transports _____
- Sample may be taken from central canal to diagnose bacterial/viral infections



The Reflex Arc

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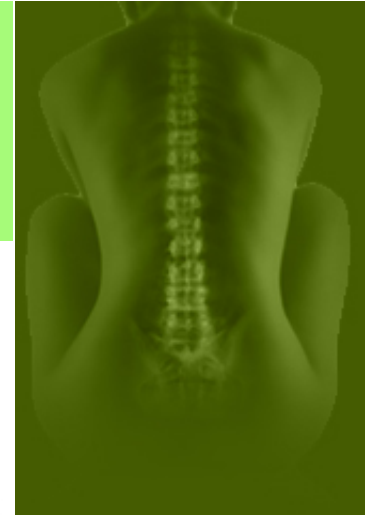


**Dorsal
= back**

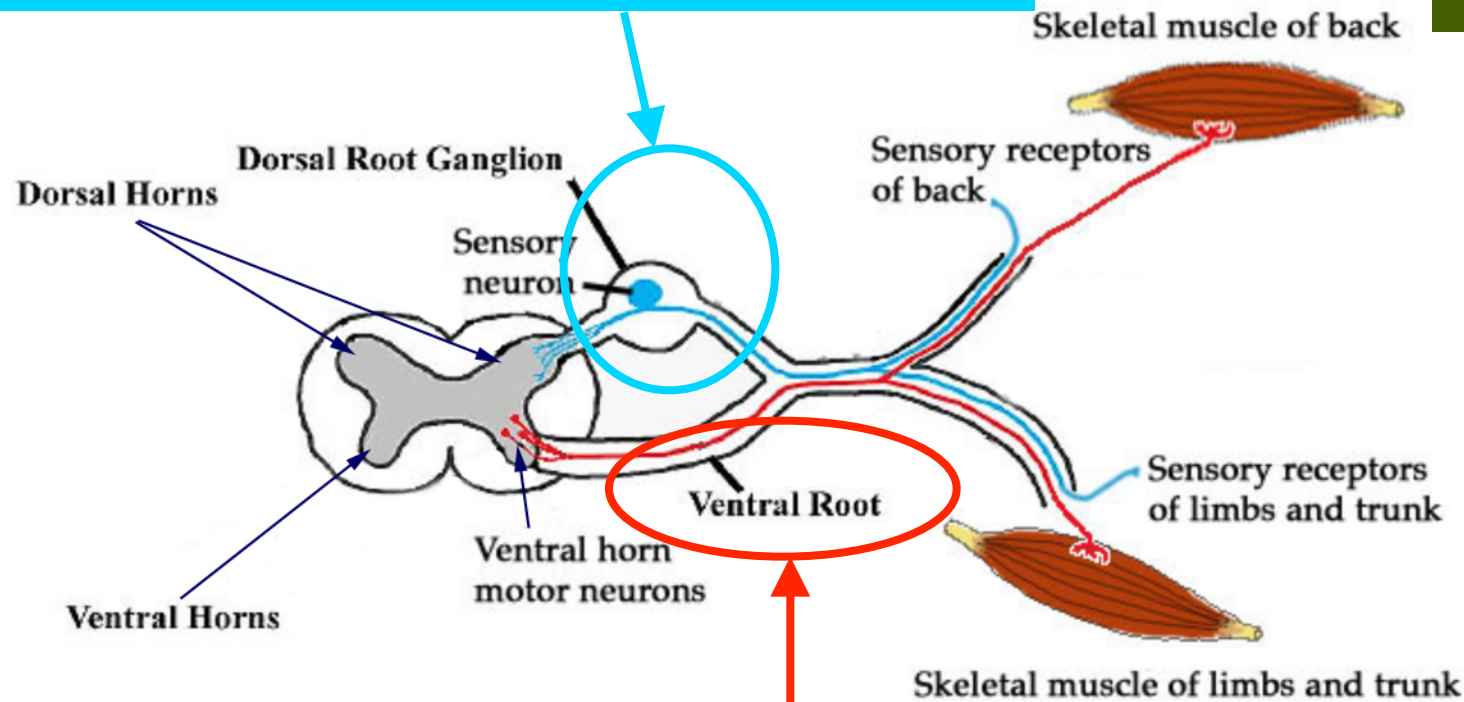
**Ventral
= front**



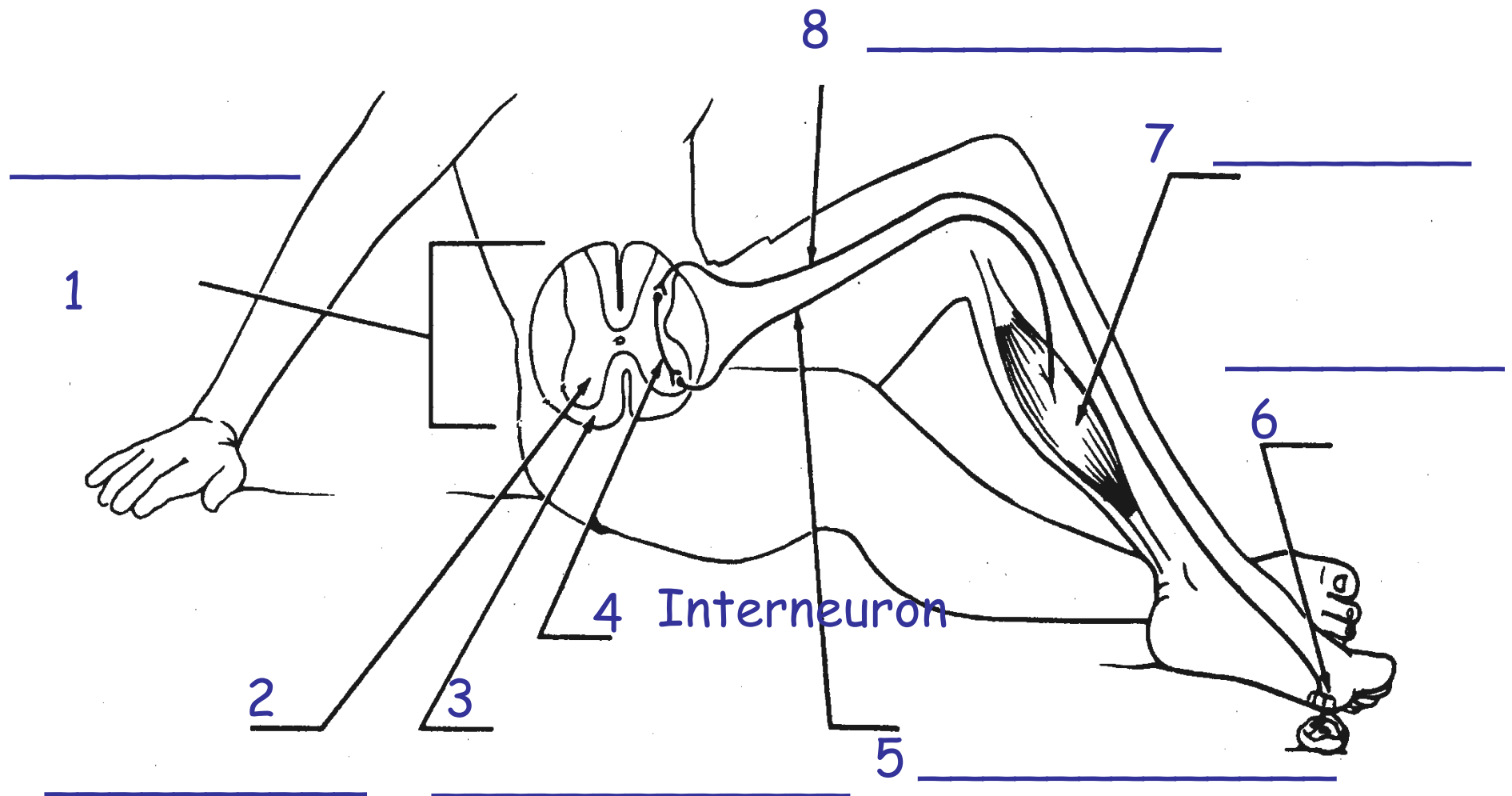
Dorsal and Ventral Roots



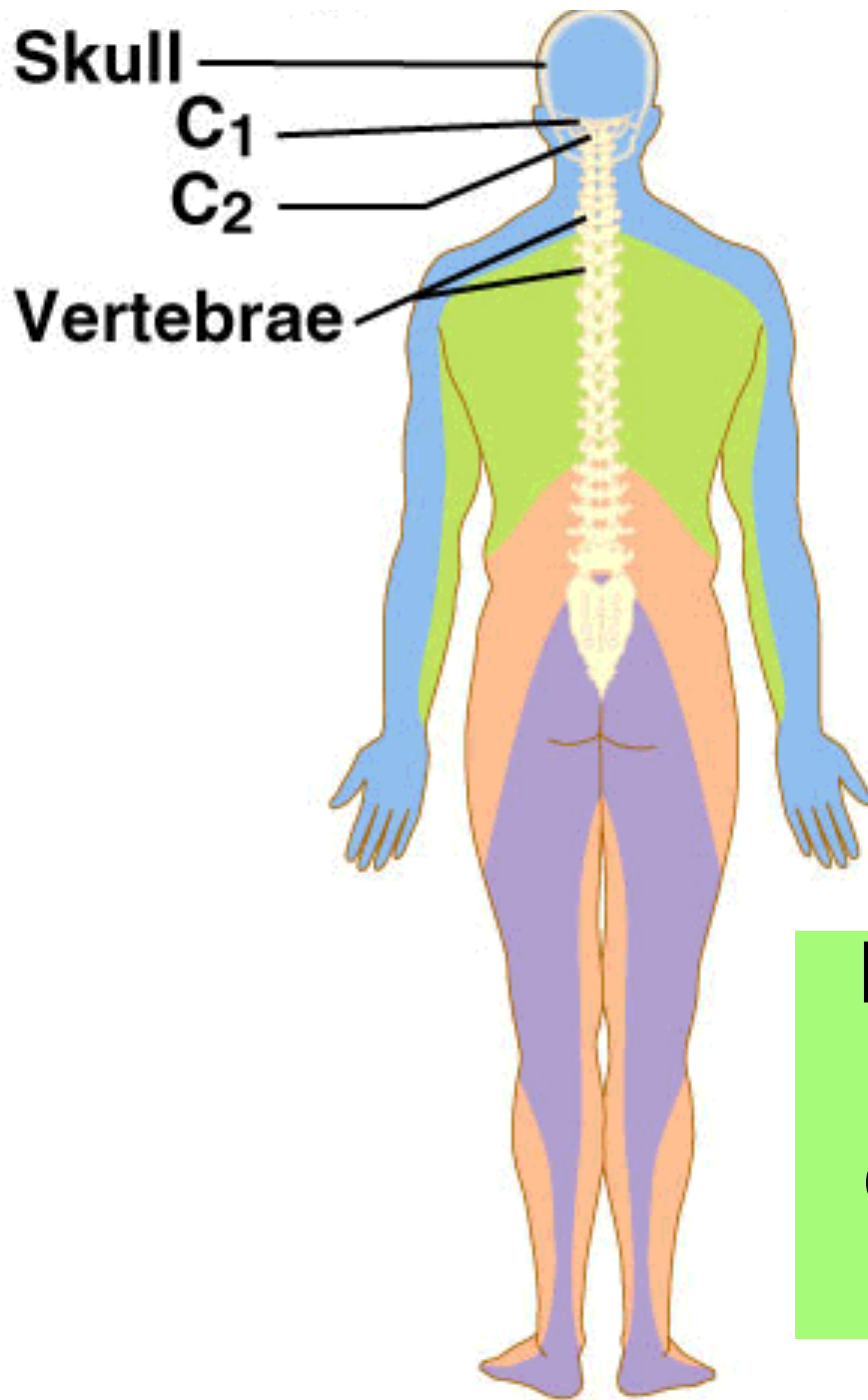
Dorsal root ()
carries _____ neurons



Ventral root ()
carries _____ neurons



**Label the components of the
reflex arc**

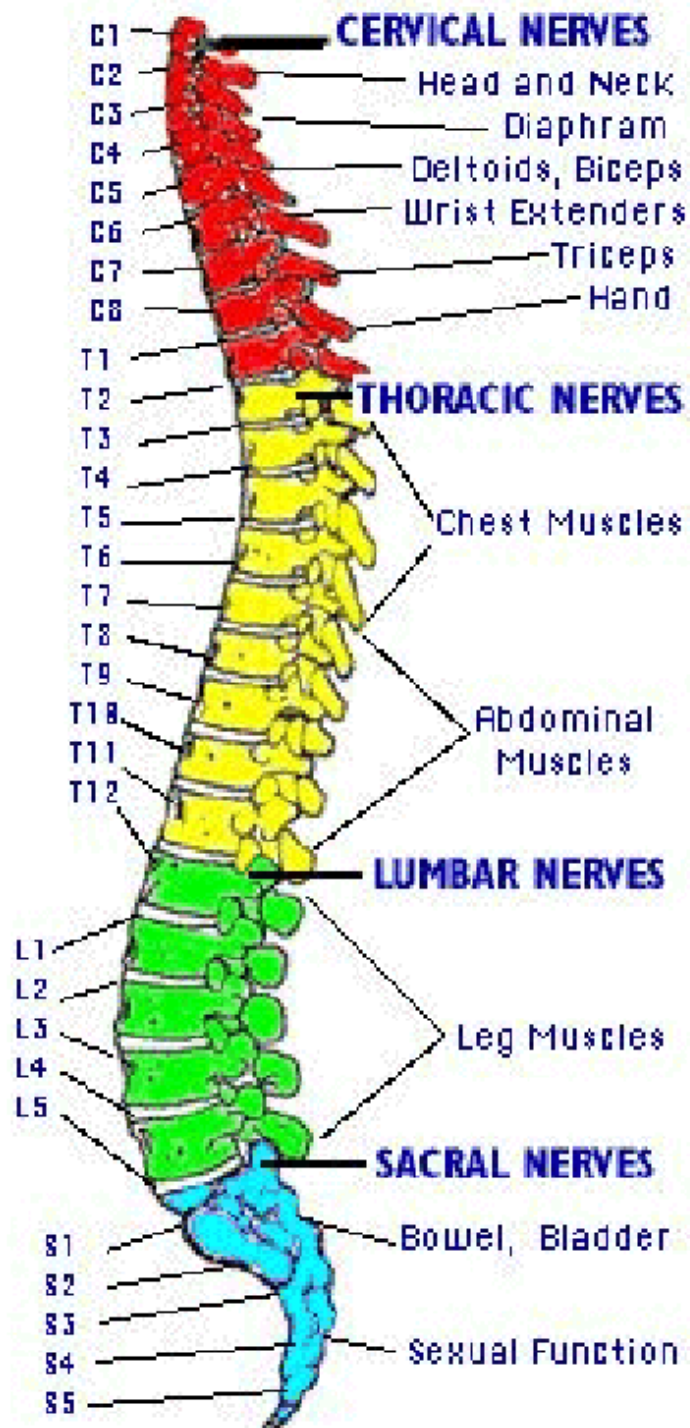


- Cervical nerves**
Control: Head, neck, diaphragm, and arms
- Thoracic nerves**
Control: Chest and abdominal muscles
- Lumbar nerves**
Control: Leg muscles
- Sacral nerves**
Control: Bladder, bowel, sexual function, and feet

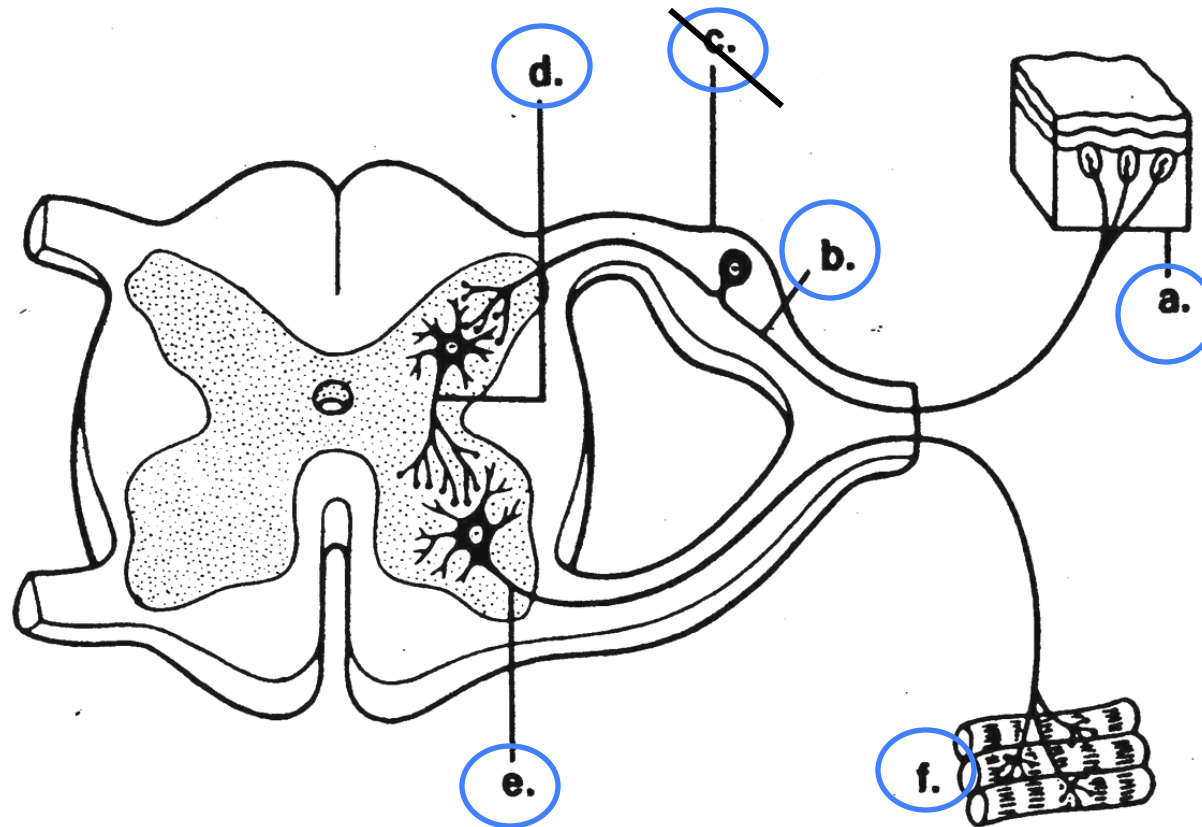
Different parts of the spinal cord control different parts of the body

Different parts of the spinal cord control different parts of the body

This info is used a lot by chiropractors & physiotherapists.



Label the Diagram



a. Receptor
b. Sensory Neuron
d. Interneuron

e. Motor Neuron
f. Effector (muscle)