

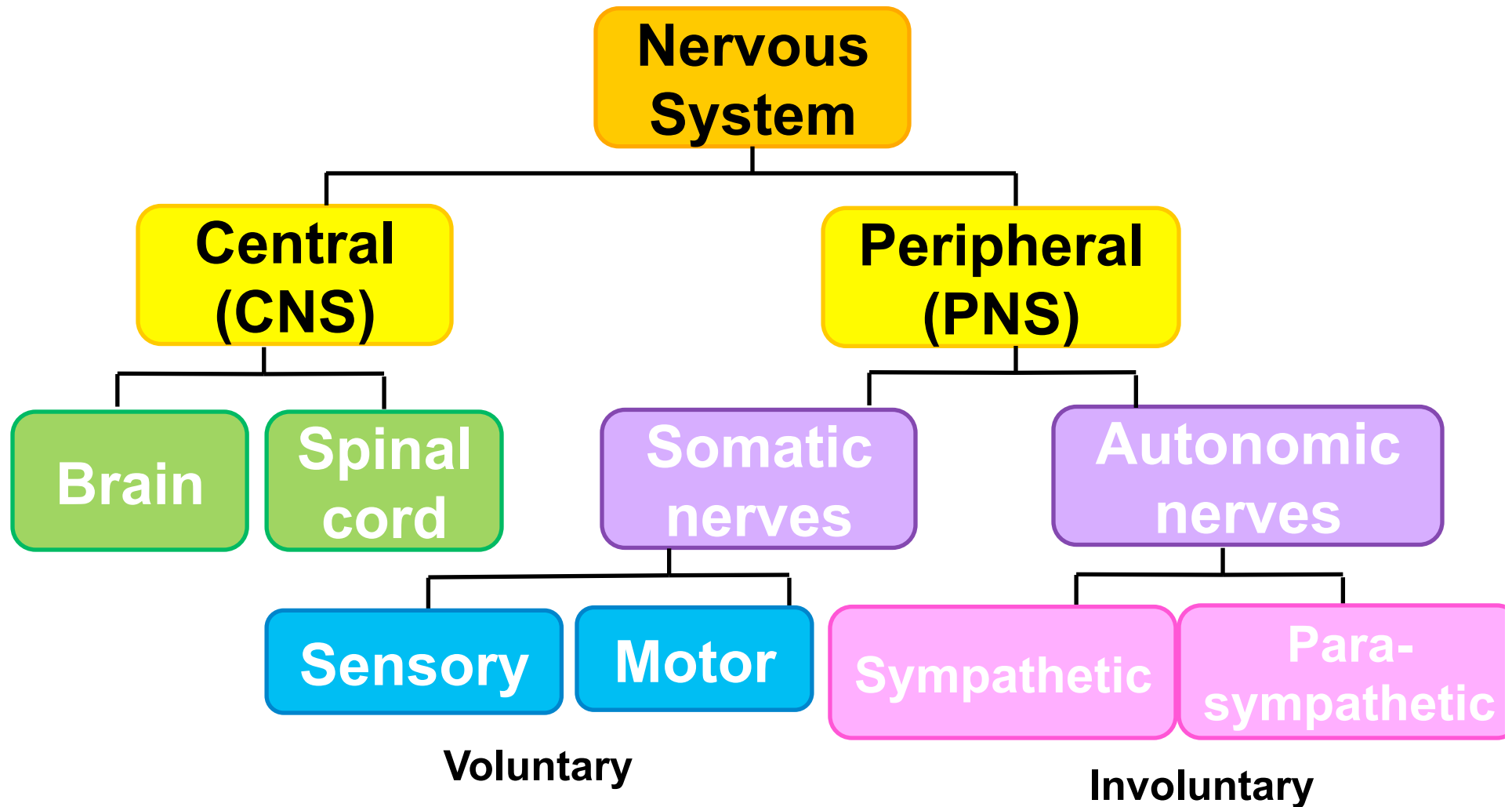
Hmm...Do you see the face?



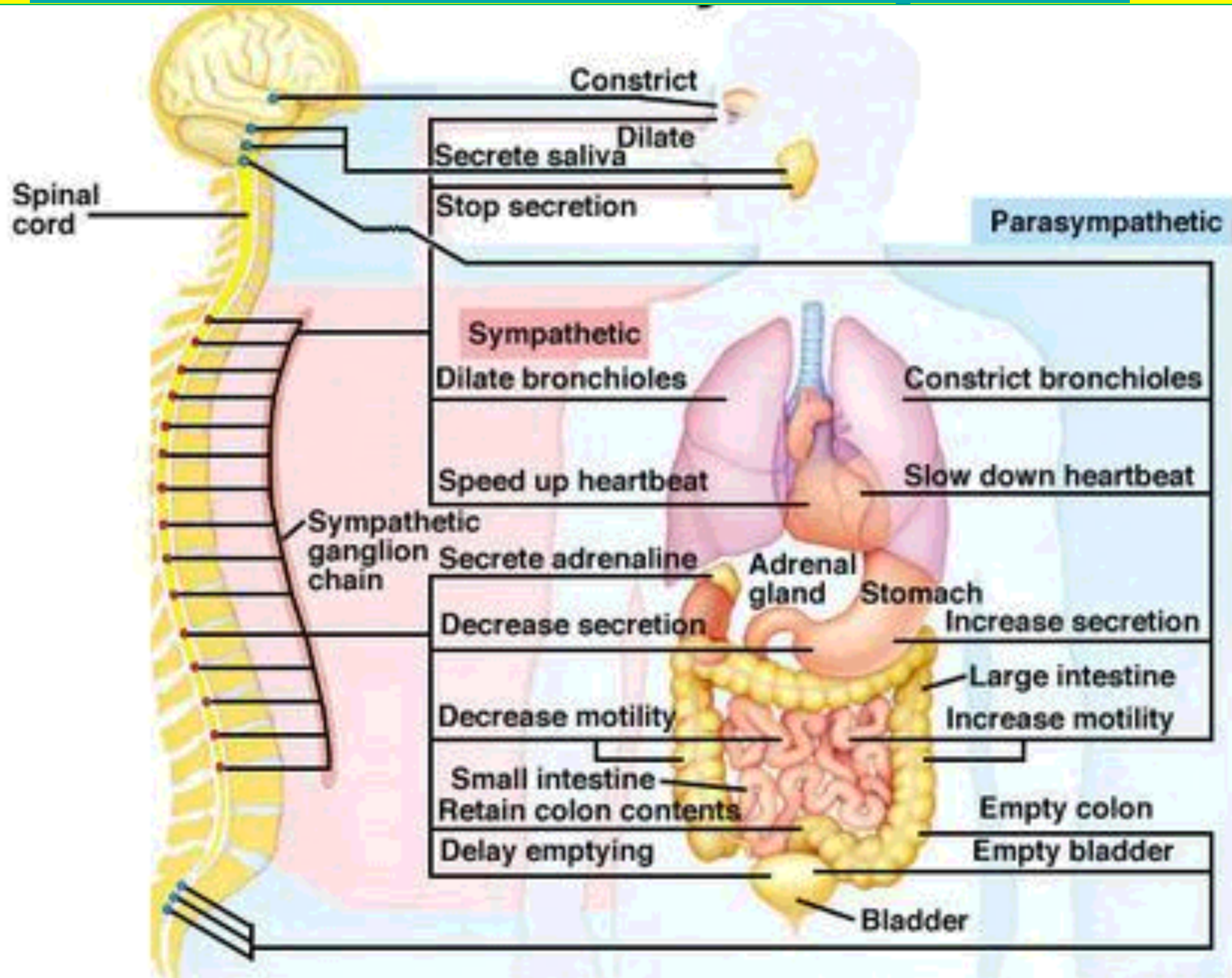
Subliminal messages in today's culture?
[Click the link to find out!](#)

[Also, this link!](#)

Divisions of the Nervous System



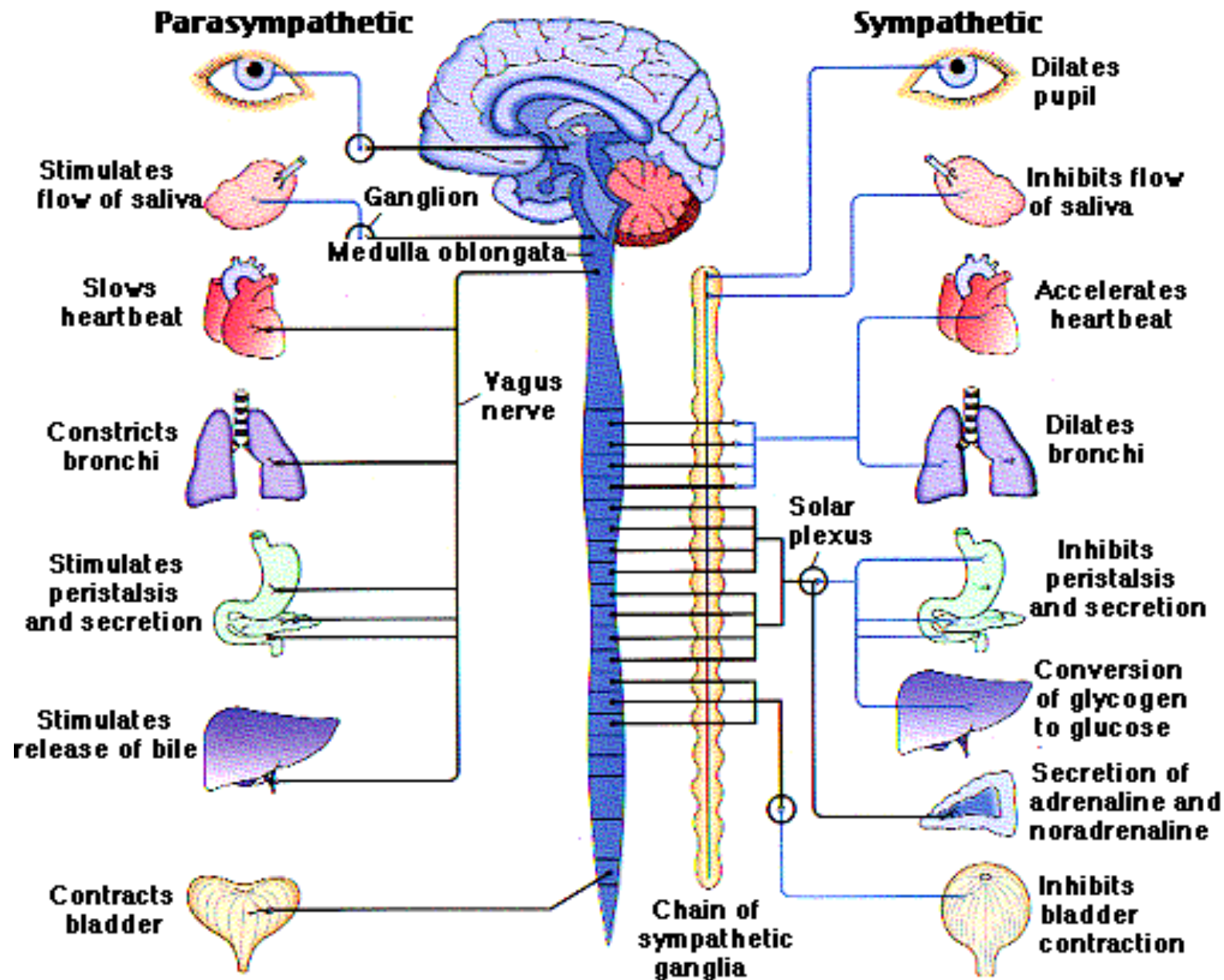
Autonomic Nervous System



The Autonomic Nervous System

- **Part of the peripheral nervous system**
- **Mainly made of motor nerves**
- **Involuntary 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)

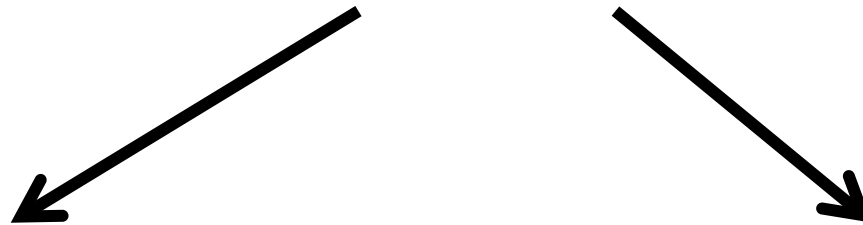
- Prepares the body for stress (flight-or-fight response)

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

These 2 systems balance each other out!

CRASH COURSE

Autonomic Nervous System: Crash Course



PARASYMPATHETIC Nervous System: Crash Course

SYMPATHETIC Nervous System: Crash Course

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.

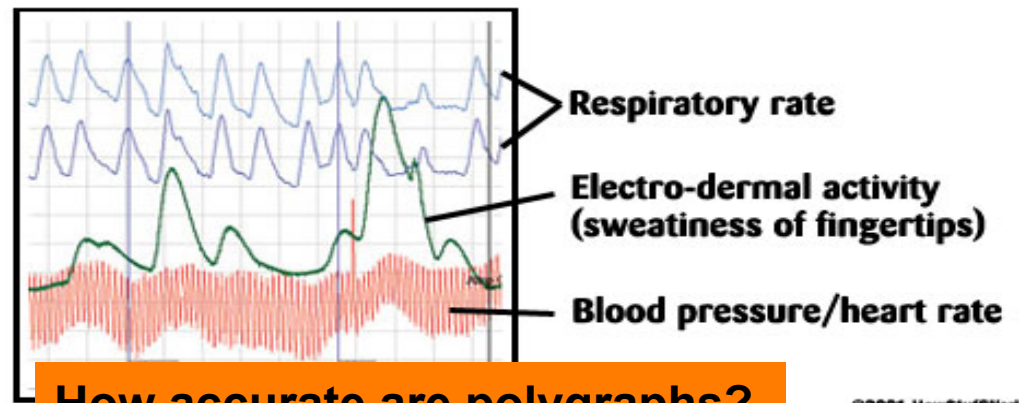
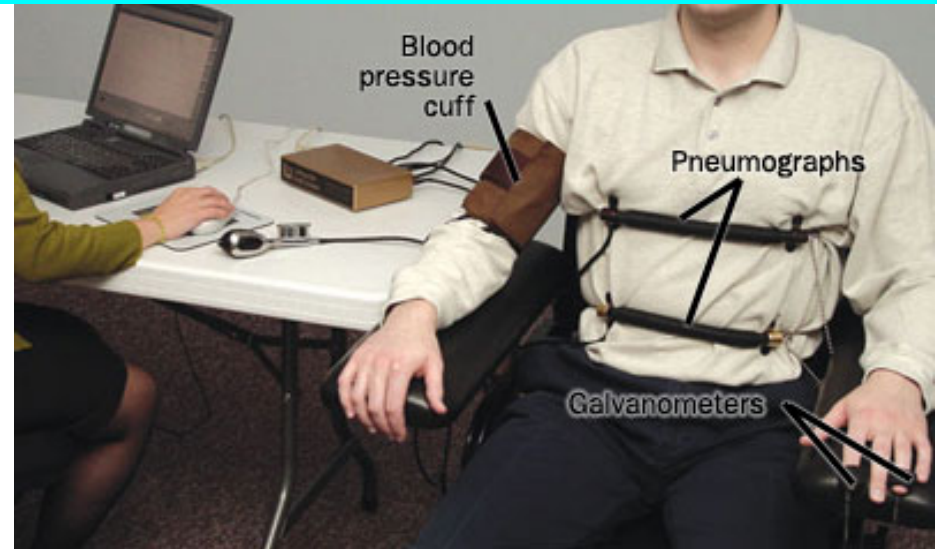


Lie Detector



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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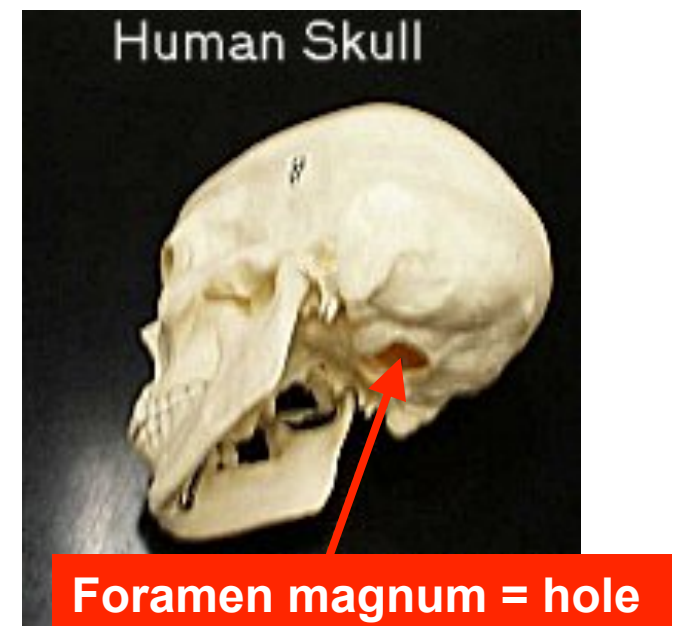
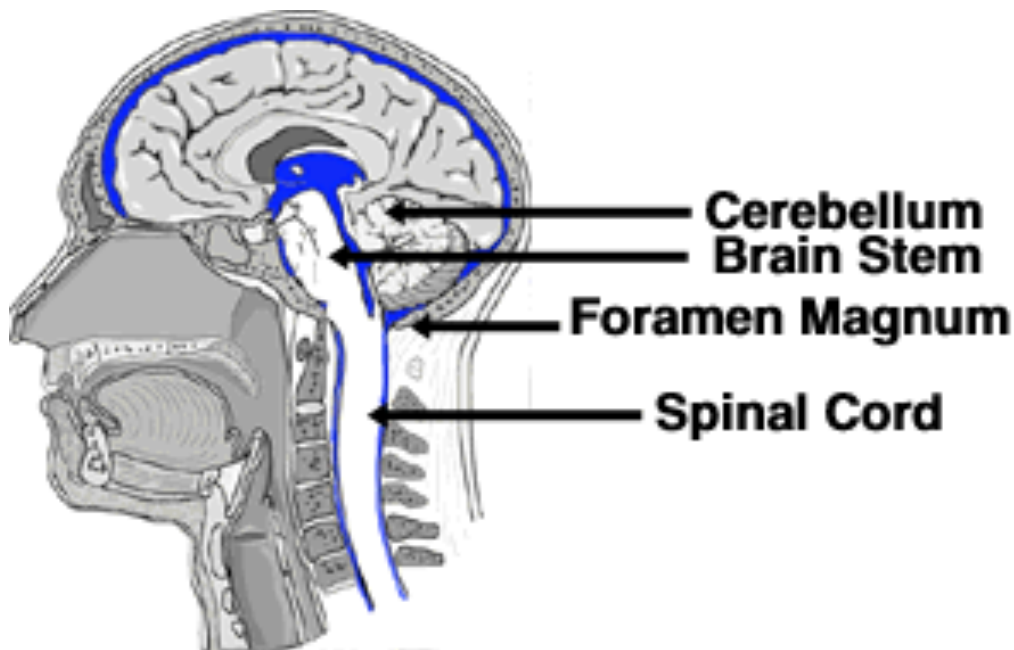
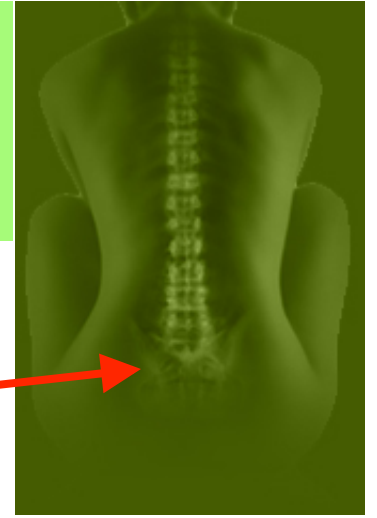
70 – 87.5 % accurate

The Spinal Cord



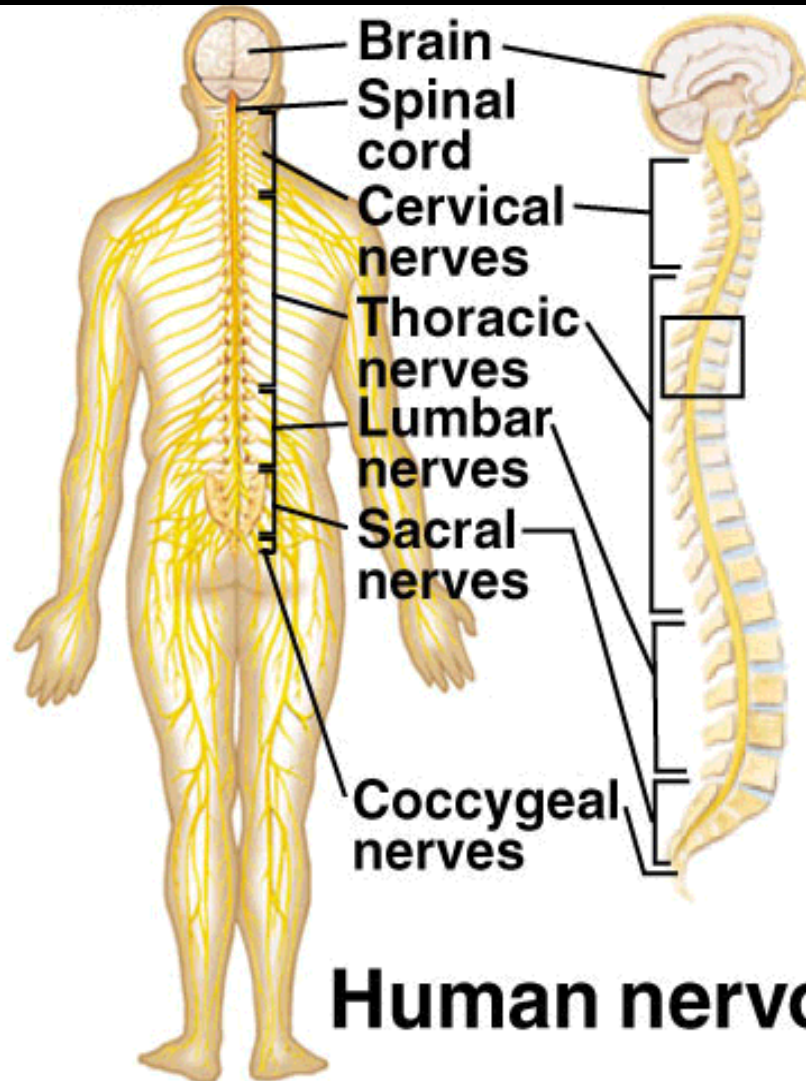
Spinal Cord and the brain

- Runs from the base of the **sacrum** into the brain through the **foramen magnum** (hole in the bottom of the skull)



Functions

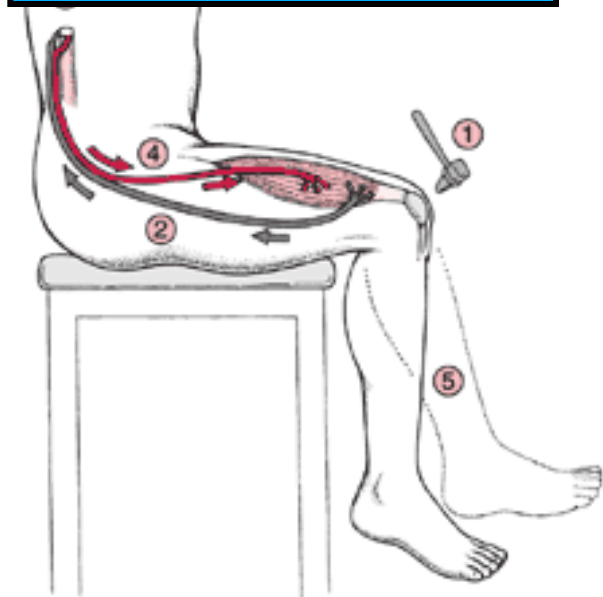
1. Connects the brain and the PNS



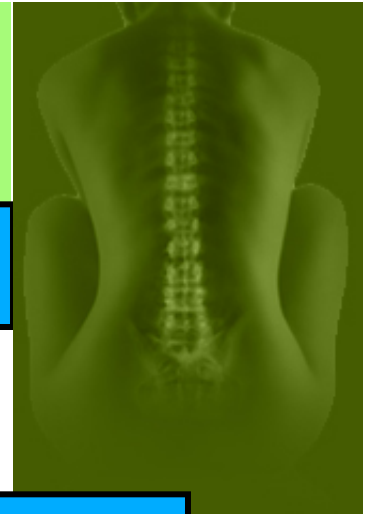
A

Human nervous system

2. Reflex arc

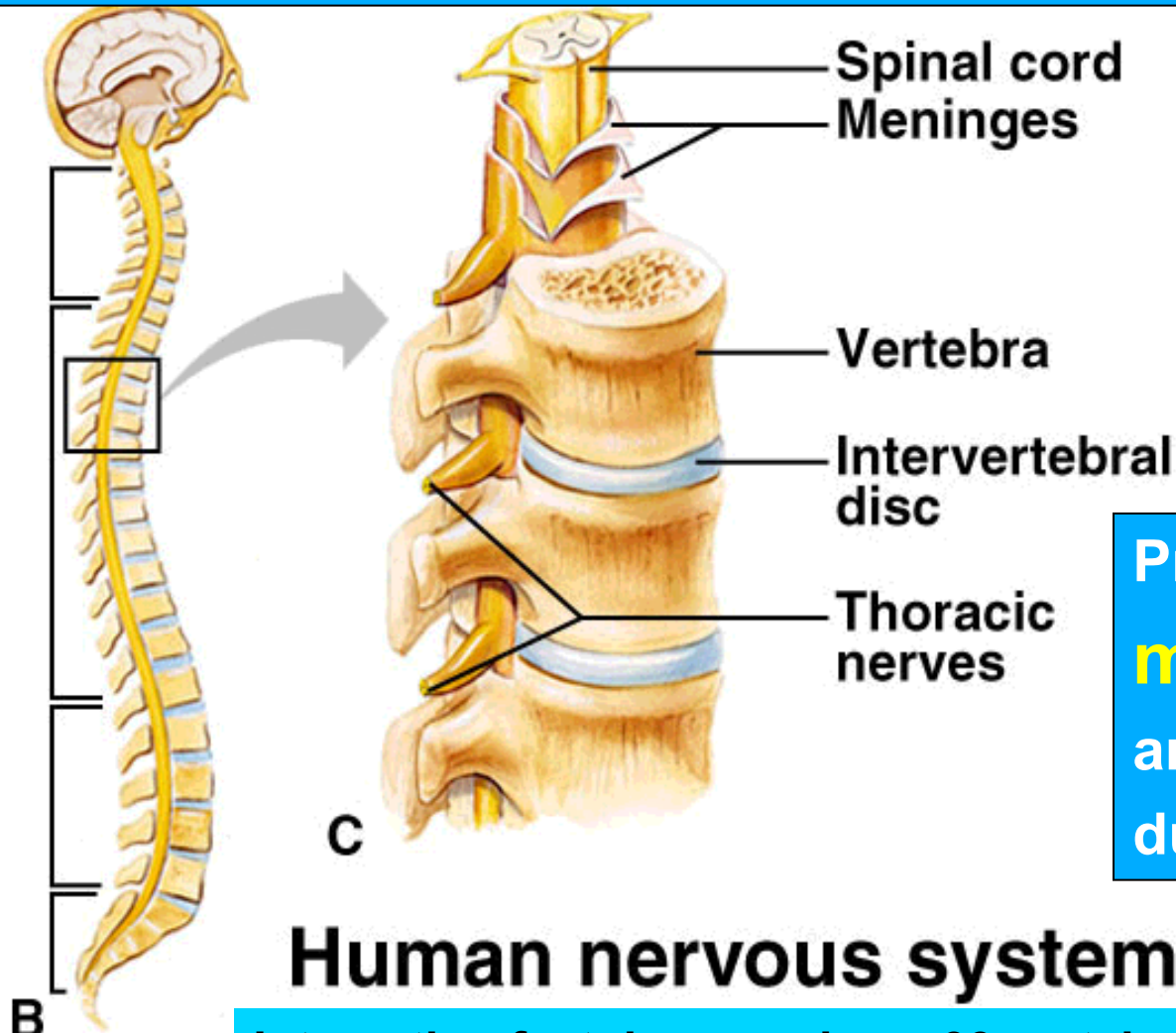


B



Location

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



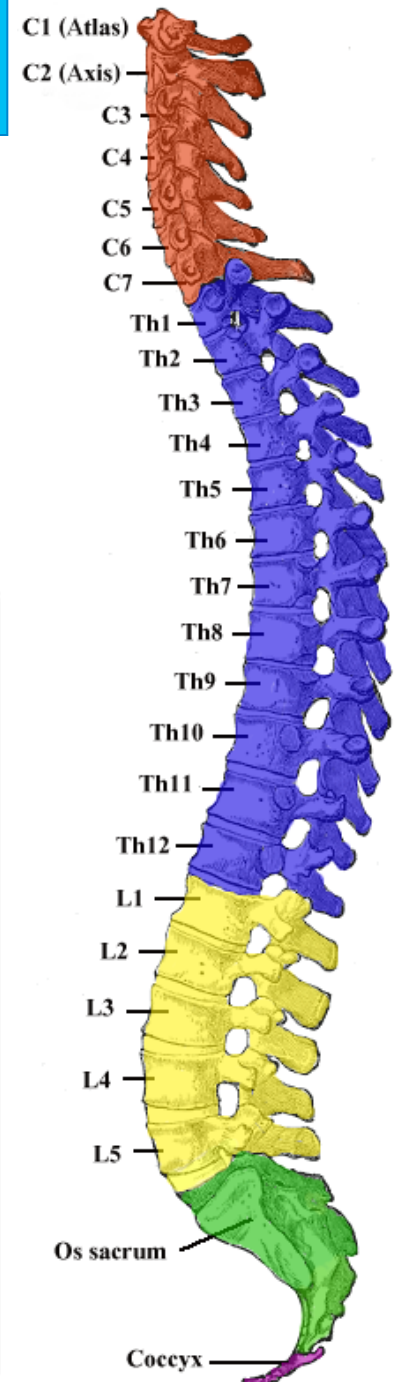
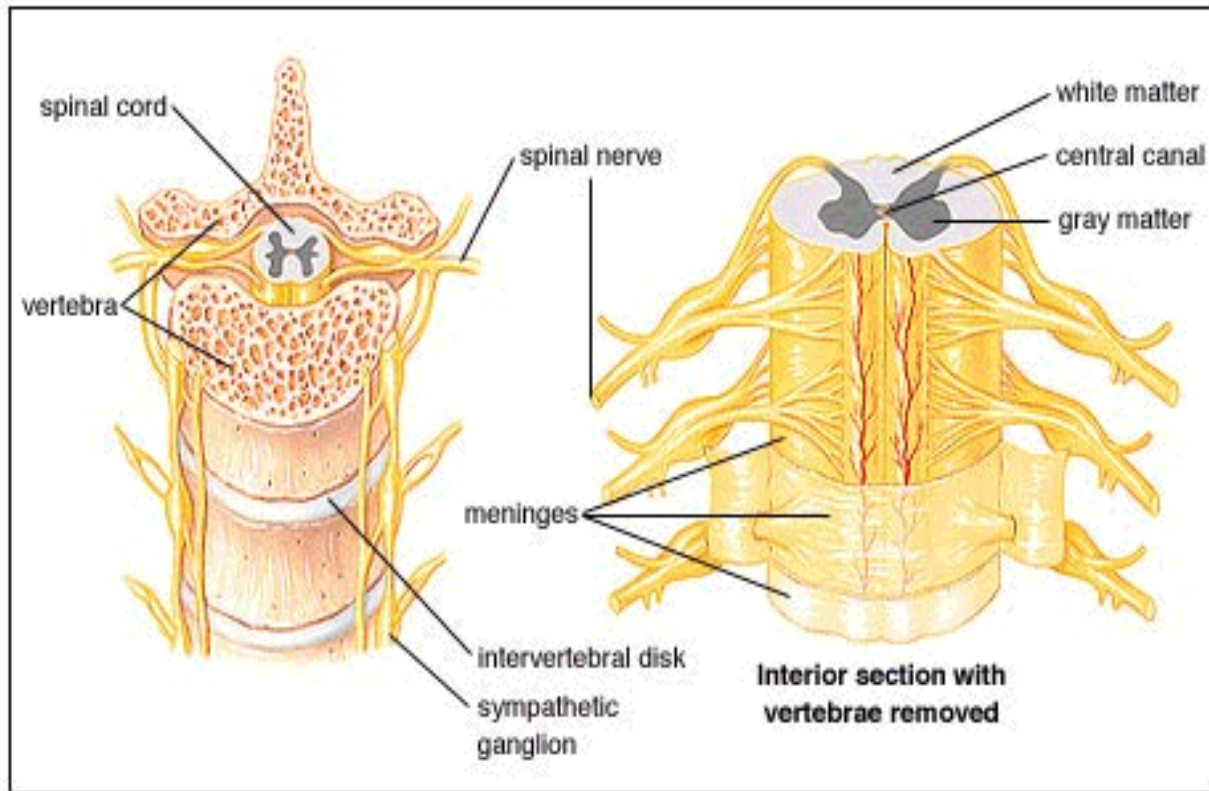
Protected by the **meninges** (pia mater, arachnoid and dura mater)

Human nervous system

Interesting fact: humans have 33 vertebrae

How big is the spinal cord?

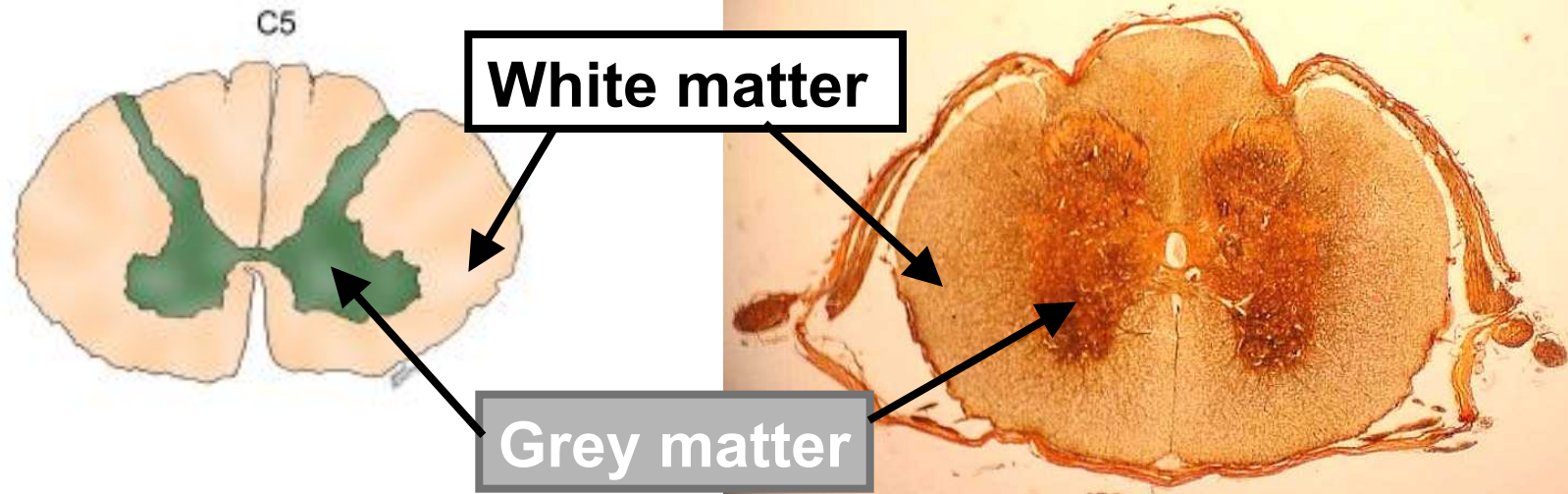
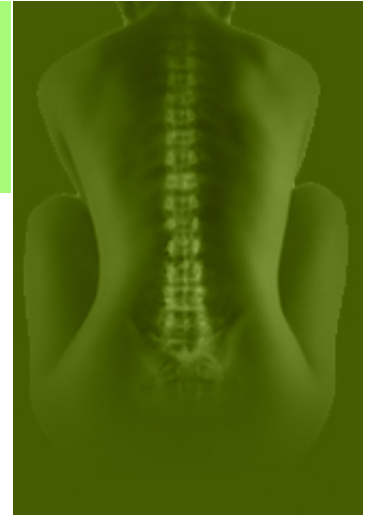
The length of the spinal cord is about **45 cm** in men and **43 cm** in women. The spinal cord has a varying width, ranging from 13 mm ($\frac{1}{2}$ in) thick in the cervical and lumbar regions to 6.4 mm ($\frac{1}{4}$ in) thick in the thoracic area.



White and Grey matter

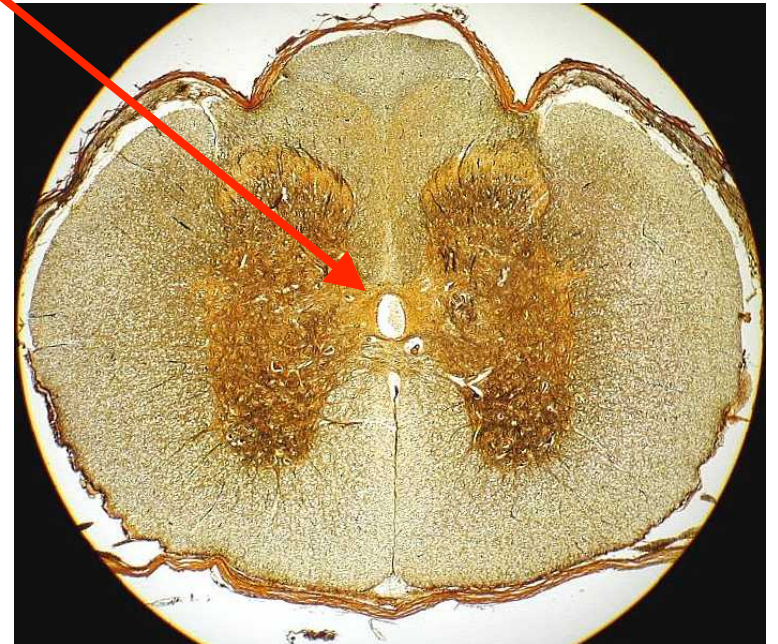
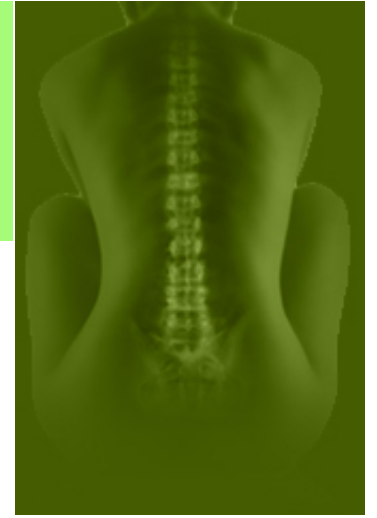
The spinal cord contains 2 types of tissue:

- White matter = outer portion
 - Myelinated
- Grey matter = H-shaped center portion
 - Unmyelinated



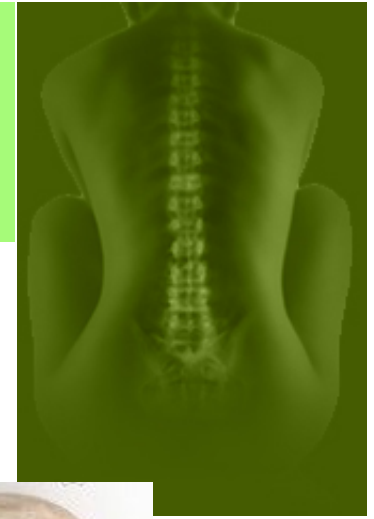
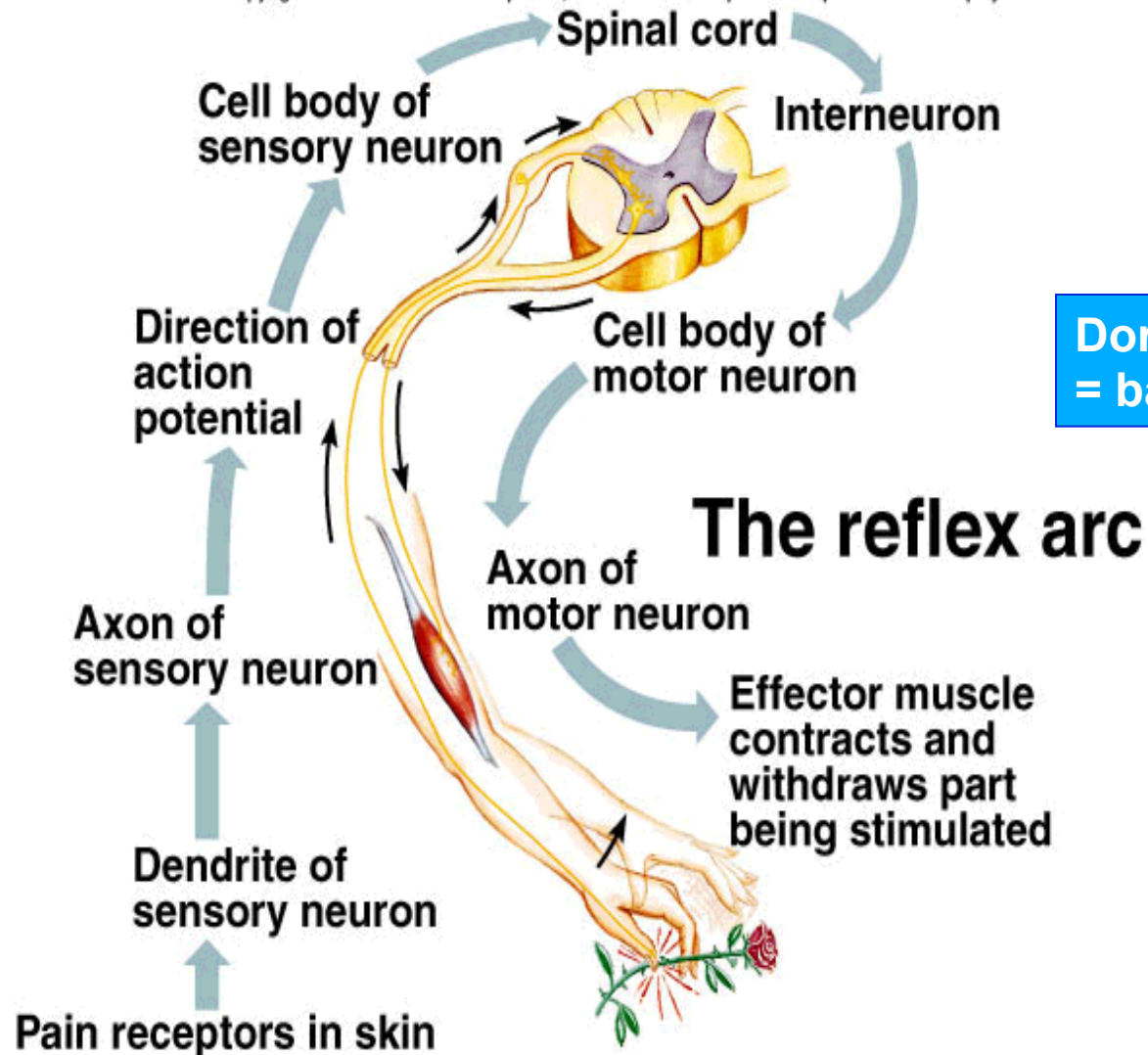
Did you notice the small hole?

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



The Reflex Arc

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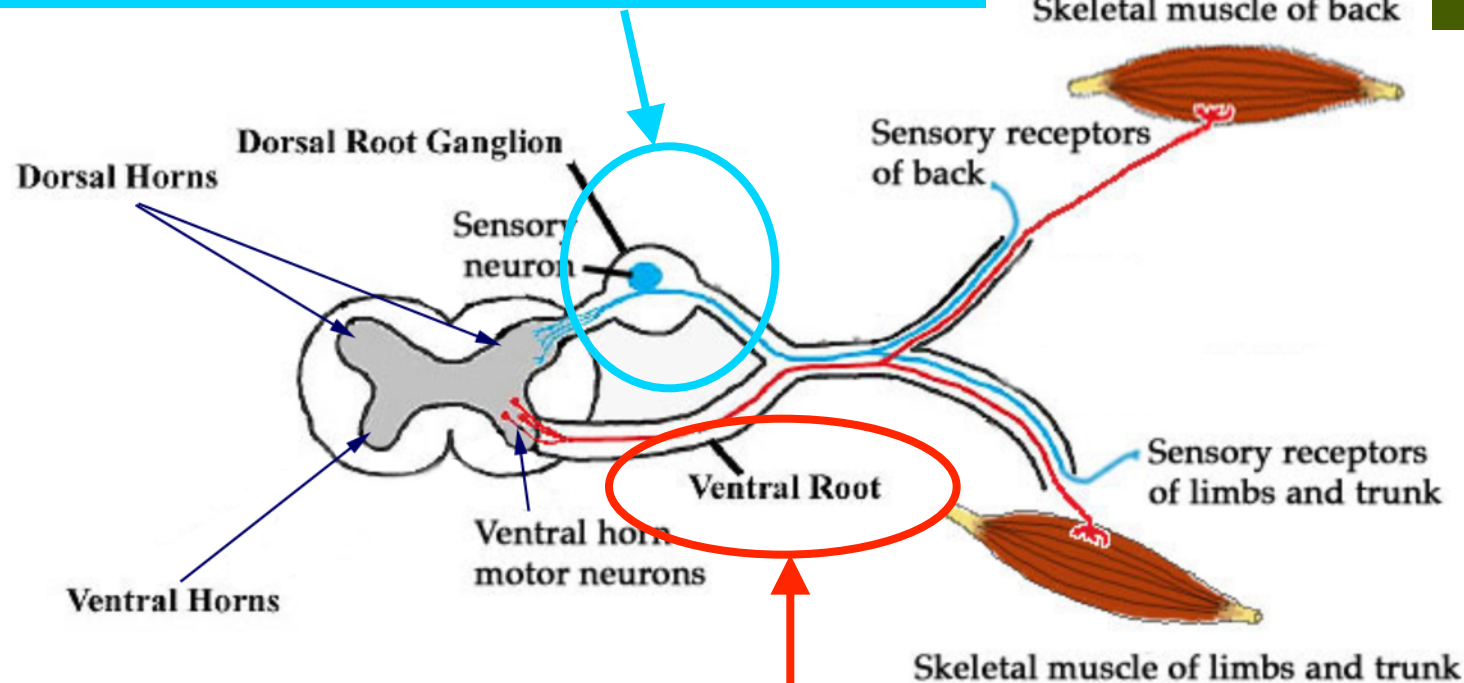
**Dorsal
= back**

**Ventral
= front**

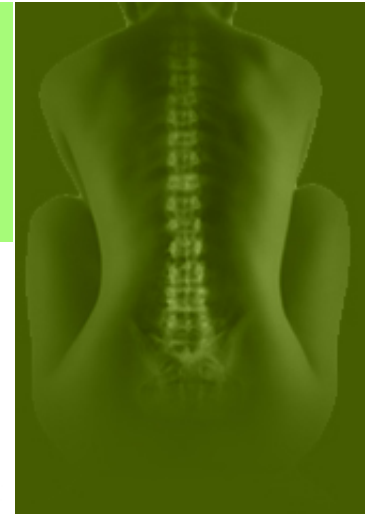


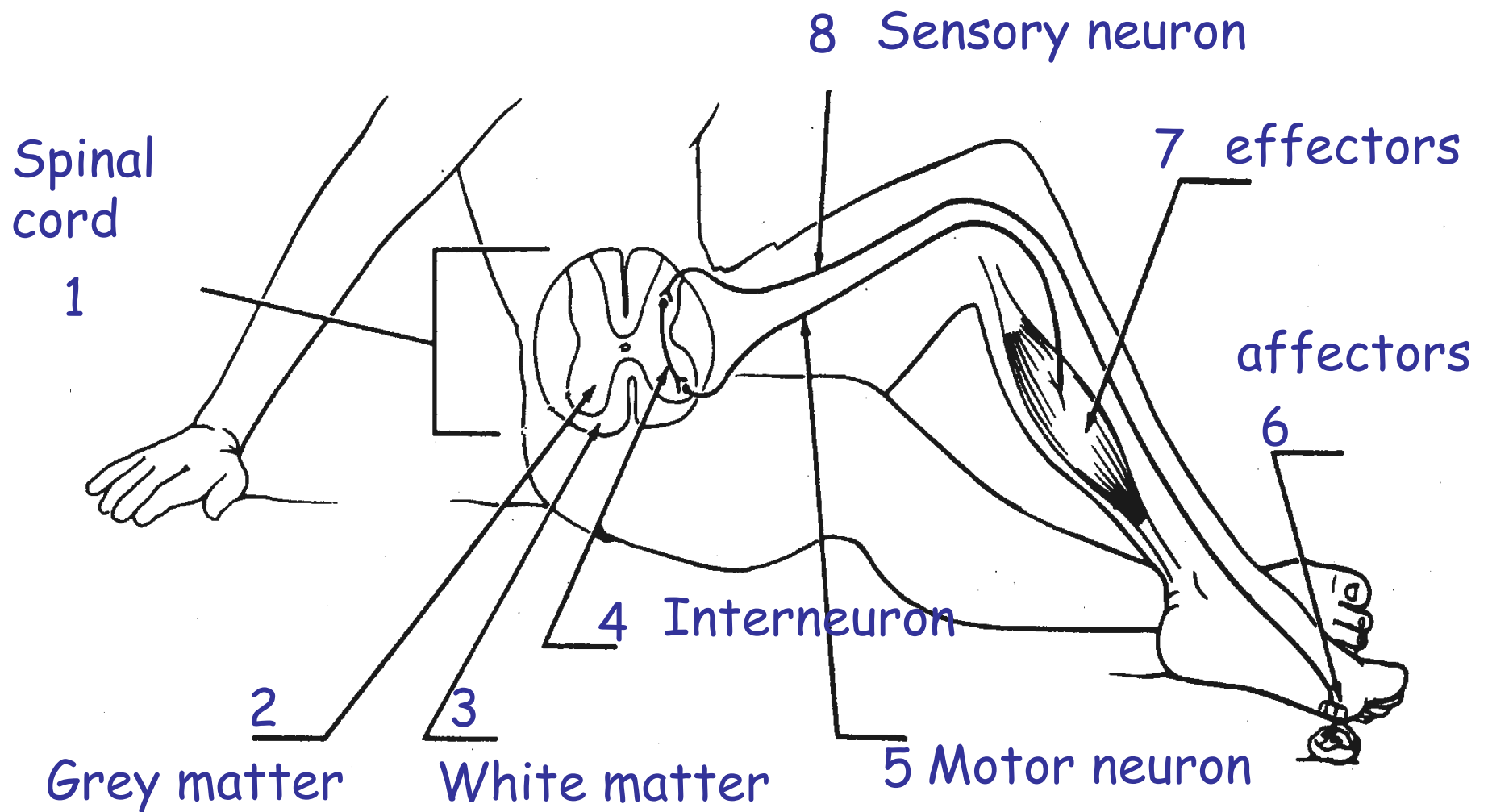
Dorsal and Ventral Roots

Dorsal root (back)
carries **sensory** neurons

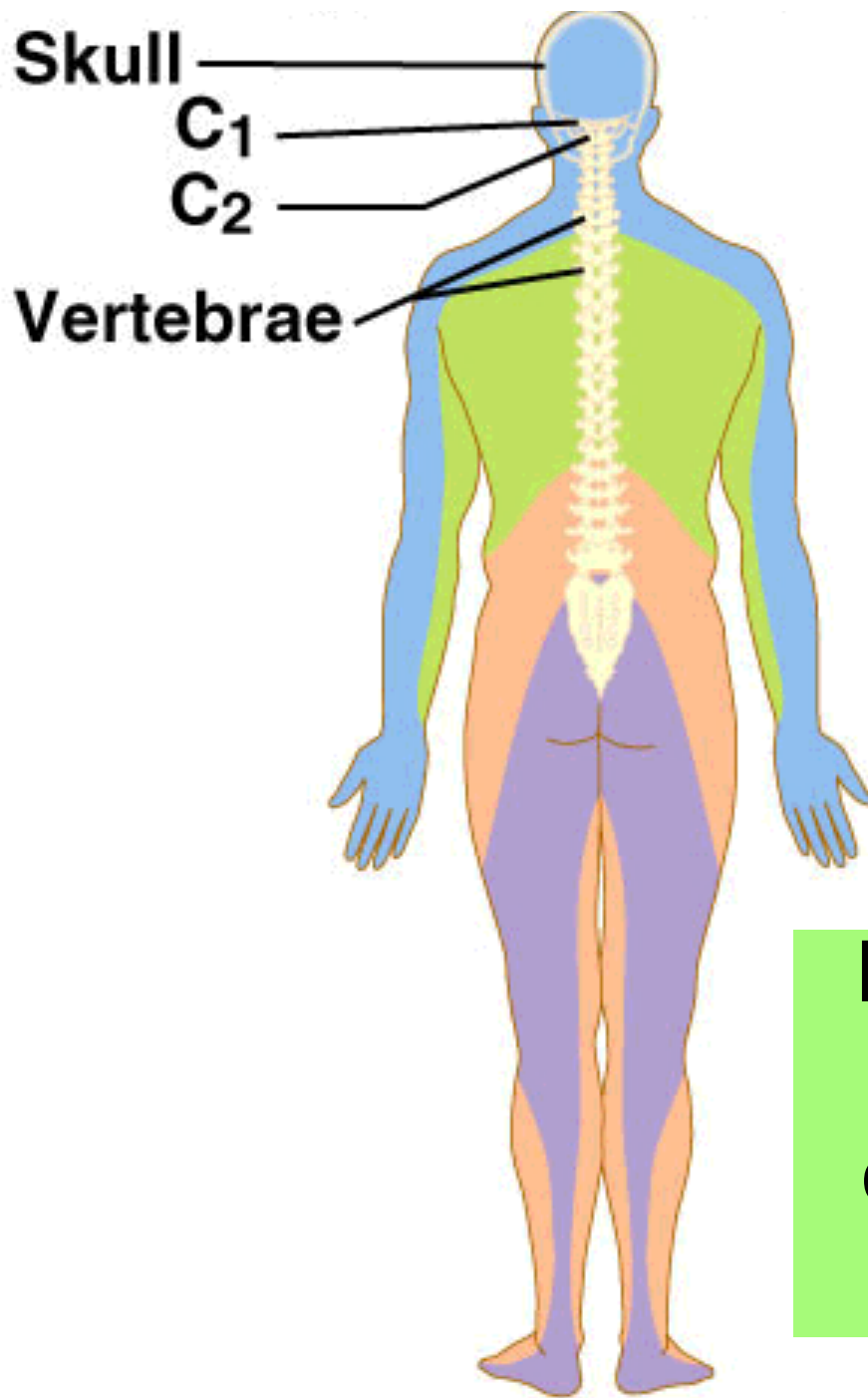


Ventral root (front)
carries **motor** neurons





Label the components of the reflex arc

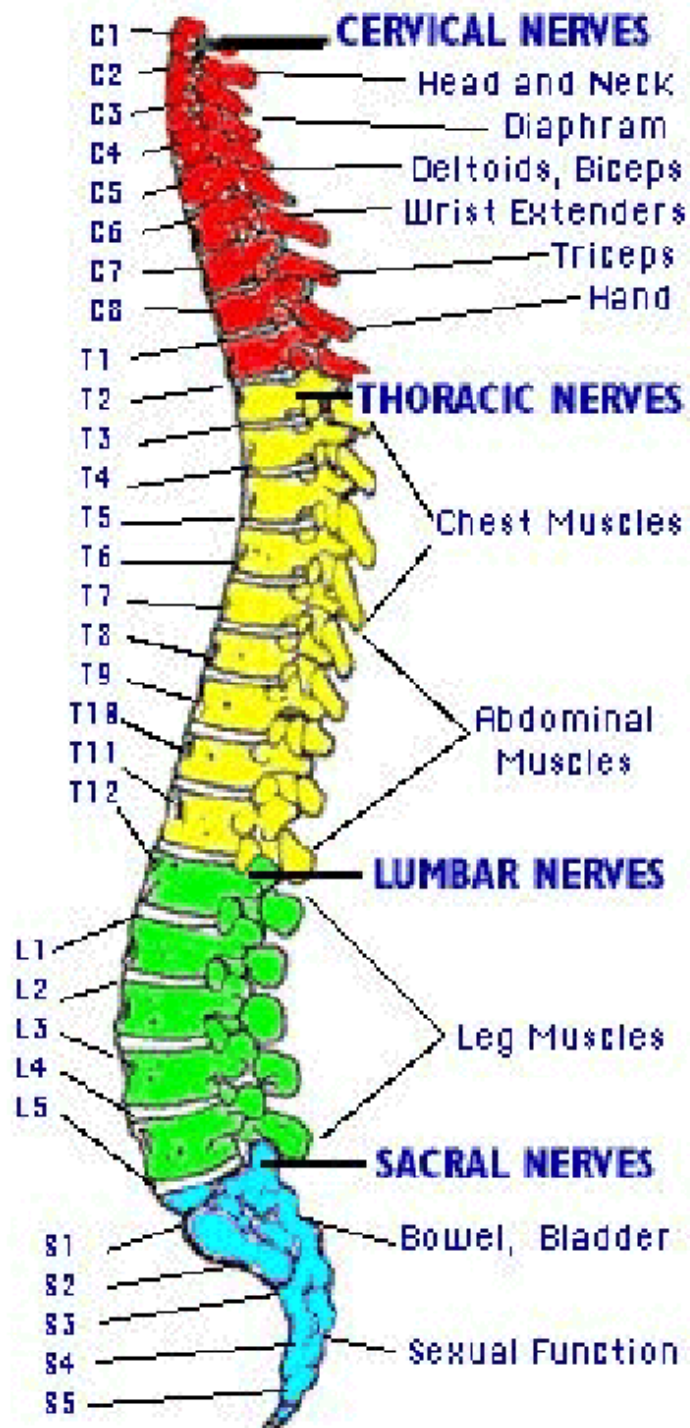


- Cervical nerves**
Control: Head, neck, diaphragm, and arms
- Thoracic nerves**
Control: Chest and abdominal muscles
- Lumbar nerves**
Control: Leg muscles
- Sacral nerves**
Control: Bladder, bowel, sexual function, and feet

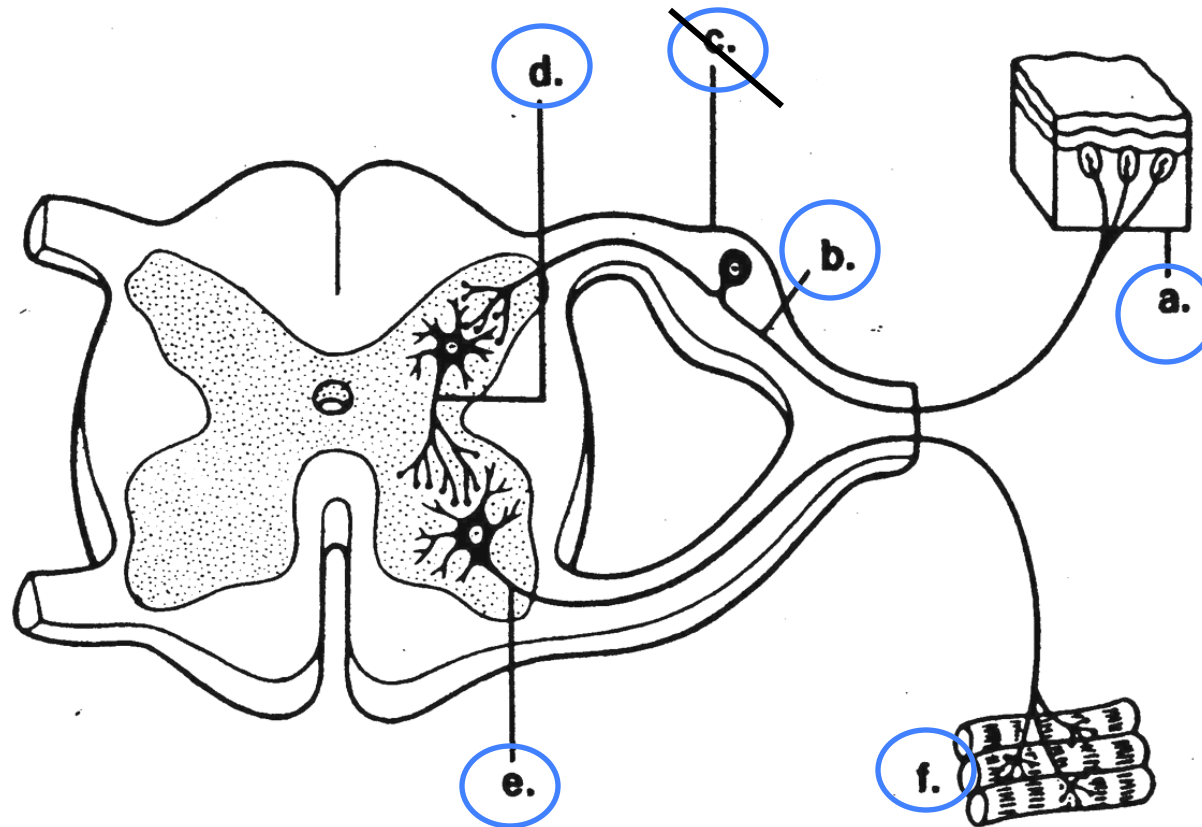
Different parts of the spinal cord control different parts of the body

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)