

Nervous System

FUNCTIONS OF THE NERVOUS SYSTEM

Sensory Input-Gathering Information

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Integration-To _____ and _____ sensory input and decide if action is needed.

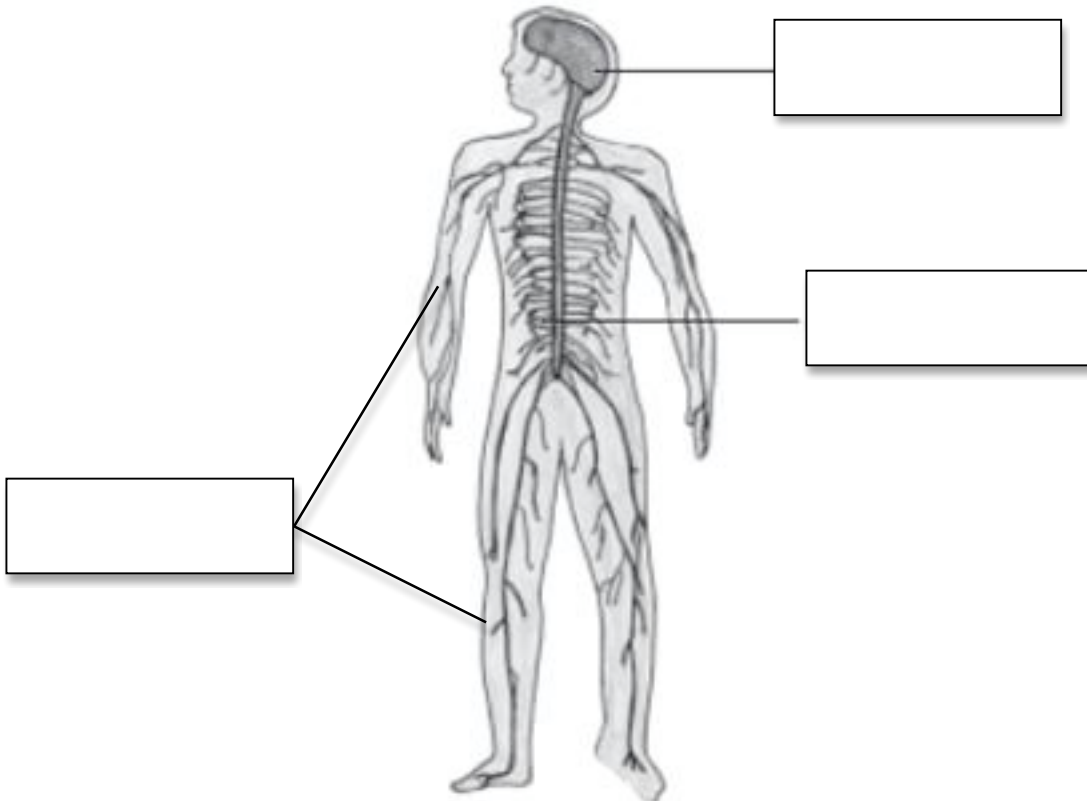
Motor Output

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STRUCTURE OF THE NERVOUS SYSTEM

The central nervous system (CNS) consists of the _____ and _____.

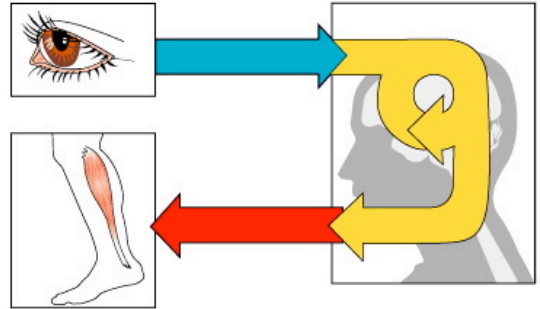
The peripheral nervous system (PNS) consists of all of the nerves outside of the _____ and _____.



FUNCTIONS OF THE PNS

Sensory (_____)

Division- sends information to the
CNS.



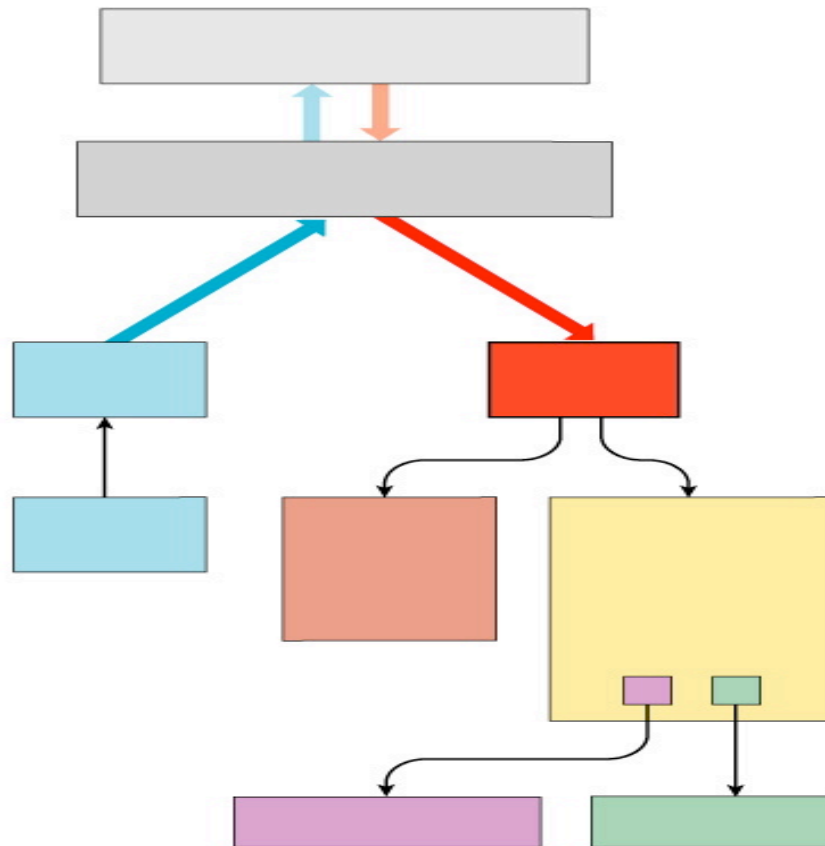
Motor (_____)

Division- _____ fibers

carry the impulse away from the CNS.

The motor division is subdivided into two sections.

- Somatic Nervous System - _____
- Autonomic Nervous System- _____



THE NEURON (_____)

- Specialized to transmit _____
- Cell Body-
- Processes-

The cell body contains the _____
and _____

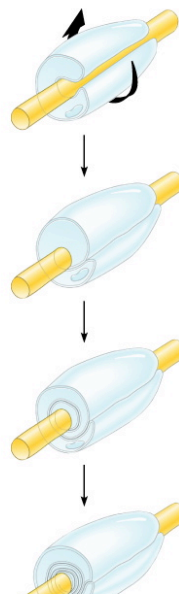
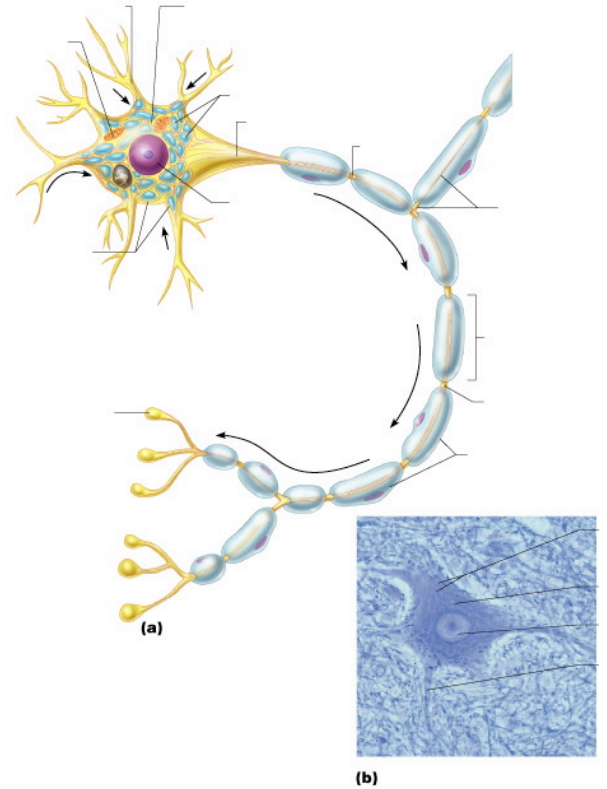
The extensions out of the cell body:

- Dendrites-
- Axon-

The axons end in _____ which
contain vesicles with _____

They are separated from another nerve cell by
a small space called a _____ or
a _____.

The nerve fibers are covered with cells called _____
which produce _____ sheaths in a jelly-roll like fashion. The gaps
in the myelin are called the _____.



THE CELL BODY

Most of the nerve cell bodies are found in the _____. This is called _____ because the cell bodies lack _____.

The _____ are clusters of cell bodies within the white matter of the CNS.

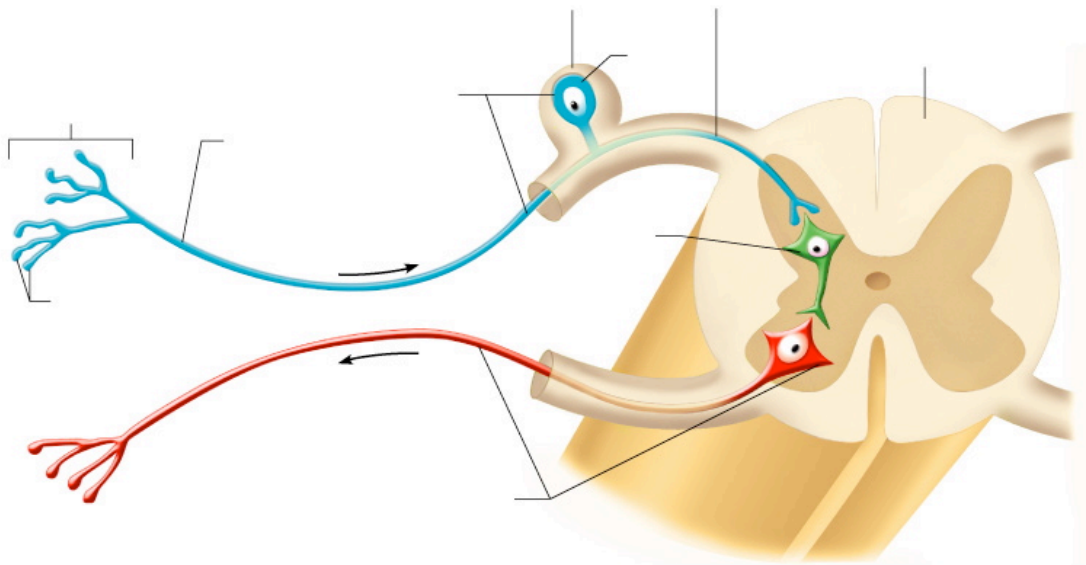
The _____ are collection of nerve cell bodies outside of the CNS.

FUNCTIONS

The sensory (_____) neurons carry impulses from the sensory receptors to the CNS.

The motor (_____) can the impulse away from the CNS to the effector, usually a muscle.

Interneurons are found in the CNS and connect _____ to _____ neurons.



A multipolar neuron has many extension from the _____

- Irritability-Ability to respond to

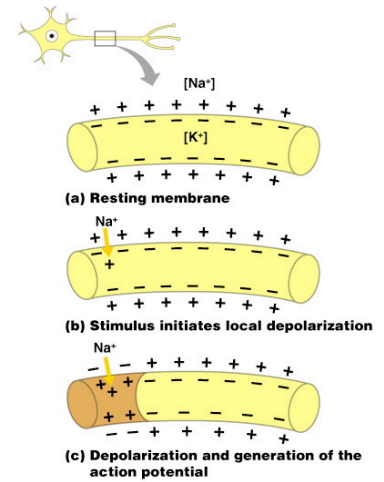
- Conductivity-Ability to transmit an

- The plasma membrane at rest is

_____.

There are fewer positive ions inside than

_____.



Depolarization-A stimulus depolarizes

the membrane and allows _____

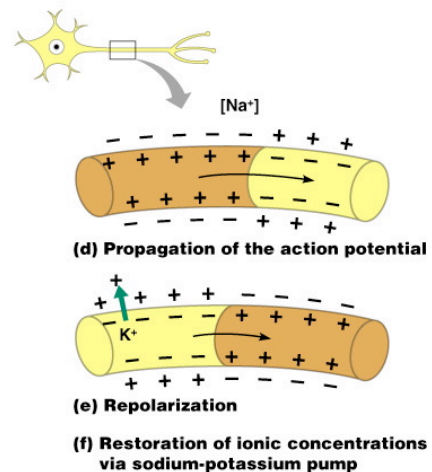
to flow in. The exchange initiates the _____.

The action potential (_____) starts and propagates the entire _____.

The _____ ions rush out as the _____ rush in. This repolarizes

the membrane. The _____ pump restores the original configuration.

This action requires _____.



Impulses are able to cross over the _____ to another nerve. Neurotransmitter is

released from the nerve's _____ terminal. The dendrite of the next neuron has a

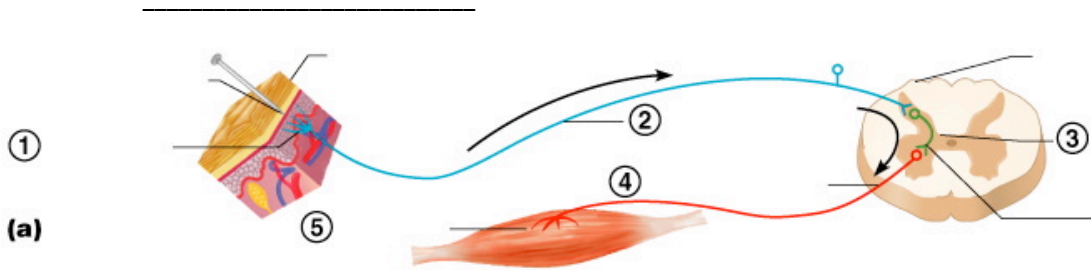
_____ that are stimulated by the _____.

An _____ is started in the _____.

THE REFLEX ARC

Reflex- A rapid _____ and involuntary response to a _____.

A Reflex Arc-A direct route from a _____ neuron to the _____ to the



Examples-What happens when you tap your knee?

What happens when you push your finger onto something sharp or hot?

Autonomic Reflexes

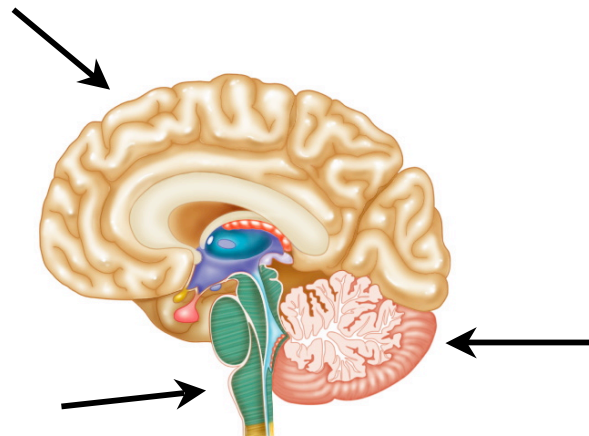
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Somatic Reflexes

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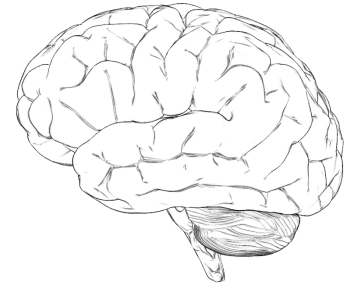
REGIONS OF THE BRAIN

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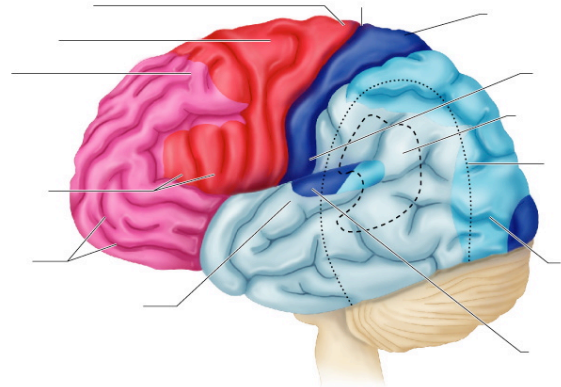


THE CEREBRAL CORTEX

- Paired (_____ and _____)
superior part of the brain. (top)
- Includes more than _____ of the brain's mass
- Divided into 4 lobes



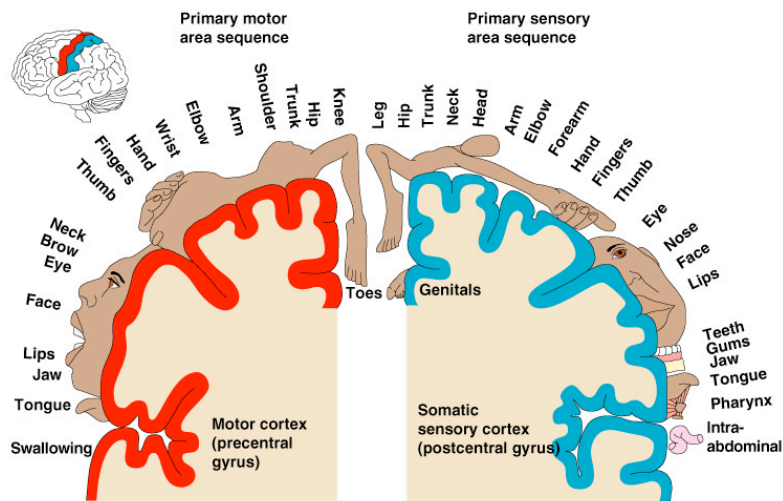
- 1.
- 2.
- 3.
- 4.



(c)

SPECIALIZED AREAS OF THE CEREBRUM

- Somatic Sensory Area-Somatic sensory area – receives _____ from the body's sensory _____
- Primary Motor Area – sends impulses to _____ muscles
- Broca's area – involved in our ability to _____

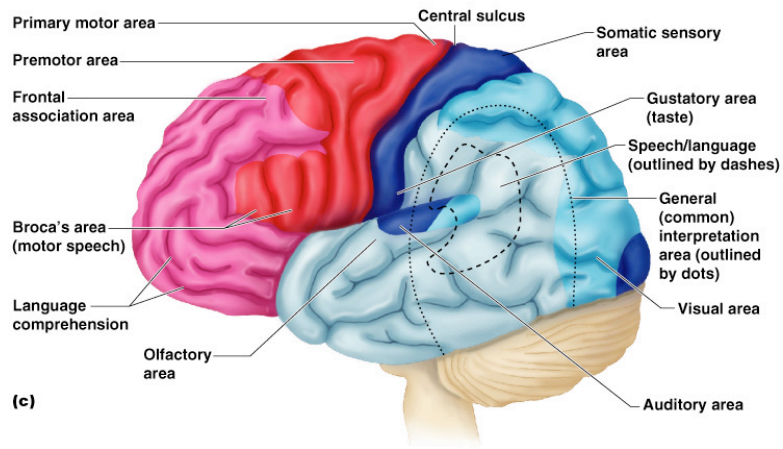


Cerebral areas involved in special senses

-
-
-
-

Interpretation areas of the cerebrum

-
-
-



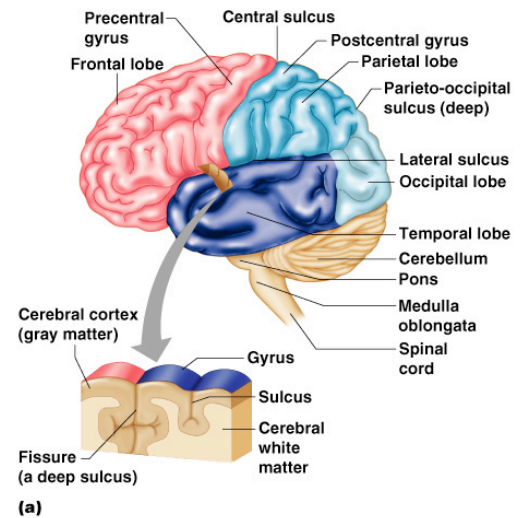
LAYERS OF THE CEREBRUM

Grey Matter

-
-

White Matter

-
-



DIANCEPHALON

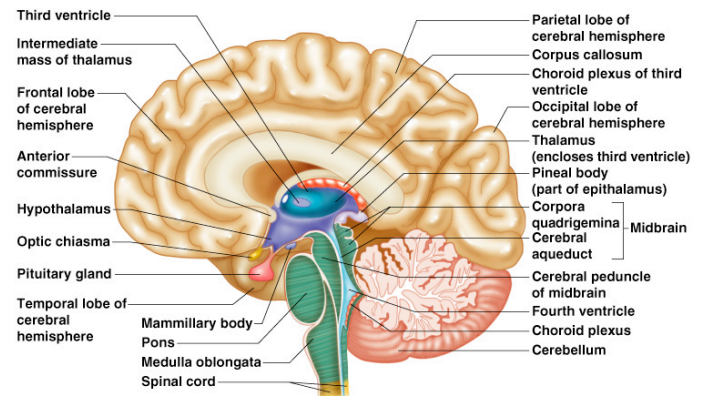
- Sits on top of the brain stem
- Enclosed by the cerebral hemispheres
 - _____
 - _____
 - _____

THALAMUS

- Surrounds the _____ ventricle
- The relay station for _____ impulses
- Transfers impulses to the correct part of the cortex for localization and interpretation

HYPOTHALAMUS

- Under the _____
- Important autonomic nervous system center
 - Helps regulate body _____
 - Controls water _____
 - _____ metabolism



(a)

BRAIN STEM

- Attaches to the _____
- Parts of the brain stem
 - _____
 - _____
 - _____

THE MIDBRAIN

- Mostly composed of tracts of _____ fibers
 - Reflex centers for _____ and _____

THE PONS

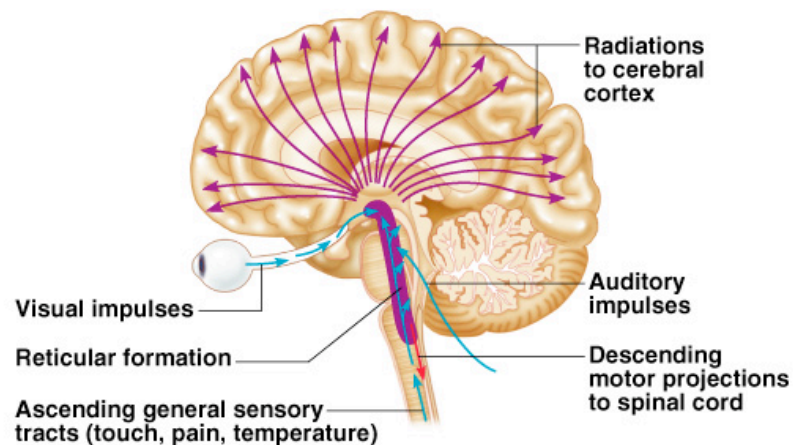
- The bulging center part of the _____
- Mostly composed of fiber tracts
- Includes nuclei involved in the control of _____

THE MEDULA OBLONGATA

- The _____ part of the brain stem
- Merges into the _____
- Includes important fiber tracts
- Contains important control centers
 - _____ control
 - _____ regulation
 - _____
 - _____
 - _____

RETICULAR FORMATION

- Diffuse mass of gray matter along the brain stem
- Involved in motor control of _____ organs (heart, lungs, ect..)
- Reticular activating system plays a role in _____ cycles and consciousness



(b)

CEREBELLUM

What is the cerebellum involved in?

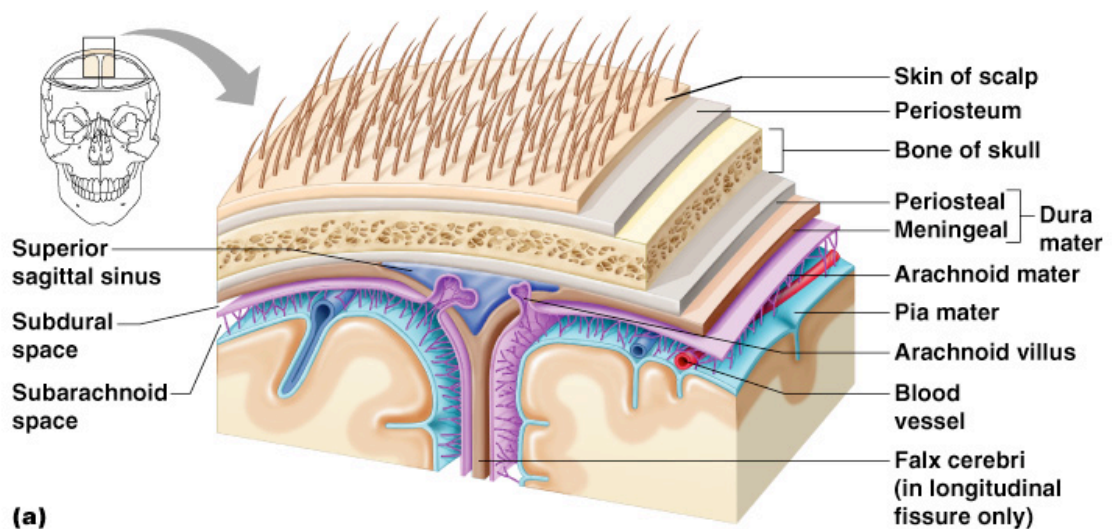
Where is it located?

List at least 4 effects on a person if the cerebellum is damaged.

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-
-
-

PROTECTION OF THE CNS

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Meninges

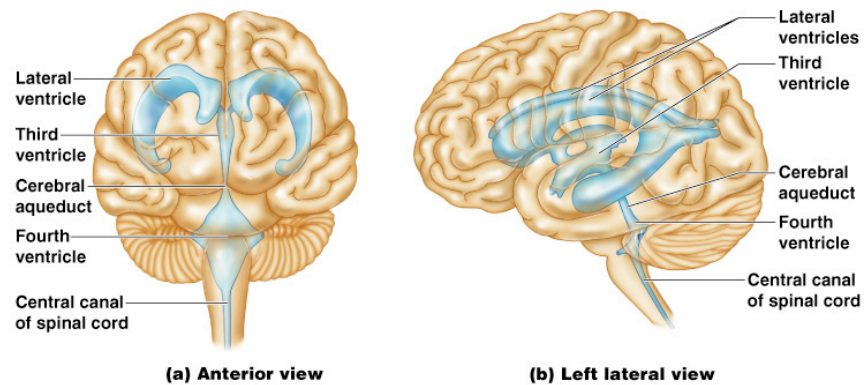
Dura Mater

- Double-layered external covering
- Periosteum-
- Meningeal Layer-

Folds inward in several areas

Cerebrospinal Fluid

Similar composition to blood _____. Formed by the _____ and is a watery cushion to protect the _____. Circulates in the _____ and the canal of the spinal cord.



Blood-Brain Barrier

Includes the _____ permeable capillaries of the body. These can help exclude many _____ substances. It is useless against the following:

-
-
-
-

Traumatic Brain Injury

Concussion-

-
-

Contusion-

-
-

Cerebral edema-

-
-

Cerebrovascular Accident

Commonly called a _____. The result is a _____ blood vessel supplying a region of the _____.

What happens if the brain is not supplied with oxygen?

What else could happen?

Alzheimer's Disease

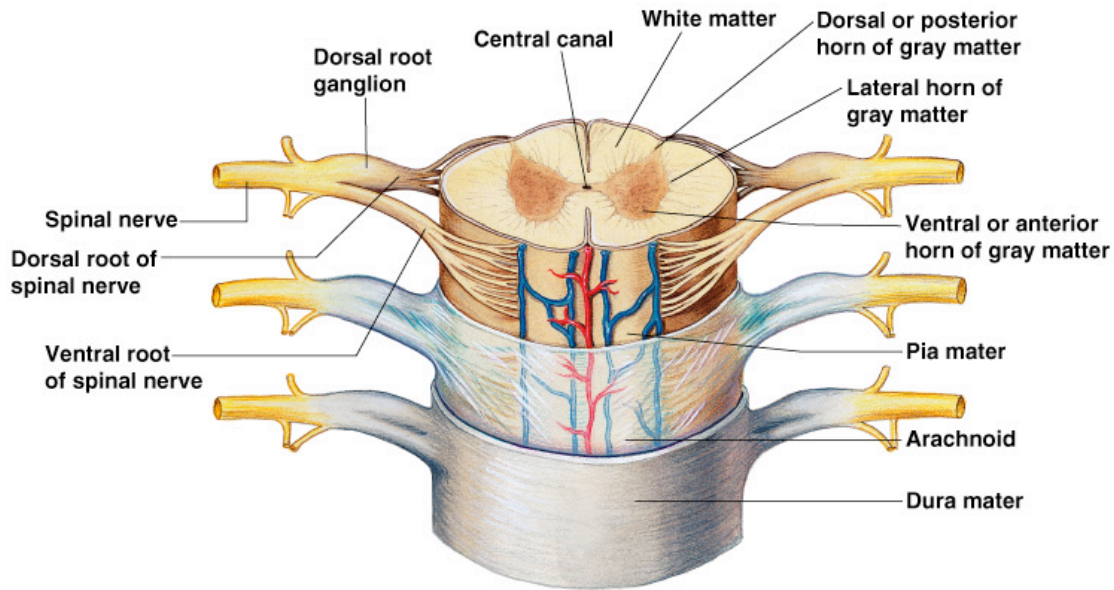
Progressive _____ brain disease that is seen mostly in the _____ but can be seen in _____ age people.

What are some structural changes in the brain?

What do victims experience?

Spinal Cord

Extends from the _____ to the region of _____. Enlargements occur in the _____ and _____ regions. The exterior matter is _____ and contains conductive tracts.

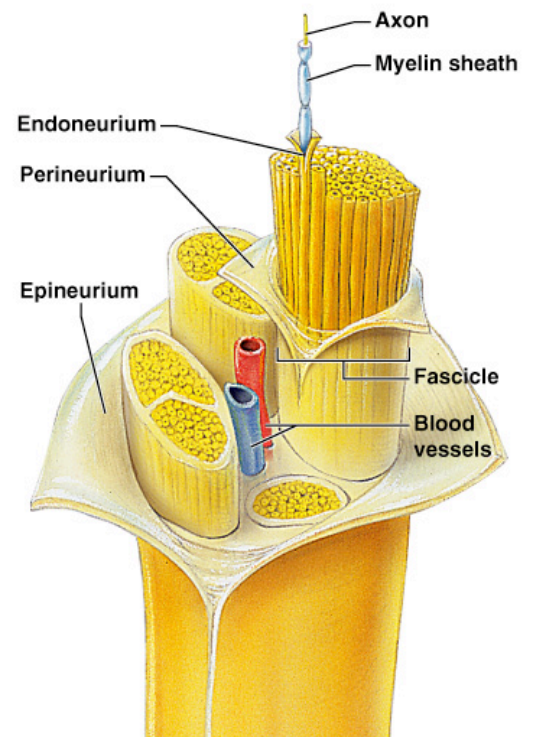


The internal grey matter is mostly _____.

The _____ cover the spinal cord. The nerves leave at the level of each vertebrae.

Structure of a Nerve

The _____ surrounds each fiber. Groups of fibers are bound into fascicles by _____. The fascicles are bound together by _____.



Afferent (_____) Nerves-Carry impulses _____ the CNS

Efferent (_____) Nerve-Carry impulses _____ from the CNS

Mixed nerves are both _____ and _____ found in the head.

Cranial Nerves

_____ pairs of nerves that mostly serve the _____ and _____.

They are in number ordered from _____ to _____. Most are mixed but _____ are sensory only.

I - Olfactory Nerve- Sense of _____

II - Optic Nerve-Sense of _____

III - Oculomotor Nerve- Motor fibers to _____ muscles.

IV - Trochlear - Motor fibers to the eyes.

V - Trigeminal Nerve-Sensory for the _____ and motor fibers for _____.

VI - Abducens Nerve- Motor fibers to the eye.

VII - Facial Nerve- Sensory for _____, and motor fibers for the _____

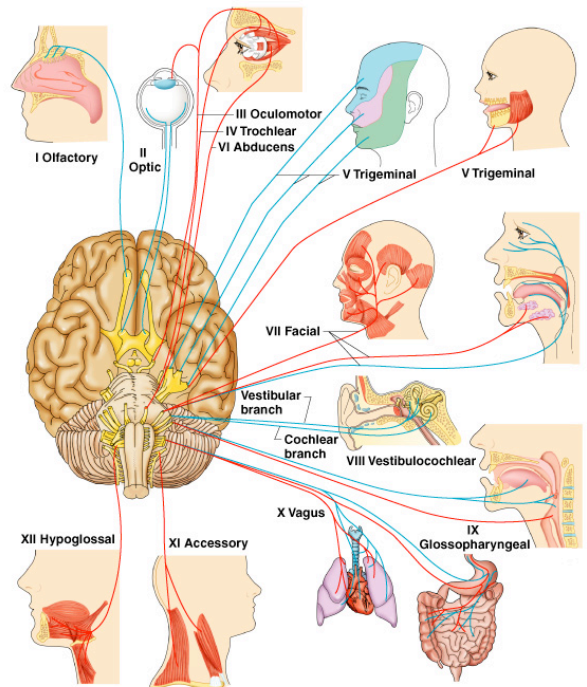
VIII - Vestibulocochlear Nerve- Sensory for _____ and _____.

IX - Glossopharyngeal Nerve- Sensory for _____ and motor fibers to the _____

X - Vagus Nerve- Sensory and motor fibers for the _____, _____ and _____

XI - Accessory Nerve- Motor fibers to the _____ and _____

XII - Hypoglossal Nerve- Motor fibers to the _____.



DEVELOPMENTAL ASPECTS

- The nervous system is formed in the first _____ of embryonic development.
- Any maternal _____ can have extremely _____ effects on the fetus.
- The _____ is one of the last areas of the brain to develop.
- After birth _____ more neurons are formed. Growth and maturation will continue for _____ years.
- The brain reaches its maximum weight as a _____.