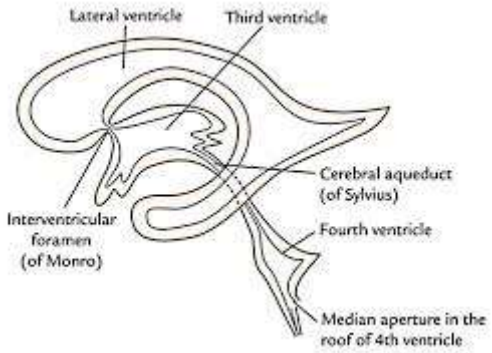
1.CEREBRAL AQUIDUCT(SA)

Cerebral aqueduct is also known as sylvian aqueduct or the aqueduct of Sylvius .
It is within the mesencephalon (or midbrain),
It contains cerebrospinal fluid (CSF),
It connects the third ventricle in the diencephalon to the fourth ventricle
It is the narrowest part of the CSF pathway
Aqueductal stenosis is a narrowing of the aqueduct of Sylvius which blocks the flow of cerebrospinal fluid (CSF) in the ventricular system.
Blockage of the aqueduct can lead to hydrocephalus, specifically obstructive hydrocephalus.



2. FORMATION & FUNCTION OF THE TELA CHOROIDIA(SA)

The **tela choroidea** is the thin, highly vascularised, loose connective tissue portion of pia mater.
It is basically the lamina propria of the ependyma and lies directly adherent to it, without any tissue in between the two .
It is double layer of pia mater which occupies the interval between the cerebellum & lower part of the ventricle.
The tela choroidea with the vascular fringes covered by secretory ependyma form the choroidea plexus of fourth ventricle.
Each plexus consists of vertical & horizontal limbs & form T shaped structure.
The vertical limb of T shaped structure reach the median aperture & project into the subarachnoid space through it.
The horizontal limbs reach the lateral apertures.
The arterial supply of these plexuses is from the posterior inferior cerebellar arteries.

3. INTERPEDUNCULAR FOSSA(SA)

The **interpeduncular fossa** is a somewhat rhomboid-shaped area of the base of the brain.

limited in front by the optic chiasma,
behind by the antero-superior surface of the pons,
antero-laterally by the converging optic tracts, and
postero-laterally by the diverging cerebral peduncles.

The floor of interpeduncular fossa,

from behind forward, are the posterior perforated substance,
Corpora Mamillaria,
Tuber Cinereum,
Infundibulum, And
Pituitary Gland.

Contents of interpeduncular fossa include

Oculomotor Nerve,
Trochlear Nerve And
Circle Of Willis.

4. LATERAL GENICULATE BODY(SA)

The **lateral geniculate nucleus** is a relay center in the thalamus for the visual pathway.

It receives a major sensory input from the retina.

The LGN is the main central connection for the optic nerve to the occipital lobe, particularly the primary visual cortex.

In humans, each LGN has six layers of neurons (grey matter) alternating with optic fibers (white matter).

The LGN is a small, ovoid, ventral projection at the termination of the optic tract on each side of the brain. .

The LGN receives information directly from the ascending retinal ganglion cells via the optic tract and from the reticular activating system.

Neurons of the LGN send their axons through the optic radiation, a direct pathway to the primary visual cortex.

In addition, the LGN receives many strong feedback connections from the primary visual cortex.

5. PARTS OF THE BODY CONTROLLED BY PARACENTRAL LOBULE(SA)

Paracentral lobule is on the medial surface of the hemisphere and is the continuation of the precentral and postcentral gyri.

The paracentral lobule controls motor and sensory innervations of the contra lateral lower extremity.

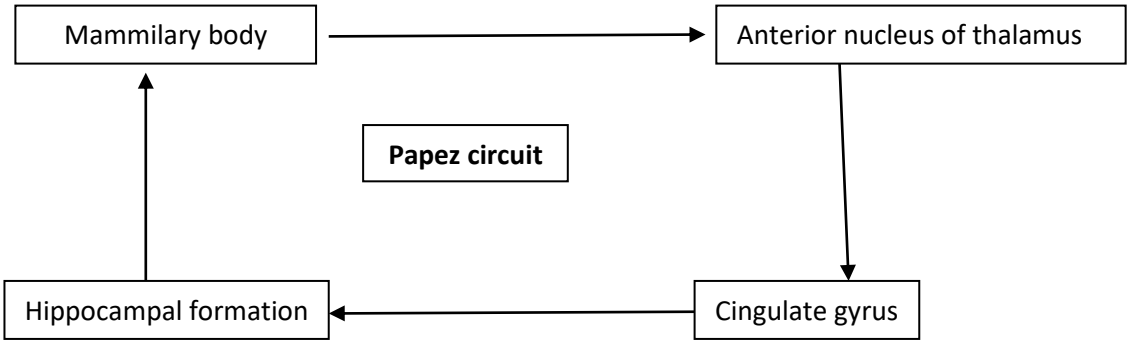
It is also responsible for control of defecation and urination.

It includes portions of the frontal and parietal lobes

- The anterior portion of the paracentral lobule is part of the frontal lobe and is often referred to as the supplementary motor area.
- The posterior portion is considered part of the parietal lobe and deals with somatosensory of the distal limbs.

6.PAPEZ CIRCUIT OF RECENT MEMORY(SA)

The **Papez circuit** or **medial limbic circuit**, is a neural circuit for the control of emotional expression.
It interconnects limbic structures, hippocampus, fornix, mammilary body, mammilothalamic tract, anterior nucleus of thalamus, cingulated gyrus, cingulum, para hippocampal gyrus.
It is important for long term permanent memory.

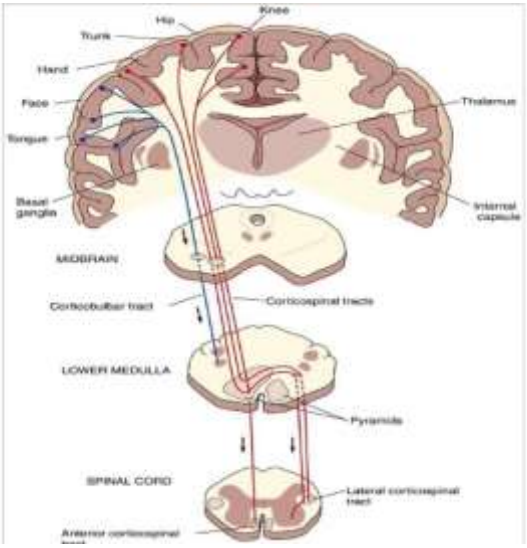


7.PYRAMIDAL TRACT(SE)

These are aggregation of upper motor neuron.
Nerve fibers travel from cerebral cortex terminate either in brain stem or spinal cord.
Transmits motor impulses that controles the functions of body.
It consists of two parts
1. lateral corticospinal tract-lies in the lateral funiculus.
2. Anterior corticospinal tract-lies in the anterior funiculus.

The pyramidal or corticospinal tract is formed by the axons of pyramidal cells lying in the motor area of cerebral cortex.
From here the fibers course through the posterior limb of internal capsule, midbrain, pons, and medulla oblongata.

At the lower level of medulla oblongata, 80% of fibers cross to the opposite side forming pyramidal decussation.these fibers enter lateral column of white mater of spinal cord and descend as lateral corticospinal tract.



These fibers terminate by synapsing through the inter nuncial neurons at the anterior horn cells.

The 15% of fibers do not cross ,enter anterior white column of spinal cord to form anterior corticospinal tract.

Functions

- The cerebral cortex controles gross and fine skilled voluntary movements of opposite half of body through anterior horn cells.
- This tract is facilitatory for flexors and inhibitory for extensors.
- Anterior corticospinal tract controles voluntary gross movement like walking & running.
- Corticospinal tract facilitates superficial reflexes and muscle tone.
- Actions of basal ganglia and cerebellum and mediated by corticospinal tracts.

8. GRAY AND WHITE RAMI COMMUNICANTES(SN)

Each spinal nerve receives a branch called a **gray ramus communicans** from the adjacent paravertebral ganglion of the sympathetic trunk.

The gray rami communicantes contain postganglionic nerve fibers of the sympathetic nervous system and are composed of largely unmyelinated neurons.

This is in contrast to the white rami communicantes, in which heavily myelinated neurons give the rami their white appearance.

The white rami communicantes are the preganglionic sympathetic outflow from the spinal cord.

The cell bodies for the preganglionic sympathetic myelinated fibers in the white rami communicantes lie in the ipsilateral (same sided) intermediolateral cell column in the spinal cord which extends from T1-L2.

there are no more white rami communicantes below L2 because the intermediolateral cell columnends before this. The fibers of the sympathetic trunk above and below T1-L2 originate from white rami communicantes within T1-L2. Above and below T1-L2 there are only gray rami.

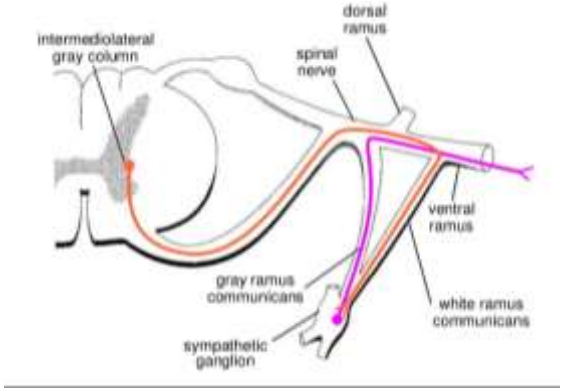
FUNCTIONS

Some cervical ganglia and thoracic ganglia send gray rami communicantes directly to the heart.

Thoracic ganglia send grey rami communicantes to their adjacent body wall. They supply blood vessels, sweat glands, and arrectores pilorum muscles.

Lumbar ganglia have grey rami communicantes that rejoin the appropriate spinal nerves to supply the abdominal wall and lower limbs.

The pelvic ganglia form grey rami communicantes whose lateral (postganglionic) branches supply the pelvic wall and lower limb.



9.EFFECTS OF UPPER MOTOR NEURON LESION(SA)

An **upper motor neuron lesion** (also known as **pyramidal insufficiency**) occurs in the neural pathway above the anterior horn cell of the spinal cord or motor nuclei of the cranial nerves.

Upper motor neuron lesions occur in the brain or the spinal cord as the result of stroke, multiple sclerosis, traumatic brain injuryand cerebral palsy.

SYMPTOMS

- Muscle weakness. A pattern of weakness in the extensors (upper limbs) or flexors (lower limbs), is known as 'pyramidal weakness'
- Decreased control of active movement, particularly slowness
- Spasticity, a velocity-dependent change in muscle tone
- Clasp-knife response where initial higher resistance to movement is followed by a lesser resistance
- Babinski sign is present, where the big toe is raised (extended) rather than curled downwards (flexed) upon appropriate stimulation of the sole of the foot. The presence of the Babinski sign is an abnormal response in adulthood..
- Increased deep tendon reflex (DTR)