

Cerebral Cortex

Gyri and sulci –
Brodmann System –
Primary motor area –
Primary Visual area –
Primary auditory areas –
Primary sensory reception –
Primary site of personality
Associative Areas -

Cerebral Cortex

Gyri and sulci – (hills and valleys) accomplishes the increase in storage space in the human telencephalon.

Brodmann System – system for mapping the brain and giving specific areas that have a proven function a specific number.

Primary motor area – 4 (pre-central gyrus)

Primary Visual area - 17 (occipital pole – area for most acute vision)

Primary auditory areas – 41 & 42

Primary sensory reception – 3, 1, & 2 – post central gyrus.

Primary site of personality are the frontal pole. There is no number. Site for frontal lobotomy. Moniz, a Portuguese Dr won a Nobel prize for this in 1949.

Associative Areas - Many of the primary areas have associative areas as well. These are areas that modify/temper/interpret the primary areas. (4s for example suppresses 4.)

Damage to the Cortex

Apashia –

Visual Aphasia -

Auditory Aphasia –

Wernicke's Aphasia –

Motor aphasia

Apraxia – .

Agraphia –

Agnosia –

Damage to the Cortex

Apashia – the inability (loss) to understand or express symbols.

Visual Aphasia - If the damage to the dominant side of the brain (angular gyrus, area 39 in the parietal lobe) you get visual aphasia. AKA Word aphasia or alexia. An analogy – you see the printed text, but the letters/words mean absolutely nothing.

Auditory Aphasia – If the association area for auditory reception on the dominant side you may get a condition where you can't understand your own language - Auditory aphasia (sound w/o meaning). You can't understand any of the words you previously understood. This is the associative area, not the primary.

Wernicke's Aphasia – If the patient has both problems, it's called wernicke's aphasia

Motor aphasia (aka verbal aphasia) injury to the regions of understanding the spoken words. The patient understand it, but when they speak it, they fail – gibberish or repetitive words comes out.

Apraxia – the inability to carry out previously learned acts even though there is no paralysis. (again, not primary, but associative area has been affective) – For example: patient doesn't know how to put a key in the lock and unlock the door.

Agraphia – loss of writing ability (you can read and understand, but you can't write)

Agnosia – loss of ability to recognize things even though the patient sees them previously recognized them. Even though the patient doesn't recognize it, they may still respond to it.

Meninges

Three layers of protective connective tissue:

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-
-

Mater –

Spaces Between the layers:

-
-
-

Meninges

Three layers of protective connective tissue:

- **Dura mater** (tough mother) - made of tough connective tissue. Attached to/intermixed with the inner layer of the skull (endosteum).
- **Arachnoid mater** (Spider mother) - very thin, filament like connective tissue.
- **Pia Mater** (tender mother) - very thin, capillary rich (good blood supply) attached directly to the material of the brain. Follows the gyrus and sulci.

Mater – means mother.

Spaces Between the layers:

- **Epidural space** – between the outer bone and dura mater. (in a few places where the dura has pulled away from the bone. These are sinuses. They are spaces for large veins.
- **Sub-dural space** – between the dura mater and arachnoid. Has a small amount of lubricant that keeps the archnoid and dura from sticking together. Not much space.
- **Sub-arachnoid space** – between the arachnoid and pia and is where you find CSF.

Other Structures

Arachnoid trebeculations –

Where there are deep crevices –

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-
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Filum Terminale –

Spinal Cord Ends –

Other Structures

Arachnoid trebeculations – attach the arachnoid layer to the pia mater.

Where there are deep crevices, the dura will dip down into these areas and take on special names.

- Falx cerebri - separates the right and left cerebral hemispheres.
- Tentorium cerebelli - Separates the occipital lobe above, from the cerebellum below.
- Falx Cerebelli - separates the two cerebellums.

Filum Terminale – pia mater extends all the way down from L2/L3 to the coccyx to anchor the cord in place.

Spinal Cord Ends – at the level of L2/L3 but the spinal nerves keep on going.

Blood supply to the brain

From four main arteries

- The right and left internal carotids – enter at the level of the eyes. (enters the brain itself)
- The right and left vertebral's (merge to join one artery, the basilar around the upper end of the medula.)

Vertebrals: supply the brain stem and posterior 1/3rd of the cerebrum/telencephalon,

Internal carotids: take care of most of the rest of the brain (anterior 2/3rds of the brain)

The connection is called: the circle of Willis – functions to connect the vertebral arteries with the basilar artery.

Spider Analogy

- **The hind legs** are the right and left vertebral arteries.
- **Body of the spider** is basilar artery
- **The front legs of the spider** are the posterior cerebral arteries
- **Eyes of the head** – internal carotids (they are a circle because they enter at an angle)
- **Bottom of head** - Posterior communicating artery
- **Top of head** - Anterior Cerebral artery
- **Finishing the top** – Anterior communicating artery.
- **The bushing eyebrows** are the middle cerebral arteries.
- **Off the bushy eyebrows** are the striate arteries. (striate are the site of many strokes goes into the internal capsule)
- **Coming off of the body** – pontine arteries (go to the pons)

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