

Second Spotter Test List

1) Central sulcus

- The central sulcus separates the frontal lobe from the parietal lobe, and also separates the primary motor cortex anteriorly from the primary somatosensory cortex posteriorly.
- The prominent sulcus, when looking laterally. Roughly in the middle from anterior to posterior. It does not travel all the way inferiorly and intersect with the lateral sulcus

2) Lateral sulcus

- The lateral sulcus divides both the frontal lobe and parietal lobe above from the temporal lobe below.
- Easy to identify, begins a few inches posterior from the front of the brain, travels slightly superior and posteriorly, before travelling mostly posteriorly.
- It is on the lateral surface

3) Parietooccipital sulcus

- Only a small part of the parieto-occipital sulcus, or parietooccipital fissure is seen on the lateral surface of the hemisphere, its chief part being on the medial surface.
- Separates the parietal and occipital lobes

4) Cingulate sulcus

- On the medial surface, the main sulcus superior to the corpus callosum. Above the corpus callosum is the cingulate gyrus, and then there is the cingulate sulcus which divides the top portion from the cingulate gyrus.

5) Cingulate gyrus

- the gyrus directly above the corpus callosum, on the medial side.
- Part of limbic system, part of the papez circuit
- Involved with processing short term memory into long term memory.
- Hippocampus receives info from cortex, info sent through fornix, then the mammillary bodies. Mammillary body it goes to thalamic nuclei, then to cingulate gyrus. Then reverberated through circuit

6) Calcarine Sulcus

- On the posterior end of the brain, divides the occipital lobe, almost horizontally. The most posterior sulcus that will be asked.
- Below is the primary visual area, above is visual association area.

7) Primary motor area

- Primary motor area- 4 (Brodmann's area)
- The pre central gyrus, extends on the medial surface also. There are large areas within the PMA that represent the fine motor movements, e.g. for the fingers and hand.
- Begins on the superior/medial surface of the brain where lower limbs are located and extends down towards lateral sulcus, where the upper limbs, tongue and mouth areas are.
- Contralateral control, so when damaged there will be weakness contralaterally (called paresis) or complete loss on one side (paralysis). Because one side is affected it is called hemiparesis etc.

8) Prefrontal cortex

- The most anterior part of the frontal lobe, just behind the forehead
- This brain region is associated with planning complex cognitive behaviour, personality expression, decision making, and moderating social behaviour.
- Bilateral lesion here will lead to impaired judgement, concentration, initiative and problem solving.

9) Paracentral lobule

- The paracentral lobule is located on the medial surface of the cerebral hemisphere, it is the medial continuation of the precentral and postcentral gyri (primary motor and primary sensory areas). It has motor and sensory functions related to the lower limb.
- The anterior two-thirds are part of the primary motor area controlling the leg, foot and urinary bladder.
- Important involvement in coordination of the urinary bladder – it exerts control of pontine micturition and storage areas which then exert control over nerves that will stimulate or inhibit the internal/external urethral sphincters and detrusor muscle. Ultimately controlling whether urine is stored or expelled.
- Sympathetic control will close the internal sphincter and inhibit detrusor – thus preventing expulsion and allowing urine to fill bladder.
- Parasympathetic control will stimulate detrusor muscle to expel urine, and also inhibit the internal urethral sphincter to open the passage for expelling urine.

10) Premotor and supplementary motor

- Anterior to PMA, involved in the initiation and sequencing of movement. Works with PMA and is involved in adjusting posture during voluntary movement.
- Supplementary motor extends in medial surface, involved in more complex movement initiation. Activated when we think about moving.

11) Frontal eye field

- Located in the middle frontal gyrus and extends down
- Produces parallel movement of the eyes together e.g. side to side together
- Maintains vision – e.g. both eyes looking at the same spot, coordinates eyes

12) Primary sensory area

- Primary sensory area-3,1,2 (Brodmann's area)
- Parietal lobe is divided into three areas. The primary somatosensory area is located just behind central sulcus (post central gyrus). Aka primary sensory area – receives all sensation except special sense from the head and limbs. Including touch, proprioception, temperature, pressure, pain, 2 point discrimination.
- Receives sensation contralaterally, so if there is a lesion there is contralateral anaesthesia (loss of sensation on one side = hemi-anaesthesia).
- Like the PMA, the PSA has larger areas for the tongue, face, hands fingers etc.

13) Superior parietal association area (lobule)

- Area 5 and 7, located behind post central sulcus, on the superior surface of parietal

- Can assess objects with closed eyes (through general senses). Can sense the 3D aspects of an object and figure out what it is. This is called stereognosis.
- If there is a lesion they will have trouble with spatial processing (of an object etc.) touch and feel processing.
- This is called perceptual agnosia or astereognosis.

14) inferior parietal association area (lobule)

- areas 39 and 40. Important, higher function – detects or recognises right from left, detecting the right and left side of your own body.
- Helps with complex mathematical problems – lesion = acalculia
- Helps with drawing/graphics – lesion = agraphia
- Inability to read = alexia
- Confusion between left and right (neglect syndrome, where you neglect one side)
- Anomia = inability to name objects.
- However if the damage is in the non-dominant hemisphere they will only have neglect syndrome, but if it is in dominant side they will lose above higher functions.

15) Primary visual area

- Primary visual area-17 (Brodmann's area). Pretty much the posterior pole of occipital lobe
- In the occipital lobe, locate in the gyrus that forms the wall of the Calcarine sulcus
- Forms an image from the retina via optic nerve to PVA. Poor quality though. Both sides receive info from both eyes.
- Connected to association area by short association fibres and to the other visual area by commissural fibres.

16) Primary auditory area

- The temporal lobe is divided into three gyri by horizontal sulci. The superior gyri (just below lateral sulcus and above superior temporal sulcus) is an important gyrus relating to auditory.
- Primary auditory area-41-42 (Brodmann's area) is located almost exactly in the middle of the brain, slightly anterior perhaps, just below the lateral sulcus. The secondary auditory area is located just posterior to this.
- These areas detect changes in the frequency and intensity of sound, direction from where it came from. Info is projected bilaterally so lesion does not produce significant hearing impairment
- Stroke usually causes no deafness.

17) Visual association area

- Visual association area-18, 19 (Brodmann's area). Located in the occipital lobe, just anterior to the PVA. Larger size than PVA. Just inferior and posterior to the parietooccipital sulcus.
- Makes a higher quality image, perceives colour, movement and direction of objects, recognises objects, determines precise geometrics of an object.
-

18) Broca's speech area

- Broca's speech area-44,45 (Brodmann's area)
- Located inferior and anteriorish portion of the frontal lobe. Find the lateral sulcus and follow that up an inch, just anterior to this is the brocas area. Sends

fibres/impulses to the motor cortex to control muscles used in speech. Helps to produce coordinated speech (of the tongue and mouth muscles etc.)

- If damaged the patient will be able to say some words, but it will be interrupted speech with missing words.
- Comprehension is usually intact but have difficult piecing a sentence together.
- Non-fluent aphasia – they can't talk fluently. As if they were learning and trying to talk a new language.

19) Wernicke's speech area (auditory associate area)

- Wernicke's speech area-22 (Brodmann's area). Located on the posterior end of the superior temporal gyrus, just behind the PAA and SAA.
- Has a higher function in auditory sensation.
- Helps comprehend a language, basically a sensory speech area. Makes sense of the language/words you are hearing.
- Lesion to Wernicke's speech area, is called sensory aphasia or receptive (fluent) aphasia. In ability to comprehend speech, however their spoken speech is okay.
- Where as lesion to Broca's area leads to inability to speak fluently, a lesion to Wernicke's leads to an inability to comprehend language you hear.
- Global aphasia = when both areas are damaged and you can't speak or understand speech.