Temporal Lobe

The temporal lobe composes all the tissue that lies below the Sylvian sulcus and anterior to the occipital cortex. Subcortical temporal lobe structures include the limbic system, the amygdala and the hippocampal formation.

Broadmann identified 10 temporal areas, lateral surface 41, 42, 22 are auditory & ventral visual stream on lateral temporal lobe (20, 21, & 38). There regions are referred as infero-temporal cortex by Von Economo's designations.

Functions:- TL does not have a unitary function. It houses -

- primary auditory cortex, secondary auditory cortex, visual cortex, limbic cortex, amygdala and hippocampus.
- Three basic sensory functions -
  (i) Processing auditory input.
  (ii) Visual object recognition.
  (iii) Long term storage of sensory input.

⇒ Hippocampus works in concert with the object recognition ~~of objects in space~~ and memory functions of the neocortex.

⇒ plays important role in organising the memory of object in space.

⇒ Amygdala - adds affective tone (emotion) to sensory input and memories.

Symptoms of temporal lobe lesions.

- Nine periferal symptoms are associated with disease of temporal lobe.

1) Disorder of Auditory perception.
   a) Speech perception. — Difficulty in discriminating speech sounds presented quickly.
   b) Music perception — Primary auditory cortex is responsible for pitch differentiation.
2) Disorder of Music perception —
3) Disorder of visual perceptions.
4) ~~Disorder of~~ selection of visual & auditory input.
5) Organisation & categorization.
6) Using contextual Information.
7) Memory.
8) Affect of personality
9) Kluver – Bucy Syndrome
10) Altered sexual behaviour.

Occipital lobe

In the occipital lobe the area of principal importance is area 17, the striate area, which is the primary cortical center for vision. Closely associated with it is the ~~primary cortical~~ prestriate area, Broidman's 18 and 19. It is regarded as a visual "association" center.

Disorders:—

1. V1 damage and Scotoma — blind spot in the visual field caused by the small lesion in the occipital lobe V_1 area.

2. V1 damage and Blind sight —

3. V_4 damage and color

4. V_5 damage and movement perception. — inability to perceive motion, Object do not appear moving, they suddenly appear "here and there" (Akinetopsia)

5. Occipital damage & visual agnosia. Inability to combine visual impressions into complete patterns.

Parietal lobe :—

In the parietal lobe, there is the first the postcentral area, Broadmann's 3-1-2, which lies immediately posterior to the central sulcus. This is a sensory area, concerned primarily in sensations of touch & taste. ~~Behind it are several areas~~ It receives fibres & related indirectly to touch & kinesthetic functions and is of proved importance in them.

Functions of Parietal lobe:-

* Uses of spatial information —

(A) Object recognition –
(B) Guidance of movement.

* Somatosensory functions.

Damage to post central gyrus leads to the following problems –

A). Somatosensory thresholds.
It produces clumsy movement.

B). Somatoperceptual disorders.

(i) astereognosis — inability to recognize the nature of an object by touch.
(ii) simultaneous extinction —

C). Blind touch

D). somatosensory agnosias.

Posterior Parietal Damage symptoms.

(1) Balint's syndrome.
(2) Right Parietal lesion syndrome.
(A) Contralateral neglect.
(B) object recognition.

(3) Left parietal syndrome.
(A) Gerstmann Syndrome —
(B) Apraxia.
(C) Drawing.
(D) Spatial Alleution.

Frontal lobe:- three general areas may be distinguished. —

① The precentral area, Brodman's area 4, lies immediately in front of the central sulcus. When stimulated electrically, this region yields movements of various parts of the body and for this reason is also called the motor area.

② Immediately in front of the precentral area is the intermediate precentral area, sometimes called the premotor area or Broadman's area 6, which is immediately concerned in motor functions.

③ In the larger & anterior part of the frontal lobe including several architectonic areas are the prefrontal areas, sometimes referred to as the frontal "association" areas b'coz they have some specific functions in integrating mental activity.

Within the prefrontal areas and just anterior to the intermediate precentral areas are the frontal eye fields, so called because stimulation of this region causes eye movements. This area corresponds to Brodman's area