



CEREBRUM

15.4.2020

I MBBS

DR. BHAVANA

COMPETENCIES AND SLOs

AN62.2		Describe & demonstrate surfaces, sulci, gyri, poles, & functional areas of cerebral hemisphere
	62.2.1	At the end of the session the phase I student shall be able to Describe surfaces, sulci, gyri, poles of cerebral hemisphere
	62.2.3	At the end of the session the phase I student shall be able to demonstrate surfaces, sulci, gyri, poles, & functional areas of cerebral hemisphere



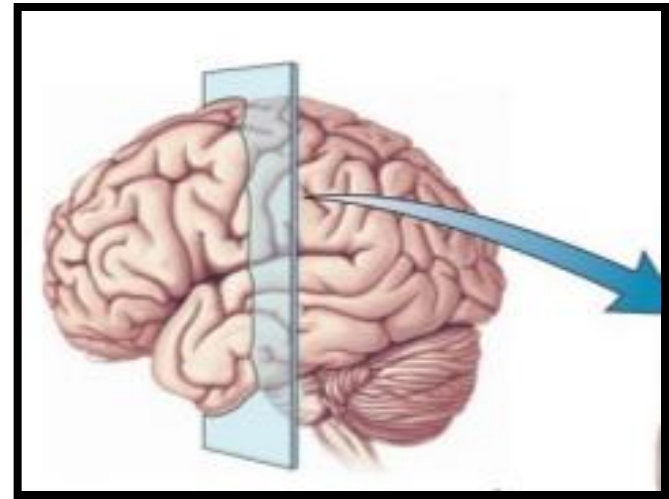
CONTENTS

- Introduction
- Features
- Sulci and gyri
- Applied anatomy

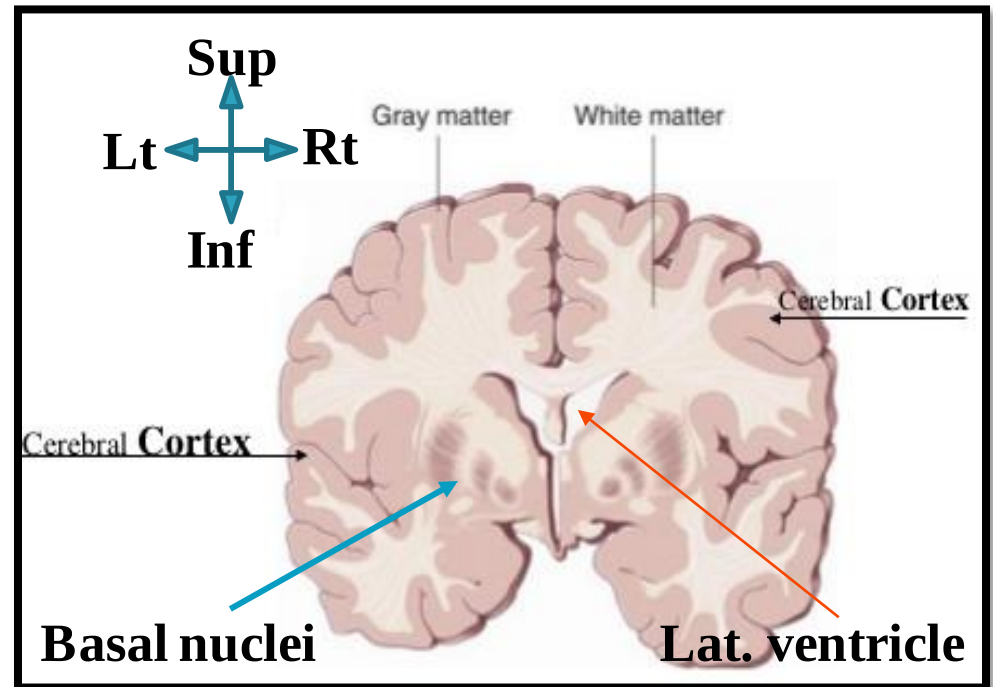


INTRODUCTION

- Has 2 hemispheres
- Each hemisphere –
 - Outer cortex (Grey matter)
 - Inner white matter
 - Basal nuclei
 - Lateral ventricle
- Is covered by 3 meninges
 - Dura mater
 - Arachnoid mater
 - Pia mater

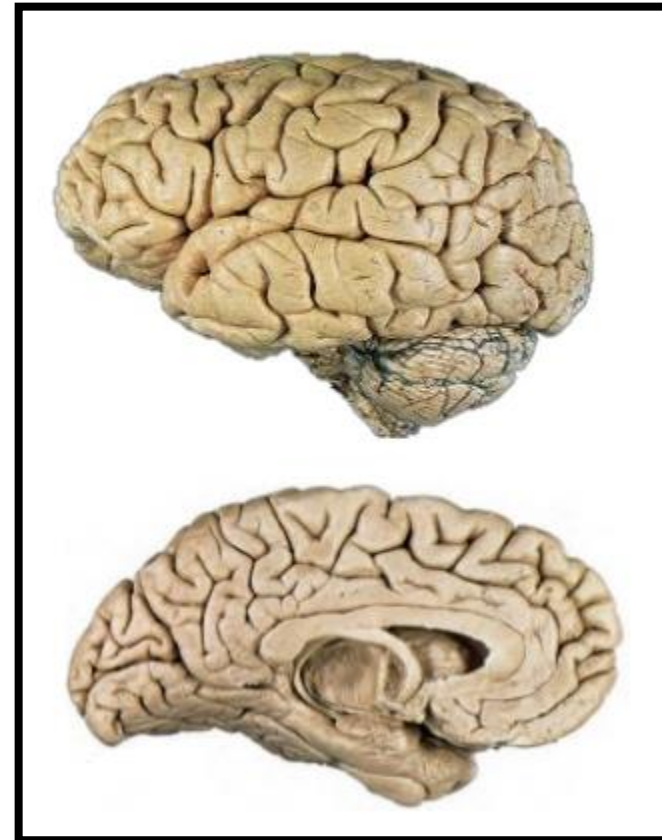
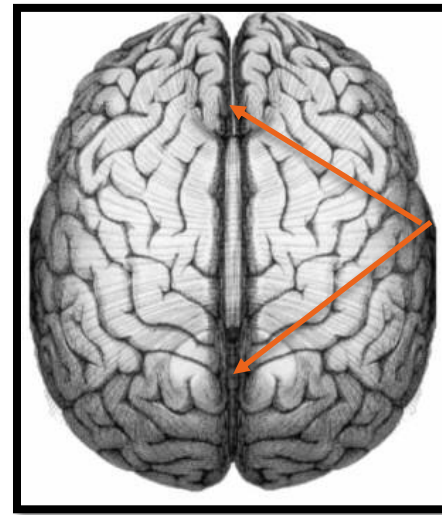


Coronal Section



FEATURES

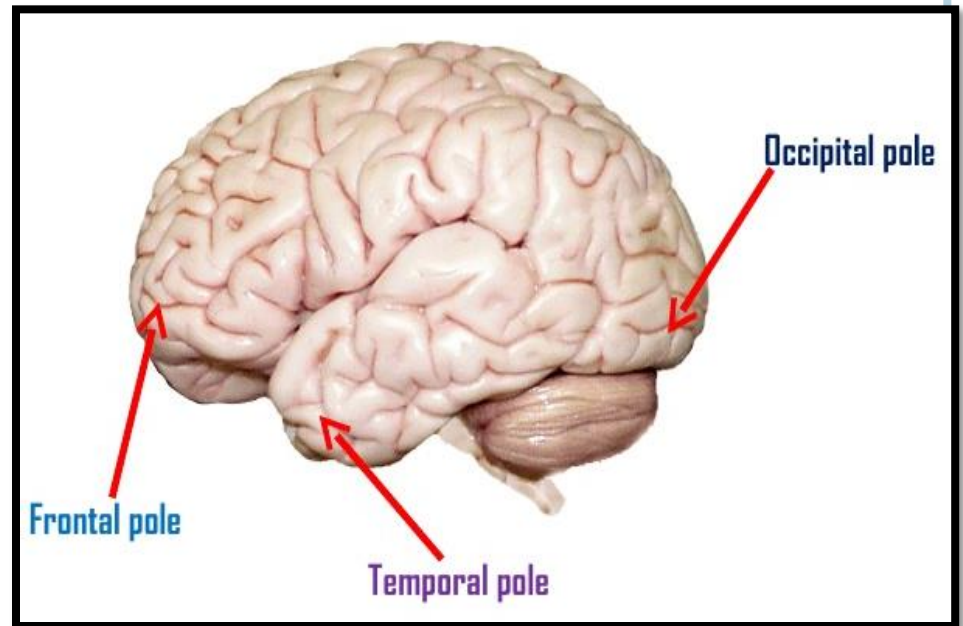
- **Median longitudinal fissure** – (Orange arrows)
- Separates 2 hemispheres except at corpus callosum
- **Each hemisphere** –
 - 3 poles
 - 3 borders
 - 3 surfaces



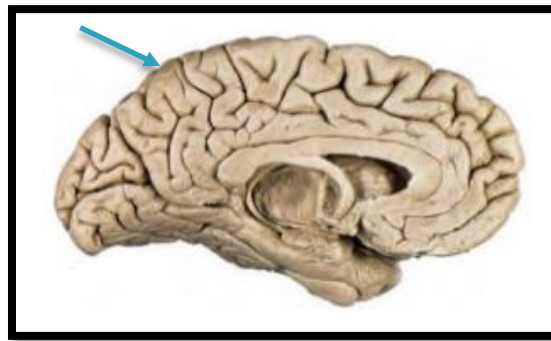
FEATURES

○ 3 poles –

- Frontal – in front and in anterior cranial fossa
- Temporal – in middle cranial fossa
- Occipital – behind and on tentorium cerebelli

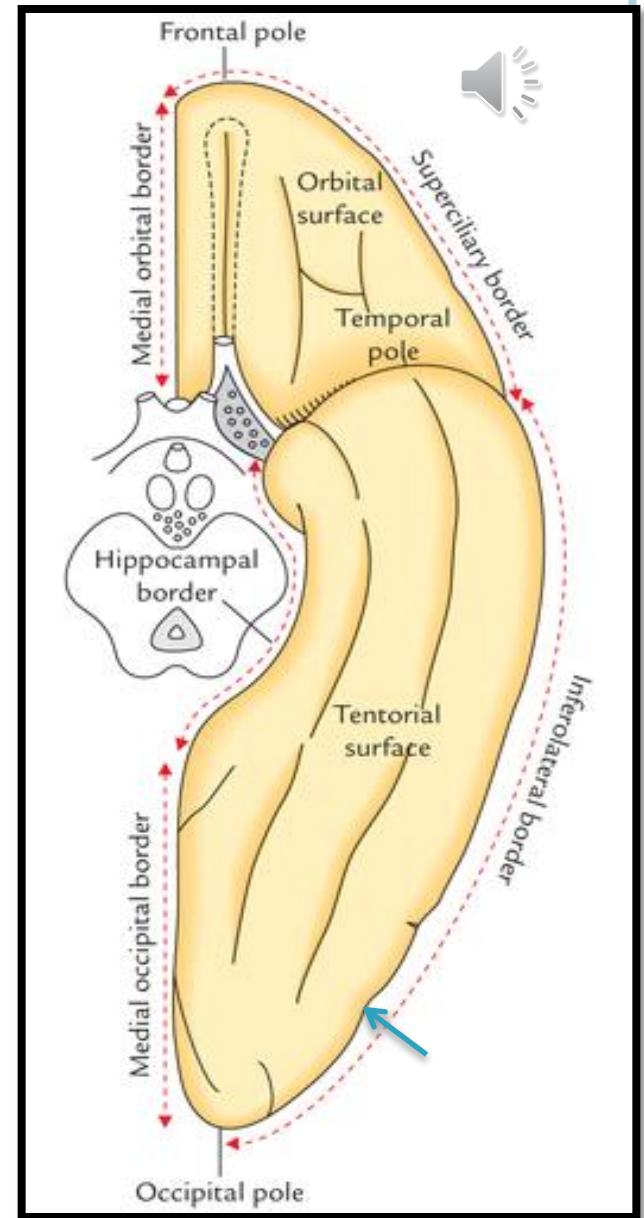


FEATURES



○ 3 borders –

- Superomedial
- Inferomedial – 2 parts separated by diencephalon.
 - Medial orbital border
 - Medial occipital border
- Inferolateral – part in front of lateral sulcus is called superciliary border
 - Slightly in front of occipital pole shows **preoccipital notch**



FEATURES

- 3 surfaces –

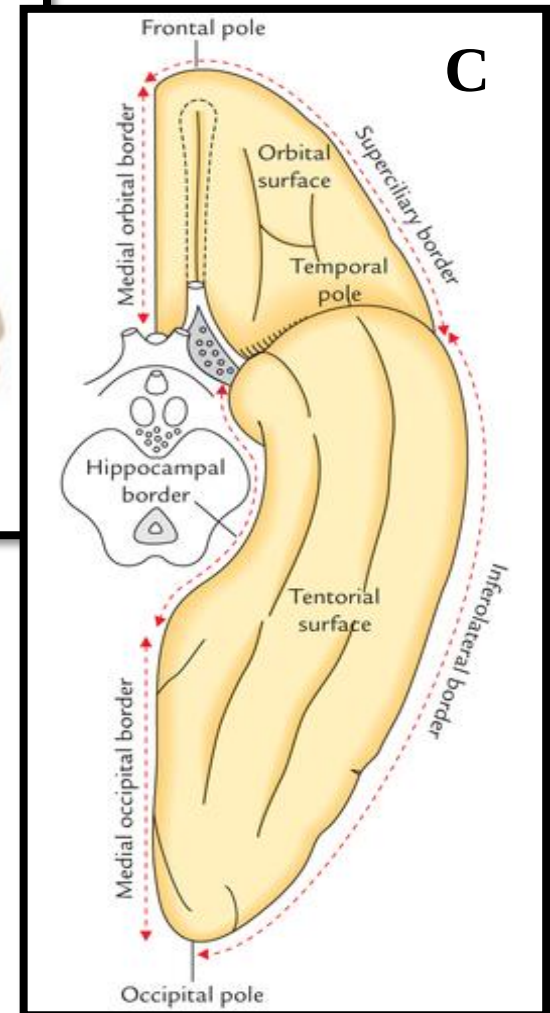
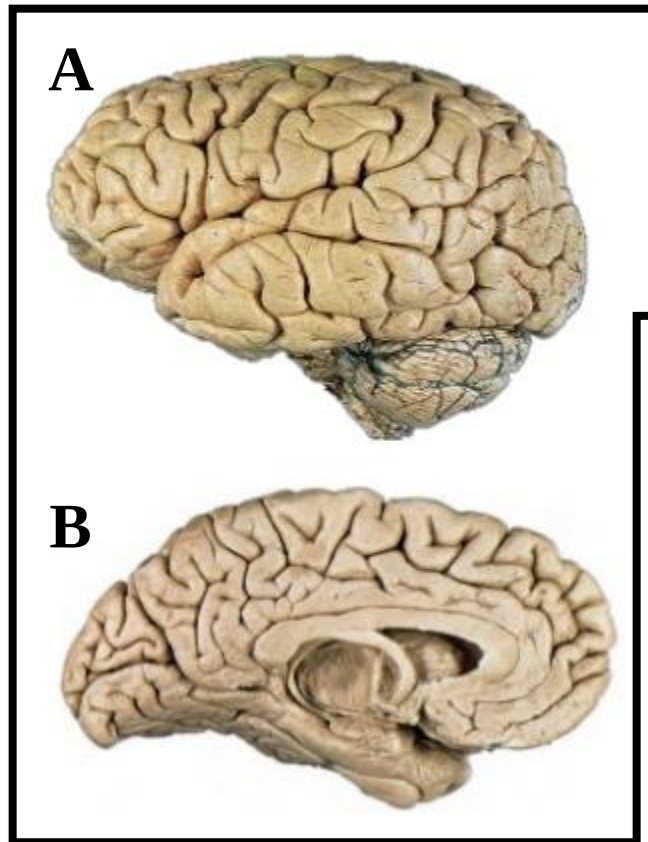
- A. Superolateral

- B. Medial

- C. Inferior – has
2 parts
separated by
lateral sulcus

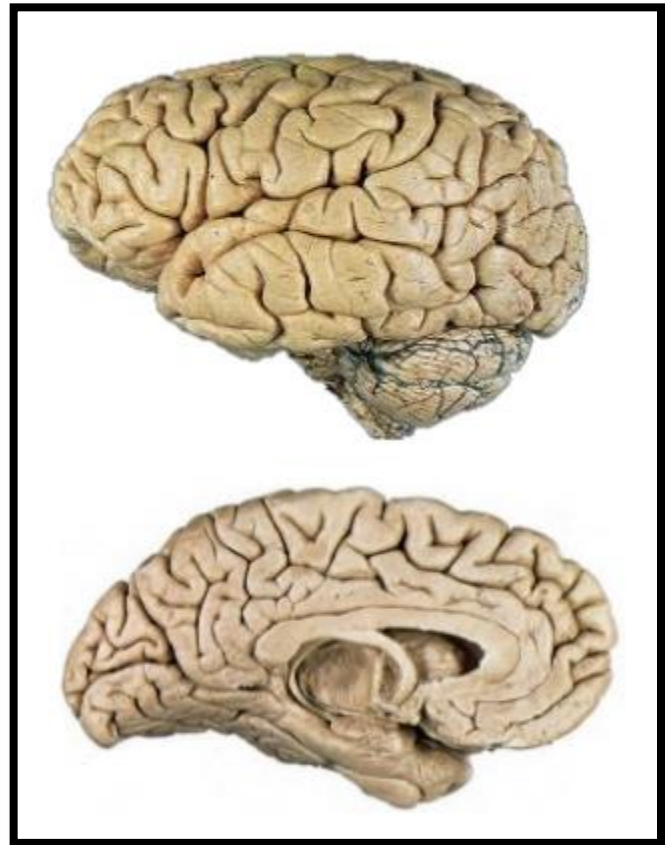
- Orbital

- Tentorial



SULCI AND GYRI

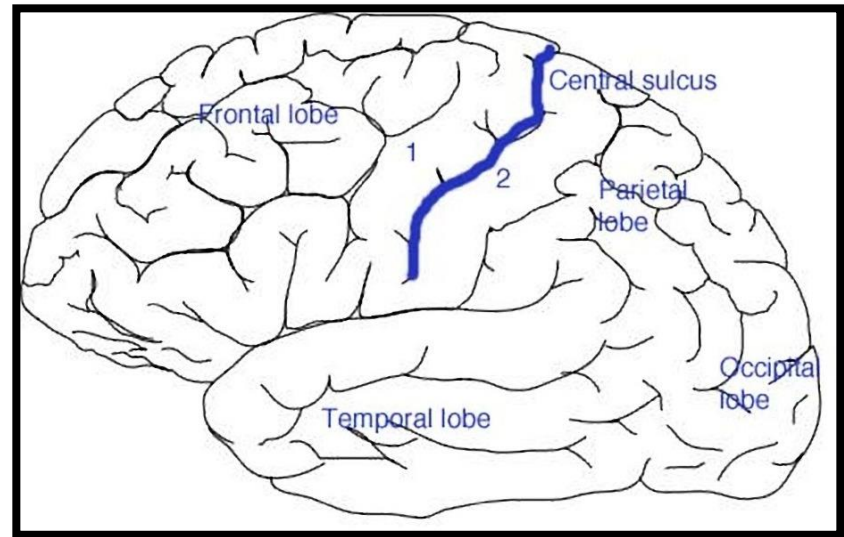
- The cerebral cortex on surface shows many folds – **gyri**
- Neighboring gyri are separated from each other by fissures – **sulci**



TYPES OF SULCI

○ Limiting –

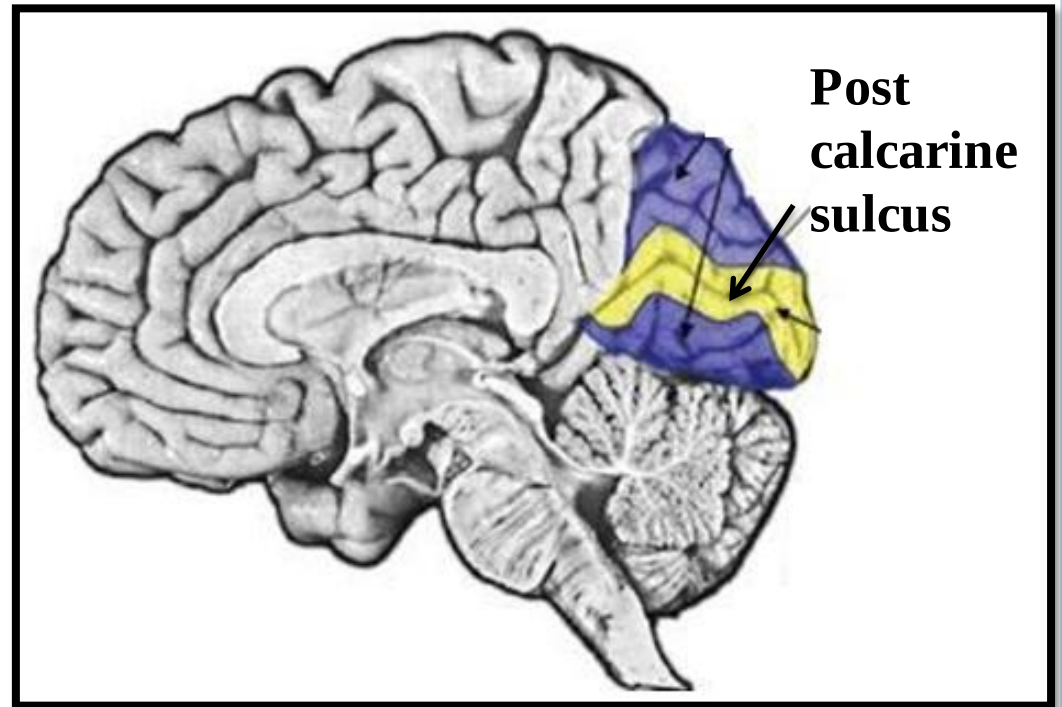
- Sulcus which separates 2 gyri which are structurally and functionally different
- **E.g. central sulcus** –
 - Separates motor and sensory areas



TYPES OF SULCI

○ Axial –

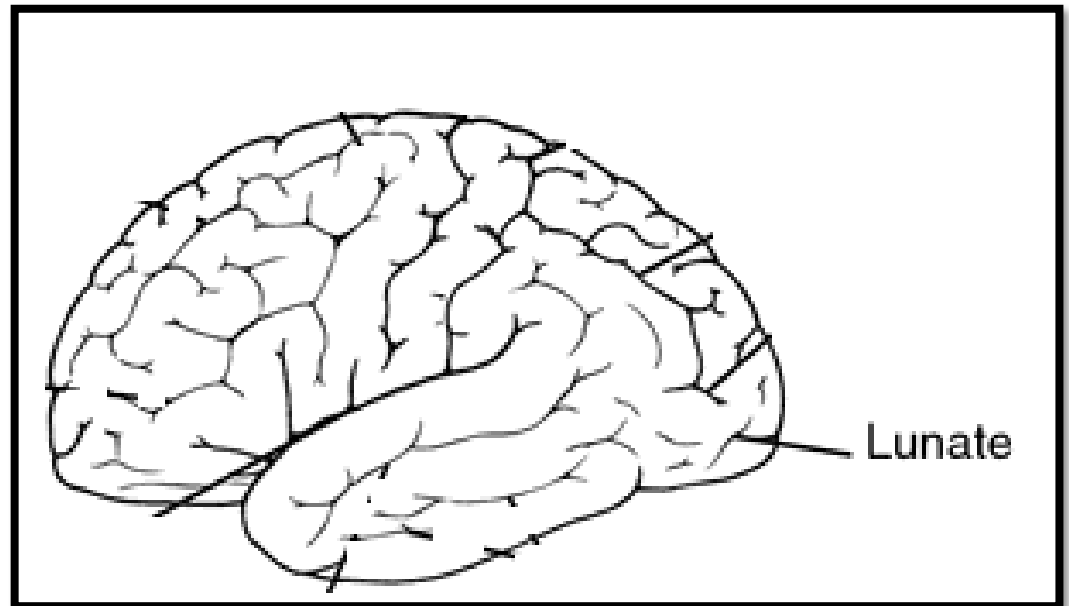
- Sulcus along whose axis grows any 1 type of cortex
- **E.g. posterior part of calcarine sulcus** with visual cortex along it



TYPES OF SULCI

- **Operculated** –

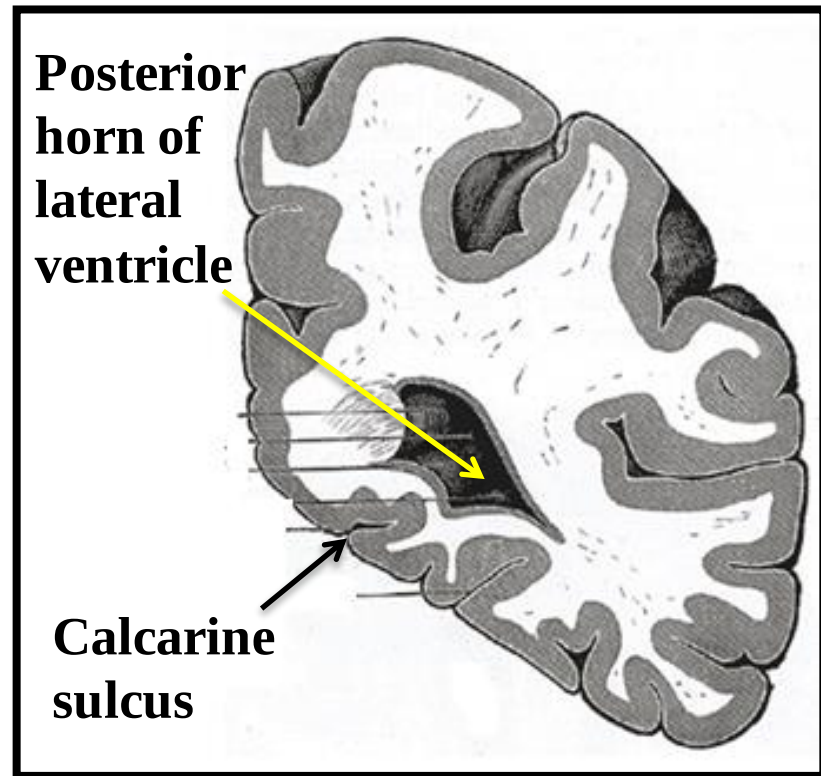
- When lips and floor of a sulcus separate 3 areas from each other
- **E.g. lunate** sulcus and areas 17, 18, 19



TYPES OF SULCI

○ Complete –

- Deep sulcus which reaches from surface up to ventricle and presents elevation in cavity
- **E. g. anterior part of calcarine sulcus** – calcar avis in posterior horn



TYPES OF SULCI

○ Primary –

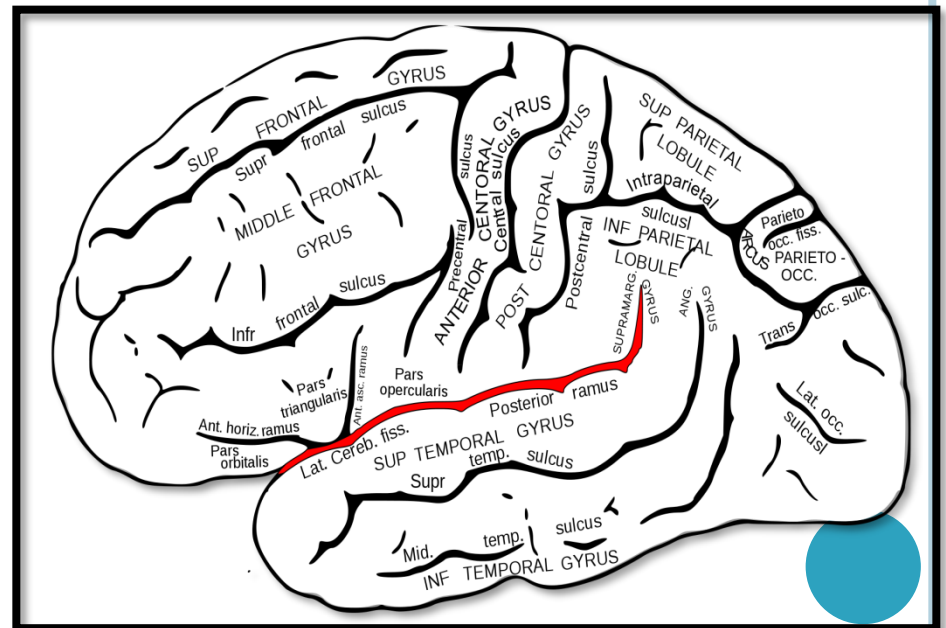
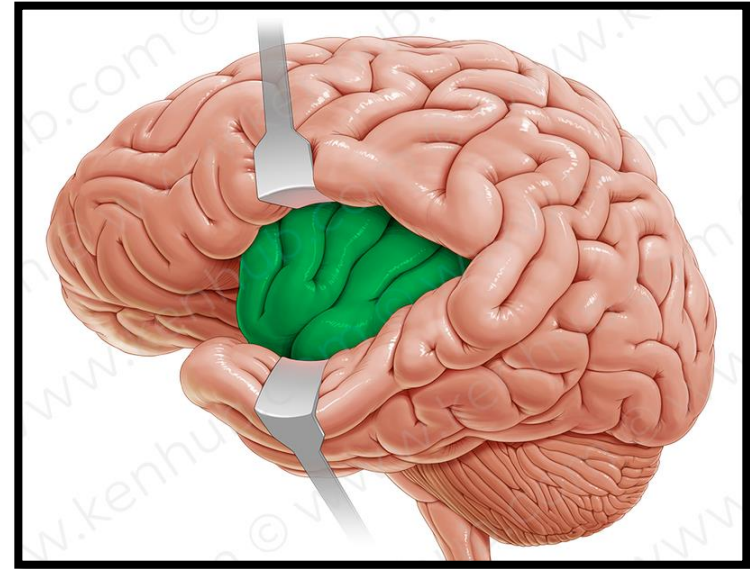
- Sulcus which develops independently only due to exuberant growth of cortex

- E.g. most of sulci

○ Secondary –

- Sulcus whose development is dependent on other factors

- E.g. lateral sulcus





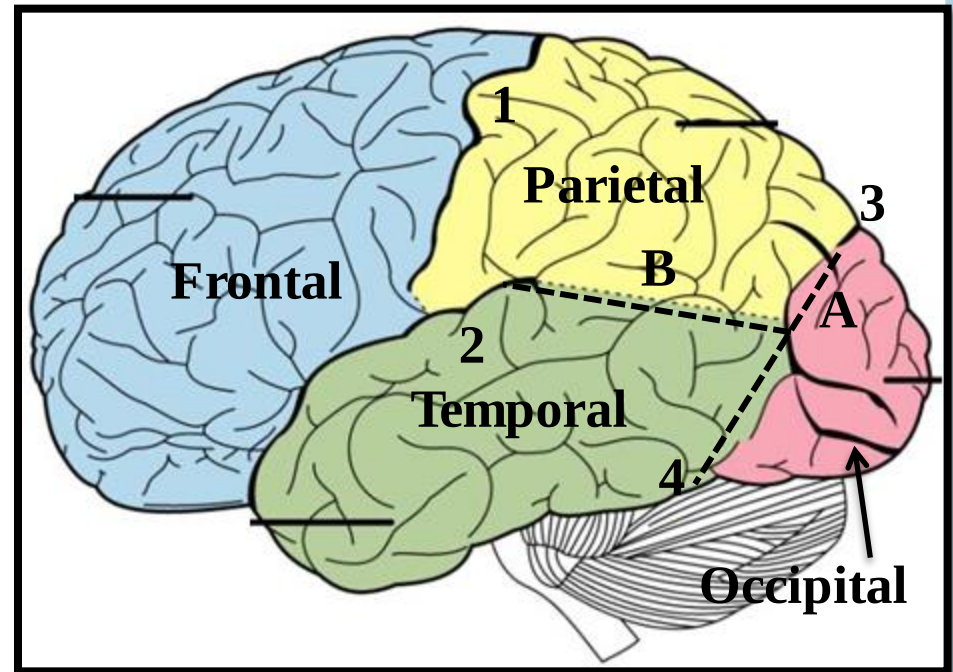
IMPORTANT SULCI AND LOBES OF CEREBRUM

1. Central sulcus
2. Lateral sulcus – posterior ramus
3. Parieto-occipital sulcus
4. Pre-occipital notch

○ On superolateral surface –

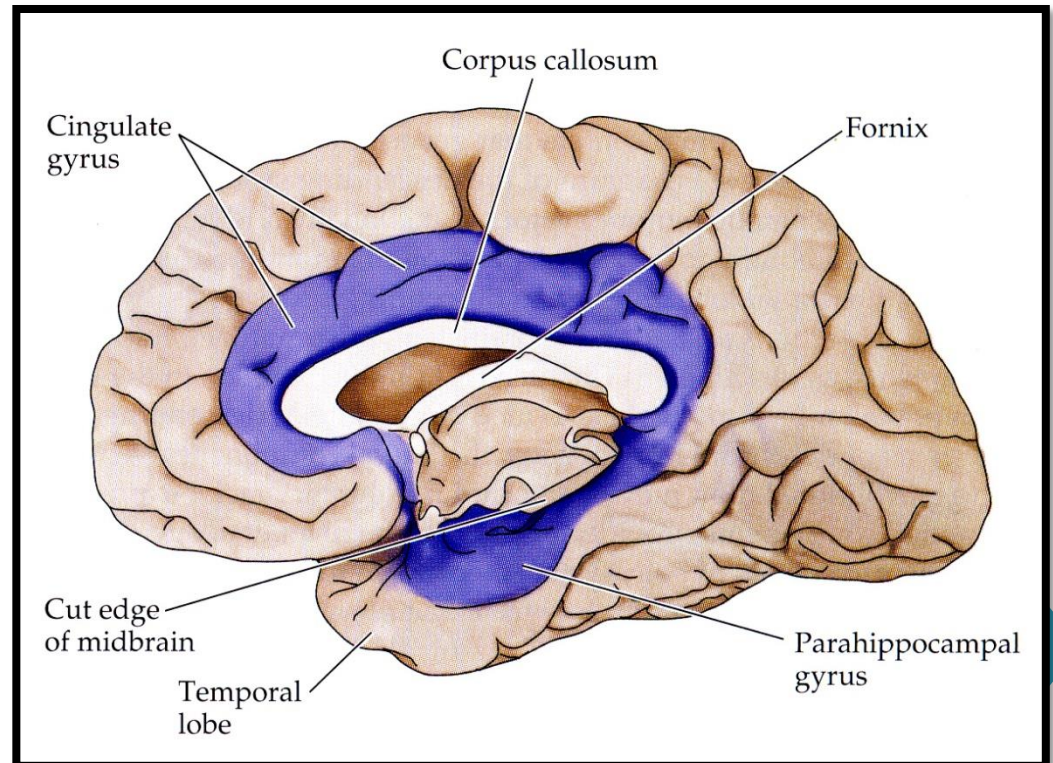
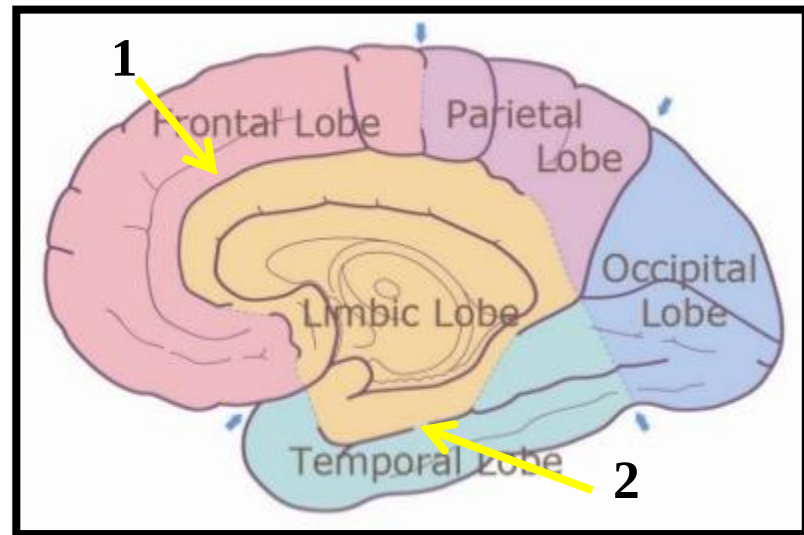
○ 4 lobes –

- Frontal
- Parietal
- Occipital
- Temporal

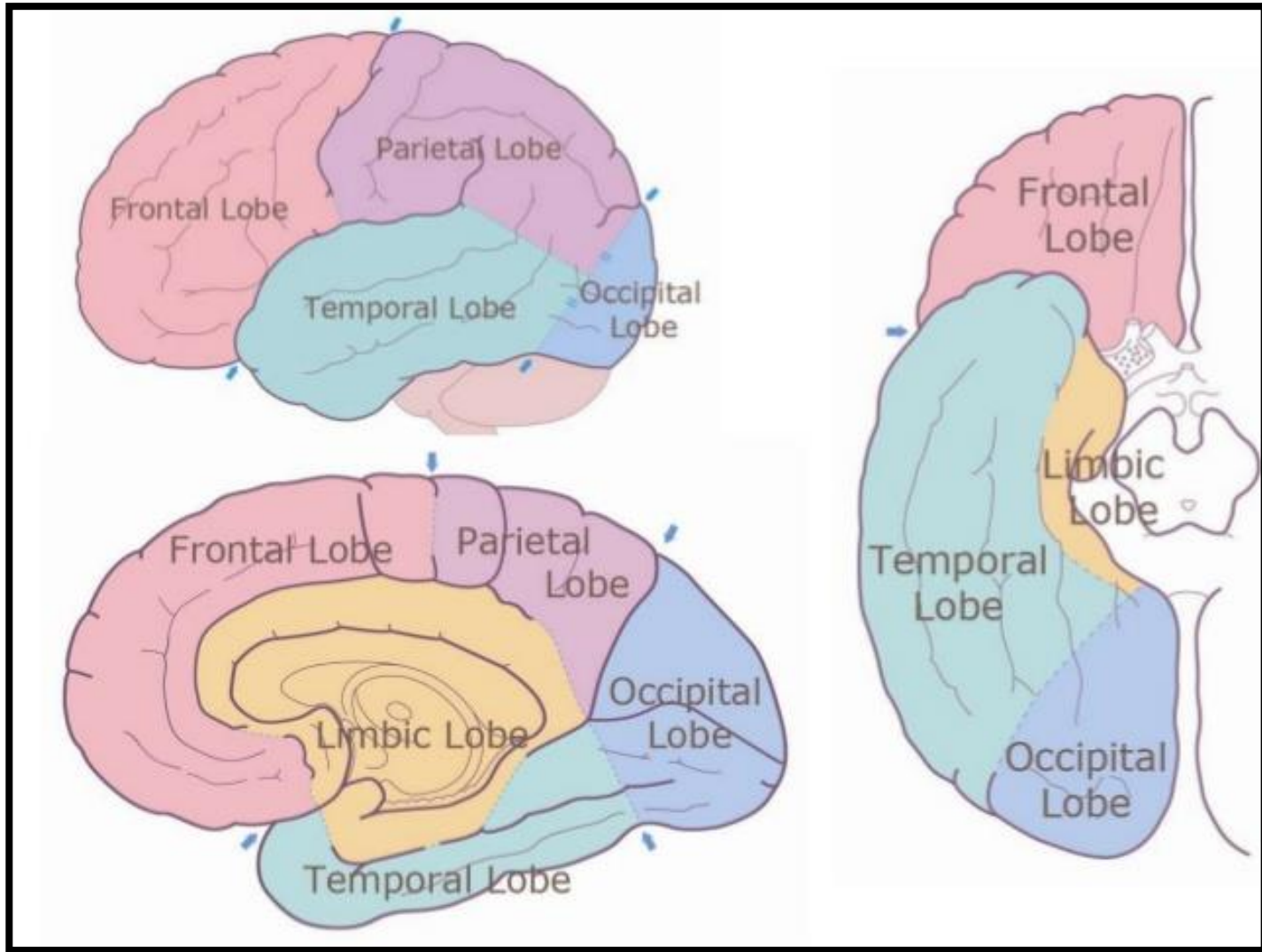


IMPORTANT SULCI AND LOBES OF CEREBRUM

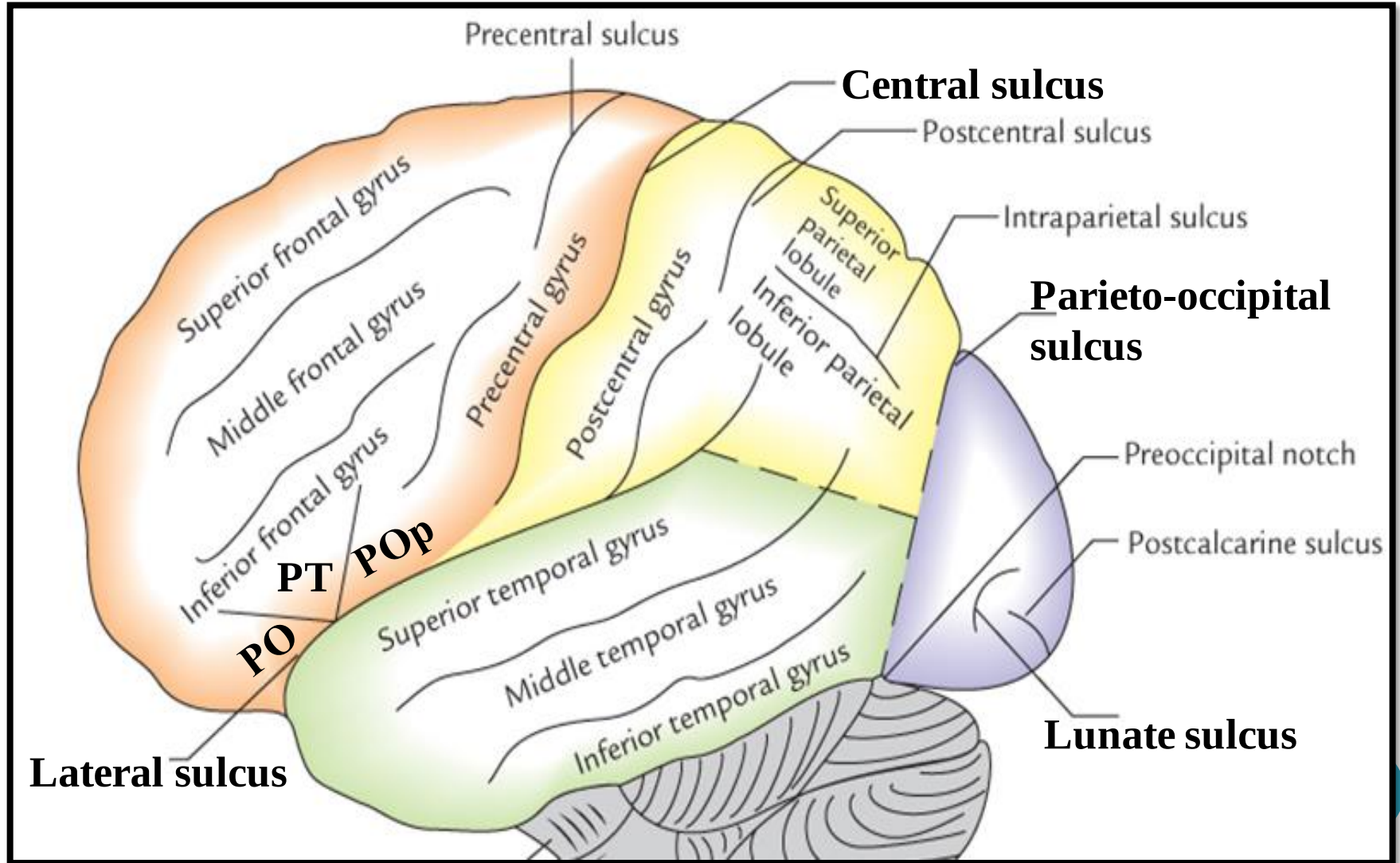
1. Cingulate sulcus
 2. Collateral sulcus
- On medial surface –
 - 1 extra lobe –
 - Limbic



LOBES OF CEREBRUM



SULCI AND GYRI ON SUPEROLATERAL SURFACE



SULCI AND GYRI ON SUPEROLATERAL SURFACE

No.	Sulcus	Related gyri	Area	Lobe
1	Central	Precentral	4	Frontal
	Precentral & Postcentral	Postcentral	3,1,2	Parietal
2	Superior frontal	Superior frontal	6	Frontal
	Inferior frontal	Middle frontal	6	
		Inferior frontal		
3	Lateral sulcus – anterior horizontal ramus	Pars orbitalis		Frontal
	Anterior ascending	Pars triangularis	45	
	Posterior	Pars opercularis	44	

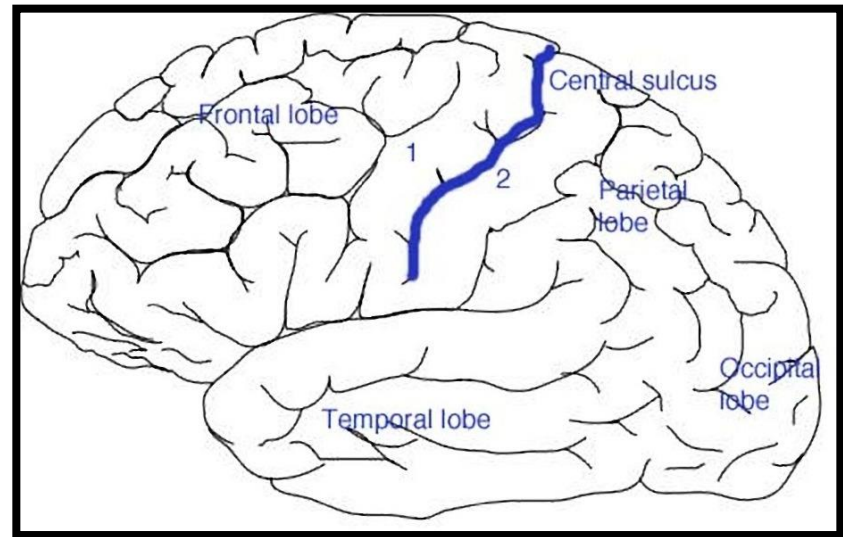
SULCI AND GYRI ON SUPEROLATERAL SURFACE

No	Sulcus	Related gyri	Area	Lobe
4	Intraparietal	Superior parietal lobule	5,7	Parietal
		Inferior parietal lobule	40,39	
5	Parieto-occipital	Arcus parieto-occipitalis		
6	Lateral occipital and lunate	Superior occipital	17,18,19	Occipital
		Inferior occipital		
7	Superior temporal	Superior temporal	41,42,22	Temporal
	Inferior temporal	Middle temporal		
		Inferior temporal		

SULCI

○ Central sulcus – of Rolando

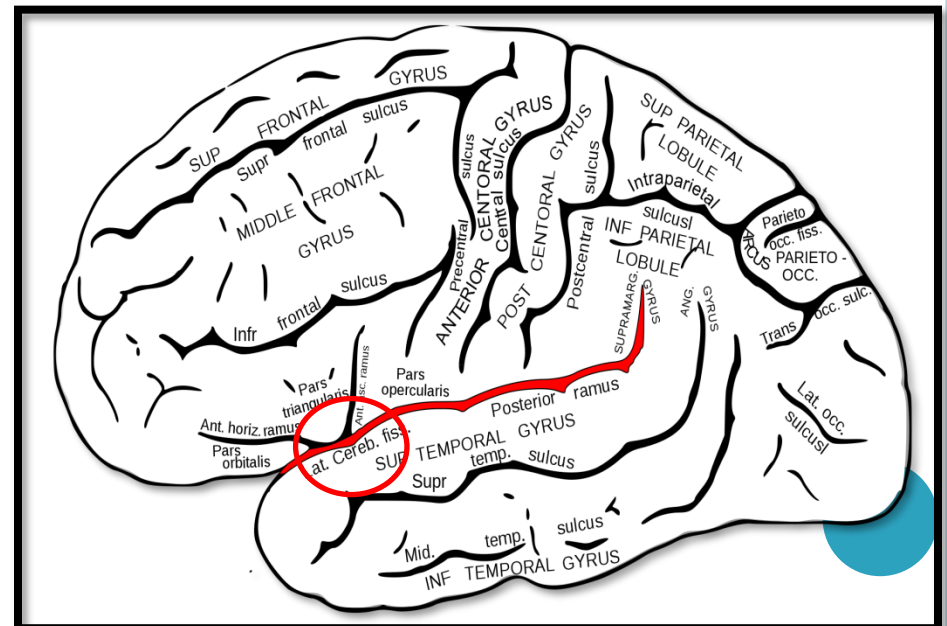
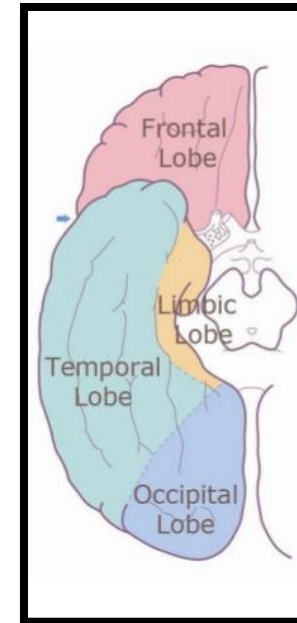
- **Type** – limiting
- **Starts** – superomedial border just behind midpoint
- **Ends** – slightly above posterior ramus of lateral sulcus
- Also extends on medial surface



SULCI

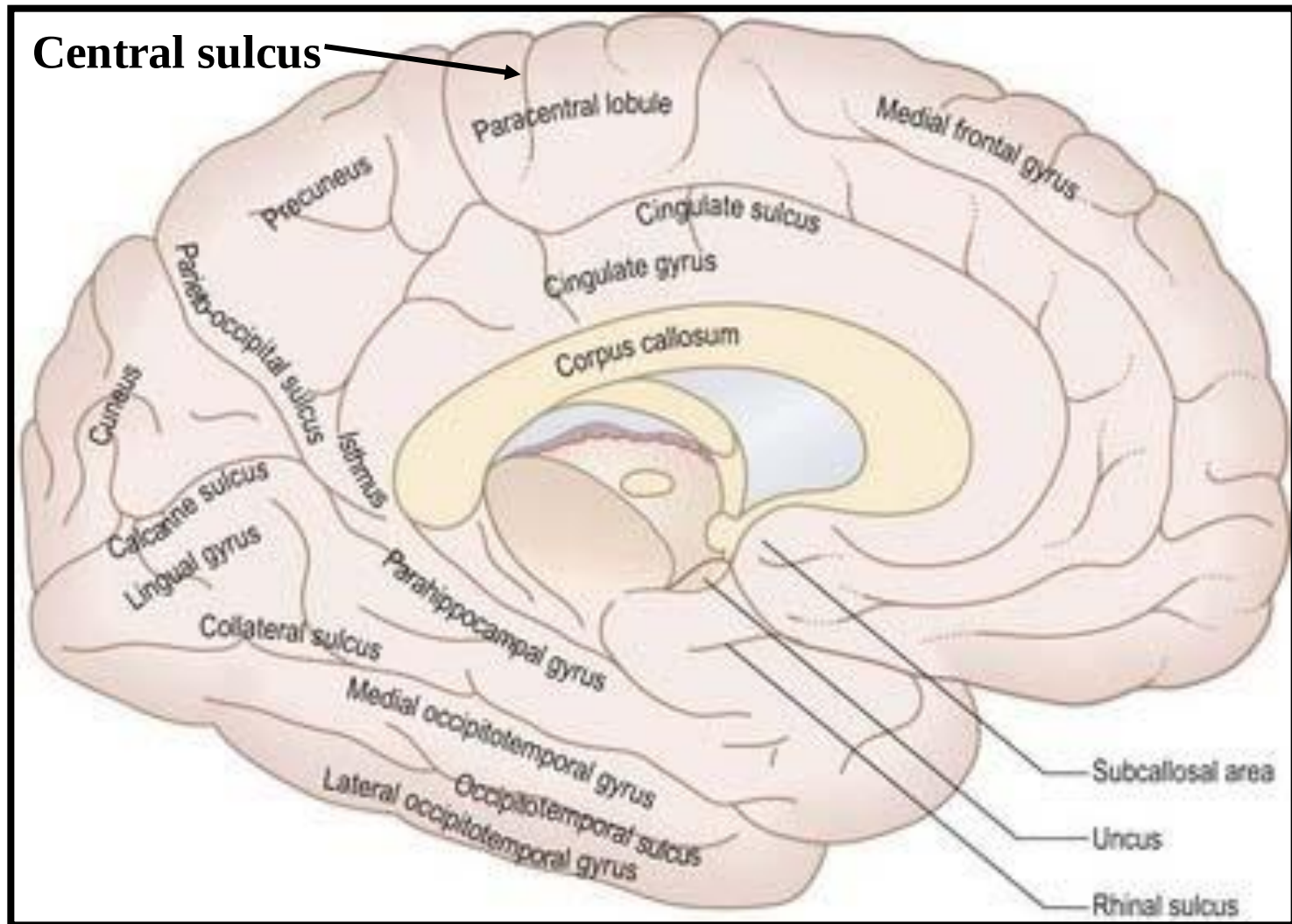
○ Lateral sulcus – of Sylvius

- **Type** – secondary
- **Parts** –
 - **Stem** – starts on inferior surface and ends on superolateral surface at **sylvian point** (Red circled area)
 - **Rami** –
 - Anterior horizontal
 - Anterior ascending
 - Posterior





SULCI AND GYRI ON MEDIAL SURFACE



SULCI AND GYRI ON MEDIAL SURFACE

No.	Sulcus	Related gyri	Area	Lobe
1	Callosal and cingulate	Cingulate		Limbic
		Medial frontal		Frontal
2	Central	Paracentral lobule	4 & 3,2,1	
3	Parieto-occipital	Precuneus	5,7	Parietal
		Cuneus	17,18,19	Occipital
4	Calcarine	Lingual		

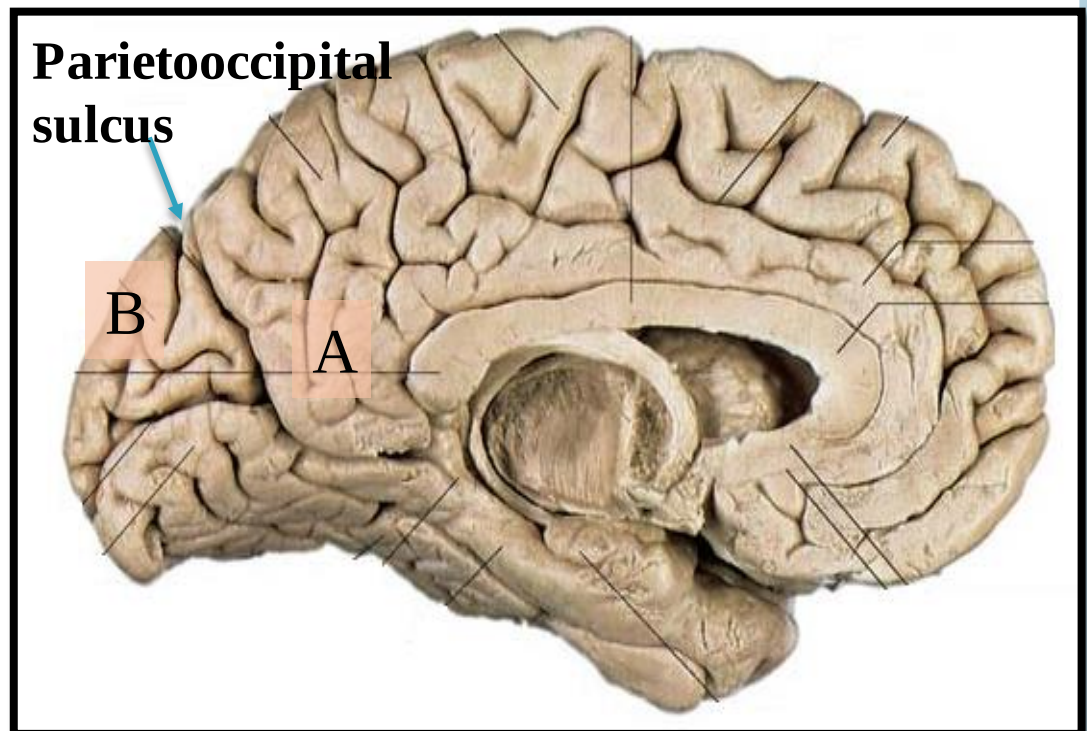
SULCI

○ Calcarine –

- On medial surface extending on superolateral surface
- Parts – from meeting point with parieto-occipital sulcus

A. Anterior

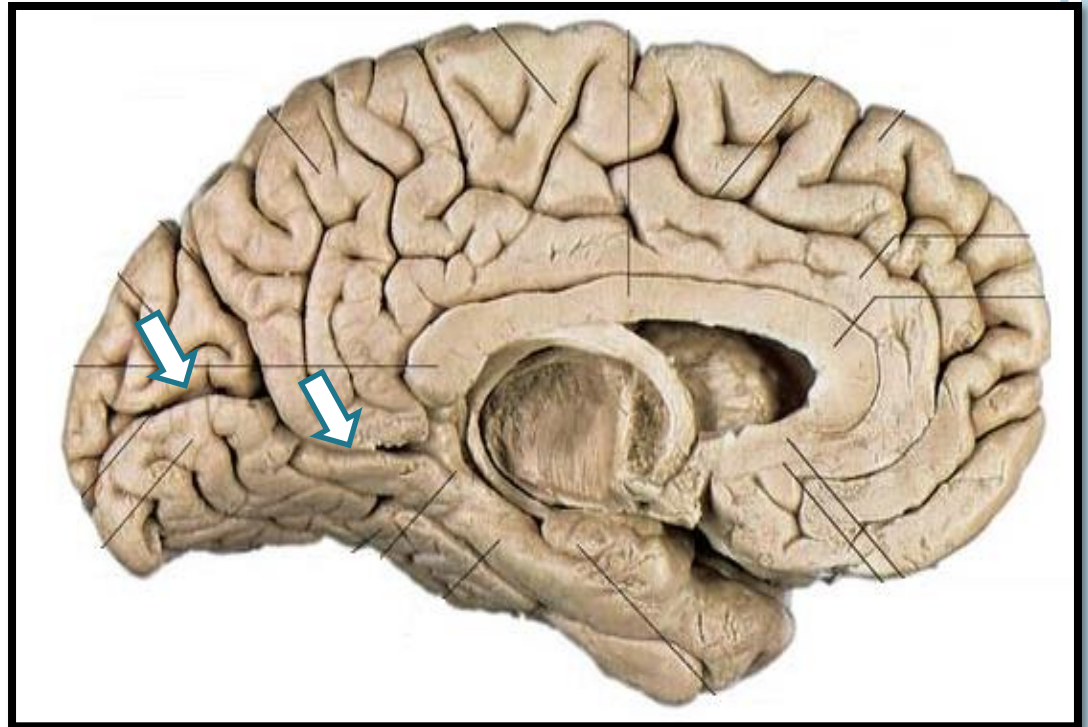
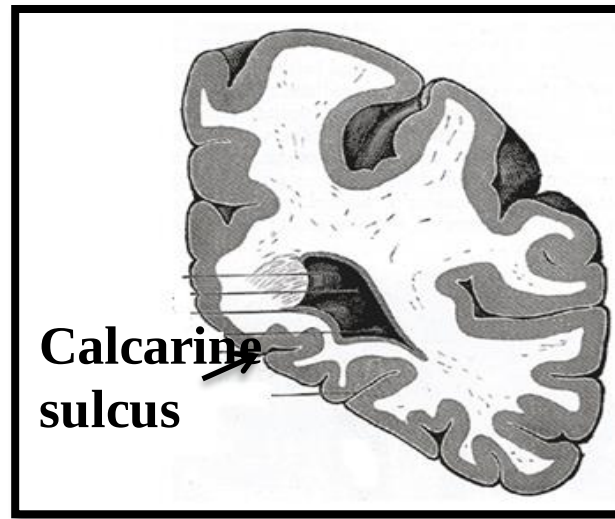
B. Posterior



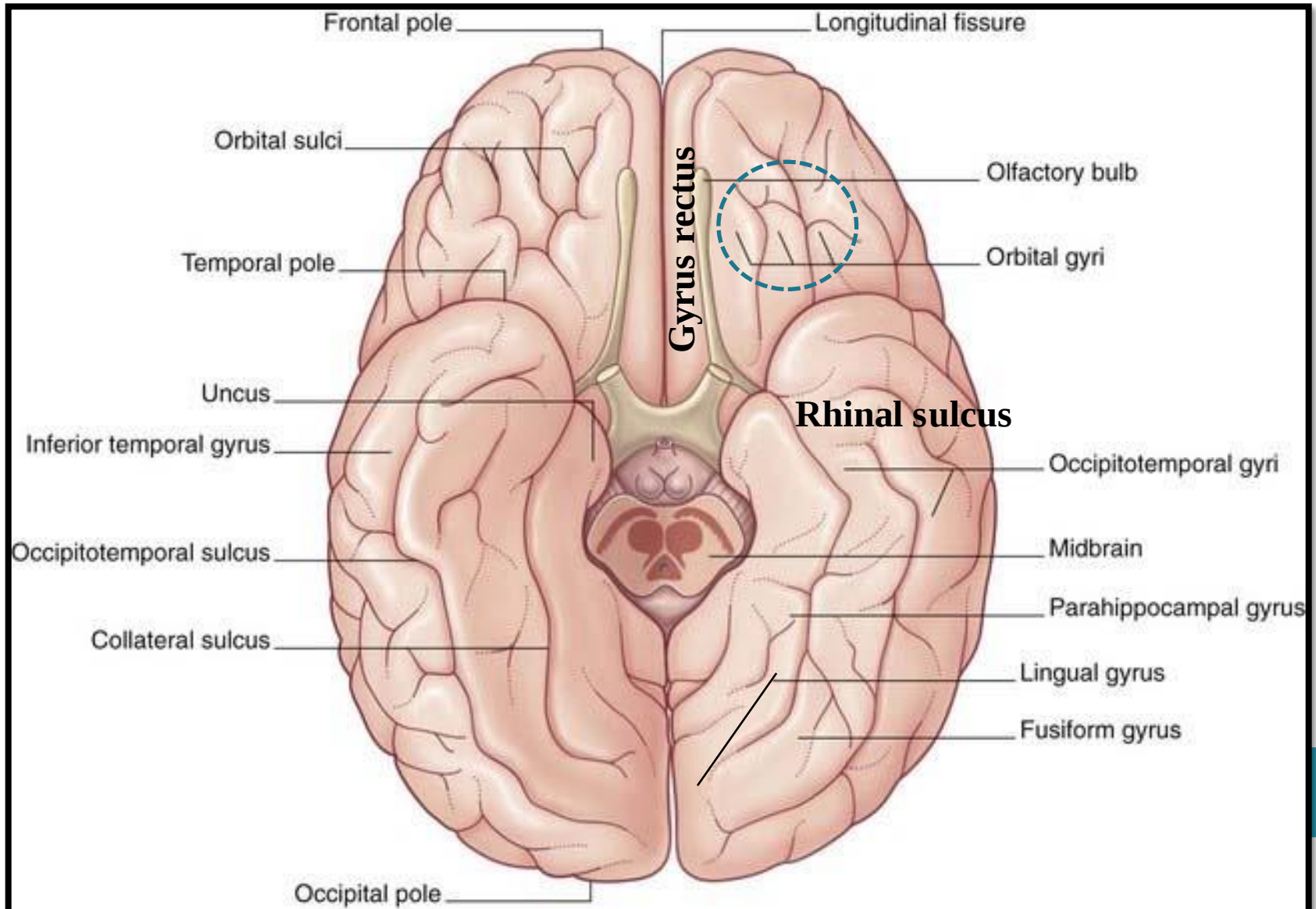
SULCI

○ Calcarine – Parts –

- Anterior –
 - Complete type
 - Raises calcar avis in posterior horn of lateral ventricle
- Posterior –
 - Axial type
 - Surrounded by visual cortex



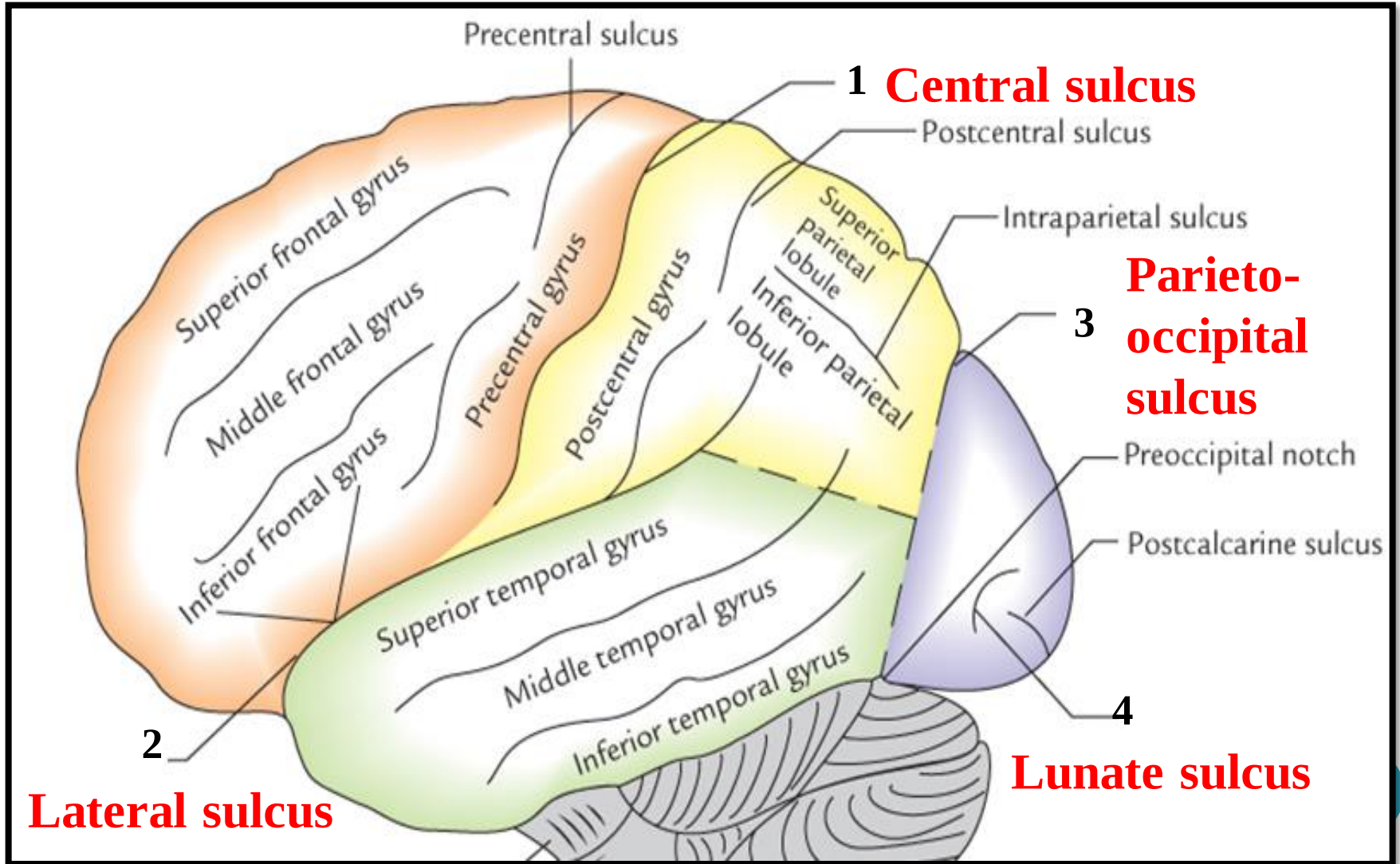
SULCI AND GYRI ON INFERIOR SURFACE



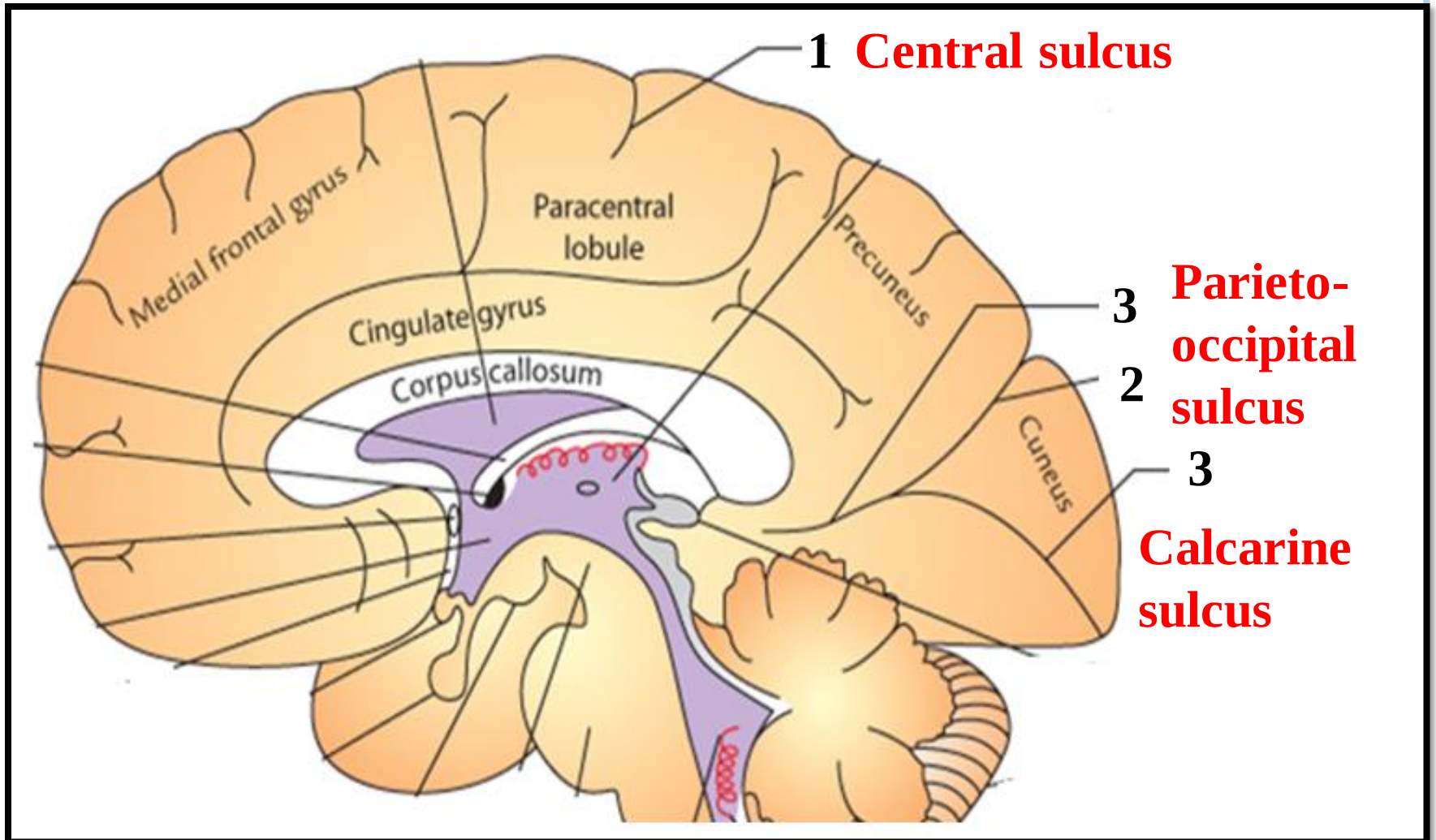
SULCI AND GYRI ON INFERIOR SURFACE

No.	Sulcus	Related gyri	Lobe
1	Olfactory	Gyrus rectus	Frontal
2	Orbital	Medial, lateral, anterior and posterior orbital	
3	Collateral	Parahippocampal	Limbic
4	Rhinal	Uncus	Temporal
5	Occipito-temporal	Medial and lateral occipito-temporal gyri	

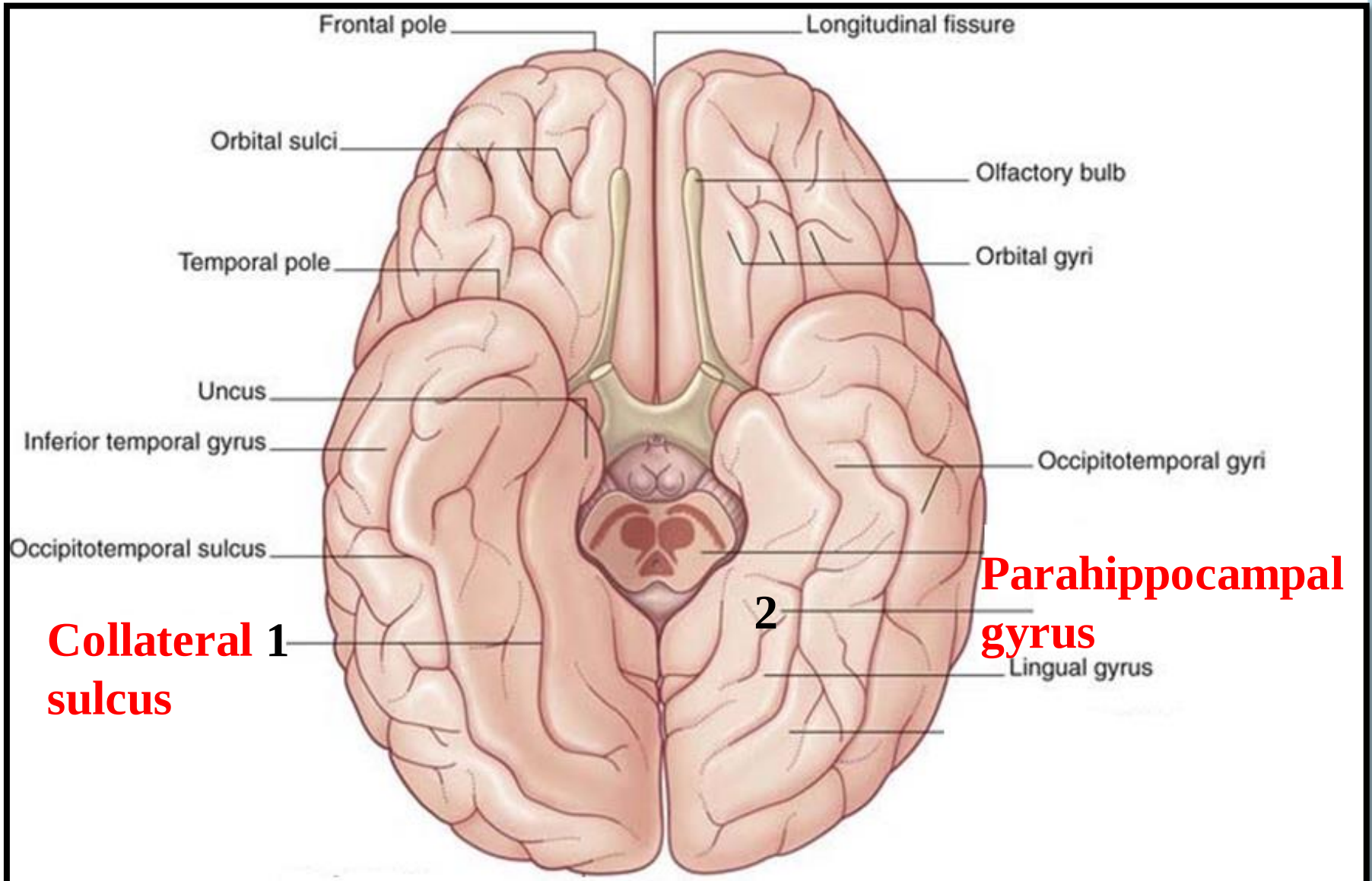
LET'S REVISE



LET'S REVISE



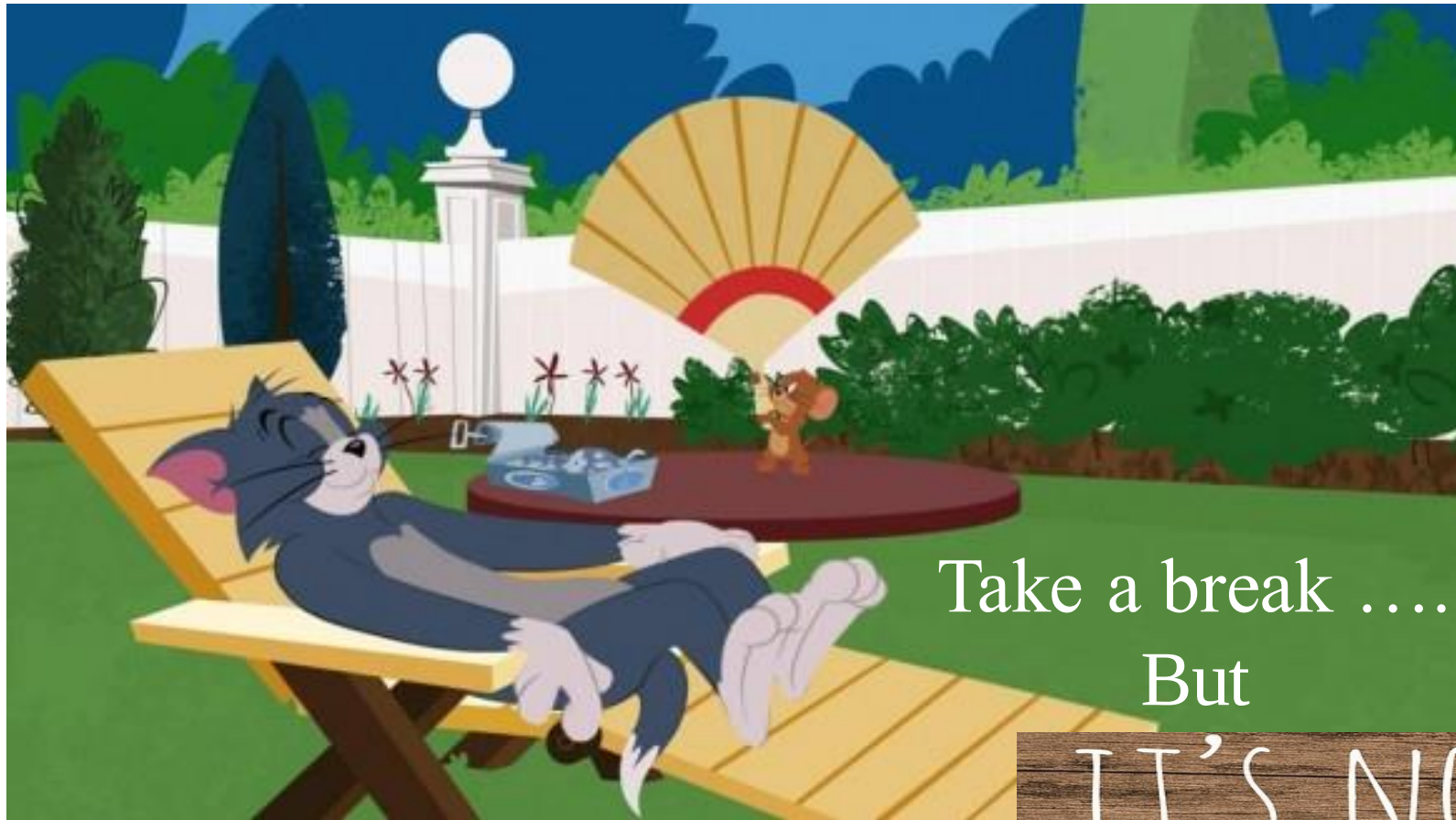
LET'S REVISE



QUESTIONS

- SAQs –
 - Draw and label superolateral surface of cerebral hemisphere
- LAQ –
 - Superolateral surface of cerebral hemisphere – sulci, gyri and functional areas





Take a break
But

IT'S NOT
OVER
—YET—