

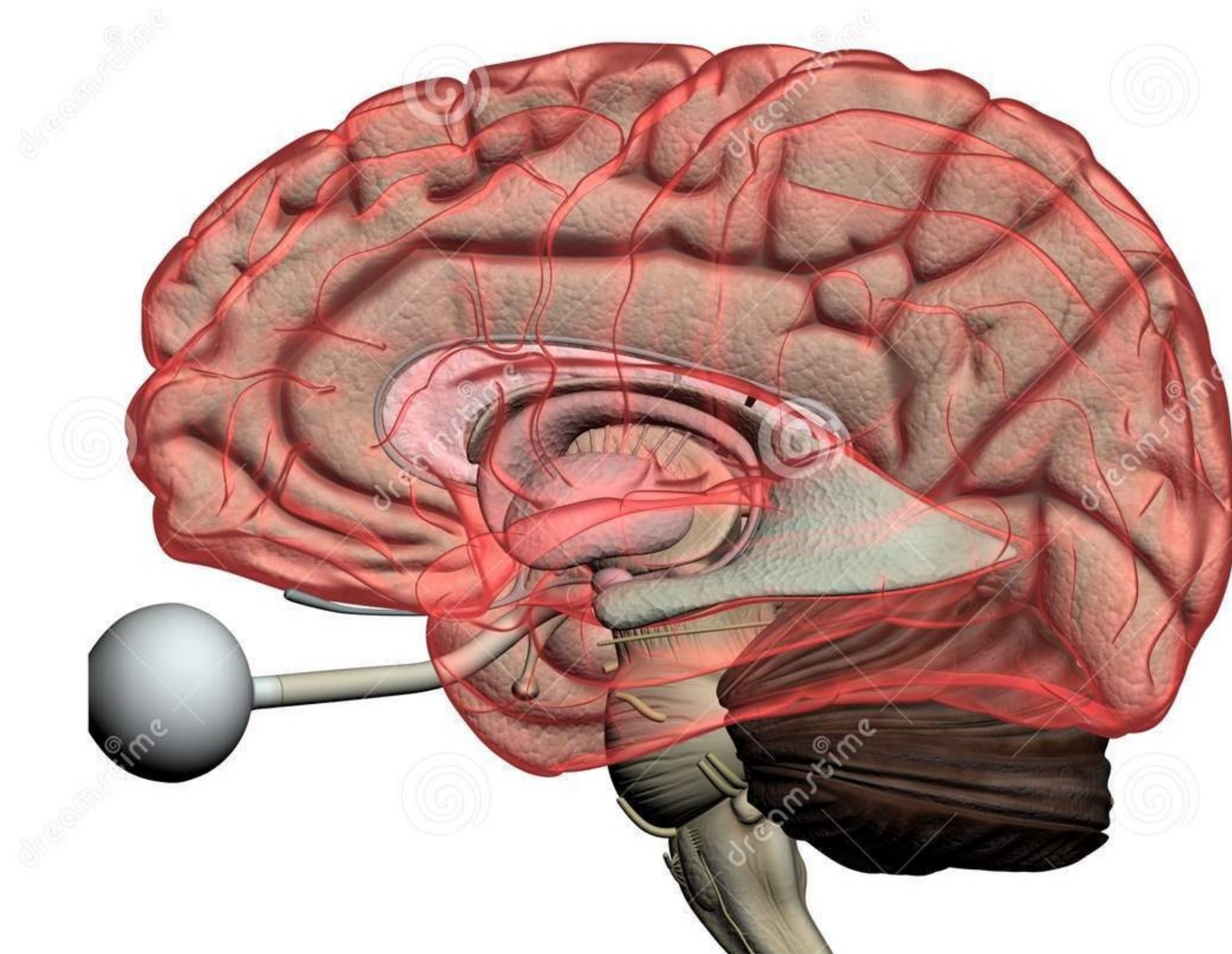
# **Neurological Visual Impairment**

**Anatomy, behaviours and characteristics**

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# Visual impairments

## Occular vs. Neurological



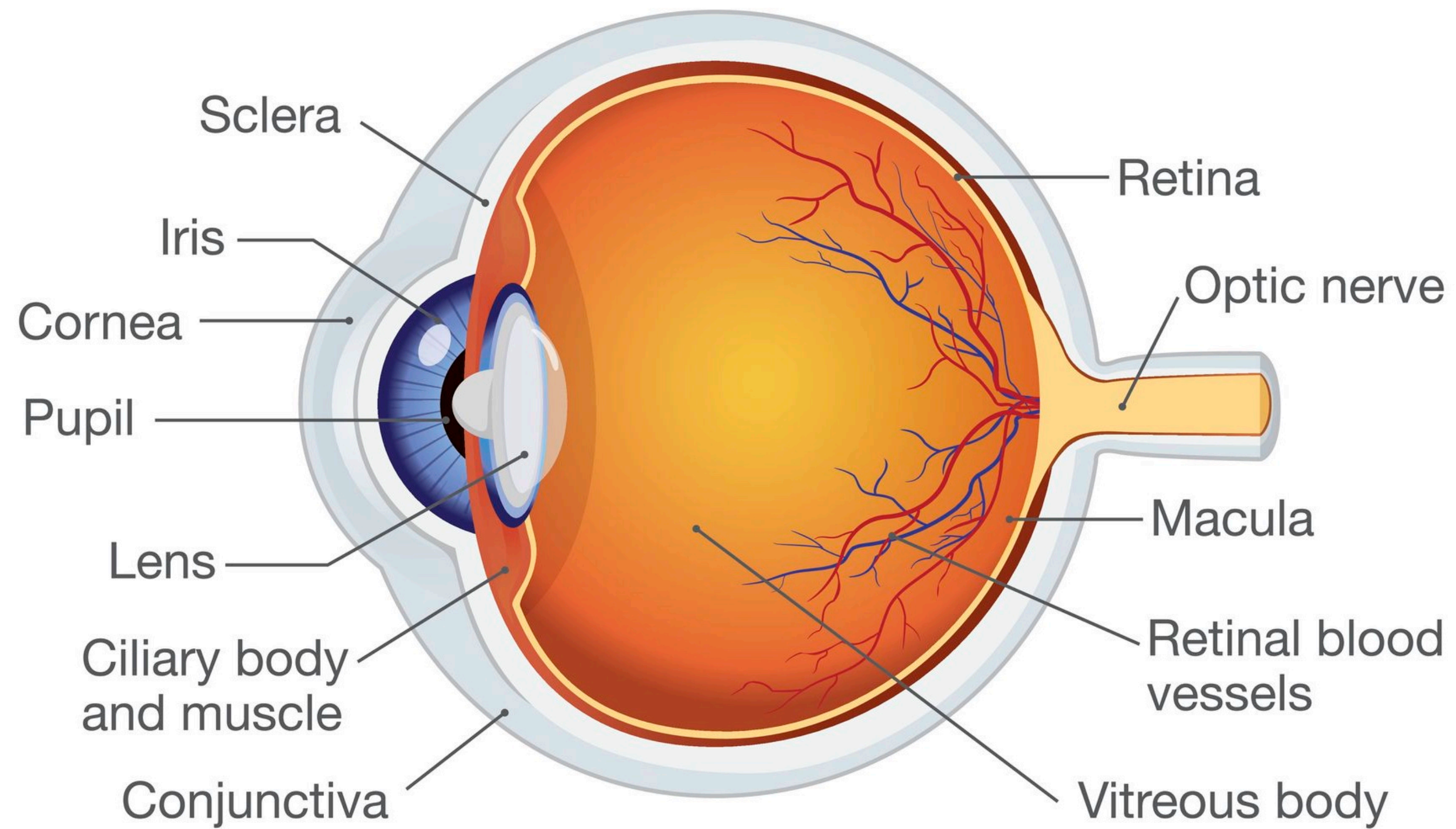
There are two types of visual impairments, coming from two different organs:

Ocular visual impairment is caused by a defect of one or more components of the eye structure.

Neurological visual impairment is caused by a damage or a disorder of one or more pathways or parts of the brain responsible for vision processing.

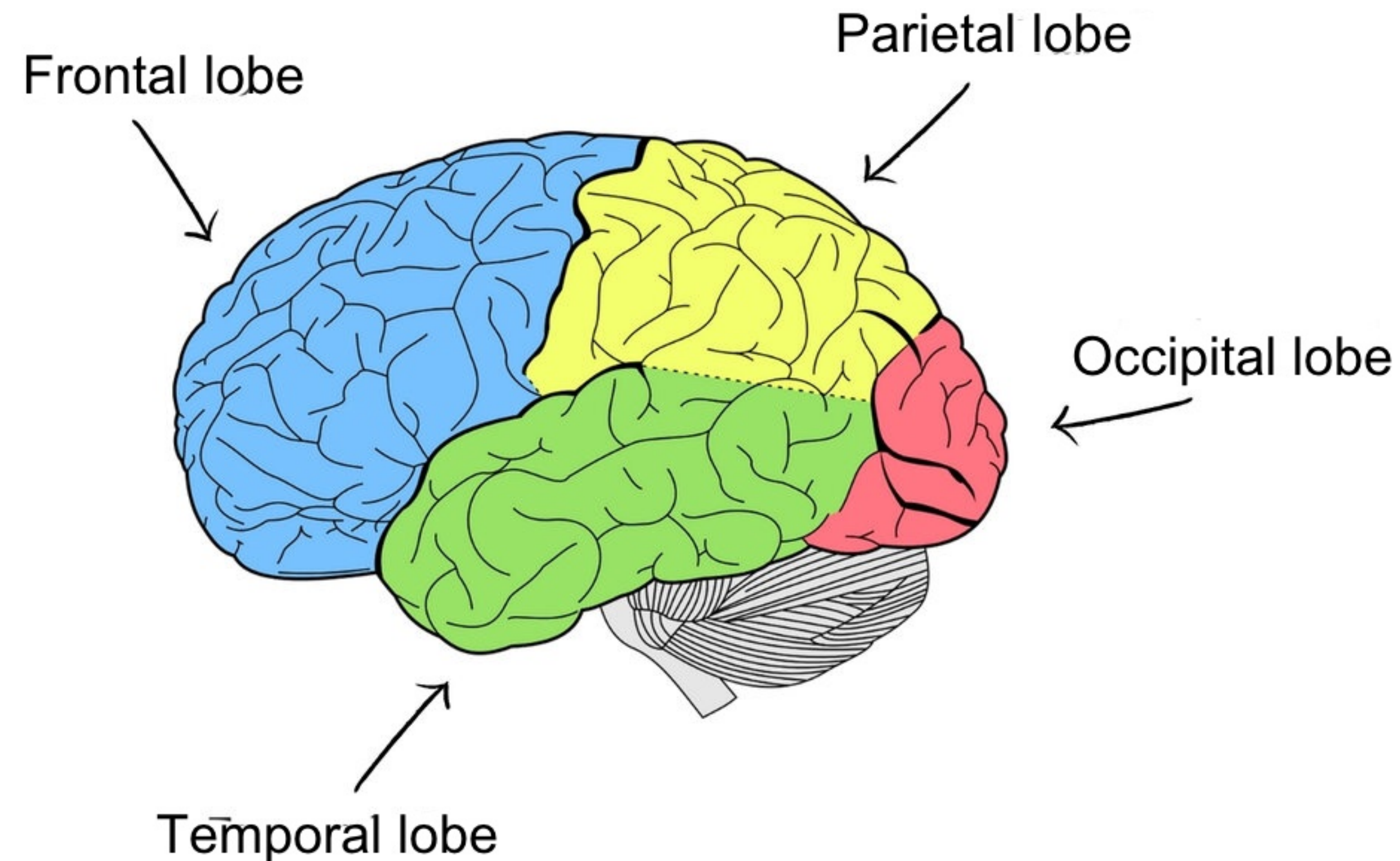


# Structure of the eye





# Structure of the brain



**Occipital lobes:** Process the information about the visual images received from the eyes and transfer them to the parietal and temporal lobes.

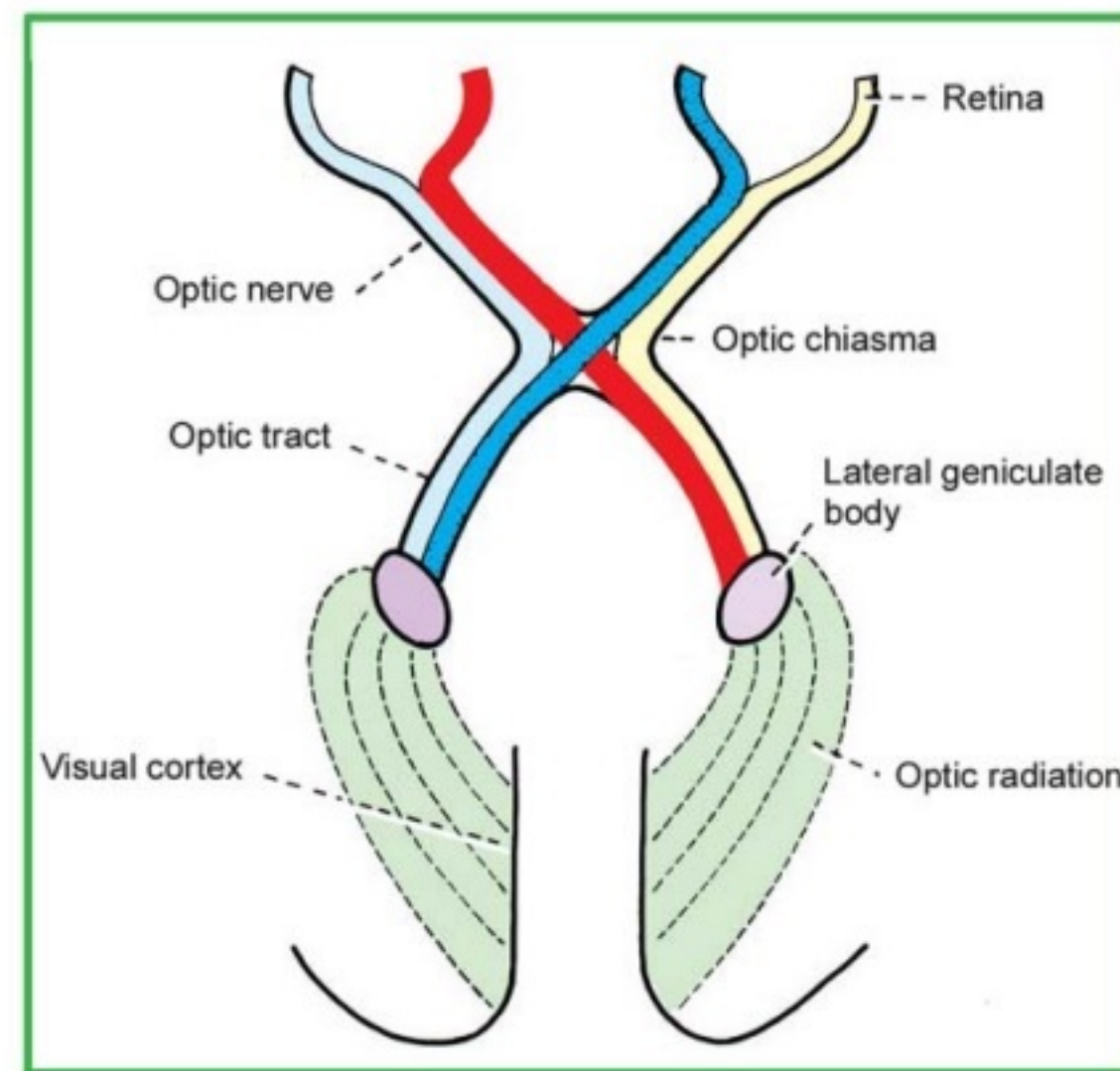
**Parietal lobes:** Feel and move the body, process language, and support visual search, visual attention and visual guidance of movement.

**Temporal lobes:** Analyze input from the senses, process language and speech production, and provide memory banks for knowledge and image recognition.

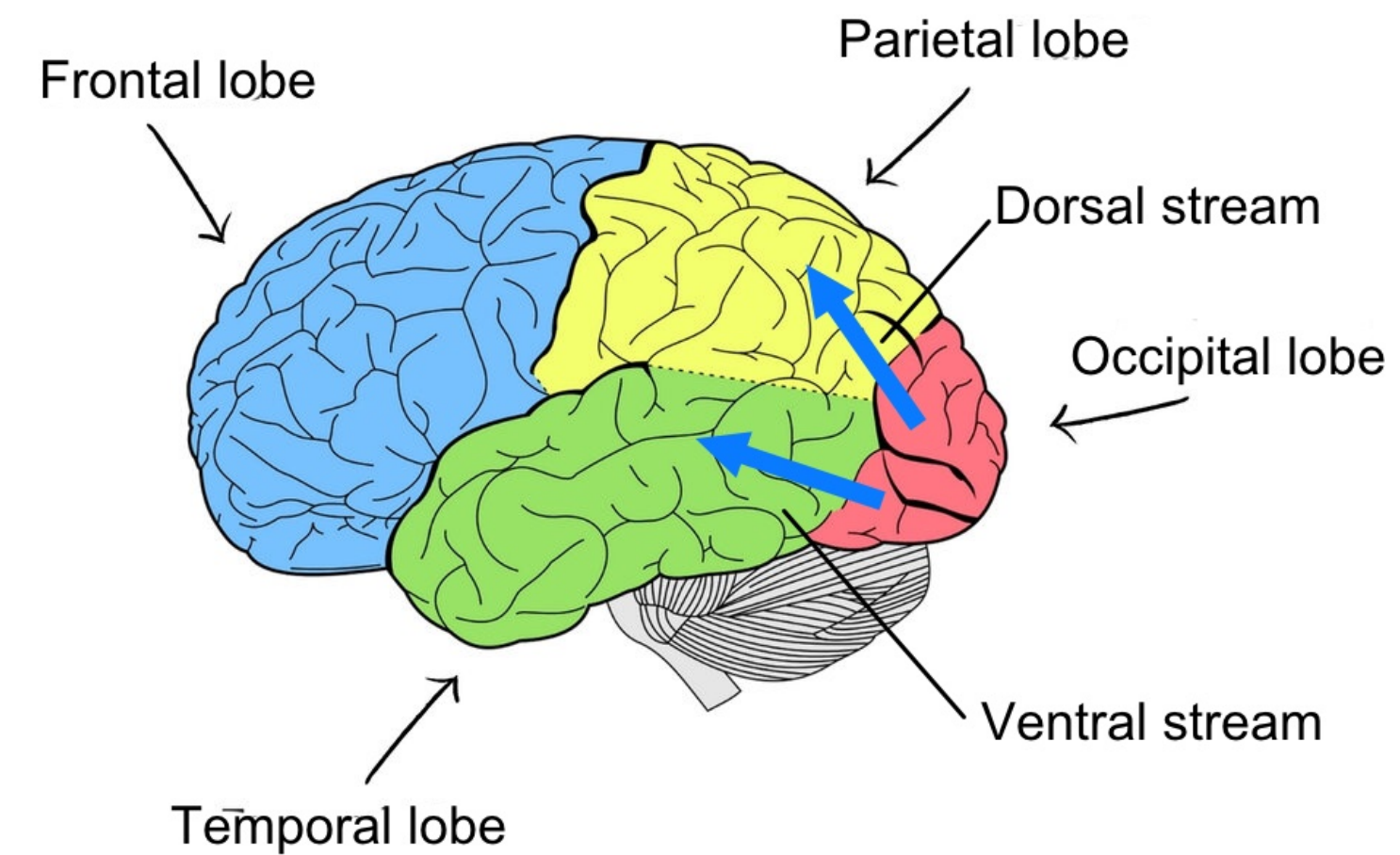
**Frontal lobes:** Choice making, problem solving, thinking and planning.

# Pathways

## From the eyes to the brain and beyond



The image enters the eye, hit the retina and follows the optic nerve. At the optic chasm, the optic nerve fibres cross and enter the brain. The image continues its path to the primary visual cortex (V1) in the occipital lobes.

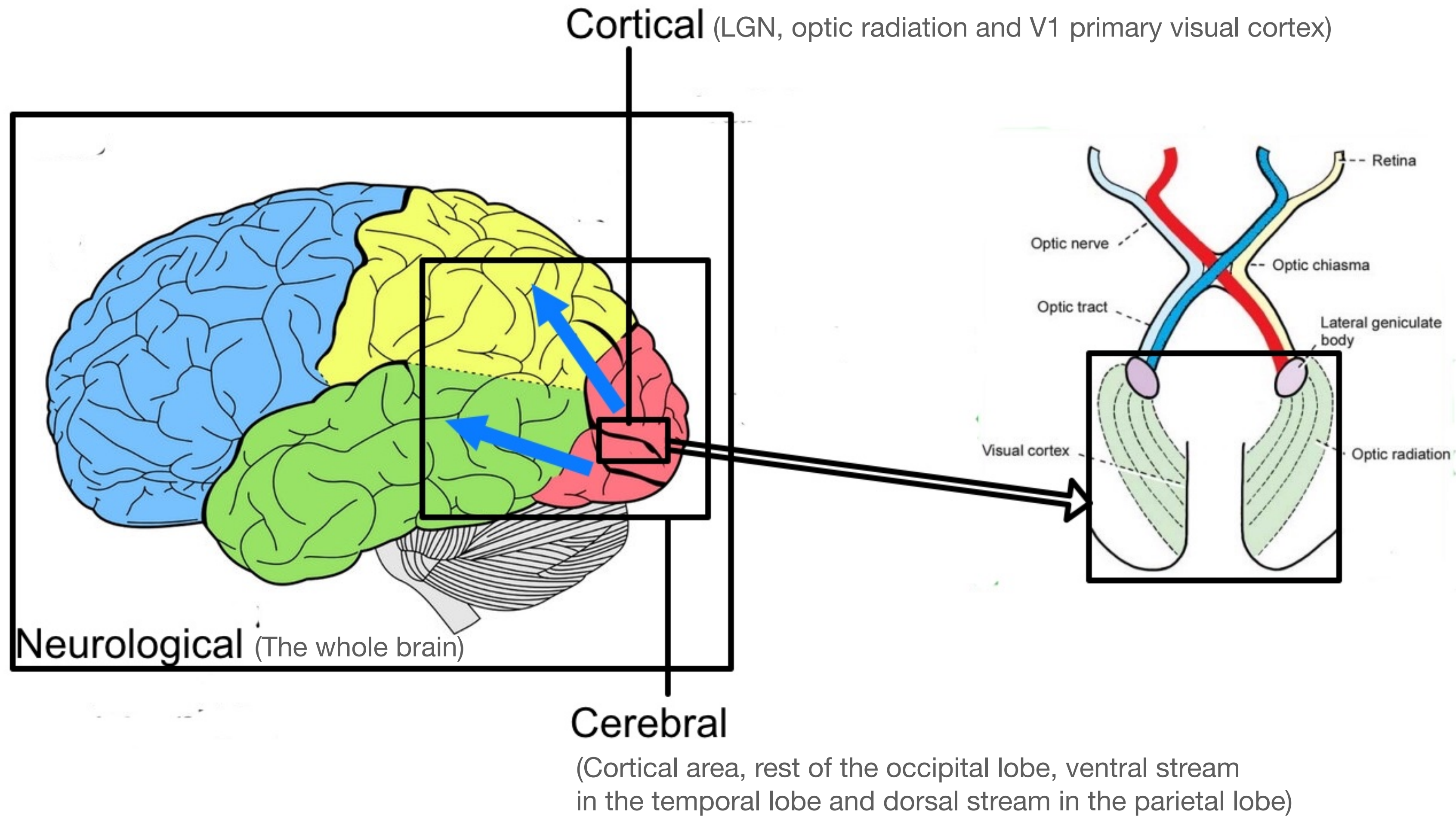


Ventral stream or “what” pathway for identification, recognition and orientation (faces, objects, shapes, colors, routes).

Dorsal stream or “where” pathway for perception (location, movement and spatial relation).



# Neurological, cerebral and cortical



# Behaviors, characteristics and aetiologies

## Characteristics:

Visual acuity  
Visual field preferences  
Contrast sensitivity  
Color preference  
Recognition  
Orientation  
Visual latency  
Visual search  
Visual attention  
Visual guidance of movement  
Perception of movement

## Behaviors:

### Difficulty:

- Reading smaller text
  - Finding objects
  - Copying text or picture
- Accurately reaching for objects

### Unable to recognize:

- Text
- Objects
- Faces
- Gestures
- Facial expressions

Tendency to get lost

### In crowded environments:

- Stress
- Withdrawal
- Angry outburst
- Anxiety
- Holding someone's hand
- Closing eyes while walking with someone

## Aetiologies:

Hypoxia / Anoxia  
Neonatal hypoglycaemia  
Hydrocephalus  
Cortical dysplasia  
Injury to the periventricular  
Intraventricular hemorrhage  
Meningitis  
Tumors  
Trauma  
TORCH infections  
Genetic disorders

# References

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