

10.2.6

Disorders of Neural Pathways

Watch the following: [Visual Pathways Video](#)

The neural pathway for visual information that travels from the retina to the occipital lobe goes as follows:

1. Optic nerve
2. Optic chiasm
3. Optic tract
4. Lateral geniculate nucleus (LGN) of the thalamus
5. Optic radiations
6. Primary visual cortex

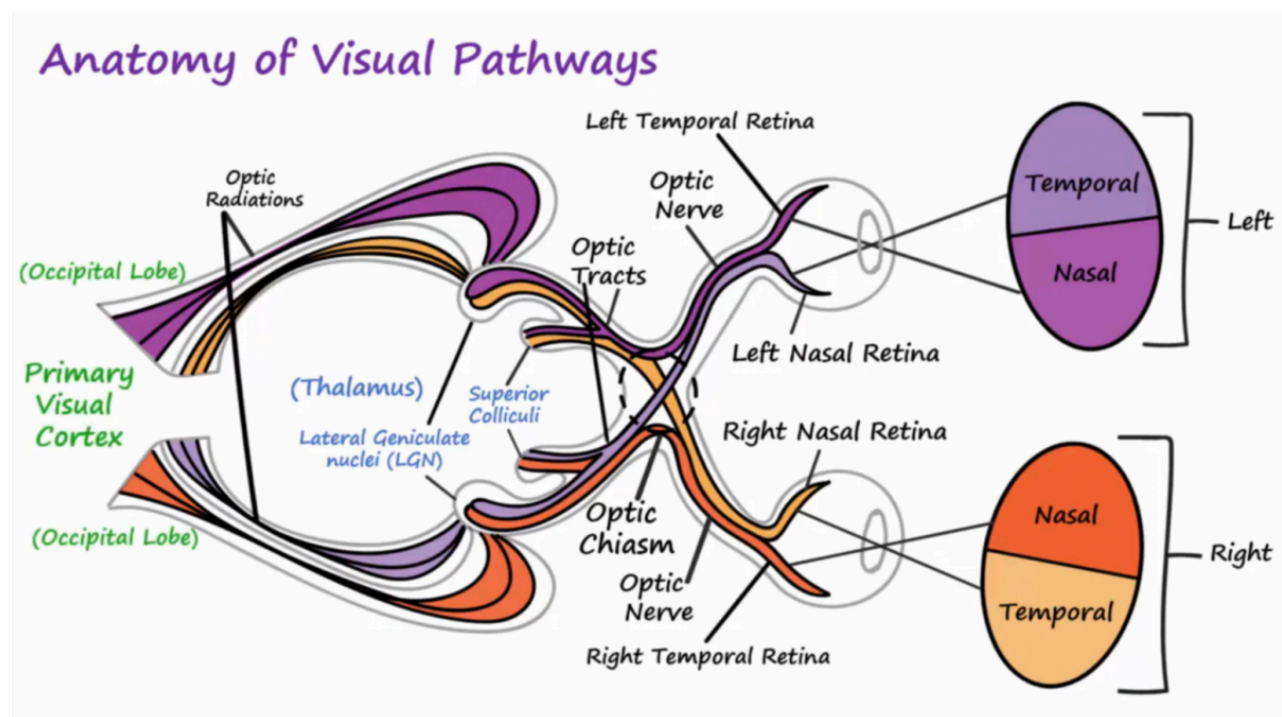


Image by L.B. BYUI S19

Visual information may be disrupted as it travels along these pathways by pathological conditions such as trauma, tumors, and vascular lesions. It is important to understand how vision can be affected depending on where a lesion in this tract occurs. *Note: the suffixes -opia and -opsia both denote a visual disorder and mean the same thing for the following terms.

Unilateral Anopsia means blindness in one eye. Various damage to the eye could cause this. The picture below shows how it could be caused by damage to the optic nerve. A lesion of the right or left optic nerve leads to right or left eye blindness respectively. Common causes of damage to the optic nerve include infections, immune conditions that attack nerve tissue (like multiple sclerosis), trauma, glaucoma, or any diseases that affect the brain and central nervous system. **Bilateral anopsia** is the term used to denote blindness in both eyes.

A lesion in the optic chiasm leads to **bitemporal hemianopsia**, which is a visual deficiency where the outer visual fields of both eyes are not perceived. It is also known as “tunnel vision.” Any damage to the area near the optic chiasm can cause this condition. The most common cause of this visual problem is a tumor that presses on the optic chiasm. The pituitary gland is located directly beneath the optic chiasm, so enlarged pituitary tumors are often the reason for the visual disturbance. A meningioma (tumor arising from the meninges) in the vicinity of the optic chiasm could also be a cause. Finally, circulation problems may also cause it if blood supply is compromised to the neurons of the optic chiasm.

Homonymous hemianopsia (otherwise known as **bilateral hemianopia**) is a visual deficit where a person can only see one side (right or left) of the visual field in each eye. This condition occurs when there is damage to the visual pathway after the optic chiasm. A lesion in the left visual pathway leads to bilateral right hemianopia and vice versa. The most common cause of this damage is a stroke. A stroke can interrupt blood flow to the neurons of the optic tract that carry information from the optic chiasm to the thalamus. Injured neurons between the thalamus and the visual cortex also contain nerve fibers from the same right or left side of both eyes, so a stroke that affects areas of the parietal and occipital lobes can also cause homonymous hemianopsia.

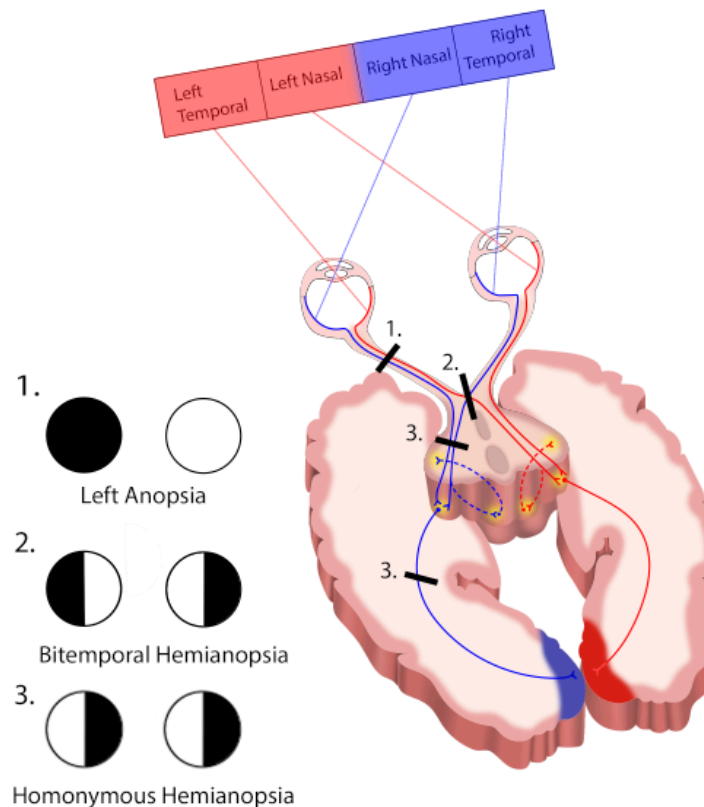


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