

Central Visual Processing in Patients with Visual Field Defects

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The complex process of vision involves the classical visual pathway, which spreads from the eye to beyond the visual cortex. While some visual information is being processed in the retina itself, the overwhelming computational load is carried by the central nervous system. Visual information is filtered and transmitted to the efferent oculomotor pathway, which serves to move critical visual field targets on appropriate retinal locations, like the fovea. Both pathways occupy a significant portion of the brain. If disease, central or peripheral, leads to an overlapping loss of visual field of the left and the right eye, the processing of visual information is altered. Depending on the size and location of the visual field defect, distinct visual functions may be affected, like reading fluency or search performance for example. Two lines of evidence are used to investigate the impact of visual field loss: Evidence from actual patients with visual field deficits and data from healthy subjects with simulated visual field defects. This research shows that adaptive strategies in both the visual and the oculomotor system may significantly benefit the visually impaired. Such strategies may be spontaneously adopted or may be trained in the course of neurorehabilitation.

In this presentation I review current evidence on the impact of visual field loss on visual processing, perception and oculomotion.