

# The coma in glaucoma: Retinal ganglion cell dysfunction and recovery

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Retinal ganglion cell (RGC) degeneration causes vision loss in patients with glaucoma, and this has been generally considered to be irreversible due to RGC death. We question this assertion and summarise accumulating evidence that points to visual function improving in glaucoma patients with treatment, particularly in the early stages of disease. We propose that prior to death, RGCs enter periods of dysfunction but can recover with relief of RGC stress.

We first summarise the clinical evidence for vision improvement in glaucoma and then detail our experimental work that points to the underlying processes that underpin clinical improvement. We show that functional recovery can occur following a prolonged course of RGC dysfunction and demonstrate how the capacity for recovery can be modified. Detecting RGC dysfunction and augmenting recovery of such 'comatosed' RGCs holds clinical potential to improve early detection of glaucoma and improve visual function.

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