

Visual Cortical Implants for Blind Patients

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The human Visual cortex is one of the most important and complex sections of our brain. The Visual cortex receives signals from the eyes and decodes them so we can perceive sight. The pathways from the eyes to the visual cortex run through the middle of the brain via the optic nerve.

If the eyes or the optic nerve are damaged then that person will either have sight problems or blindness. A visual cortical implant would theoretically be able to fix the problem of damaged sight by sending signals to the main visual processing center in the visual cortex. These signals would directly bypass the optical nerve, therefore allowing for a broad number of prospective patients.

Early experimentation with the visual cortex started in the late 20's early 30's. Experiments that caused both blind and healthy patients to see points of light were conducted. Later on different methods were used to generate points of light in someone's sight. Drs. Brindley and Lewin developed a permanent device for chronic stimulation of neural tissue in 1968. Their device was implanted in a 52-year-old woman who had gone totally blind six months before the operation. The device had 80 electrodes, each with its own receiver. The device was able to create many points of light in the patient's sight.

More experimentation was conducted on the visual cortex. These experiments involved testing different levels of stimulation on the visual cortex. These yielded good results but patients reported that the points of light created began to fade. Scientists decided to try a procedure called kindling. Kindling consists of refreshing the stimuli to the brain. This caused the patient to regain a bright image of the point of light but after a while the patient had local seizures due to the level of exposure of electricity.

In recent years testing on rats has yielded promising results. Scientists have been able to develop a system where a camera has been able to send signals to a signal processor and generate an image into individual points of light. These points were monochromatic. Testing still continues to create a visual cortical implant that would be useable

on a human. Research seems promising and sight may very well be restored to the blind.

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