The Argus™ II Retinal Stimulation System

Designed to give patients with Retinitis Pigmentosa restored basic vision.

Mason P. Wilson IV
Electrical and Biomedical Engineering, University of Rhode Island

The Argus™ II is comprised of five basic parts. The first is a digital camera fitted to a pair of sunglasses. This digital camera takes photographs in real time. These images are then sent to the second main part, which is the video-processing unit. Here the images are turned into light pulses of different brightness. These pulses are then sent to the radio transmitter in which they are sent to the radio receiver. The receiver then sends these pulses to a 60 electrode array in which the image is then duplicated by these pulses. They are sent through the optic nerve just like our photoreceptors do now.

Since only 60 electrodes are being used, vision isn't exactly the same as what we have now. Patients must retrain their brain in order to decode what it is that the device is seeing. The patient can only see basic shades, and can merely tell general outlines of objects, generally of a large scale.

Due to the fact that the optic nerve is still used, the criterion for getting this device is quite extensive. The patient must have proof of prior seeing capabilities, since it is primarily the photoreceptors that are being replaced by the Argus™ II. It is currently being supported by NIH for the treatment of Retinitis Pigmentosa which is a type of hereditary retinal dystrophy, a group of inherited disorders in which abnormalities of the photoreceptors (rods and cones) or the retinal pigment epithelium (RPE) of the retina lead to progressive visual loss. Firstly, patients generally experience night blindness followed by acute tunnel vision. Over the course of time the disease could lead to a complete loss of vision.

This is the second version of the device being made by Second Sight Medical Products, Inc. The first device known as the Argus™ 16, was first set out for testing in 2002, and is still in clinical trials at the University of California at LA. This device is very similar to the new Argus™ II, except the retinal implant consisted of a mere 16 electrodes compared to the now 60.

The Argus™ II is still in testing for feasibility. Main goal of the testing is to measure visual acuity and safety of this device, with secondary measurements being made to determine mobility, quality of life, and capability of everyday activities dependant on sight. Researchers are in development now of a 1,000 electrode third-generation design of the Argus™ system. With 1,000 electrodes, researchers hope to achieve the ability for facial-recognition by the patients.

Sources:

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