ADVERTISING FEATURE

Functional vision

Australia's bionic vision: restoring sight to millions

Dr Ash Attia, chief executive of Melbourne-based Bionic Vision Technologies, with the company's "revolutionary" bionic eye device.

Retinitis pigmentosa, a rare genetically inherited disease that leads to retinal degeneration and blindness, affects an estimated 3 million people worldwide, including 8000 Australians.

People with retinitis pigmentosa lose their peripheral vision progressively until only a narrow "tunnel view" remains. While some sufferers retain limited vision throughout their lives, most lose their sight completely.

There is no cure for this devastating hereditary disease, although the development of a bionic eye – an implantable prosthesis for vision-impaired people with inherited retinal disease – is offering new hope for sufferers. And a Melbourne-based medtech is at the vanguard of such efforts.

Vision Australia describes retinitis pigmentosa as "a genetic eye condition that causes cells in the light-sensitive retina, located at the back of the eye, to degenerate slowly and progressively".

Symptoms generally develop between the ages of 10 and 30 years. Early symptoms include difficulty seeing at night (night-blindness) or in dimly lit areas, a narrowing field of vision and light and glare sensitivity.

"There is currently no standard treatment or therapy for retinitis pigmentosa," Vision Australia says.

According to the National Eye Institute in the US, retinitis pigmentosa results from harmful changes in any one of more than 50 genes. "These genes carry the instructions for making proteins that are needed in cells within the retina, called photoreceptors. Some of the changes, or mutations, within genes are so severe that the gene cannot make the required protein, limiting the cell's function," the institute explains.

The market for treatment of this disease – covering drug, device and surgery segments – holds significant potential given its pervasiveness and the lack of any available standard treatment. Estimates of retinitis pigmentosa's prevalence vary, ranging from one in 750 to 1000 people in India and China, and from one in 3000 to 5000 in the US, Europe and Australia.

Consequently, the business intelligence company Expert Market Research expects the global retinal disorder treatment market to reach $US16.45 billion by 2026.

An Australian medical technology company, Melbourne-based Bionic Vision Technologies (BVT), is poised to make major inroads into the retinitis pigmentosa treatment market with a breakthrough implantable device that aims to achieve for blind people what Cochlear achieved for the profoundly deaf.

BVT has developed a "bionic eye" prosthetic implant that can restore functional vision to blind people suffering from inherited retinal diseases such as retinitis pigmentosa.

Following a successful two-year feasibility study conducted on patients with retinitis pigmentosa, BVT is on track to complete clinical trials in early 2024 with plans for the device to become available commercially in the US and Europe in late 2024 subject to additional capital funding.

BVT's bionic eye consists of implanted and body-worn components.

Patients wear "smart glasses" with a small video camera mounted inside. The live feed from the camera is processed and transmitted via an implanted microchip to an electrode array placed in a naturally occurring pocket behind the retina called the suprachoroidal space. The electrodes stimulate remaining cells in the retina to generate spots of light that give a patient a sense of vision.

Similar to the cochlear implant, electrical signals stimulate the nerves and deliver visual information to the brain via the electrodes placed behind the patient's eye.

Clinical study data from patients implanted with the device show the prosthesis is safe and gives significant improvements to functional vision and quality of life. Users reported an improved awareness of external objects and surroundings.

"Our early studies have confirmed the safety and efficacy of our next-generation device. The next step is to initiate worldwide clinical trials ahead of seeking regulatory approval in key markets, starting in the US with Australia, Europe, China and India to follow," says BVT chief executive Dr Ash Attia.

"We are on the cusp of something revolutionary with global market potential.

"BVT is creating the early foundations for a new generation of high-value jobs along with a significant local and international investment opportunity, but ultimately we are talking about people's lives. This technology has the potential to improve the lives of millions of people worldwide."

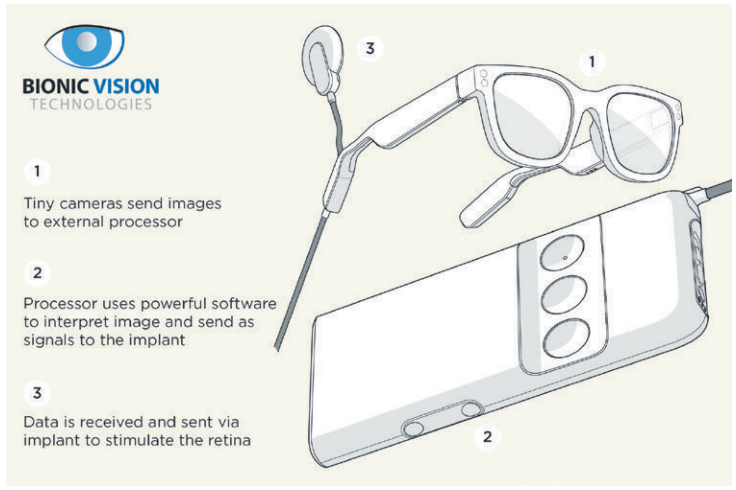
According to BVT, its bionic-eye device has three key advantages:

- Superior vision-processing capabilities.
- Implanting the device involves a relatively simple surgical procedure.
- BVT's implant method allows the device to be upgraded or replaced as new technology becomes available.

BVT is developing and commercialising ground-breaking technology that was initially funded by the Australian Research Council from 2010 to 2016. In 2017, BVT received $23.6 million from Hong Kong-based State Path Capital and China Huarong International. Last year, BVT received $1 million from the federal government's Medical Research Future Fund.

Additional funding is being sought to complete the clinical trials required for regulatory approval in international markets.

BVT's R&D partners and stakeholders include CSIRO's Data61, the Centre for Eye Research Australia, the Bionics Institute, Tricycle Developments, Cirtec Medical, the Australian National University, the Royal Victorian Eye and Ear Hospital and the University of Melbourne.



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