Trial of bionic eye within three years

By Simon Lauder

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The small camera transforms the visual input into signals that stimulate neurones on the retina. (ABC TV)

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Melbourne researchers have developed a prototype for a bionic eye which they hope to implant in a person within three years.

It has been nearly two years since Prime Minister Kevin Rudd's 2020 ideas summit, where the prospect of a functioning artificial eye grabbed headlines.

Researchers received a $42 million grant from the Federal Government to develop the prototype.

The consortium behind the device, Bionic Vision Australia, says the eye will help patients suffering from degenerative vision loss to increase their mobility and independence.

Research director Anthony Burkitt unveiled the design this morning.

The prototype consists of a mini camera, mounted on a pair of glasses, that sends information to an image processor which can be kept in the wearer's pocket.

Professor Burkitt says the processor will then send a signal wirelessly to an electronic unit which is surgically inserted in layers on the outside of the eye.

"The electrode ray is inserted into the back of the eye, which is where - for normal-sighted people - the central part of the visual field would be," he said.

"This is the part of the retina which has the greatest density of the receptive neurons.

"The electrical impulses that are sent out from the electrode ray are picked up by the neurons in the retina and then sent back through the optic nerve to the vision centres of the brain."

There are 98 electrodes in the prototype bionic eye and each adds an extra point of reference, showing up as a dot in the visual field.

"It consists of points of light. These are called phosphenes and these are able to provide not an entirely perfect representational image, but enough information for these patients to regain their mobility and their independence," Professor Burkitt said.

"This is what we call our first generation device - the wide view neuro-stimulator. It will enable patients to be able to navigate in their environment and be able to avoid obstacles."

Life-changing potential

More than 50,000 Australians are visually impaired because of conditions like retinitis pigmentosa and macular degeneration.

Mr Rudd is still getting his head around the details, but he is excited by the progress that has been made since the summit.

"It's medical developments like the bionic eye that have the potential to improve the health and quality of life of Australians around this country and, in fact, people around the world," he said.

The chairman of Vision Australia, Kevin Murfitt, describes the bionic eye as a revolution.

"It will be ... the innovation of a lifetime if it comes off, because it helps so many people," he said.

"Being able to recognise people. Absolutely amazing. And we live in a very beautiful world and ... nothing replaces the beauty of your family and world."

Mr Murfitt says he is optimistic the eye will be available in a few years.

"I think this consortium is doing it in a very staged and planned way," he said.

"In 2013 they'll have the first phase, which should give us vision to be able to move around and see obstacles.

"And then in another five or six years, the next phase will actually allow us to recognise faces and read large print.

"So it's got huge potential. This is truly a revolution and will be the biggest thing in terms of blindness and low vision since Louis Braille invented the Braille alphabet over 200 years ago. This will be the next big remarkable invention."

Bionic Vision Australia hopes the first bionic eye will be available for human implant by 2013.

It will only have 96 electrodes. A 1,000 electrode eye should be ready for tests by 2014.