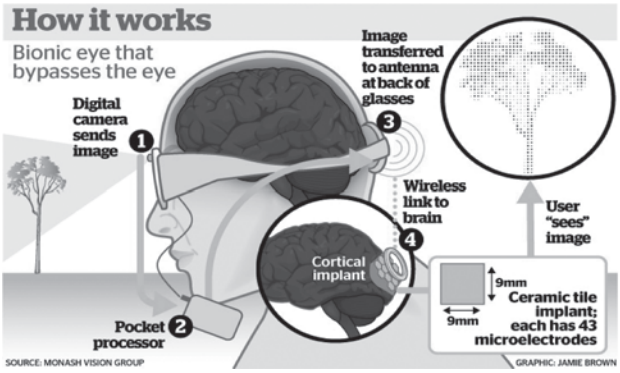
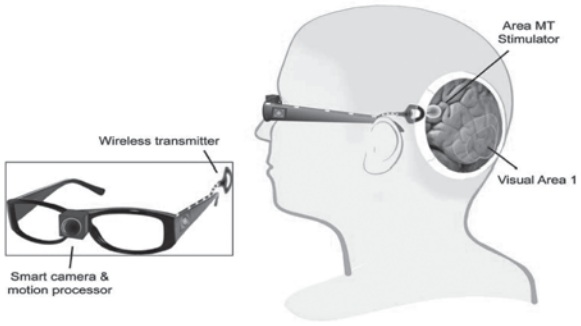
Medical News

Bionic eye will send images direct to the brain to restore sight





In future you may not even need eyes to see. Next year, a blind person in Australia will be the first to receive "bionic eyes" that bypass most of the visual system entirely. Instead, a camera mounted on a pair of glasses will feed information about the world directly to the brain.

The breakthrough should help restore vision in people without a working retina. "You don't need an eyeball at all," says Arthur Lowery at Monash University in Clayton, Victoria, Australia who is developing the bionic eye. Lowery thinks it could help more than 80% of clinically blind people see their way around better.

A scientist named Giles Brindley did it first while working at Cambridge in the 1960s. In those days, "you needed a bookcase full of equipments to have the electronics with the transmitters," Lowery says, and the tech wasn't practical for everyday use. Then in the 1970s American William Dobelle headed to Portugal to test out his own vision system for the blind, adding in an actual camera. But still, the technology wasn't quite there: wires connected to the back of the head had to be fed through the skin, a sometimes leaky system.

Today Lowery and his group can use pea-sized smartphone cameras and tiny computer processing technology, the same that's in tablets and mobile phones. The plan is to implant up to 11 small tiles, each loaded with 43 electrodes, into areas of the brain that deal with vision. That's because the system is based on a front-mounted cell-phone sized camera that's hooked up to the brain's vision system not through the eyes, but at the back of the head, in a one-inch area just above into the grey matter under the skin where the neck ends. It's here where the brain processes vision. An implantable tile of 43 electrodes would send electrical pulses to the brain through the visual cortex, creating a vision of representative 'dots' for patients who can't see. When these areas are stimulated, people report seeing flashes of light. Lowery believes that each electrode could create a dot of light that is similar to seeing one pixel. In total, the tiles will provide around 500 pixels – enough to create a simple image. Although this resolution is far cruder than the 1 to 2 million pixel image a normal eye can produce, it should restore the basic elements of sight. Images picked up by the camera will be sent to a pocket-sized processor worn by the user. This device will pull out the relevant parts of an image and send it to the tiles. Not a picture-perfect view of the world, but instead, the image will be more like a couple hundred dots configured to help guide a patient's way. "The processor is like a cartoonist," says Lowery. "It has to represent a complex situation with minimal information."

A face could be recreated with just 10 dots, Lowery says. "It doesn't sound like much but there's more information in that than you'd think." "If there's a dot moving away from you, you stop talking," "If all goes to plan, the blind volunteers will wake up with a crude sense of vision" he says. "We think it's going to be initially perceived as dots of various sizes in the distance," Lowery says. The dots could then be programmed, not just to see images, but also to help: Lighting up the clearest pathways out of a room, recognizing household objects, or even turning a room full of blurry colleagues dotted at a conference table into a cast of distinct computer-programmed emojis, so the patient can

sort out who's who. "It's just the beginning, really, of a deeper understanding of learning how to work with human perception," Lowery says.

The team has spent roughly $20 million researching the tech, and is manufacturing batches of the devices now. They will need to get the device approved for Australian hospital trials from a research ethics committee before they can tap into their first patient. But in late 2016, they hope to be able to open up a patient's cranium and slip in about four of those teeny electrode tiles. As they push them into the cellophane-like covering of the brain, connecting the tech up to human grey matter, they'll be slowly learning how to bring up the lights for someone who's lost their sight.

The first volunteers will have recently lost their sight due to injury, as the device may not work for those blind since birth. If all goes to plan, the volunteers will wake up with a crude sense of vision, "like a John Logie Baird television from the 1920s", says Lowery.

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Medical Joke

Psychiatric Hotline

Hello. Welcome to the Psychiatric Hotline
If you are obsessive-compulsive, please press 1 repeatedly.
If you are co-dependent, please ask someone to press 2.
If you have multiple personalities, please press 3, 4, 5 & 6.
If you are paranoid-delusional we know who you are and what you want. Just stay on the line so we can trace the call.
If you are schizophrenic, listen carefully and a little voice will tell you which number to press.
If you are manic-depressive, it doesn't matter which number you press. No one will answer.
If you are anxious, just start pressing numbers at random.
If you are phobic, don't press anything.
If you are anal retentive, please hold.

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