

Portable device worn on eyeglasses offers hope for people with low vision

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A miniature camera using optical character-recognition technology, mounted onto the eye glasses of people who are considered legally blind dramatically improves their ability to read an email, newspaper article, menu or page in a book. Credit: UC Regents

A miniature camera using optical character-recognition technology,

mounted onto the eyeglasses of people who are considered legally blind, dramatically improves their ability to read an email, newspaper article, menu or page in a book, a study by researchers with UC Davis Health System has found.

Using the [device](#) the study participants were significantly better able to perform activities of daily living. The device recognizes text and reads it to the user using an earpiece that transmits sound, and can also be programmed to recognize faces and commercial products.

The device offers new hope for the large and growing number of individuals with age-related macular degeneration or advanced-stage glaucoma, two of the leading causes of [vision](#) loss among the elderly in the United States, said Mark J. Mannis, professor and chair of the UC Davis Department of Ophthalmology & Vision Science.

The research, "Evaluation of a Portable Artificial Vision Device among Patients with Low Vision," is published online today in *JAMA Ophthalmology*.

"Age-related macular degeneration is one of the most common causes of blindness in the elderly and it has no cure in its advanced stages," said Mannis, Fosse Endowed Chair in Vision Science Research and the study's co-author. "This device offers hope to patients who are beyond medical or surgical therapy for the condition."

"It is easily used and could potentially bring greater independence, particularly for older patients who are struggling with vision loss," Mannis said.

An estimated 1.8 million Americans 50 and older are affected by age-related macular degeneration, according to the U.S. Centers for Disease Control and Prevention. That number is estimated to reach

approximately 3 million by 2020. Age-related macular degeneration is the leading cause of permanent impairment of reading and fine or close-up vision among people 65 and older.

The pilot study included 12 participants with low vision, six men and six women, all of whom were patients at the UC Davis Eye Center at UC Davis Health System in Sacramento, Calif. With an average age of 62, the participants experienced [vision loss](#) from a wide array of disorders, including [age-related macular degeneration](#) and end-stage glaucoma. The participants' best corrected vision was 20/200 or worse in their better eye. All were legally blind.

In order to establish their baseline vision the researchers assessed the participants' visual functioning using a 10-item test with patients only using their eye glasses and no low-vision aids for the assessment.

Initially, none of the participants were able to perform five of the 10 tasks: reading a message on an electronic device such as a smartphone or tablet, a newspaper article, menu, letter or page from a book. Eleven could recognize paper money denominations; eight could locate a room in a hallway using wall-mounted signs; and seven could recognize products and distinguish between similarly shaped and sized cereal boxes.

The researchers then trained the participants to use the portable artificial vision device, which operates either by pointing at an item, tapping on it, or pressing a trigger button. A wire attaches the device to a small pack containing the device's battery and computer. It can be carried, fit into a pocket or attached to a belt.

After using the device for one week, all of the participants were able to perform nine of the 10 items on the test, with only one individual reporting any technical difficulty. The [participants](#) reported finding the

device simple and easy to use, and said they would consider using it in their daily lives. The authors performed a separate sub-analysis of seven patients who were using other low-vision aids and found that their performance on the test was better when using the device, as well.

"Patients with low vision often are often dependent on hand-held or electronic magnifiers, which may be somewhat cumbersome to use", said Elad Moisseiev, co-author and UC Davis vitreoretinal surgery fellow.

"This is the first independent clinical study to evaluate this new low-vision-aid device based on novel optical-character recognition technology," Moisseiev said. "Our results show that it can be a very useful aid for patients with low vision in performing activities of [daily living](#), and increase their functional independence."

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Provided by UC Davis

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