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Far-Out Eye Exams In Earthly Places

A new vision test created by researchers at NASA's Jet Propulsion Laboratory holds promise for the early, painless detection of glaucoma, macular degeneration, and even certain kinds of strokes and brain tumors.

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By Diane Rezendes Khirallah
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Poets call the eyes "windows to the soul." For Wolfgang Fink, senior member of NASA's Jet Propulsion Laboratory in Pasadena, Calif., they're windows to the brain. A computer model he's created with colleague Alfredo Sadun holds promise for the early, painless detection of glaucoma, macular degeneration, and even certain kinds of strokes and brain tumors.

To take the new vision test, a person covers one eye while viewing a grid on a notebook equipped with a touch screen. While keeping vision fixed on the center of the grid and going at whatever pace is most comfortable, he or she must trace missing portions of the grid. The computer processes the data and generates a three-dimensional image of the visual field for evaluation by a physician.

Fink says it's very interactive and patients prefer it to traditional testing, which can take as long as 40 minutes. "They sit and wait anxiously; they can't blink," he says. "But this takes five minutes. People report that they enjoy it."

Glaucoma and macular degeneration are the two leading causes of blindness. If caught early, glaucoma responds to treatment. In a recent clinical trial among patients with suspected glaucoma, 79% who tested normal with traditional scans showed signs of the disease under the new test.

NASA is interested in the test for manned space flights. Zero gravity can cause increased pressure in the skull, Fink says, leading to temporary visual field defects or even stroke. The test can also tip off doctors about brain tumors that affect the field of vision. "You can administer the test on the Internet, or in the middle of nowhere--and uplink the data to a central computer by satellite," Fink says. "It won't replace a doctor, but where expertise isn't easily available, it gives you a proficient opinion, and a doctor can confirm it."

Already in clinical trials at the University of Southern California, the 3-D Computer-Based Threshold Amsler Grid Test may become commercially available as early as next year. Fink anticipates it could become as common and easy-to-use as in-store blood-pressure monitoring machines. He envisions it in optometrists' offices, pharmacies, hospitals, and even supermarkets.

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