

Astronaut vision may be impaired by spinal fluid changes: study

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NASA is currently studying ways to counteract eye problems, as the US space agency works toward sending people on months or years-long missions to Mars by the 2030s

Astronauts may experience blurry vision and impaired eyesight after long spaceflights due to changes in spinal fluid that occur while in microgravity, researchers said Monday.

Nearly two-thirds of [astronauts](#) have reported problems with their eyes after spending months at the International Space Station, according to research presented at the annual meeting of the Radiological Society of North America (RSNA).

According to lead researcher Noam Alperin, professor of radiology and biomedical engineering at the University of Miami Miller School of Medicine, "some of the astronauts had severe structural changes that were not fully reversible upon return to Earth."

The problems includes flattening at the back of their eyeballs and inflamed optic nerves, which can lead to far-sightedness.

Researchers initially thought that the problems were due to changes in the way blood is distributed in the body in microgravity, with more fluid lingering around the head area than would be typical on Earth where gravity pulls it downward.

Alperin and colleagues studied before and after brain scans on seven astronauts who had spent multiple months at the orbiting space station, and compared them to nine astronauts who made short trips up and back aboard the US space shuttle, which was retired in 2011.

They found that long-duration astronauts had significantly more cerebrospinal fluid (CSF) in the brain.

This fluid typically helps cushion the brain and spinal cord while circulating nutrients and removing waste materials.

On Earth, this spinal fluid system is designed to accommodate changes whether a person is sitting, standing or lying down. But in space, "the system is confused by the lack of the posture-related pressure changes," Alperin said.

Longterm space flyers also had "significantly increased post-flight flattening of their eyeballs and increased optic nerve protrusion," said the findings.

Alperin said the research offers the first quantitative evidence cerebral [spinal fluid](#) plays a direct role in visual impairment syndrome.

NASA is currently studying ways to counteract these eye problems, as the US space agency works toward sending people on months or years-long missions to Mars by the 2030s.

Retired NASA astronaut Clayton Anderson said he did not experience any problems with vision after his five month stint in [space](#) in 2007.

"It appears—from additional NASA studies performed at Johnson Space Center in Houston—that I have a special protein sailing through my body, that does not allow this phenomenon to occur," Anderson wrote on quora.com.

"Protein question still being researched, I believe," he added on Twitter.

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