Long spaceflights found to lead to blood flowing in the wrong direction in some cases

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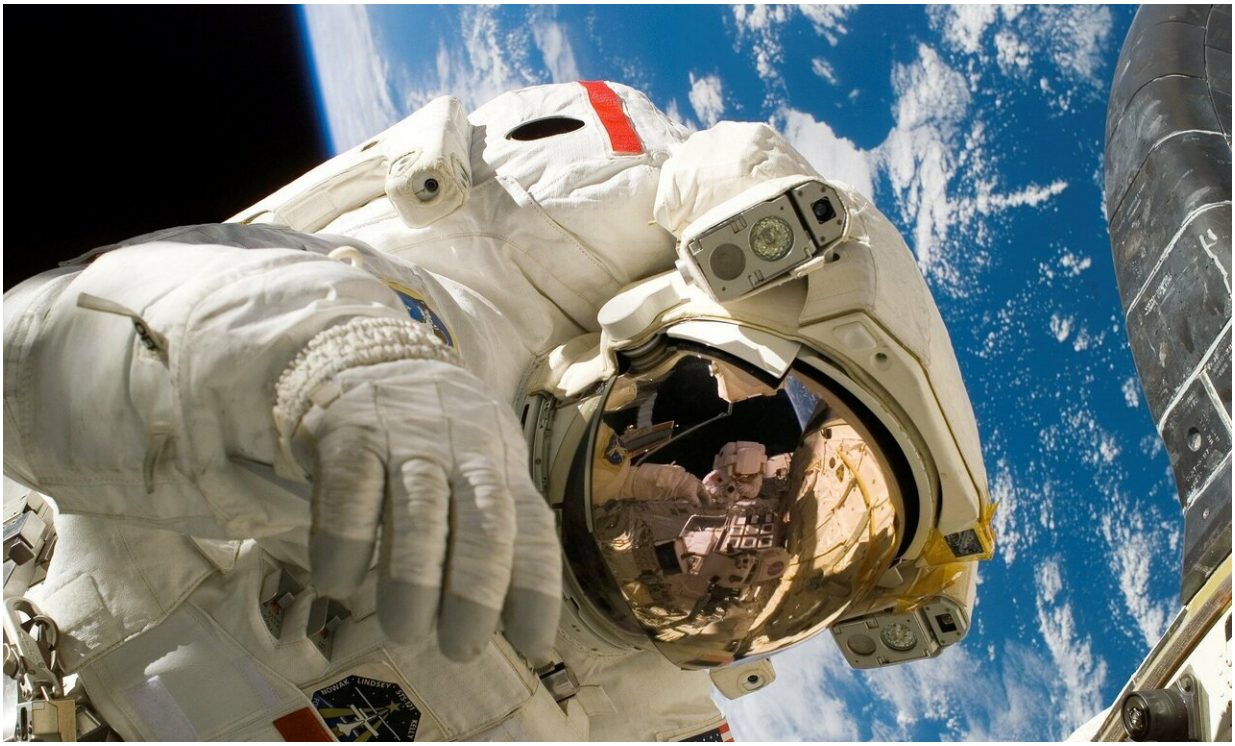

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An international team of researchers has found that people in space for long durations can experience blood flowing in the wrong direction in the jugular vein. In their paper published on *JAMA Network Open*, the group describes their study of blood flow in astronauts.

As astronauts have come to spend longer periods in space, scientists have been studying what the effects of freefall on the body. Prior studies have shown that it can lead to weakened muscles, which is why astronauts have to use exercise machines. Long space flights have also been found to cause bone loss, a loss of blood volume and a weakened immune system. Researchers also report that extended freefall deconditions cardiovascular health—the system weakens when it does not have to work as hard against gravity's influence on blood flow. More recently, astronauts have reported that after spending six months or more in space, they begin experiencing blurred vision. In this new effort, the researchers were looking into these new reports to find out what might be behind it.

Suspecting that changes to blood flow might be behind changes to vision, the researchers tested blood flow in the left jugular vein of 11 astronauts—its job is to move blood out of the head when lying down. When standing or sitting, blood moves out of the head through other veins—the jugulars mostly prevent too much blood loss. The researchers measured blood volume passing through the left jugular vein both before and after several astronauts carried out extended missions on the International Space Station—the astronauts also carried out tests of their own at 50 and 150 days into their missions.

Once the astronauts returned to Earth, the researchers analyzed all of the data from all of the tests. They found instances blood stagnation and reverse blood flow. They also found two instances of small blood clots. The researchers suggest the reversed blood flow was likely due to organs in the chest shifting positions, resulting in one or more of them pressing on the jugular vein. It is not deemed a serious problem at this time. They note also that testing of pressure suits aboard the space station has met with mixed results in improving blood flow.

More information: Karina Marshall-Goebel et al. Assessment of

Jugular Venous Blood Flow Stasis and Thrombosis During Spaceflight, *JAMA Network Open* (2019). DOI: 10.1001/jamanetworkopen.2019.15011