

Staying strong

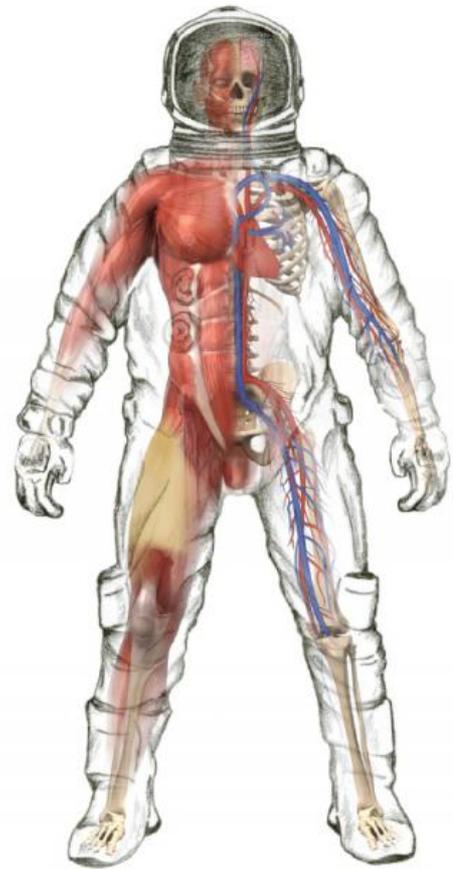
The challenge of keeping fit in space

Our bodies have changed through years of natural selection to cope with the stresses and strains of life on Earth. Remove our fragile frames from the place they have adapted to thrive in and very quickly we start to face significant challenges.

One of the main problems is the **microgravity** associated with life in orbit around Earth. Loss of bone density and muscle mass are real concerns. In the earlier days of spaceflight, astronauts lost up to 2 per cent of their bone density for every month they spent in space. That means carefully planned diet and exercise regimes are crucial. Making sure the astronauts consume enough vitamin D and calories, as well as limiting their sodium intake from salt consumption, has helped.

Studies have also shown that the Advanced Resistive Exercise Device, launched to the International Space Station (ISS) in 2008, has made a difference too. It is a sort of weightlifting device that allows astronauts to 'lift' twice as much as previous exercise machines. These factors combined mean that ISS crew members can stay on board for six months at a time and not lose bone (though there are still questions about fracture risk).

Returning to Earth after an extended stay in space also has its own challenges. When Canadian astronaut Chris Hadfield touched back down, he realised that he had become accustomed to a weightless tongue. Once his tongue weighed something again he had to relearn to talk.



Common physiological changes that astronauts experience:

- Loss of bone density and muscle mass
- Short-term fluid redistribution (facial/chest puffiness)
- Neurovestibular problems (space sickness)
- Intraocular pressure (vision problems)
- Orthostatic intolerance (inability to stand up)

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ABOUT THIS RESOURCE

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