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Healthcare devices sent to orbit for space testing

By **CHEN MEILING** in Beijing and **CHEN HONG** in Shenzhen

China recently sent five advanced healthcare devices into orbit aboard an experimental vessel, marking the nation's first practical step toward realizing its dream of building a hospital in space. The devices will be tested in orbit over the next three years, with the primary goal of advancing astronaut healthcare and space medicine research.

The spacecraft carrying the devices was launched from the Jiuquan Satellite Launch Center in northwestern China on Monday, according to Shenzhen University of Advanced Technology, based in Guangdong province, which is leading the project in collaboration with the Chinese Academy of Sciences' Innovation Academy for Microsatellites in Shanghai.

As of Wednesday, the topic "Shenzhen builds a hospital in space" had garnered 4.63 million hits on Chinese social media platform Sina Weibo. "It feels like science fiction has come to life. It's truly amazing! Modern technology is simply beyond imagination," a user commented.

The test project is expected to address health challenges in space posed by microgravity, radiation and confined environments. Astronauts face several health risks in such conditions, including bone density loss, muscle atrophy, slowed wound healing, cardiovascular changes and psychological stress.

Zhu Dijian, Party secretary of the university, noted that growing competition in space exploration has made astronauts' health a key research focus. "Amid increasingly fierce global competition in space, China has been making sustained efforts to fill technological gaps," he said.

Xu Zhiming, president of the university's College of Clinical Medicine and executive director of its Future Medical Center, said that a microgravity environment can reduce skeletal loading and affect blood circulation, radiation can damage the skin and endocrine system, and the confined space can influence mental health.

The project aims to expand in-orbit medical monitoring and life support systems for astronauts and future space tourists, he added.

China plans to send its astronauts to the moon by 2030 and has also pledged support for commercial space travel, pointing to the need for in-orbit medical support.

According to Xu, the five devices are currently designed for remote operation in space, and they are capable of transferring data back to Earth in real time. "Future experiments will involve using the devices on animals — and even humans — in space," he said.

In a microgravity environment, changes in the body's fluid distribution and abnormal blood circulation may significantly slow down the wound healing process, Xu said, noting that one of the devices uses plasma technology to promote tissue regeneration and accelerate healing while reducing the chances of wound contamination.

Gu Ying, a CAS academician and director of the Future Medical Center, said that another noninvasive device uses ultraviolet therapy to simulate sunlight and help astronauts maintain their vitamin D levels, thereby preventing deficiency disorders.

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In addition, it supports calcium metabolism for better bone health in a microgravity environment, Gu said.

Also aboard the experimental spacecraft is a microfluidic cell analyzer that can diagnose viral and bacterial infections within one minute using just a single drop of blood. The other devices help monitor vital health parameters, such as pulse and blood pressure, or offer high-quality plant protein.

The project team is developing more space healthcare devices for diagnostic, treatment and rehabilitation purposes, with the key features being "compact and easy to use".

Xu, the executive director, said that data collected through the experiments will benefit medical research on Earth. "We've found that stem cells are highly active in space, which is beneficial for delaying organ aging and can support stroke rehabilitation. Maybe one day, diseases that cannot be cured on Earth will be eliminated in space," he said.

In the future, space travelers will be trained to use these devices, and they will also have access to consultations with artificial intelligence-powered medical experts, he said.

Xu said that he foresees a time when medical spacecraft will serve as mobile hospitals for astronauts aboard space stations and travelers on board commercial spaceships, and medical facilities will be built on other planets and the moon.

He added that some domestic commercial aerospace companies, as well as universities in the United Kingdom and Russia, have contacted him for cooperation on future projects.

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