

# Virtual Incision surgical robot in space brings potential for distance surgery on Earth

Article

**The news:** Virtual Incision will send its surgical robot MIRA to the International Space Station (ISS) in 2024 to perform preprogrammed simulated surgical testing on small objects

remotely.

- **NASA** recently [awarded](#) a grant to the University of Nebraska-Lincoln, where **Shane Farritor**, Virtual Incision's co-founder and chief technology officer, is a professor of engineering.

**How it works:** Unlike larger robotic surgery platforms that have 1,000-plus-pound mainframes and can't fit in many operating rooms, MIRA is small enough to fit inside a microwave-size locker.

But, no, astronauts won't be operated on anytime soon. MIRA's mission entails cutting simulated tissue and manipulating small objects, Farritor told Insider Intelligence. Surgery in space will be programmed in advance so it won't interfere with the astronauts' work, he said.

**So, what's this all have to do with surgery on Earth?** "Working with NASA aboard the space station will test how MIRA can make surgery accessible in even the most faraway places," Virtual Incision CEO John Murphy said in a statement. Robotic surgery is precise, can reduce human error, and someday could enable remotely controlled procedures on patients from afar. Patients who live far from health systems and hospitals with staffing issues could greatly benefit.

Plus, the small incisions are minimally invasive, help patients heal faster, and can reduce a patient's stay in the hospital, per Farritor.

**The opportunity:** Healthcare executives see robotic surgery as a legitimate way to digitally transform operating rooms.

- **66%** of providers say they're very or somewhat likely to implement robotic technology in high-precision procedures and surgeries in the next two years, particularly as a 5G use case, [according to](#) Verizon's 2021 5G Business Report.

## Value vs. Planned Usage of Select 5G Applications According to US Healthcare Industry Tech Professionals\*, Nov 2020

% of respondents

	Very/somewhat likely to implement within 2 years	Very/somewhat valuable to my industry
Use of remote health monitoring technologies that collect medical and health data from individuals in one location and transmit it to providers in a different location	75%	81%
Use of mobile networks by healthcare providers for high-quality video during telemedicine visits	78%	79%
Fast and seamless sharing of large files to improve patient care	72%	79%
Complex point-of-care imaging and diagnostic services for emergency medical technicians (EMTs)	69%	79%
Wearable monitoring devices that send patient data to healthcare providers in real time	70%	78%
Real-time sharing of high-resolution 3D medical images	72%	78%
Use of more prolific AI tools to help medical professionals to identify, diagnose, and treat patients	68%	74%
Use of "smart objects" that respond to provider and patient needs at healthcare facilities	64%	72%
Use of AR, VR, and next-generation medical imaging to provide immersive medical training experiences	66%	72%
Use of robotic technology in high-precision procedures and surgeries	66%	71%
Use of AR, VR, and spatial computing for less invasive treatments, like physical therapy or for mental/neurological disorders	65%	69%
Deployment of drones equipped with medical emergency supplies to emergency sites	56%	65%

*Note: \*manager level or higher with decision-making power in IT/IS infrastructure and security, application development, or wireless plans/services*

*Source: Verizon Business, "Verizon 5G Business Report" conducted by Morning Consult, Jan 27, 2021*

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**The challenge:** Many of today's robotic surgery platforms are too large for operating rooms with their mainframe designs, Farritor noted. That's why only 1 in 10 operating systems in the United States have access to robotic-assisted surgery, per Virtual Incision.

"Mainframes require a dedicated operating room, extensive setup, and specialized staff training," Farritor said. "MIRA aims to make robotic-assisted surgery more accessible to surgeons and patients through its miniaturized design that is intended to simplify the surgery and setup."

**The big takeaway:** The size and price of current robotic surgery systems may hold back implementation.

Larger systems like **Intuitive Surgical's** da Vinci were among the first to hit the market, but the ISS proof of concept could show how a compact robot can bridge distances from space to

remote areas on Earth.

“Robotic-assisted surgery on Earth is already a reality, but logistical inefficiencies of current systems are keeping it from being accessible in any operating room on the planet,” Farritor said. “That’s where MIRA fits in. Our hope is that MIRA is authorized for use in US operating rooms before it heads to space.”

**What’s next?** Virtual Incision will submit the surgical robot to the FDA by the end of 2022, with potential commercial availability to follow.

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