

# Mayo will test robotic heart procedure for rural patients

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Mayo Clinic researchers are poised this spring to test a remote cardiac procedure that could be a major breakthrough for rural hospital care—a procedure in which a patient's clogged artery is propped open by robotic

tools controlled by an off-site doctor.

In the initial test, the Mayo doctor will only be in the next room, able to step in as needed. A successful test, however, would pave the way for a future in which doctors could perform the procedure from miles away.

That would be meaningful for patients in rural areas whose emergency cardiac procedures can be delayed—and who can suffer worse outcomes—if their local hospitals aren't equipped to provide a procedure known as a [percutaneous coronary intervention](#), or PCI, said Dr. Mackram Eleid, the Mayo interventional cardiologist who is leading the remote research.

"That's where the need is," he said.

Mayo's research in partnership with Corindus, the manufacturer of the remote PCI platform, has been in animal organs in the United States, but it led to the first human remote PCI in India last year. The doctor and procedure in that case were 20 miles apart.

Lag time between the doctor's movements and the robot's actions have been the major technological challenge, though improvements in wireless networks are addressing that, Eleid said. Research found that 400 milliseconds of lag was acceptable, but that anything longer did affect the doctors' performance.

So far, only the final step of a PCI—the opening of a clogged artery and placement of a mesh stent to keep it clear—can be done remotely. The setup steps of accessing patients' arteries and threading catheters inside them are still done on site.

The research is supported by a \$3.3 million grant from the Helmsley Charitable Trust, a philanthropic organization that has invested millions

in rural health care facilities and technology in Minnesota.

Robotic surgery is evolving rapidly, with Fridley-based Medtronic unveiling its Hugo surgery system earlier this year and California-based Da Vinci Surgery reporting more than 6 million procedures with the use of its robotic consoles. However, almost all of those procedures have occurred with the robotic console and doctor in the operating suite.

Proving that the remote technology works would lead to a new wave of questions, including whether small hospitals could afford to invest in the equipment and personnel to provide robotic PCIs.

Eleid said an additional benefit, beyond faster and better coronary treatments for rural patients, would be healthier doctors. They are exposed to radiation during on-site PCIs, which require the use of radioactive dye so that doctors can see the patients' arteries, and suffer back and neck issues due to the heavy lead aprons they must wear.

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