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SPEAKER: Robotic spine surgery is the use of robotic guidance for the placement of spinal instrumentation. When we do surgery on the spine, generally, there are two main reasons to do surgery. One is decompression. If the nerve roots or the spinal cord is compressed, we decompress the nerves or the spinal cord. And two is instability. If there's instability of the spinal cord, we may have to stabilize or perform a fusion.

Our hope is that by bringing enabling technologies into the operating room, technologies like robotic surgery or navigation-guided surgery, that we can make surgery safer, faster, and more reproducible, and hopefully, be able to benefit more patients. With robotic-assisted surgery, some people have the conception that the robot's doing the work, and the surgeon may be off in a different location.

And although I don't want to predict what might happen in the future, technology is rapidly changing, today, robotic-assisted surgery does still involve the surgeon right at the surgical table of the patient. So if you were a patient, and you were looking into a surgery where a robotic-assisted spinal surgery is happening, you would still see the primary surgeon at the table, an assistant surgeon across the table from that primary surgeon, and the robotic arm next to the primary surgeon moving into the locations that the primary surgeon has identified for it to move into.

Qualified candidates for robotic spinal surgery are people who have degenerative disease of the back who also have instability necessitating a fusion. Not everybody who has instability will need a fusion surgery. But if you have instability to a degree that it requires an instrumented fusion, then robotic spinal surgery is an option.

Currently, the widest uses of robotic spinal surgery are in the lumbar spine, but we are seeing increasing usage in the thoracic spine and even into the cervical spine. We have begun to use it for traumatic cases and also for oncologic cases or spinal tumor cases. So it does have utilizations in both trauma and in spine tumors as well.

So in a typical procedure we would begin, prior to the surgery, by having had either a CAT scan or by doing a CAT scan during surgery. After obtaining the CT scan, we decide on the length and size of our screws. All of that gets built into the robotic software.

So when we go into surgery, the beginning part of it is to place a reference frame for the robotic arm that's usually placed somewhere on the surgical table. And then after placing the reference frame, we make our incisions, and the robotic arm is guided to the areas where it has determined that screws should go based on the previously planned locations and trajectories.

In general, our first set of patients were, for the most part, patients with degenerative spinal disease, meaning back pain resulting from arthritis. Broadly, they have done very well. We have noted-- and we are following this cohort very closely-- we have noted good accuracy of screw placement. We've noted decreased pain medication intake and a faster recovery to leaving the hospital and going home.

We've also set up an enterprise team at our campuses in Minnesota, Florida, and Arizona. People can trust that they'll get Mayo Clinic quality of care and a high level of fidelity in the programs that we've established here.

For me as a provider and as a physician, when I take care of patients my main worry is how that patient's going to do and providing the best plan of care for that patient. Being able to work with teams of doctors across disciplines and help develop those plans of care and help make patients better one person at a time is the main driver for me to be at Mayo Clinic.

In addition, Mayo Clinic does have, as one of our central components, that we want to be leaders in advancing technology. And so as a patient or as a physician, you would know that when you come to Mayo Clinic or send a patient to Mayo Clinic that they're going to get tailored care, individualized care, multidisciplinary care, and also care that, when safe and when effective, will incorporate the leading technologies of the day, and that includes robotic spinal surgery.