

MARK LYONS: Deep brain stimulation has been available in this country since about the mid to late '90s. The indications for deep brain stimulation currently in the US are essential tremor, which is an action tremor. So patients that are trying to use their hands or arms, when they try to actually use it, they shake. And they can't control coffee cups. They can't eat. They can't write their name.

But we also do the procedure for Parkinson's disease, which is a degenerative brain disease, as many people know. And that is a second indication. The third indication that we do DBS for is dystonia, which is a type of muscle contraction disorder. Also, this surgery is very effective for that.

The way that we do our procedures-- we generally do them awake. And the reason we do them awake is that we like to stimulate. And what that means is that we put tiny microelectrodes down to the target area. And we'll usually put in three at a time. And then we will stimulate and record through those electrodes looking for the best response for the patient's symptoms and minimal side effects. And once we determine which of those trajectories is the optimal one, we remove the microelectrodes, and we place the permanent electrode in. And then we do some additional stimulation, again, to confirm good effect and no or minimal side effect.

One of the new, exciting things we're doing here at Mayo Clinic with our DBS program is we're using segmented leads. The biggest advantage right now of the segmented lead is the ability to be able to have an asymmetric current that allows you to stimulate at the precise spot you want to stimulate, but only stimulate the part at that location you want to stimulate. So I can stimulate laterally and get great response, but I don't have to stimulate medially, and stimulate a structure that gives the patient side effects we don't want. Whereas, before, you sort of had to accept great tremor control, and I had to accept some side effect because in order to get great tremor control, you're getting a little negative stimulation on the other side of this cylindrical lead. The segmented lead is a great advance for that.

Most patients actually tolerate the procedure very well, despite the fact that it's awake. They're being asked questions. They're being asked to do certain activities so that we can test them.

The device, once it's implanted, is and connected it to a power pack or a battery-- something similar to this. It goes underneath the collarbone. And the entire system's underneath the skin. It's all implanted. And that's how it's programmed. It's programmed with an iPad. It can be several feet away. And in fact, when new programming treatment options come up, it can be downloaded to their device, like an iPhone.

So the technology is really getting better and better. The results have been excellent in almost all patients. Most patients who come back in for their programming are extremely pleased with how they're doing. It turns their lives around in many instances. It is difficult, sometimes, for patients to go through this because some of them have a progressive disease, and they've been through a lot, and it can be a little rough on them. But once you come out the other side, after the procedure's done, and they've recovered, I have not had any patients so far said they wish they didn't do it.

So it's a very rewarding surgical procedure to do and to be able to offer to patients. So it's a very exciting time for this field. It continues to grow dramatically. And I think the Mayo Clinic is on the forefront in terms both of participating in trials and experimental trials in terms of volume of patients that we are able to do at all three of our sites. So it's a very exciting time for deep brain stimulation.

[MUSIC PLAYING]