CARMEN TERZIC: We are here at the Fourth Annual Symposium on Regenerative Medicine at the Mayo Clinic, Rochester, Minnesota. And we are joined by Dr. Kendall Lee, who is the director of the Neuroengineering Lab at Mayo Clinic, and also the director of research in the Department of Neurosurgery Enterprise, which means that he leads the research initiative in the department, not only in Rochester, but also in Arizona and Florida in the Mayo health care system.

And he gave a wonderful presentation today where he explored new technologies as well as a new approaches to cure-- this is the word that we want to use here-- the possibility to cure and restore function in patients with a spinal cord injury. And I would like him to give us a summary of your presentation.

KENDALL LEE: Well, first, I would like to thank you, Dr. Terzic, as well as the organizers of this meeting. It was a lot of fun to give the presentation, and to inform the public about what work we are doing in Neuroengineering Laboratory, as well as the collaboration that we have with PM&R, Physical Medicine Rehab and Neurosurgery. There are two aspects of the work that I would like to talk to you about today.

The first has to do with epidural stimulation. Now, this is really exciting, because we recently received what's called Transform the Practice grant from the Mayo Research Committee to study whether it is possible to stimulate epidurally in patients who have spinal cord injury to regain their lost motor function-- lower extremity motor function.

Recently, it's been described that the patients with epidural stimulation just below the level of the lesion, the patients are able to regain some of their motor function. This is tremendous, because before, there really was very little option for these patients. With the grant that we received, we are currently in the process of working through all of the regulatory issues with the FDA, the IRB, and our research committees to now allow us to recruit patients to replicate that study.

It's very important that the findings are replicated so that we can extend this work to other patients. We have a very exciting collaboration with Dr. Reggie Edgerton who, as you know, is one of the preeminent neuroscientists in this area of spinal cord simulation and in work related to reanimating paralyzed limbs.

The second aspect that I would like to talk to you about is work that we've been doing now for about four years, in particular with our graduate student, Mr. Peter Grahn, who is helping us to study the possibility of now stimulating directly within the spinal cord. This is exciting, because if we can stimulate the spinal cord directly, we may be able to control even better these neuronopoles that, so far, after the spinal cord injury, lay dormant.

We know that the nerves are there, the muscles there. How do we control those functions once again? We're using technologies that we've developed in conjunction with our Mayo Division of Engineering, Professor Kevin Bennet, who is our chair of the Division of Engineering. He's also the Co-director of Engineering. And together with the neuroscientists, neurosurgeons, neurologists, and engineers, we are hoping to build novel implantable devices that can once again allow our patients to retain motor control.

CARMEN TERZIC: Well, this is very, very exciting, and bringing a lot of hope for patients with this condition, with the devastating condition. Are you vision that this is going to-- it can be beyond muscle control or limb control, like, what about bladder and bowel?

KENDALL LEE: Oh, yes, of course. And we know-- if you ask our patients with spinal cord injury, control of our bladder function, autonomic functions, is just as important as regaining motor control. And the answer is yes. We are very much interested in, also, how do we use neuroengineering techniques to control those aspects of bodily function?

CARMEN TERZIC: Thank you very much, Dr. Lee, for this wonderful presentation, and for giving us the summary of your very, very exciting project that is going to impact the lives of many patients.

KENDALL LEE: Great, thank you very much.