CARMEN TERZIC: I'm Dr. Carmen Terzic, Chair of the Department of Physical Medicine Rehabilitation. And we're here today with Dr. Claudia Lucchinetti, one of our top neurologists at Mayo Clinic, Rochester. And she's one of the leader national and international in multiple sclerosis.

So we are here in the Neurorehabilitation Summit. The second neurorehabilitation Summit meeting here in Mayo Clinic, Rochester. And then she is one of our key speaker and faculty today. So here, Dr. Lucchinetti is going to give us an update what is new in multiple sclerosis, and a highlight of her talk.

CLAUDIA LUCCHINETTI: Well, thank you Dr. Terzic. Today, I had an opportunity to update the group on our current thinking her earning progressive MS. So we know that our treatments for MS have largely focused on the inflammatory or the relapse phase of the disease and yet our patients continue to progress over time. So my goal today was really just to highlight what are some of the key drivers of progression in MS.

I specifically highlighted the following. First of all, what's clear in progressive MS is that MS patients have a certain kind of a lesion called a smoldering plaque. And that smoldering plaque represents an area of ongoing smoldering inflammation in a preexisting area of damage. We find that that plaque is really present, more so among progressive MS patients. And we really don't know if our current treatments are targeting that.

Another query I highlighted was the importance of the axon in progressive MS. Currently, our therapies do a decent job of limiting demyelination and inflammation. But the problem is, is that axons, when they lose their myelin coat, they undergo both acute and chronic energy failure. And this causes mitochondrial dysfunction. So I spoke at length regarding these mechanisms, and that a key driver of future research has to be on how to limit this mitochondrial dysfunction and damage over time, since we think that's contributing to tissue damage.

Furthermore, we talked a bit about iron and the role of how iron might contribute to this oxidative damage, and to what extent that's playing a good trophic or supportive role in the disease, versus the toxic degenerative role of the disease, and how that fits in with age. I also then close the talk talking about the role of the cortex, and the concept that MS is really more than just a white matter disease, but more of a global brain disease, which affects not only the so-called normal appearing matter but the cortex, which is a covering of the brain, which can be extensively involved in progressive MS, and a key driver of not only progression, but cognitive dysfunction in the disease.

Finally, we talked about the question is MS an inflammatory disease or a primary neurodegenerative disease. I presented some data to suggest that as we originally thought, this is a classic inflammatory hemline disease. But the problem is is that inflammatory demyelination sets in motion chronic progressive neurodegenerative phenomenon, which our future therapies have to target in order to really have a meaningful impact on the type of disability that ultimately gets many of our MS patients.