

AAN Clinical Research Fellow Doris Leung, MD: On the Hunt for Imaging Biomarkers for Neuromuscular Disease

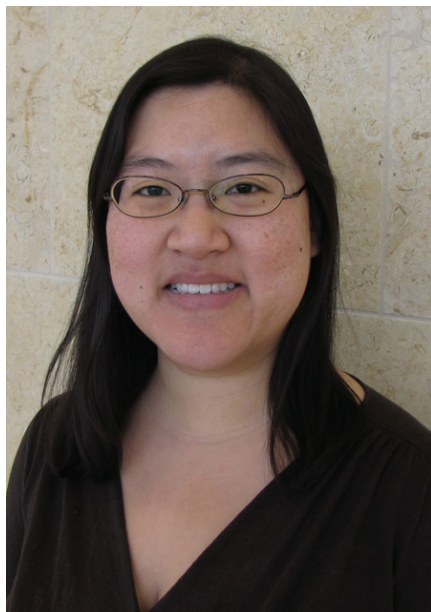
BY OLGA RUKOVETS

Doris Leung, MD, a 2011 AAN and AAN Foundation Clinical Research Training Fellow, likes solving mysteries — both in and outside of the lab. An avid reader of adventure and detective novels, Dr. Leung brings her appetite for the unknown to the clinical problems she studies in her research.

After earning her medical degree from Duke University School of Medicine, Dr. Leung completed her neurology residency at the Stanford University Hospital in 2009. Currently, Dr. Leung is a clinical research fellow at the Kennedy Krieger Institute's Center for Genetic Muscle Disorders.

Dr. Leung's AAN fellowship proposal, aims to use advanced techniques in MRI to develop new ways of examining and monitoring patients with progressive muscle weakness due to facioscapulo-humeral muscular dystrophy (FSHD).

Starting with the “magical quality” of neurology, which first attracted



DR. DORIS LEUNG: “Muscle imaging is really just beginning to establish its role in neuromuscular neurology, and I’m interested in how we can incorporate it into our armamentarium of diagnostic tools to make us better neurologists.”

WHAT WAS YOUR RESEARCH QUESTION?

My research will involve the use of new techniques in magnetic resonance spectroscopy to evaluate skeletal muscle in patients with FSHD.

We are hoping to use this technique to develop quantitative biomarkers that can be used to monitor disease progression in clinical trials. Right now this project is still in the planning stages, and we hope to start enrolling patients in the summer.

WHY DID YOU CHOOSE THIS SPECIFIC PROJECT?

What I really like about this project is that it addresses a present need in the field of muscular dystrophy research. When I was doing background research, I was surprised by how much literature on muscle spectroscopy is already available.

In the 1980s, there were quite a few papers published on magnetic resonance spectroscopy in muscular dystrophy, but it never really became part of routine clinical care or a common clinical research biomarker. There are some technical reasons for this, but I also think that the demand for imaging biomarkers wasn't as urgent then.

There have been several major advances in defining the mechanism of FSHD recently, and this has really improved the prospects for treatment options for the disease in the foreseeable future. We need reliable and practical biomarkers to monitor disease

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her to the specialty, Dr. Leung spoke to *Neurology Today* about her motivations and research in neuromuscular medicine.

Policy Watch

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Dr. Bever pointed out that PQRS, which includes many measures focused on preventive care and chronic conditions such as diabetes and heart disease, does not include enough measures that are relevant to neurology to allow comparison from one neurologist to the next.

“The measures might be helpful to healthy patients seeking good primary care or patients suffering from the high-volume conditions but would not be helpful for less common conditions, such as neurological conditions, where care is not measured,” he said.

Additionally, the PQRS program has frustrated many neurologists because CMS has been slow in making payouts to physicians who successfully submitted quality data. Further, those who have not earned the incentive for participating have generally been unable to learn why.

“The second big issue is whether CMS can carry out what has been mandated (regarding Physician Compare),” Dr. Bever said. “The experience with the

PQRS program would suggest that this will be a challenge for them.”

Findlay, the consumer advocate, agrees that PQRS has been problem-plagued to the point that it might have to be scrapped entirely. But that would not doom Physician Compare, which could use quality measures from other sources, such as the “meaningful use” incentive program to encourage physicians' use of electronic health records.

More broadly, Findlay said, the basic idea behind Physician Compare — that patients should be able to know the quality of care physicians provide — is bigger than the federal government. In addition to private payers' efforts to provide comparative information about physicians, the Robert Wood Johnson Foundation is

funding Aligning Forces for Quality, a huge initiative in 17 communities that is experimenting with ways to measure and report the quality of care delivered by physicians.

Dr. Bever questions whether patients are really interested in comparative data. “There is a more than a 10-year history of public reporting programs that have demonstrated that consumers are relatively insensitive to them,” he said.

IMPLICATIONS FOR PHYSICIAN PAY

In addition to helping patients choose high-quality physicians, CMS also will start using a “value modifier” in 2017 to calculate physician pay based on the quality of care provided.

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“There's no direct provision that the only measures that we could use for the value modifier comes from Physician Compare,” Dr. Rapp said. “But certainly one would expect [Physician Compare and a value-based purchasing program] to have a great deal of overlap.”

WHAT TO DO NOW

Unless something changes, PQRS data on physicians will eventually be posted publicly so Dr. Bever encourages neurologists to review their reports for accuracy.

Findlay at Consumers' Union is hoping physicians will become more engaged in quality improvement and reporting efforts.

“We're certainly going to be telling consumers that you need to ask your physicians whether they are participating in these kinds of things,” he said. “I think physicians that don't do that over the next four or five years are going to be put at a disadvantage, and hopefully part of that disadvantage will be that patients will begin to say, ‘You know, I just think I'm going to go to another doctor who values this.’” •

Up & Coming

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progression if we want to generate useful clinical data, and I think that MR imaging and spectroscopy may be a non-invasive way to address that need.

WAS THERE A PARTICULAR CASE OR PATIENT THAT INSPIRED YOUR INTEREST IN THE RESEARCH QUESTION?

I remember at one point in my clinical neurophysiology fellowship, I read an EMG text that said we could EMG any muscle in the body if we had a long enough needle — which is true, but it sounds kind of ominous, doesn't it?

The point I decided to take away from that instance is that there are limitations to any single diagnostic test, particularly in muscle diseases, where the examination, electrophysiology, and even muscle biopsy can only get you so far. Muscle imaging is really just beginning to establish its role in neuromuscular neurology, and I'm interested in how we can incorporate it into our armamentarium of diagnostic tools to make us better neurologists.

AAN Clinical Research Training Fellowships are funded by the AAN, the AAN Foundation, and the AAN Foundation Corporate Roundtable, and provide \$55,000 per year for two years, plus \$10,000 per year for tuition to support formal education in clinical research methodology at the fellow's institution or elsewhere. More than 70 training fellowships have been awarded through the program since its inception in 1996. For more information about the program, visit <http://bit.ly/egrG8L>.

DO YOU HAVE A MENTOR WHO HAS INFLUENCED YOU?

My mentor for this project is Dr. Kathryn Wagner, director of the Center for Genetic Muscle Disorders at the Kennedy Krieger Institute. Her dedication to her patients and her research in muscle disorders is truly inspiring to me and to everyone that works with her. From the beginning, she has helped me develop the goals of my project and forge the partnerships I would need to complete it. The

opportunity to work with her has been a real privilege.

WHY DID YOU CHOOSE TO GO INTO NEUROLOGY?

Neurology was my first clinical rotation in medical school. I don't think I seriously considered neurology before that, and I don't think I ever seriously considered any other specialty afterward. The neurologists I worked with on my rotation really loved what they did, and their enthusiasm was what motivated me the most — and the cases we saw were fascinating, as well.

One time, we were able to localize a lesion because the room was extremely warm and we noticed giant beads of sweat on the patient's forehead that stopped exactly at the midline. It was all perfectly logical, of course, but there is also a magical quality about these kinds of cases, which I love.

WHY DID YOU CHOOSE TO FOCUS ON NEUROMUSCULAR MEDICINE?

I really enjoy the multidisciplinary approach to medicine, and neuromus-

cular medicine in particular has given me many opportunities to work with — and learn from — other specialists. The clinics I've trained in are able to provide patients with immediate access to physical therapy, occupational therapy, speech therapy, nutrition, social work, nursing care, genetic counseling, and equipment specialists in a way that really consolidates and enhances their care. Working with these teams has also made me a better physician in more ways than I can count.

ON A MORE PERSONAL NOTE, TO LET OUR READERS KNOW SOMETHING ABOUT YOU OUTSIDE OF YOUR RESEARCH, COULD YOU TELL US WHAT BOOKS ARE ON YOUR READING LIST RIGHT NOW?

The last two books I've read are *Apollo 13* by Jeffrey Kluger and James Lovell and *Murder at the Vicarage* by Agatha Christie. No one who knows me would find this surprising, but I almost always read the endings of books first. I just have to know what happens! •