

April 21, 2005

<http://www.pioneerlocal.com/cgi-bin/ppo-healthfam>

## Nerve center signals hope

Jack Miller Center takes aim  
at peripheral neuropathy

By **Stephanie Fosnight**

Staff Writer

Pioneer Press

At the Jack Miller Center for Peripheral Neuropathy at the University of Chicago, doctors are tapping the talents of mice and men -- and learning from both.

Raymond Roos, M.D., tests a patient's grip strength or gait to help him diagnose peripheral neuropathy, the name for more than 100 disorders resulting from damage to the body's peripheral nervous system. Meanwhile, Brian Popko, Ph.D., tests a mouse's grip strength or gait to understand what causes peripheral neuropathy.

Dr. Roos presides over the clinical half of the Center, leading a team of physicians who diagnose and treat the disorder. Popko holds sway in the research half, searching for causes with the help of doctoral students and a supporting cast of thousands of mice.

The Center, the brainchild of peripheral neuropathy sufferer and Lincolnshire businessman Jack Miller, all started with a chance remark.

Miller had already spent four years seeking a diagnosis for the persistent, worsening pain in his feet, and his search for treatment options took him from New York to the Mayo Clinic in Rochester, Minn.

"After three days of staying in that godforsaken little town and peeing in a plastic bottle, the head neurologist said, 'Yes, you have peripheral neuropathy, but you'll die of something else first,'" said Miller, a lifelong athlete who wasn't pleased with the idea of spending the rest of his life in pain.



Lincolnshire businessman Jack Miller funded a clinical and research center for peripheral neuropathy after the disorder appeared in his feet 10 years ago. (Brian O'Mahoney/Staff Photographer)

So when Miller visited a support group and met people crippled from the disorder, he said to the group, "You're all talking about trying to relieve the symptoms. Nobody is talking about trying to find a cure."

Then one member turned to him and said, facetiously, "If you've got the money, you make it happen."

"I thought, 'OK, I will,'" said Miller, founder and president of Quill Corporation.

The Jack Miller Center was established in May 2001 with the help of the University of Chicago neurologists who ultimately treated Miller. From the beginning, Miller and head neurologist Roos envisioned the center as a place where doctors and scientists would work together, and they recruited top molecular biologist Popko from North Carolina.

"Our goal is to bring the arms of the Center together, to take the scientific breakthroughs that are obtained from the research bench and partly through studying mice, and to translate these into better care for patients and better treatments," Roos said.



So far, the Center is accomplishing its dual purposes of funding research and treating patients. People fly in from all parts of the country to be treated, and Popko's team has successfully identified a gene responsible for adult-onset muscle weakness in one strain of mice.

Researcher Brian Popko tests the grip of a mouse as part of his research at the Jack Miller Center for Peripheral Neuropathy. (Photo by Dan Dry)

"Now, we're able to say, 'What does this gene normally do, such that (the absence of the function) leads to this disorder,'" Popko said. "What we're doing is identifying molecules and pathways that, when disrupted, lead to peripheral nerve disorders."

For his studies, Popko searches for mice with genetic abnormalities that result in symptoms like muscle weakness and other ailments common among peripheral neuropathy sufferers.

"We subject these mutant mice to a variety of screens, much like what Dr. Roos does with his patients when they come into the clinic," Popko said. "We characterize these mice clinically. We examine them and try to determine what's wrong with them."

Recent biological advancements like the sequencing of the human and mice genomes offer hope that studying rogue genes in mice will lead to better treatment for humans, even though many peripheral neuropathies are not genetic.

"It really gives us insight into the molecules that are potential targets in peripheral nerve disorders," Popko said.

Glencoe dentist Seymour Gottlieb knows there is no cure for the nonstop tingling he's endured in his feet for the last five years, but at least now he knows what he has. The trouble started five years ago, just days after a surgery.

"I felt the heaviness in my legs, I felt tiredness, I had a loss of gait, and the tingling started in my feet," said Dr. Gottlieb, who is semi-retired from his Highland Park clinic. "It spread gradually into my fingers and hands and up to the top of my head. It got to the point where I was so weak I couldn't walk without help."

Within a week Gottlieb's strength returned, but the tingling and warming sensations remained throughout his body.

"Then, the same way it came, it dissipated over the next couple of months, from the head down," he said. However, the tingling never left Gottlieb's feet. He describes the sensation as the tingling you notice after your feet recover from "falling asleep."

"I have it right now," he said, propping up his feet while sitting on the long couch in his living room. "Obviously, it's not going to dissipate."

As these strange sensations progressed and regressed through his body, Gottlieb looked for answers. He went to podiatrists, neurologists and anesthesiologists, but nobody could explain what was happening to him. Then he attended a lecture at the Northbrook library where he learned of the Jack Miller Center, and where physician Kourosh Rezaia diagnosed him.

Gottlieb has chosen not to take medication for the neuropathy, since he feels only tingling and no pain, though he may reconsider if it ever gets worse.

"I felt that, as it is now, I could get along without medication," he said. Yet, Gottlieb is grateful to have a name for the disorder that had puzzled him for all those years. In fact, 20 million people in the United States have peripheral neuropathy

"This is a disease from which a few people die, though not a big percentage," said Miller. "This is a disease that can go from a mild form to an extreme form. There are people who can't handle paperwork, for example, because their fingers are too sensitive."

Miller's own neuropathy symptoms now are controlled by medication, and he continues to lift weights, swim, golf and work out. However, he still feels numbness and pain in his feet at the end of a long day, and has occasional trouble sleeping because of the pain in his feet. He is grateful his neuropathy isn't as extreme as those others experience.

"I do believe this is something that can be cured," Miller said. "If people can be relieved of the symptoms, then they can live a normal life. If they can't be relieved, then their life is pretty miserable."

Both Miller and Gottlieb have idiopathic peripheral neuropathy, which means doctors don't know the causes. Known causes of peripheral neuropathies include diabetes and carpal tunnel syndrome, as well as trauma, chemotherapy drugs, autoimmune responses, alcoholism, systemic diseases, and exposure to toxic substances.

Despite the dozens of peripheral neuropathies, possible causes, and symptoms, Roos says the center's approach to research and treatment could yield broadly-applicable results.

"There are many causes, but there are probably some final common pathways by which nerves dysfunction," he said. "For example, perhaps if one could identify a growth factor that was effective in the repair of peripheral nerves, that would work in 95 percent of peripheral neuropathies, even though they may have very different causes. Or, if one could identify ways of protecting the peripheral nerves from toxic injuries like chemotherapeutic drugs, maybe that would work not only against these injuries but against other causes of peripheral neuropathy, such as diabetes."

Miller has now turned toward solidifying the Center's future. The institution sponsored a nerve symposium last year, and Miller is working on more fundraising and creating an endowment.

"It started, it's up and running, it's doing a good job, and now it takes more money to make it happen," said Miller, who has set a fundraising goal of \$1 million for this year.

And Gottlieb is especially grateful for Rezanian's thoroughness. During his diagnosis process, the doctor suggested a lower-back MRI to rule out any other causes of the symptoms.

"The MRI showed a malignant spot on my kidney," said Gottlieb, who underwent successful removal surgery last fall. "That maybe saved my life."

*For information about the Jack Miller Center for Peripheral Neuropathy, call 773-702-5800 or visit [millercenter.uchicago.edu](http://millercenter.uchicago.edu).*

**Nerve function and malfunction**

Peripheral neuropathy describes more than 100 disorders that result from damage to the peripheral nervous system, which are nerves connecting the central nervous system to the muscles, skin and organs of the body.

Two main categories of peripheral neuropathies are mononeuropathies and polyneuropathies. Mononeuropathy occurs when a single nerve is damaged, as in carpal tunnel syndrome, which is caused by compression of the median nerve in the wrist. Multiple mononeuropathies are caused by damage to two or more nerves.

Polyneuropathy is a symmetric process involving the peripheral nerves at the ends of the extremities. Polyneuropathy has a wide range of causes, including diabetes, toxic injury from chemotherapy, exposure to toxic substances, and many more. It's important to distinguish between mononeuropathies and symmetric polyneuropathies because these processes tend to have very different causes and treatments.


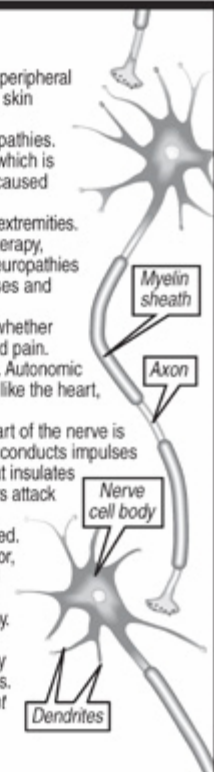
Peripheral neuropathies also are classified according to the type of nerve they affect, whether sensory, motor, or autonomic. Sensory nerves transmit sensory experiences like touch and pain. Motor nerves control skeletal muscles like those in the arm or leg. Autonomic nerves regulate automatic biological functions necessary for life, like the heart, digestion, and sexual, bowel, and bladder function.

Another way to classify peripheral neuropathies is by what part of the nerve is damaged. Peripheral nerves include the cell body, the axon that conducts impulses away from the cell body, and the myelin sheath, a fatty protein that insulates the nerve process. Some neuropathies attack the axon, and others attack the myelin sheath.

Symptoms depend on the type of peripheral nerve that is involved. The neuropathy can be sensory, causing pain and numbness; motor, causing weakness; or autonomic, causing light-headedness and sweating abnormalities. The neuropathy can also be mixed. For example, some people have a sensory-motor peripheral neuropathy.

Determining the cause of an idiopathic neuropathy means doctors can learn how to treat the disorder. Treatment is either by addressing the cause, if it is known, or by controlling the symptoms.

— Stephanie Fosnight



Human nervous system