

# Diabetic nerve damage may increase energy needed for walking

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A new study suggests that diabetes-related nerve damage (peripheral neuropathy) may reduce the amount of energy stored by the Achilles tendon during walking. The tendon connects the back of the heel to the calf muscles. This reduction increases the energy required for locomotion ("cost of walking"). The article is published ahead of print in the *Journal of Applied Physiology*.

Peripheral [neuropathy](#) is a type of nerve damage that affects up to 68 percent of people with diabetes. People with diabetes-related neuropathy may experience symptoms such as weakness, numbness and pain in the hands and feet. Symptoms in the feet may make walking and balance control difficult.

Researchers studied three groups of adult volunteers: One group had diabetes and diabetes-related [peripheral neuropathy](#) ("neuropathy"), another had diabetes without neuropathy ("diabetes") and a [control group](#) had neither diabetes nor neuropathy ("control"). The researchers observed the volunteers during standardized walking tests to measure the amount of energy the Achilles tendons stored and released while walking. The research team also measured the strength and ability of the knees and ankles to flex as well as changes in the [calf muscles](#) during the walking tests. In healthy people, the Achilles tendon stores and releases a large amount of energy during movement, which minimizes the amount of energy the calf muscles need to expend.

The diabetes and neuropathy groups had more stiffness in their Achilles tendons and less range of motion in the joints than the control group did. Increased tendon stiffness means that less energy can be stored in the tendons, which makes the lower leg muscles work harder, the researchers explained. "The results strongly point toward the reduced energy saving capacity of the Achilles tendon in diabetes and [diabetes-related peripheral

neuropathy] patients as an important factor contributing to the increased metabolic [cost of walking] in these patients," the research team wrote. Less stored energy and a higher cost of walking may lead to decreased mobility and an increased risk of diabetes complications.

The full article, "Altered Achilles tendon function during walking in people with [diabetic neuropathy](#): implications for metabolic energy saving," is published in the *Journal of Applied Physiology*.

**More information:** Milos Petrovic et al. Altered Achilles tendon function during walking in people with diabetic neuropathy: implications for metabolic energy saving, *Journal of Applied Physiology* (2018). [DOI: 10.1152/jappphysiol.00290.2017](https://doi.org/10.1152/jappphysiol.00290.2017)

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