

# How to avoid foot amputation in diabetic patients

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Scientists from Tomsk Polytechnic University and National Autonomous Mexico University have developed techniques to treat diabetic foot syndrome with special insoles with silver nano-particles. The technique helps to fight foot ulcers in diabetic patients, and facilitates their healing and disinfection, reducing the risk of amputation.

Silver preparations being developed by Tomsk Polytechnic University jointly with Novosibirsk and Mexican counterparts are able to reduce such risks.

"The research has shown silver's [antibacterial properties](#) facilitate rapid healing of ulcers and suppurations in patients with diabetic foot syndrome. Together with colleagues from Mexico, where the problem is particularly acute, we are working to create special insoles for [diabetic patients](#). The development has passed [clinical tests](#). In patients who had used the insoles impregnated with [silver nanoparticles](#), [foot ulcers](#) healed up, the risk of amputations significantly reduced," says TPU Professor Alexey Pestryakov, Head of the Department of Physical and Analytical Chemistry.

Diabetic foot syndrome is one of the latest and most serious complications of diabetes. Due to the large amount of sugar in the body there are changes in peripheral nerves, blood vessels, skin and soft tissues, bones and joints. Infections, ulcers, suppurations and other problems are emerging. Up to 15 percent of people with diabetes are at risk of developing foot ulcers. Advanced diabetic foot syndrome can

lead to amputation.

A team led by the scientist develops pharmaceuticals based on silver nano-particles having universal impact on viruses, bacteria and fungi. The scientists have cooperated with Mexican colleagues for more than 10 years.

"We have got a contract with the Mexican government, gained large grants for research. Built a serious team consisted of scientists and doctors. Together we work to improve the quality of our products, we carry out joint research and experiments," says Pestryakov.

**More information:** Belén Borrego et al. Potential application of silver nanoparticles to control the infectivity of Rift Valley fever virus in vitro and in vivo, *Nanomedicine: Nanotechnology, Biology and Medicine* (2016). [DOI: 10.1016/j.nano.2016.01.021](https://doi.org/10.1016/j.nano.2016.01.021)

Provided by Tomsk Polytechnic University

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