

# Drug boosts snakebite survival time by half: study

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Rubbing snakebites with an ointment that slows the functioning of lymph glands could boost survival times by 50 percent, according to a study released Sunday.

In experiments on humans and mice, researchers in Australia showed that a class of compounds called nitric oxide donors delays the entry of toxins from potentially deadly snakebites into the blood stream.

Nitric oxide (NO), a molecule involved in regulation of blood pressure and the control of [brain activity](#), has been shown to [lower blood pressure](#) in patients who suffer acute strokes.

The new finding is of more than academic interest: every year some 100,000 people worldwide die from snakebites, and another 400,000 must amputate limbs that have been injected with poison.

It has long been known that many snake venoms contain large molecules that transit the human body's [lymphatic system](#) before entering the [bloodstream](#).

Separately, scientists have also established that nitric oxide slows down a pumping mechanism within the lymphatic system, a part of the body's immune system that carries a clear fluid -- called lymph -- toward the heart.

Dirk van Helden, a researcher at the University of Newcastle in New

South Wales, put these two facts together to suggest a possible treatment for snakebites.

"We hypothesised that a nitric oxide-releasing agent applied topically would slow lymphatic transit time and entry of the [venom](#) into the circulation, delaying onset of toxicity," he and his colleagues wrote in the study.

To test their theory, the researchers injected a venom-like substance into one foot of 15 volunteers, and measured the time it took for the [toxin](#) substitute to reach lymph nodes in the groin.

The experiment was later repeated, except this time the drug-laced ointment was spread around the puncture within one minute of the injection.

Result: the transit time dropped from an average of 13 minutes to 54 minutes, four times slower.

Further experiments using real toxins in rats yielded roughly the same results.

Finally, the researchers compared the survival time in rats injected with venom that were treated with the ointment against those that were not, and found that the [nitric oxide](#) rats kept breathing 50 percent longer.

"These results point to a new method of snakebite first aid that may also be useful for bites to the torso or head," the researchers concluded.

Currently, the most common treatment is to immobilise the patient and restrict blood flow as much as possible until medical assistance is available.

**More information:** A pharmacological approach to first aid treatment for snakebite, *Nature Medicine* (2011) doi:10.1038/nm.2382 .  
[www.nature.com/nm/journal/vaop...nt/full/nm.2382.html](http://www.nature.com/nm/journal/vaop...nt/full/nm.2382.html)

### Abstract

Snake venom toxins first transit the lymphatic system before entering the bloodstream. Ointment containing a nitric oxide donor, which impedes the intrinsic lymphatic pump, prolonged lymph transit time in rats and humans and also increased rat survival time after injection of venom. This pharmacological approach should give snakebite victims more time to obtain medical care and antivenom treatment.

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