

People with spider phobia handle tarantulas, have lasting changes in brain after short therapy

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Tarantula spider. Credit: International Society of Arachnology

A single brief therapy session for adults with a lifelong debilitating spider phobia resulted in lasting changes to the brain's response to fear.

The therapy was so successful, the adults were able to touch or hold a tarantula in their bare hands six months after the treatment, reports a new Northwestern Medicine study.

This is the first study to document the immediate and long-term [brain changes](#) after treatment and to illustrate how the brain reorganizes long-term to reduce [fear](#) as a result of the therapy. The findings show the

lasting effectiveness of short [exposure therapy](#) for a phobia and offer new directions for treating other phobias and anxiety disorders.

"Before treatment, some of these participants wouldn't walk on grass for fear of spiders or would stay out of their home or dorm room for days if they thought a spider was present," said Katherina Hauner, post-doctoral fellow in neurology at Northwestern University Feinberg School of Medicine and lead author of the paper, published in [Proceedings of the National Academy of Sciences](#). "But after a two or three-hour treatment, they were able to walk right up and touch or hold a tarantula. And they could still touch it after six months. They were thrilled by what they accomplished."

The study with 12 adults was conducted when Hauner was a graduate student in the lab of Susan Mineka, a professor of psychology at Northwestern.

Fear of spiders is a subtype of an anxiety disorder called specific phobia, one of the most common [anxiety disorders](#) affecting about 7 percent of the population. Common [specific phobias](#) also include fear of blood, needles, snakes, flying and enclosed spaces.

The therapy involved gradually approaching the spider. Before the session, the participants were even afraid to look at photos of spiders. When they did, the regions of the brain associated with [fear response](#) - the amygdala, insula, and cingulate cortex - lit up with activity in an fMRI scan. Next, when asked to attempt to touch a tarantula in a closed terrarium or approach it as closely as possible, they were not able to get closer than 10 feet on average.

During the therapy, participants were taught about tarantulas and learned their catastrophic thoughts about them were not true. "They thought the tarantula might be capable of jumping out of the cage and on to them,"

Hauner said. "Some thought the tarantula was capable of planning something evil to purposefully hurt them. I would teach them the tarantula is fragile and more interested in trying to hide herself. "

They gradually learned to approach the tarantula in slow steps until they were able to touch the outside of the terrarium. Then they touched the tarantula with a paintbrush, a glove and eventually pet it with their bare hands or held it.

"They would see how soft it was and that its movements were very predictable and controllable," Hauner said. "Most tarantulas aren't aggressive, they just have a bad reputation."

Immediately after the therapy, an fMRI scan showed the [brain regions](#) associated with fear decreased in activity when people encountered the spider photos, a reduction that persisted six months after treatment.

When the same participants were were asked to touch the [tarantula](#) six months later, "they walked right up to it and touched it," Hauner said. "It was amazing to see because I remembered how terrified they were initially and so much time had passed since the therapy."

Hauner also could predict for whom the therapy would be most effective based on an individual's brain activity immediately after the treatment. Participants with higher measurements of activity in brain regions associated with visual perception of fearful stimuli immediately after the treatment were much more likely to show the lowest fear of spiders six months later.

"This suggests that observations of brain activity immediately after therapy may be a useful future tool in predicting an individual's long-term outcome," Hauner said.

She also found the brain regions associated with inhibiting fear only showed changes immediately after the exposure therapy and not after six months, indicating that differing brain mechanisms may be responsible for immediate versus long-term fear reduction.

Provided by Northwestern University

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