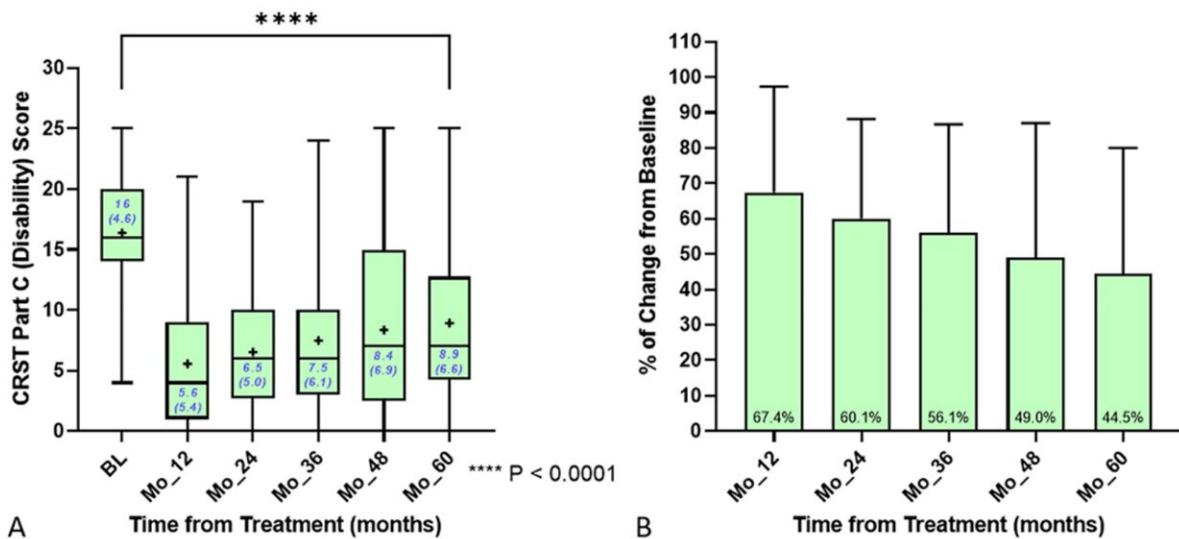


Focused ultrasound treatment for essential tremor highly effective after 5 years

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A: Observed change in CRST Part C (disability) scores from baseline at the annual follow-up, calculated by separate ttests per visit. Boxes indicate medians with interquartile ranges; whiskers, ranges; and plus signs, means. The mean score values (standard deviations) are noted in blue type. B: Mean observed change in CRST Part C (disability) scores from baseline at the annual follow-up. Credit: *Journal of Neurosurgery* (2022). DOI: 10.3171/2022.6.JNS212483

A scalpel-free, high-tech form of brain surgery pioneered at UVA Health offers long-term relief for patients with essential tremor, a common movement disorder, a five-year review shows.

The study offers important insights into the durability of the benefits of focused [ultrasound](#) treatment for [essential tremor](#). Five years after treatment, clinical trial participants continued to their treated tremors reduced by more than 70%, the researchers report. There were no progressive or delayed complications.

"It is exciting to see such durable results after an [outpatient procedure](#) for a sometimes disabling problem like ET," said researcher Jeff Elias, MD, a UVA Health neurosurgeon who served as the study's Principle Investigator. "It is important to note that most of the patients had very long-lasting benefits, but there are some cases where tremor can recur."

Focused ultrasound for essential tremor

The focused ultrasound procedure focuses [sound waves](#) inside the brain to disrupt faulty brain circuits that cause unwanted movement. Unlike traditional brain surgery, it does not require incisions nor opening the skull. The minimally invasive procedure is guided by [magnetic resonance](#) imaging (MRI), so doctors can pinpoint the exact right spot in the brain before delivering the treatment.

Initial tests of the procedure at UVA and a small number of other sites often produced dramatic results: Study participants would enter an MRI with their hand shaking uncontrollably and emerge with their ability to write or feed themselves restored.

While promising, those early tests could not reveal how long the benefits of the procedure would last. This new study followed the clinical trial participants for five years and found that they continued to enjoy major reduction in their tremor. Other measures of quality of life were improved as well. Side effects did not occur after the procedure was complete.

"This important trial verifies the long-term benefits and safety of the focused ultrasound procedure that we have performed for hundreds of patients with tremor at UVA," said Shayan Moosa, MD, a UVA Health neurosurgeon partnering with Elias to perform focused ultrasound procedures. "As this is an incision-less and outpatient treatment, we are able to effectively reduce tremor in patients who may not be able to or may not want to pursue more-invasive options."

The study described the outcomes of 40 trial participants from the original study cohort. It represents the largest long-term follow-up study of the procedure, known as "unilateral thalamotomy," possible to conduct so far.

The pioneering clinical trials at UVA and a handful of other sites paved the way for the federal Food and Drug Administration to approve focused ultrasound for the treatment of essential tremor in 2016. That made the procedure available to patients outside clinical trials, though there are still a limited number of hospitals with the advanced technology and expertise needed to offer it.

The FDA also has approved focused ultrasound for the treatment of Parkinson's disease tremor and dyskinesia (involuntary movements) based on research at UVA Health and elsewhere. UVA is investigating the technology's potential for a wide variety of other medical applications, from treating cancer to opening the brain's protective barrier to deliver now-impossible treatments for diseases such as Alzheimer's.

Based on its highly promising research, UVA launched the world's first focused ultrasound cancer immunotherapy center earlier this year. The center aims to combine focused ultrasound with immunotherapy to enhance the immune system's ability to battle cancers.

The new center was launched in conjunction with the Charlottesville-based Focused Ultrasound Foundation, a longtime supporter of UVA Health's focused ultrasound research.

Elias and his collaborators have published their five-year follow-up results in the *Journal of Neurosurgery*.

More information: G. Rees Cosgrove et al, Magnetic resonance imaging–guided focused ultrasound thalamotomy for essential tremor: 5-year follow-up results, *Journal of Neurosurgery* (2022). [DOI: 10.3171/2022.6.JNS212483](https://doi.org/10.3171/2022.6.JNS212483)

Provided by University of Virginia

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