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# Treating Movement Disorders: Parkinson's Disease, Essential Tremor and Dystonia



Contributor: [Michael T. Hayes, MD](#)

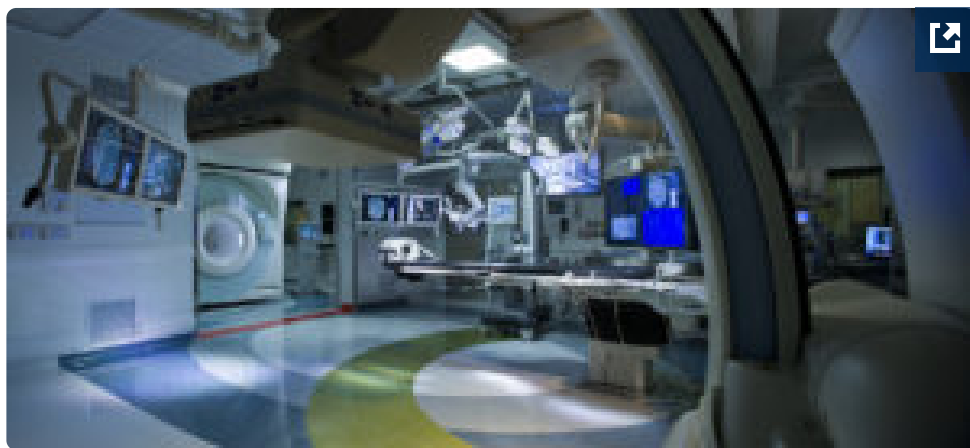
Michael T. Hayes, MD, is Neurological Director of the Functional Neurosurgery Program for Movement Disorders at Brigham and Women's Hospital (BWH).

Movement disorders are a group of neurological conditions that cause abnormal voluntary or involuntary movements, or slow, reduced movements. These disorders can affect movements such as walking, and complex tasks like playing the piano or writing.

"No two patients with a movement disorder are alike, so treatment must be tailored to the individual. In order to achieve the best outcome each patient must be continually evaluated to decide the appropriate treatments, which may involve injections, medications, or in some cases surgery," says [Dr. Michael T. Hayes](#), Neurological Director of the Functional Neurosurgery Program for Movement Disorders at Brigham and Women's Hospital (BWH).

## Parkinson's Disease

Approximately one million people in the U.S. are affected by Parkinson's disease, a neurological disorder characterized by tremors, muscular rigidity, and slow, imprecise movements.



*The Advanced Multimodality Image Guided Operating (AMIGO) suite at BWH.*

Parkinson's disease happens because of a loss of neurons in an area of the brain called the substantia nigra, which results in a loss of the neurotransmitter dopamine.

"The first-line treatment for Parkinson's is a medication that increases dopaminergic stimulation in the brain. While these drugs improve symptoms in many cases, they can become ineffective over time at which point we consider other treatments, which may include surgery," says Dr. Hayes.

The most common surgical technique for Parkinson's disease, known as [deep brain stimulation](#) (DBS), also works to increase dopamine in the brain.

"Approximately fifteen percent of Parkinson's patients are appropriate for DBS, and patients who undergo the procedure typically get positive results," says Dr. Hayes.

**"For some people with movement disorders, focused ultrasound and deep brain stimulation can help treat symptoms that don't respond to medications."**

## Essential Tremor

Essential tremor is a disorder of the nervous system that causes involuntary and rhythmic shaking in the arms, hands or fingers and sometimes the head, vocal cords or other body parts. The disease affects approximately seven million Americans and is common in people over the age of 65.

The cause of essential tremor is unknown. As with Parkinson's disease, it is thought to involve the loss of neurons, though precisely where in the brain is not well understood.

"This loss of neurons can often occur in the cerebellum, an area of the brain that helps people maintain smooth movements," says Dr. Hayes.

Essential tremor can be debilitating for some patients and sometimes difficult to treat. Both medication and DBS can be effective treatments. According to Dr. Hayes, approximately 70 percent of patients who undergo DBS see a reduction in tremors and other involuntary movements, and are also able to greatly reduce medication doses.

Newer, less invasive treatments, such as [focused ultrasound](#), have also been shown to improve a patient's tremors (see video below).



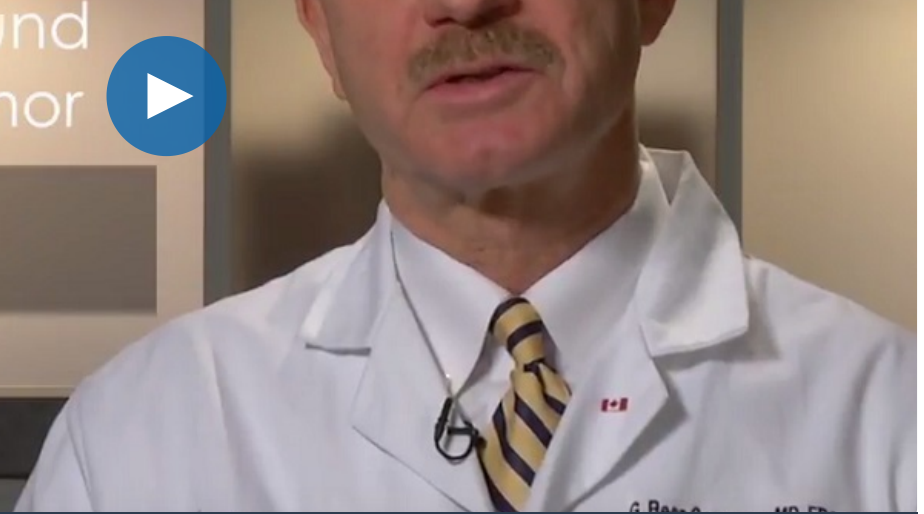
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# Focused Ultrasound For Essential Tremor



G. Rees Cosgrove, MD  
Director of Epilepsy  
and Functional Neurosurgery



*Focused ultrasound can be performed on an outpatient basis for patients with essential tremor.*

"Focused ultrasound was approved by the Food and Drug Administration in 2016 as a treatment for essential tremor. Studies on its effectiveness in Parkinson's disease are underway," says Dr. Hayes.

## **Dystonia**

Dystonia is a movement disorder in which a person's muscles contract uncontrollably. "One treatment for dystonia is medication that relaxes the muscles," says Dr. Hayes.

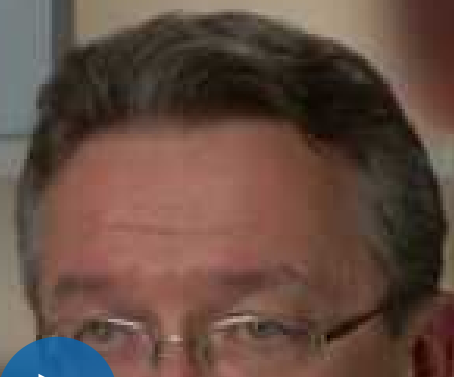
Another treatment for dystonia includes botulinum toxin injections, which relax the muscles for roughly three months. There are also some forms of dystonia that respond well to deep brain stimulation.

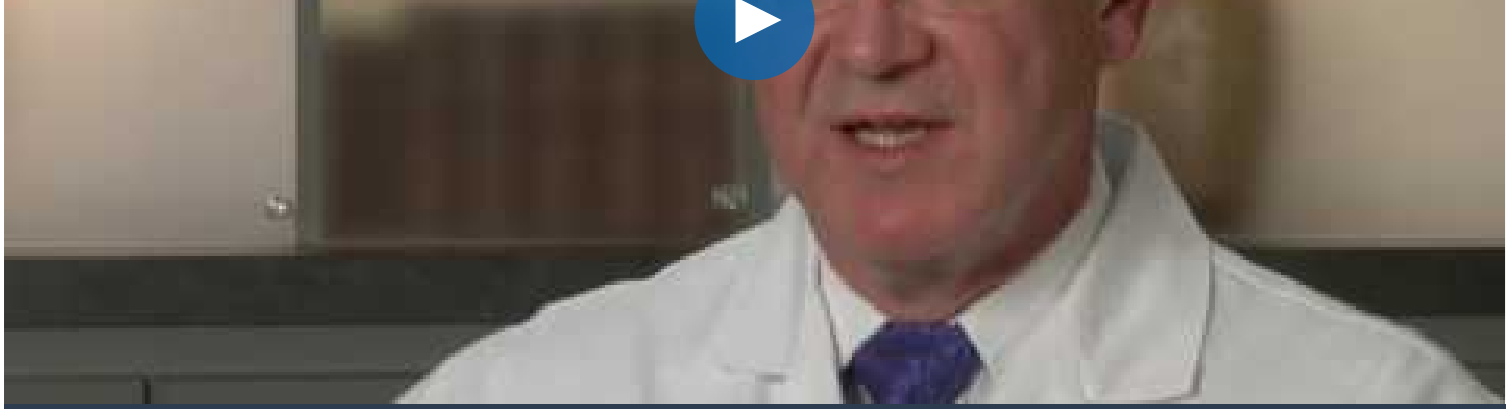
The [Division of Movement Disorders](#) within the Department of Neurology at BWH provides treatments, such as medications, botulinum toxin injections, DBS and surgery, for patients with a broad range of movement disorders, including Parkinson's disease, essential tremor and dystonia.

- By Dustin G.



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*In this video, Michael Hayes, MD, discusses care and treatment for Parkinson's disease, essential tremor and dystonia.*

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