

# Multiple Sclerosis



*Dr. Aimee Borazanci is leading a study testing a new treatment that has the potential to repair nerve damage that can occur in both progressive and relapsing MS.*

→ **MULTIPLE SCLEROSIS** causes lesions that can damage the central nervous system, disrupting signals between the brain and body. Patients may experience difficulty walking, muscle stiffness, weakness, vision problems, pain, depression, memory issues and more. The cause of MS is not known, although it is believed to be some combination of genetics and environment. Worldwide, more than 2.3 million people are living with MS, the majority of them women.

Early symptoms are non-specific and mimic other disorders, so MS is difficult to diagnose. Yet, early detection is critical to minimizing the risk of long-term disability. Disease progression and severity in an individual cannot be predicted. Although there are FDA-approved drugs that can reduce the frequency and severity of attacks, there is no cure.

Through compassionate patient care, cutting-edge research and world-class educational programs, the Multiple Sclerosis Program at Barrow Neurological Institute is making powerful strides against this disease, giving patients new hope.



**2-3 TIMES**  
more common in  
women than men



MS is more  
prevalent in areas  
**FARTHEST**  
from the equator



**1 MILLION**  
Americans live  
with MS

ABOUT BARROW  
NEUROLOGICAL INSTITUTE



#1 IN ARIZONA  
#11 IN THE UNITED STATES  
for neurology and neurosurgery



CLINICAL IMPACT

92,515

BNI Clinic visits

3,135

number of neurosurgeries

1,578

number of spine surgeries

\$2.8 MILLION

amount of charity care



GLOBAL IMPACT

54

visiting scholars, research fellows and observers from Mexico, India, Egypt, Pakistan, UK, Russia, China, Chile, Spain, Brazil, Japan, France, Italy, Kingdom of Saudi Arabia, Indonesia, Turkey, Germany, Poland, Colombia, Philippines, Israel, Argentina and Thailand.

PROGRAM ACCOMPLISHMENTS

The Multiple Sclerosis Program at Barrow Neurological Institute provides expert care through treatment, rehabilitation, neuropsychology, social work and research to take the best possible care of MS patients today, while working to find better treatments for tomorrow. Barrow is home to three clinical trials that are testing treatments for patients with progressive MS and relapsing MS as well as comparing early aggressive therapies with standard of care in preventing long-term disability.

There is significant shortage of MS specialists in the U.S. and around the world. Our one-year MS fellowship allows the fellows to gain more experience in diagnosing and treating MS patients, and to participate in MS research. Funding for the fellowship program has been supported by the Barrow Neurological Foundation.

RESEARCH ADVANCES

Nearly half of patients suffering an MS relapse are left with residual disability. There are currently no biomarkers that predict when a relapse will occur, how severe it will be, or how well it will respond to steroid treatment. Aimee Borazanci, MD, is leading multiple studies testing a new innovative treatment that has the potential to repair the damage to nerves that has occurred with MS. This new treatment is being tested in progressive MS and relapsing MS and can be added to the MS treatment that the patient is already taking. The success of this treatment would be a breakthrough in the MS world, as patients would not only be able to slow their disease progression, but actually see improvement in their symptoms and disability, making a huge impact on their quality of life.

Ashley Stokes, PhD, an Assistant Professor of Imaging Research in the Keller Center for Imaging Innovation, is conducting a pilot project to implement an advanced magnetic resonance imaging (MRI) method to characterize cerebral perfusion in newly diagnosed patients. Cerebral perfusion may be indicative of chronic inflammation, which is a hallmark of MS. Dr. Stokes is using the advanced MRI method to correlate perfusion with patients' symptoms via a quality of life survey, in the hopes of identifying biomarkers indicative of MS symptoms and prognosis. The team is completing data collection from more than 50 patients and presented results at the International Society for Magnetic Resonance in Medicine in May 2019 in Montreal. This research is personal for Dr. Stokes because her younger brother has MS.



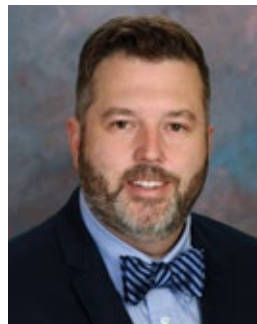
Ashley Stokes, PhD



↑ Barrow Neurological Institute Chair of Neurology, Dr. Jeremy Shefner, participated in Bike the US for MS this summer, riding 4,295 miles from Maine to Washington to raise funds and awareness for our Multiple Sclerosis program. In September, riders came to Barrow to meet with some of our patients, take a tour and present Drs. Shefner and Borazanci with a check for \$20,000 raised.

## ON THE HORIZON

Although there is no single laboratory test to diagnose multiple sclerosis, MRI has been a crucial tool in achieving a timely and accurate diagnosis. In October, Richard D. Dortch, PhD, joined Barrow as an Associate Professor in the Keller Center for Imaging Innovation. His research objectives are to develop and validate quantitative MRI methods for the nervous system and use these to improve understanding of diseases like multiple sclerosis.



Richard D. Dortch, PhD

Dr. Dortch and Dr. Stokes are launching a multiple sclerosis imaging fellowship to train a full-time fellow in advanced imaging biomarker development for MS. The team hopes to develop new imaging biomarkers to improve outcomes for patients everywhere with MS.

Studies have shown that driving ability is compromised in many MS patients, resulting in accident rates about three times higher than healthy individuals. Barrow clinicians have observed that about half of their MS patients show a decline in the speed at which they process information, which is crucial for driving. Ram Narayan, MD, is leading a clinical trial to assess the effectiveness of a high-fidelity driving simulator to improve cognitive performance and on-road driving performance in MS patients.

## BY THE NUMBERS



### RESEARCH

**320**

active research studies

**839**

patients enrolled in clinical trials

**\$9 MILLION**

in federal research grant support



### DONOR IMPACT

**\$3.98 MILLION**

for basic and translational research

**\$3.65 MILLION**

for strategic initiatives including Barrow Aneurysm & AVM Research Center, Barrow Artificial Intelligence Center, neuroimaging and stroke

**\$1.26 MILLION**

for education and fellowship programs

**\$2.52 MILLION**

for community outreach programs



## THANK YOU FOR YOUR SUPPORT

We are extremely grateful to Barrow Neurological Foundation donors for their generous contributions. Their support for our research will not only help with groundbreaking, novel ideas for treatment of multiple sclerosis patients, but will also ensure that Barrow Neurological Institute becomes a leader in our area of focus. We thank you for your dedicated support!

Aimee Borazanci, MD

↑ *To address the shortage of MS specialists, Barrow offers a one-year MS fellowship that allows the fellows to gain more experience in diagnosing and treating MS patients, as well as participate in MS research. This fellowship is funded by Barrow Neurological Foundation.*

**Barrow Neurological Foundation** raises awareness and funding for patient care, medical education, community outreach and research offered at Barrow Neurological Institute. Barrow is an internationally-recognized leader in neurology, neurosurgery and neuroscience research, treating patients with a wide range of conditions, including brain and spinal tumors, concussion and brain and spinal traumas, neuromuscular diseases, stroke, cleft and craniofacial disorders, and cerebrovascular disorders. It is home to several centers of excellence, including the Ivy Brain Tumor Center, Muhammad Ali Parkinson Center and Gregory W. Fulton ALS and Neuromuscular Disease Center. [www.SupportBarrow.org](http://www.SupportBarrow.org)



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