



SEVERE BACK PAIN as a result of a spinal injury or disorder can affect every aspect of daily life. It can make simple activities like cooking, cleaning, or getting dressed unbearable and leaving the house extremely challenging. Many of those suffering from debilitating back pain have to stop doing the things they love most, and as a result they begin to feel isolated from their friends and family. The pain eclipses everything, robbing them of all the joy in life.

The Sonntag Spine Center at Barrow Neurological Institute, led by Juan Uribe, MD, seeks to revolutionize the treatment of spinal disorders and spinal injuries through collaboration and innovation. The spine team is dedicated to assisting patients in returning to a healthy, fulfilling lifestyle through surgical advancements and expanded research and education in spinal disorders.



3,000+

spine surgeries
performed each year



1,145

patients enrolled
in spine registry



20+

peer-reviewed articles
published in past year

BARROW NEUROLOGICAL INSTITUTE BY THE NUMBERS



CLINICAL IMPACT

91,800+

total number of
patient visits

20,900+

telemedicine visits

5,700+

brain and spine surgeries



GLOBAL IMPACT

78

international
research fellows and
visiting scholars

EDUCATION AND TRAINING

Under the leadership of Volker K.H. Sonntag, MD, the Sonntag Spine Center's namesake, Barrow established itself as a trailblazer in education, research, and treatment of spinal disorders. Dr. Uribe continues to expand upon this tradition, propelling Barrow into the future of spine education and surgery. In February 2022, the spine team held the first-ever Sonntag Spine Center Symposium, which was attended by more than 200 top spine surgeons and researchers from across the country. The symposium focused on minimally invasive and emerging techniques for complex spine surgery.

The Center's Virtual Reality Spine Lab stands at the forefront of surgical spine education. Using virtual reality to simulate an operating room allows surgical trainees to practice complex techniques without involving real patients. The platform is also accessible anywhere in the world. During the 2022 Neurosurgery Research and Education Foundation Spine Fundamentals Cadavers Course, hosted by the Sonntag Spine Center, neurosurgery residents and fellows from across the country were provided the opportunity to gain hands-on spine surgery experience using virtual reality. All 22 course attendees reported very positive feedback regarding their experience.

In addition to training residents and fellows, the spine team provides opportunities for undergraduate students to engage in hands-on research. In summer 2022, the Center welcomed international undergraduate student Gerardo Gómez Castro, who was supported through the Franke Global Undergraduate Internship Program. Gerardo came to Barrow from Mexico and interned with Brian Kelly, PhD, in the Spine Biomechanics Laboratory.

RESEARCH ADVANCEMENTS

The Spine Biomechanics Laboratory, led by Brian Kelly, PhD, helps neurosurgeons optimize surgical treatments from a mechanical standpoint, so patients can have the best possible outcomes in the long term. Last year, Dr. Kelly and his team completed a study that investigates how force and stress are distributed across rods secured to the spinal column via pedicle screws to stabilize the spine or correct deformity. The data showed trends for higher stress areas along the rods, as well as activities that contribute to higher stress on them. This helps surgeons understand the most vulnerable aspects of this type of procedure so they can utilize the best reinforcement strategies.



International student, Gerardo Gomez Castro

The Spine Biomechanics Laboratory also developed a prototype suction tube with retraction force sensing by creating custom software and 3D-printing a model with real-time output. The role of the suction tube is to detect how much force the surgeon is using when moving aside critical nerves to access a surgical site. Carefully monitoring this force can help reduce the risk of nerve injury during surgery. Additionally, the team implemented a new optical motion-tracking system to track how spinal joints move in different test simulations.

Barrow has one of the most robust institutional spine registries in the world. Jay Turner, MD, PhD, leads efforts for the Barrow Neurological Clinical Outcomes Center (BNCOC), an internal spinal research registry and patient database that tracks patient outcomes to develop safety measures, quality improvements, and best practices. Currently, 1,145 spine patients are enrolled in the BNCOC, with 613 of those patients added within the last year. The BNCOC has now expanded to become a quality initiative, which will allow it to include all neurosurgery patients at Barrow, making for a more comprehensive registry.

ON THE HORIZON

The Sonntag Spine Center will increase its presence at national and international symposiums and conferences, as well as increase local education options for residents and fellows. The Virtual Reality Spine Lab will continue to develop new surgical-procedure training simulations and will launch a new, multi-center study with residents and fellows to evaluate the effectiveness of the platform. Additionally, the Spine Biomechanics Lab will begin studies using the new optical motion-tracking system and will test its prototype suction tube to measure its effectiveness in reducing the risk of nerve injury during surgery.

BARROW NEUROLOGICAL INSTITUTE BY THE NUMBERS



RESEARCH

397

active research
studies

791

patients enrolled
in clinical trials

\$14 MILLION

in federal research
grant support



DONOR IMPACT

\$20 MILLION

total distributed to Barrow
Neurological Institute,
including:

\$3.5 MILLION

designated to specific
centers/programs

\$15.4 MILLION

for basic, clinical, and
translational research

\$1.5 MILLION

in endowments



Juan Uribe, MD, is chief of the division of spinal disorders, Volker Sonntag chair of spine research, and vice chairman of neurosurgery at Barrow.

THANK YOU FOR YOUR SUPPORT

The goal of spinal surgery is to improve the quality of life of those who suffer from disease, injury, or congenital deformity while providing outstanding patient care. Your support is greatly appreciated and is so very important as we investigate less-invasive surgical procedures aimed at reducing recovery time and improving patient outcomes while training the next generation of world-class neurosurgeons.

Your generosity fuels new ideas, and we are excited for this next great chapter in spine research, treatment, and surgery.

With gratitude,

Juan Uribe, MD
Chief, Spinal Disorders
Sonntag Chair of Spine Research
Vice Chair, Neurosurgery
Barrow Neurological Institute

The mission of Barrow Neurological Foundation is simple: to be the catalyst of our donors' passion for transformation by providing the resources for Barrow Neurological Institute to achieve its mission of saving human lives through innovative treatment, groundbreaking research, and by educating the next generation of the world's leading neuroclinicians.

Barrow
Neurological Foundation

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