

Sonntag Spine Center



1 Juan Uribe, MD, chief of the division of spinal disorders and Volker Sonntag Chair of Spine Research, performs a robotic-guided fusion surgery in the lumbar spine.

our back is, literally and figuratively, the center of your body. Even minor back pain can impact almost every aspect of your daily life. In the United States, at least \$50 billion is spent annually on back pain, not to mention the loss of productivity and the devastating effects of opioid addiction and suicide.

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.



BARROW NEUROLOGICAL INSTITUTE BY THE NUMBERS





CLINICAL IMPACT

77,600+

total number of patients seen at Barrow annually

22,200+ telemedicine visits

5,700+ brain and spine surgeries



GLOBAL IMPACT

11

research fellows and visiting scholars from Brazil, Columbia, India, Ireland, Pakistan, Russia, Thailand, and Turkey

PROGRAM ACCOMPLISHMENTS

When the Sonntag Spine Center's namesake, Volker K.H. Sonntag, MD, came to Barrow, the spine was largely an afterthought in neurosurgical education. Through his expertise and leadership, Dr. Sonntag made the spine an integral part of neurosurgery. Dr. Uribe, Dr. Sonntag's successor, is now propelling Barrow into the future of spine education and surgery with groundbreaking research into minimally invasive surgical procedures that significantly reduce patient recovery time.

The team at the Sonntag Spine Center envisioned the creation of a virtual reality laboratory that would provide advanced training for residents and fellows across a wide breadth of spinal procedures. Last year, that became a reality. The team formally developed the Virtual Reality Spine Lab, a surgical education platform that creates an immersive 3D environment in spinal anatomy with a focus on the learning experience. They also hired 3D application developer and coder Ryan Ehredt. With Ryan's expertise, the team was able to update and refine their virtual platform to conduct pilot testing with faculty and residents. After receiving feedback and making further refinements, the spine team launched a pilot study for the platform at Barrow. The Virtual Reality Spine Lab has the potential to push the entire spine field forward, allowing life-like surgical simulations to be practiced anywhere in the world.

RESEARCH ADVANCES

Barrow is a member site for the American Spine Registry (ASR). Recently, the ASR became the new repository of choice for the Quality Outcomes Database (QOD) Spine Registry, the nation's largest spine registry. This collaboration will allow the Sonntag Spine Center to access vital clinical information from across the United States.

Jay Turner, MD, PhD, continued work on 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. Data from the BNCOC allows the spine team to analyze current methods and patient outcomes in order to help make recommendations on treatments based on data from similar cases. In 2021, the spine team enrolled 178 new spine patients in the BNCOC. Additionally, the spine team hired Victoria Eudy as a research assistant to support database-related projects.

Brian Kelly, PhD, leads the Barrow Spine Biomechanics Laboratory, which is geared toward further studying and understanding the effects



A researcher in the Spine Biomechanics Laboratory shows a finite element analysis image, which allows the spine team to reproduce the movement in a real human spine.

of implantable devices on spinal surgical procedures. Last year, Dr. Kelly's team completed two studies on digital imaging correlation techniques that will help better inform treatment for stress and strain in the spinal joints with implantable instruments.

ON THE HORIZON

The spine team plans to launch a multi-institutional endeavor with surgical residents and fellows to evaluate the effectiveness of the Virtual Reality Spine Lab. Five top-tier academic programs across the United States have already joined this effort, forming a consortium of like-minded educational centers interested in virtual education and surgical training.

A new study in the Sonntag Spine Center will assess the influence of spinal surgery on patient mobility, recovery, sleep patterns, and rehabilitation progress by utilizing patient activity trackers worn both preand post-operation. Ultimately, the goal of the study is to create a preand post-operative rehabilitation protocol for patients undergoing spine surgery that will allow them to have the best overall quality of life.

The Spine Biomechanics Laboratory plans to continue developing computer models of the spine, in addition to developing equipment, methods, and pilot testing for cervical spinal cord injury due to head impact. This promising frontier of innovation could lead to new and improved treatments for patients suffering from injuries due to roll-over motor vehicle crashes and head impact during sports.

BARROW NEUROLOGICAL INSTITUTE BY THE NUMBERS



RESEARCH

320+ active research studies

791 patients enrolled in clinical trials

\$11.7 MILLION in federal research grant support



DONOR IMPACT

\$28 MILLION

total distributed to Barrow Neurological Institute, including:

\$21 MILLION

designated to specific centers/programs

\$5 MILLION

for basic, clinical, and translational research

\$1.7 MILLION for endowed research chairs



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. With the development of the new Virtual Reality Spine Lab, we will be able to advance neurosurgical education and procedural training for a wide breadth of spinal conditions. Your support is greatly appreciated and so very important as we strive to provide unsurpassed clinical care, investigate less-invasive surgical procedures, improve patient outcomes, and train the next generation of world-class neurosurgeons who choose to specialize in spinal surgery.

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 Barrow Neurological Institute

↑ Dr. Uribe giving pointers to resident Harrison Farber, MD, who is using the Oculus Rift VR Headset in the Virtual Reality Spine Lab.

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 2910 N 3rd Ave., Ste 450 Phoenix, AZ 85013 www.SupportBarrow.org