world-class neurosurgery

A multitude of factors—including you—makes it possible

Above, Nicole Andre was 13 when she underwent life-changing surgery for a hypothalamic hamartoma at Barrow Neurological Institute. Right, Barrow's Neurosurgery Research Laboratory works with biomedical companies to develop new surgery tools, such as this device that uses plasma energy to cut into brain tissue without generating heat.

by Catherine Menor

For Denise Andre, an agonizing 13-year journey to find medical help for her daughter, Nicole, finally ended in January 2007 at Barrow Neurological Institute—2,400 miles away from their home in Manalapan, New Jersey. At Barrow, neurosurgeon Dr. Hal Rekate removed a hypothalamic hamartoma from the teen's brain, ending years of uncontrollable seizures.

"We were fortunate enough to find our 'special doctor' at Barrow Neurological Institute in Phoenix," wrote Denise in a letter to parents at the school where she works as a special education teacher. "He is the one and only neurosurgeon in the U.S. to take an interest in this rare condition that falls under the umbrella of 'orphan diseases' (labeled as such due to the lack of research money they receive). His interest and expertise, combined with advances in medical technology made this surgery possible for Nicole. Only a few short years ago, her tumor was considered inoperable (and still is by most)."

The letter was written to ask parents for their support of a school walkathon in January to raise funds for Barrow's research into hypothalamic hamartomas. "All of the children in the school participated, from preschool to fifth graders," Denise said.

Nicole's story is not unusual. Patients come from all across the country—indeed, from around the world—for care that, in some cases, is available only at Barrow. Some patients find Barrow after consulting specialist after specialist and hearing repeatedly that their condition is inoperable or that surgery would be too risky. Others are referred by neurologists and neurosurgeons who recognize Barrow's expertise in complex and challenging brain and spine conditions.

What enables Barrow neurosurgeons to handle the most difficult brain and spine cases? Ask doctors throughout the institute, and they will give you various answers. including the following **Top 10 Reasons for Barrow's Success:**

1. **Dedication to advancing medical science and patient care.** Barrow focuses its efforts on continually improving patient care and advancing our knowledge of the brain and spine. For instance, the Hypothalamic Hamartoma Center, now in its fifth year, continues to conduct research aimed at developing better treatments and expanding our understanding of epilepsy. Research at the Center has led to new endoscopic approaches for removing these devastating tumors.
2. **A team of specialists and subspecialists.** The medical team at Barrow—neurologists, neurosurgeons, neuroradiologists, neuropsychologists, neuropathologists, and other brain and spine specialists—collaborate closely in caring for patients. In addition, many subspecialize in particular areas of neuroscience. For instance, neurosurgeons at Barrow subspecialize in such areas as cerebrovascular disease, spine disorders, endoscopic procedures, traumatic brain injury, neuroendocrinology and radiosurgery. By specializing in narrow areas of neurosurgery, these surgeons may see and treat more patients with a particular disorder in one year than a general neurosurgeon would handle in a decade.
3. **The best and brightest residents and fellows.** Barrow's reputation and world-class training programs attract the most talented and energetic neurosurgery residents and fellows. These young men and women keep everyone on their toes and keep new ideas flowing throughout the institute, say attending physicians at Barrow.
4. **Research to improve the tools of neurosurgery.** In the Neurosurgery Research Lab, scientists and surgeons work closely with biomedical companies to test and enhance new surgery tools, such as advanced microscopes, image guidance systems, and cerebrovascular stents. Researchers in the Biomechanical Lab have developed new technology for spine surgery, such as computer software that generates a three-dimensional model of an injured spine for use in surgery planning.
5. **Investments in break-through technology.** Barrow continually acquires new technology that can improve patient care. The CyberKnife and Gamma Knife at Barrow, for instance, are the only ones in Arizona. An intraoperative MRI in the Neurosurgery Department is the first of its kind in the country, enabling surgeons to check images of a patient's brain before finishing a surgery.

Left, neurosurgical residents and fellows can watch live surgeries from a conference room across campus from the Neurosurgery Department, thanks to the TelePresence Teleconference System. The new system is one of the ways in which Barrow is improving medical education. Below are Dr. Neil Crawford and Andy Baek in a spine research lab.

6. **Continuing education.** Barrow hosts several international conferences each year, edits a professional journal, *Barrow Quarterly*, that is distributed worldwide, and offers training in new surgical techniques. The TelePresence Teleconference System allows observers at Barrow and even in distant locations to watch live surgeries. The goal of all these activities is to share advances in neurosurgery with neuroscience specialists around the world.

7. **Neurosurgery research to improve surgical approaches and techniques.** Surgeons and researchers at Barrow continually seek to improve surgical outcomes for patients by developing new routes into the brain and new techniques for correcting spine and brain disorders.
8. **21st Century medical education.** Training for Neurosurgery residents is becoming more experiential at Barrow, thanks to investments in computer animation, teleconferencing and anatomical studies. Just as pilots-in-training use flight simulation to learn their skills, Neurosurgery residents at Barrow prepare for surgery through a variety of simulation activities.

9. **The most technologically advanced neuroscience facility in the world.** The Barrow Neuroscience Tower, which opened in 2006, offers physicians, patients, families and staff a comfortable, efficient and healing environment. Technologically, it may be unsurpassed anywhere in the world. The Neurosurgery Department features spacious surgery suites equipped with the latest image guidance systems and surgical microscopes, the world's first intraoperative 3 tesla MRI scanner, and a "super cool" surgery suite that can be chilled to 55 degrees in just three minutes.
10. **Benefactors of Barrow Neurological Foundation.** Benefactors' gifts touch every area of Barrow, making possible the pioneering research, medical education and clinical innovation that enable the institute to successfully treat the most complex and difficult neurological disorders.

"Every component of Barrow contributes to our success," says Dr. Spetzler. "But the underpinnings of it all are the gifts from our generous donors. Without their support, none of this would be possible."

Above, the Barrow Neuroscience Tower offers unparalleled facilities for patients, families, physicians and staff. Left, Endovascular neurosurgeons Dr. Felipe Albuquerque and Dr. Cameron McDougall were the second surgeons in the country to use the first FDA-approved stent for use in the brain. Below, Barrow offers the only CyberKnife in the Southwest.