Jeffrey N. Bruce, MD '83:
EXPLORING ‘THE LAST FRONTIER’ THROUGH INNOVATIVE RESEARCH, SURGERY

Jeffrey N. Bruce, MD '83, does not shy away from challenges. In fact, he seems to thrive on them.

A look at the world-renowned neurosurgeon’s areas of expertise shows a propensity for complicated, problematic conditions and highly skilled techniques. Skull base tumors, pituitary tumors, pineal tumors—all are considered among the most difficult types of brain tumors to treat.

“I like the tumors that are challenging. These are areas where surgeries are much more intense and complex. It’s much more dramatic in terms of what you can do for the patient and the impact you can make in a patient’s life,” Dr. Bruce explains.

Dr. Bruce, who currently serves at Columbia University as Edgar M. Housepian Professor of Neurological Surgery, director of the Bartoli Brain Tumor Research Laboratory, codirector of the Brain Tumor Center, and vice chair of academic affairs, is considered a leading authority on complex tumors of the brain and skull base. He has particular expertise with pineal tumors, an extremely rare condition comprising less than 1 percent of occurring brain tumors.

He developed this expertise after being handpicked by the then chair of Columbia’s Department of Neurological Surgery and one of his mentors, Bennett M. Stein, MD, to build a neuro-oncology program and carry on Dr. Stein’s pineal tumor practice when he retired. Dr. Stein, widely considered the world’s expert in pineal tumor surgery at the time, spent the years prior to his 1996 retirement training Dr. Bruce in the intricacies of these procedures—“showing me the ropes,” as Dr. Bruce puts it. Dr. Bruce has now performed more pineal tumor surgeries than anyone else in the world and has spent decades perfecting the techniques for dealing with these complex tumors.

It’s a long way from the student who first went to medical school with the idea of being a family practice physician. “The thought of surgery was the furthest thing from my mind,” Dr. Bruce recalls of his early days at what was then Rutgers Medical School. “I spent a summer at the NIH [National Institutes of Health] and really got interested in research, and I decided that I wanted to combine the practice of medicine with research. The idea of being able to develop new treatments, new methods and protocols for dealing with medical conditions, was very compelling.”

Making a Difference

During clinical rotations, Dr. Bruce discovered his love of surgery.

“It was dynamic, fast-moving, and had immediate results. I liked the excitement, the highs and lows of surgery. The ability to make a difference in patients’ lives was really profound,” he says.

He was further intrigued by the possibilities of neurosurgery, which he says seemed like “one of the great, untapped areas” at the time.

“The brain is sort of the last frontier,” Dr. Bruce explains. “It is the
one area that still has so much mystery about it, and the idea of performing surgery in the brain and conducting research to try and improve diseases of the brain was a very compelling thing for me.”

Still undecided in the days just before the start of his fourth year at medical school, he spoke with Robert Fisher, MD, professor of surgery and chief of the section of neurosurgery at the time, who suggested spending a month training at Columbia to get a better idea of whether the field would suit him.

“It was a great experience,” Dr. Bruce says. “In the operating room, they let me assist and be involved with the patients, and I realized that neurosurgery, particularly at academic medical centers, provided the opportunity to be involved in research.”

**Surgeon as Researcher**

Subsequently, of the grueling seven years of neurosurgery residency at Columbia, he spent one year each at the NIH and Columbia conducting research and developing interests—primarily in brain tumors—that have carried through to this day. As director of the Bartoli Brain Tumor Research Laboratory, Dr. Bruce leads NIH-funded translational brain tumor research and is involved with experimental clinical protocols for the treatment of brain tumors. For the past several years, the lab has hosted students from Robert Wood Johnson Medical School.

Among their work is the clinical application of theories about the molecular biology of brain tumors. They’re exploring new drug delivery systems, immunotherapy and vaccines, and molecular genetics.

“It is really an exciting time to be involved with brain tumor research,” says Dr. Bruce. “It’s a very innovative and energetic environment, and it provides me with an opportunity to collaborate with some of the top scientists in the field.”

Recent research includes convection-enhanced delivery (CED), which uses stereotactic brain imaging to place ultrathin catheters deep in the brain, through which chemotherapeutics are slowly pumped directly into the tumor.

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