The New Hampshire NeuroSpine Institute

Winter 2013 Newsletter

Caring for the quality of your life.

Functional Neurosurgery

Diseases of our nervous system can be difficult to understand and challenging to live with. The body's nervous system is made up of the brain, spinal cord, and peripheral nerves. Neurosurgeons provide care for a range of disorders of these organs. To our good fortune, we have seen dramatic growth in our understanding of the nervous system and its diseases, as well as science fiction-like technological advancements available to the specialists who treat nervous system problems. This may be most true in the subspecialty of functional neurosurgery.

What is "functional" neurosurgery? Just as it sounds, functional neurosurgery is a super-specialized field which treats degenerative and idiopathic (i.e. without known cause) nervous system diseases which compromise an individual's everyday function. This generally includes movement disorders, pain syndromes, and epilepsy.

As a group, functional disorders have been traditionally challenging to treat. Those who suffer with them are usually under the care of a neurologist who is familiar with the patient, the history of their illness, and their treatments. A neurosurgeon with modern functional expertise can play an important role in helping make neurologists' treatments more efficient and effective.

Deep brain stimulation (DBS) gets the most attention of any current technique in functional neurosurgery. This therapy, where deep brain structures are electrically stimulated, has made significant impact particularly on the treatment of movement disorders. Movement disorders are neurological diseases which are characterized by the presence of abnormal movement or muscle tone, absence of normal movement, or combination of the two. The most well-known movement disorder is Parkinson's Disease, but other noteworthy disorders include essential tremor, dystonia, spasticity, and chorea. Those with Parkinson's Disease suffer from rigidity of their limbs, tremor, and a difficulty and slowness with normal movements. Contemporary medications can dramatically reduce these symptoms, but over time these drugs begin to lose efficacy and come with side effects. DBS is now proven as an effective procedure for reducing symptoms of Parkinson's Disease and essential tremor, and potentially lowering the amount of medication needed to treat both disorders. DBS is a minimally-invasive surgery usually performed with the patient awake under light sedation. The surgeon uses a computerized guidance system and high-resolution MRI to implant small electrodes into the deep brain target with sub-millimeter accuracy. The patient recovers from surgery quickly and usually goes home from the hospital the day after the procedure.

The functional neurosurgeon also treats pain syndromes, including trigeminal neuralgia, cancer pain, and chronic low back and leg pain. Various functional procedures may be helpful for these patients. For example, trigeminal neuralgia is a facial pain syndrome caused by abnormal activity of the trigeminal nerve (the nerve that transmits sensation from the face). This can be a disabling problem, which in its most severe form can make even eating and talking very painful. Neurologists offer medications that may significantly reduce the frequency and severity of pain attacks. When pain continues despite medicines, a neurosurgeon with functional expertise may suggest surgical microvascular decompression of the nerve, stereotactic radiosurgery to the nerve, or targeted injections of substances designed to quiet nerve activity. Stereotactic radiosurgery is a non-invasive procedure in which the neurosurgeon uses computer guidance to deliver highly focused beams of radiation. The decision as to which treatment is best for trigeminal neuralgia is complicated and done on an individual basis. This decision should be undertaken with a neurosurgeon experienced with the disease and all forms of therapy.

Current functional neurosurgery makes a significant impact on the lives of those who suffer with these chronic, debilitating conditions. Research is rapidly improving our knowledge of brain function, our understanding of these and other complicated neurological diseases, and advancing avenues of treatment, such as: gene and molecular therapy. With that in mind, the future of functional neurosurgery is extraordinarily bright.

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Back to the Slopes

Winter is a time for snow sports in northern New England. Skiing is a great way to enjoy the winter season and stay in shape. However, it can be very risky when you have not prepared physically for hitting the slopes. The possibility of back injury is greater especially because skiing is a sport that requires abrupt twists and jerks of the spine. Just as most people are not trained skiers, they also do not know the correct way to fall.

Even for a seasoned skier like Meredith, a patient at NH NeuroSpine Institute, a fall can really cramp your ski season style. As an avid skier, Meredith not only provides lessons and started skiing when she was two, but typically prides herself on getting physically prepared for the upcoming season. "I've been skiing for twenty years but I admit I haven't been putting enough time into preparing myself for the ski season over the last few years." During the 2011 ski season, Meredith had a severe fall resulting in an injury to her spine. She realized she was likely done for the season. When she began experiencing predominantly low back pain with some minor radiating left leg pain, she was sent for an MRI. The MRI results confirmed a disc pathology, and she was scheduled with Dr. Thomas J. Kleeman, Orthopedic Surgeon at NHNSI.

"I was unable to do any of my usual activities. Typically I weight train and bike in the off season. I was just hoping that at some point I was going to be able to return to those things." After reviewing the physical examination and the MRI results, it was determined that Meredith could benefit from conservative treatments rather than surgery. Dr. Kleeman worked in collaboration with Dr. Aron Jeffrey, Physiatrist at NHNSI, to create a recovery plan specific to Meredith. Since NHNSI is able to offer most treatments in house, they could monitor her progress closely. She was scheduled with the physical therapy department and set up for an epidural steroid injection. The goal was to start the physical therapy and once Dr. Jeffrey completed the injection, she would have some pain relief. Meredith could start some aggressive exercise with a physical therapist present to monitor. "After my second injection I started to feel better, and once I was able to work aggressively with the therapist, I was able to start resuming some of my activities." Meredith's treatment needs were reviewed and evaluated at every visit, and with the collaboration of treatments, she was back to completing everyday activities.

Meredith is already back to skiing. "I feel great. I do the core exercises given to me by my physical therapist and I prepared myself for this ski season!"

Remember, if you are planning to ski, you should start training about six weeks prior. Once at the slopes, be sure to stretch your muscles prior to slipping into those skis. Be sure to stretch the arms, as well as the legs. Keeping yourself fit will help prevent injury with any activity. However, if an injury does occur don't be discouraged. With the proper treatment plan, you will be back to the activities you love in no time.

The New Hampshire NeuroSpine Institute

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Neurosurgeon

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