The Center for Neurosurgery
at The GW Medical Faculty Associates

202.741.2750
www.gwdocs.com
Our doctors provide state-of-the-art medicine in the treatment and management of neurological disorders, including brain and spinal tumors, degenerative spinal conditions, epilepsy, movement disorders, cerebrovascular disorders such as stroke and aneurysm, and pain.

Procedures include minimally invasive surgical techniques for the brain and spine, deep brain stimulation for the treatment of both movement (e.g. Parkinson’s) and mood disorders, awake craniotomy techniques for mapping brain function, radiosurgery (stereotactic approaches and whole brain), carotid artery stenting, and minimally invasive treatment of brain aneurysm (coiling).

General Neurosurgery
General neurosurgery covers a large number of procedures, including traditional open surgeries to remove brain tumors, relieve cranial pressure, treat traumatic brain injury, or correct malformations of blood vessels.

Skull-base Surgery
Skull-base tumors can be addressed through traditional, open procedures or through a minimally invasive technique that is used to treat anatomical features close to the base of the skull. This approach uses instruments called endoscopes to visualize and reach the surgical target. These targets can be reached through the openings
around the eyes and ears, and within the nasal sinuses. Typical targets include the pituitary gland as well as the complex system of blood vessels that supply the brain. This minimally invasive approach results in less blood loss, reduced risk of infection, and faster recovery times when compared to open surgeries. Skull-base surgery can be used to treat many types of neurological problems, from the removal of pituitary tumors to the treatment of facial pain resulting from cranial nerve compression (trigeminal neuralgia).

**Deep Brain Stimulation**
Deep brain stimulation uses an electrical device, implanted within the deep structures of the brain, to treat movement disorders such as Parkinson's disease and dystonia, intractable pain, and mood disorders such as obsessive compulsive disorder (OCD) or intractable depression. The implanted device sends low-level electrical signals which are thought to interrupt nerve communications that underlie these disorders.

**Brain Tumor**
Brain tumors can be either benign (non-cancerous) or malignant (cancerous). Depending on their location, brain tumors can be treated with open neurosurgical procedures, radiosurgery, or minimally invasive approaches. Cancerous brain tumors are usually treated with surgery, chemotherapy, radiotherapy, or a combination of these treatments.

**Awake Craniotomy/Brain Mapping**
To prepare for surgeries that target brain tumors or epilepsy, an “awake” craniotomy can be performed to determine which areas in the patient's brain are responsible for certain functions. In this procedure, surgeons electrically stimulate regions of the brain while the patient is awake, to create a map of areas that should be avoided during surgery, such as areas that govern speech and movement. This is a painless, but major, open brain surgery which can lead to excellent outcomes by preserving critical brain functions.

**Epilepsy**
Epilepsy, or seizure disorder, can be caused by brain injury, tumors, or inborn defects of the brain which cause abnormal electrical activity. Epilepsy can often be successfully treated with a variety of drugs. However, if drugs prove insufficient, and when a site of
origin for the seizures can be determined, epilepsy can be treated with open neurosurgery, radiosurgery, or, depending on the location, minimally invasive procedures.

Pain
Pain is a complex sensation that can originate in the brain, spinal cord, and virtually any other site in the body. Injury, inflammation, and the long-term response in the “pain circuit” are not well understood. However, procedures such as physical therapy, biofeedback techniques, stress reduction, minimally invasive spine surgery, deep brain stimulation, and other approaches can help relieve pain and help patients return to normal function.

Vascular (Cerebrovascular/Endovascular)
Vascular procedures of the neurological system include carotid endarterectomy (removal of plaque in the carotid artery), stenting (placement of a tubular support in the carotid artery or other blood vessels), and aneurysm coiling (placement of wire coil inside an aneurysm to prevent rupture and bleeding). Many or most of these procedures can be performed non-invasively by threading through an artery in the patient’s thigh.

Pituitary
The pituitary gland sits in a bony structure at the base of the skull, and is sometimes the site of benign (non-cancerous) growths. It is especially suited to minimally invasive procedures both due to its location, and to the thin, and therefore easily penetrated, bone layer surrounding it. Both benign (non-cancerous) or malignant (cancerous) pituitary tumors can cause many symptoms, from abnormal thickening of bone (acromegaly) in adults, to secretion of milk from the breasts in both males and females (galactorrhea).

Radiosurgery
Radiosurgery uses ionizing radiation (most commonly, x-rays) to treat benign (non-cancerous) or malignant (cancerous) tumors in the brain. Modern radiosurgery is referred to as stereotactic radiosurgery (SRS) because a stereotactic device is used to hold the head in a carefully planned position for each treatment. This technology allows high doses of
radiation to be delivered to the tumor with minimal exposure to surrounding healthy tissue.

**Minimally Invasive Spine (MIS)**

In selected patients, the minimally invasive approach can be used in spinal surgeries. MIS procedures can be used to treat many types of spinal conditions, including degenerative or herniated disc disorders, lumbar (lower back) spinal stenosis, curvature of the spine such as kyphosis or scoliosis, spinal infections, instability of the spine, and compression fractures of the spine, such as those caused by osteoporosis (thinning of the bones). The minimally invasive approach typically uses one or two small incisions and an endoscope to visualize the structures of the spine. MIS reduces risk of infection and patient downtime, with typically excellent results.

**Complex Spine**

Complex spine procedures, such as fusion of the vertebrae to stabilize the spine, often require open surgeries to allow access to sensitive areas such as the cervical (neck) spine. However, when the vertebrae are easily accessible, as in the lower back (lumbar) area, minimally invasive procedures are increasingly used to treat more complicated disorders. Other complex spine procedures include general open surgeries to treat spinal injuries or to remove spinal tumors.

**Spinal Tumor**

Spinal tumors may be cancerous or non-cancerous. The treatment of benign tumors depends on patient symptoms such as pain or lack of mobility, and may be treated with a watch-and-wait approach, various medications, radiation, or surgery. Cancerous tumors can be treated with radiation or chemotherapy, but if these fail, surgery can often be used to relieve pain, stabilize the spine, and improve quality of life.
Anthony Caputy, M.D., F.A.C.S. is Professor and Chairman of the Department of Neurosurgery at The George Washington University and Co-Director of The George Washington University Neurologic Institute. Dr. Caputy is a graduate of the University of Virginia School of Medicine and completed his Neurosurgery residency at Georgetown University in 1986. Dr. Caputy is a leader in the field of minimally invasive spine surgery, and specializes in reconstructive, complex spine surgery. He also performs surgical procedures for treatment of brain tumor, epilepsy and acoustic neuroma, awake craniotomy for mapping brain areas, carotid endarterectomy, and general neurosurgery.

James Leiphart, M.D., Ph.D., F.A.C.S. is an Associate Professor of Neurosurgery and of Anatomy and Regenerative Biology at The George Washington University. Dr. Leiphart received his M.D. and Ph.D. degrees from Northwestern University. Dr. Leiphart completed his residency in neurosurgery at the University of California, Los Angeles, and a fellowship in epilepsy surgery at Yale University. Dr. Leiphart specializes in movement disorders, surgery for complex pain syndromes, and general neurosurgery.

Fabio Roberti, M.D. is an Assistant Professor of Neurosurgery at The George Washington University. Dr. Roberti trained at The University of Modena, Italy. He completed both his residency and a skull-base fellowship at The George Washington University. Dr. Roberti specializes in cutting-edge, minimally invasive endoscopic approaches to the skull base and pituitary, and also practices general neurosurgery. Among other prestigious organizations, he is a member of the American Association of Neurological Surgeons and the Congress of Neurological Surgeons.
Frederic Schwartz, M.D. is a Clinical Professor of Neurosurgery at The George Washington University. Dr. Schwartz received his medical degree from The George Washington University School of Medicine and completed his internship and Neurosurgery residency at The George Washington University Medical Center. Dr. Schwartz was commissioned as a Major in the US Army Medical Corps and rose quickly to serve as Chief of Neurosurgery at The Dwight David Eisenhower Army Medical Center at Fort Gordon, Georgia. After his military service, Dr. Schwartz turned toward private practice and teaching with professorships at both The George Washington University and Georgetown University. Dr. Schwartz has published articles on brain tumors and spinal disorders in the most prestigious peer-reviewed scholarly journals, and has also been a contributor to the medical ethics literature. Dr. Schwartz is board certified in Neurological Surgery.

Donald Shields, M.D., Ph.D., M.B.A. is an Assistant Professor of Neurosurgery at The George Washington University. Dr. Shields obtained his graduate and medical degrees from the Medical University of South Carolina. He completed an internship in general surgery and residency in neurosurgery at UCLA Medical Center, and fellowship training in functional neurosurgery at Massachusetts General Hospital. Dr. Shields specializes in implantation of deep brain stimulation devices for movement disorders and for mood disorders such as obsessive-compulsive disorder (OCD) and major depression. Dr. Shields is also experienced in minimally invasive spinal surgery, epilepsy, treatment of tumors in the brain and the spinal cord, and general neurosurgery.
Parking
The Center for Neurosurgery at The GW Medical Faculty Associates is located at 22nd & I Streets, NW. Parking is accessed from I Street just east of the building entrance.

Metro
The Center for Neurosurgery at The GW Medical Faculty Associates is located one block from the Foggy Bottom Metro stop (Orange & Blue lines).