

FAIRFIELD HEALTHCARE PROFILES

Leading the Field in NEUROSURGERY

Cutting-edge clinical research and technology, leading subspecialists, and a holistic approach to treating patients are at the heart of the **Yale Department of Neurosurgery**, among the best in the nation.

Part of Yale New Haven Health and Yale School of Medicine, the Yale Department of Neurosurgery is a national and international leader in research, teaching, and patient care relating to neurological disorders of the brain and spine, as well as the blood vessels supplying them.

The department's team of subspecialized surgeons treats virtually all types of neurological disorders. These include primary and metastatic brain tumors; spine, spinal cord, and pituitary tumors; spinal disorders; peripheral nerve syndromes; neurovascular disease like aneurysms and stroke; pediatric and congenital disorders; movement disorders; pain disorders and spasticity; cerebrospinal fluid disorders; and epilepsy.

"We are not only subspecialized, meaning our surgeons all have many years of additional training on a specific type of neurosurgery, but we are also at the forefront of the technologies and innovative treatments in our field," says Murat Gunel, M.D., FACS, FAHA, FAANS, department chair and chief of the Department of Neurosurgery at Yale New Haven Health.

Composed of a multidisciplinary team of surgeons, clinicians, researchers, and support staff, the department oversees laboratory and clinical research that has prompted breakthroughs in the treatment of brain tumors, aneurysms and vascular malformations, spinal cord injuries, and other neurological conditions. Its



approaches range from state-of-the-art fundamental molecular and cellular biology of the brain to gene discovery in neurological diseases and innovative translational research. "Our active research allows our patients to benefit from the latest technology, knowledge regarding their condition, and access to clinical trial treatments," Dr. Gunel adds.

Home of Many "Firsts"

In the last few years alone, the department was the first in Connecticut to perform spine surgery *in utero*, which allowed doctors to correct a spinal

canal deformity before birth, the first statewide to perform TCAR, a minimally invasive neurovascular procedure, and the first in the nation to offer intraoperative MRI and X-ray angiography with its 3-Tesla MRI/hybrid neuro suite.

Providing surgeons with high-quality images throughout brain tumor removal, MRI enables the safest resection during complex procedures to ensure neurological functions are preserved. This technology allows surgeons to treat complex conditions, especially infiltrating primary brain tumors. "For most brain tumors, the amount

of tumor removed is fundamentally important, because it directly correlates with survival and outcome," says Jennifer Moliterno, M.D., FAANS, clinical director of Yale's multidisciplinary Brain Tumor Center. "Maintaining and improving neurological function is our goal." Subsequently, the department sees the highest volume of tumor patients in Connecticut through the prominent Yale Brain Tumor Surgery Program and the Neurosurgical Oncology Program.

Other treatments include noninvasive alternatives to brain surgery, such as Gamma Knife[®] surgery, also known as focused radiation therapy. The Yale Gamma Knife Center brings together experts with more than 30 years of combined experience in this proven treatment for certain types of metastatic tumors or blood vessel abnormalities such as AVMs, and in facial pain disorders.

In addition to the department's immense resources, the surgical team's training and expertise in microsurgical techniques and neuroanatomy enable them to carry out frequent, skilled surgeries. "It's

like anything else in life—the more you do something, the better you become," says Dr. Moliterno. "Routinely performing high-volume, complex brain tumor surgeries affords me the technical experience, capabilities, and ease to perform brain tumor surgeries efficiently, safely, and effectively, which translates to improved patient outcomes."

The department is also a leader in Deep Brain Stimulation for movement disorders including Parkinson's disease and essential tremor. Last year, Eyiymisi Damisah, M.D., chief of epilepsy and assistant professor of neurosurgery, extended the use of a Deep Brain Stimulation device in an epilepsy patient for the first time in the nation. Under Dr. Damisah's leadership, the epilepsy surgery and neuromodulation program continues to expand cutting-edge treatments.

Minimally Invasive Surgeries Improve Patient Outcomes

An idiom amongst surgeons is "time is brain." For many emergent conditions such as stroke



and aneurysm, early detection is critical. If caught early on, minimally invasive techniques can be used to remove hemorrhages and arterial clots in the brain much more quickly than with traditional surgery. Entering the blood vessels through groin or wrist incisions, surgeons can improve patient outcomes and decrease recovery time.

The department's surgeons take a comprehensive approach to treatment, working with specialists in other departments of the school, including neurologists and radiologists. "We take a personalized approach to each case," says Charles Matouk, M.D., chief

of neurovascular surgery and assistant professor of neurosurgery. "Working closely with other top experts at Yale in a variety of disciplines, we create a treatment plan tailored to each patient."

Similarly, the department's pituitary tumor program and spine surgery program all utilize minimally invasive techniques. Bulent Omay, M.D., the department's chief of the Pituitary Program, works with colleagues across departments to remove pituitary tumors through the nose without an incision.

Treating the "Whole" Patient

As with neurovascular conditions, those related to the spine and neck require taking a holistic, multifaceted approach. "It's important to understand the dynamics of the entire system," says Juan Bartolomei, M.D., assistant professor of clinical neurosurgery with a specialty in spine surgery. "If a patient complains of lower back pain, for example, it might be caused by deformities in the upper back that are adding stress and causing lower back pain."

The multidisciplinary Spine Center incorporates expertise from neurosurgery, orthopedics, pain management, physical therapy, and radiology to deliver comprehensive evaluation and management for a range of spinal disorders, including degenerative back and neck conditions, herniated discs, scoliosis, and

spinal tumors.

In 2021, the department recruited world-renowned spinal oncologist Ehud Mendel, M.D., who will build Yale New Haven Hospital's first spinal oncology program. "Many cancers eventually impact the spine, so it's important to have a program dedicated to managing these cases," says Dr. Mendel.

Since the COVID-19 pandemic began, telemedicine appointments have positively impacted the convenience and efficiency of healthcare. "The majority of patients with back pain are not an emergency, so telehealth has improved the dynamic," he says. "It reduces the wait time and the number of office visits patients have to make, which makes all the difference for those in pain."

Looking Ahead

A new institution on Yale's campus will further advance neuroscientific and neurosurgical research. The Wu Tsai Institute will facilitate interdisciplinary collaboration between Yale specialists and researchers. With its offices, labs, and classrooms, the building will house the Department of Neuroscience and the Department of Psychology, along with constituents from other departments.

"The Institute will bring innovative technology and research to better understand cognition and behavior," Dr. Damisah says. "Its potential in neurological treatment advancements is enormous."



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