

MOUNT SINAI *presents*

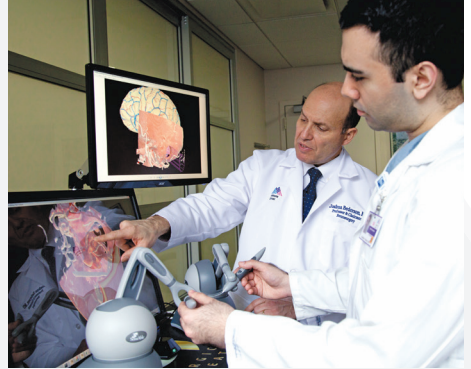
# Virtual-Reality Brain Surgery Simulator



**Mount  
Sinai**

## Excellence in Neurosurgical Care

Under the leadership of Joshua B. Bederson, MD, FACS, Professor and System Chair of Neurosurgery at Mount Sinai Health System, physicians in the Department of Neurosurgery have become internationally renowned for skull-base and cerebrovascular surgery, pituitary disorders, acoustic tumors, spinal reconstruction, epilepsy, radiosurgery, stereotactic and primary brain tumor surgery, and neuroendoscopy, among other specialty



areas. These accomplishments build upon a century of excellence: The Department of Neurosurgery at The Mount Sinai Hospital was established in 1914, and today it is ranked among the nation's top 25 programs, according to the 2013-2014 "Best Hospitals" issue of *U.S. News & World Report*. Our physicians are consistently listed in *New York Magazine's* "Best Doctors" issue.

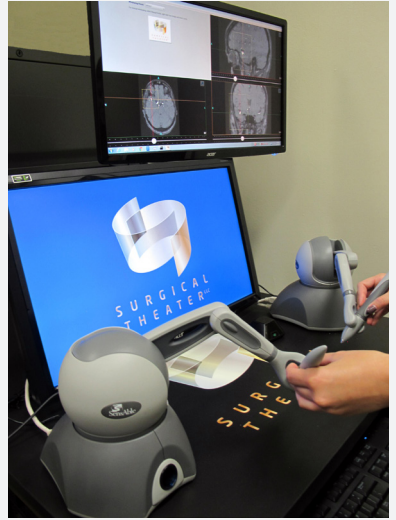
## Advancing Research

Mount Sinai researchers work closely with our clinicians to advance new therapies for improved patient outcomes, for brain, endovascular, and spine conditions. Currently, investigators are exploring deep brain stimulation as a therapy for movement disorders and primary dystonia, a painful neurological condition that causes muscles to contract, twist or shake; assessing the safety and effectiveness of coil and stent systems in intracranial aneurysm treatment; examining the impact of minimally invasive surgery of spine metastases on quality of life, pain, morbidity and mortality; and evaluating the effect of mindfulness meditation on post-operative pain in spine surgery patients. Our spine specialists also are participating in a multicenter clinical trial that aims to determine the best surgical approach for patients who have spinal cord problems caused by compression from degenerative changes in the neck's spinal column.



## Driving Improvements in Clinical Care

In 2013, Mount Sinai began using virtual-reality neurosurgical simulators, including the NeuroTouch Cranial Simulator created by the Canadian Research Council (CRC) and the Surgical Rehearsal Platform (SRP) by Surgical Theater, LLC,\* in an effort to improve outcomes and reduce complications in patients undergoing brain surgery. These are highly innovative platforms, equipped with 3D software and handheld surgical controls, to allow practitioners to plan and rehearse various procedures, such as aneurysm clippings and tumor resection, prior to actual surgery. The programs provide visual, touch, and sound feedback to the practitioner, and a computer-generated “score” that evaluates the practitioner’s success in key surgical measures: the amount of tumor “removed” and the extent of “bleeding,” for example. Surgeons can also, for the first time, input patient-specific data and brain images to develop a 3D rendering of the patient’s brain. At Mount Sinai, the programs are helping to train neurosurgery residents and advance the skill-sets of the experienced surgeon.



*\*Dr. Bederson owns equity in Surgical Theater, LLC, creator of the Surgical Rehearsal Platform (SRP), and the Surgical Navigation Advanced Platform (SNAP), a 3D navigation tool used with Surgical Theater.*



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