Neurosurgery

Advance Neuroscience Program

Each child's unique needs.

With the help of such state-of-the-art equipment as the revolutionary intraoperative MRI (iMRI), our neurosurgeons are able to determine effectiveness of surgical procedures for cranial and spinal nerve disorders and tailor the treatment to patients and their families in a way they come to trust.

What is laser ablation?

Laser ablation brain surgery is a minimally invasive form of neurosurgery that can remove abnormal tissue with little to no risk to surrounding brain tissue. Most patients go home within 24 hours and are discharged from the hospital in two days of their surgery. Recovery time can also be shortened so that ultimately the kids we treat can get back to business of being kids.

What happens during the laser ablation procedure?

- The laser applicator is removed and a stitch is placed to close the incision.
- The surgeon guides the laser into position using imaging and then thermally destroys the abnormal tissue.
- The computer provides feedback to the surgeon as the laser travels through the brain.
- The laser stops, the surgeon inserts a diagnostic tool into the incision, and the computer provides feedback to ensure no undesirable events have taken place and the target has been reached.
- As the surgeon inserts the interventional device through the center lumen of the trajectory frame, real-time images provide constant feedback to the computer. The computer carefully guides the surgeon through the targeted area.
- Once the iMRI is validated, the procedure can proceed.
- There is no need to remove the iMRI to get the images you need.
- Specialized software is used to orient the iMRI and help the surgeon with the procedure.
- The technology also lets the surgeon take images of the surgical site in the brain before completing the surgery to see easily.
- Neuropsychologists, child life specialists, skilled nurses, patient liaison, and more ensure optimal surgical positioning, access and techniques.
- Cook Children's is the second pediatric hospital in the U.S. and only the fourth hospital worldwide to build an iMRI suite.

Deep brain stimulation surgery involves two parts: implanting electrodes into the brain and a pacemaker under the skin. The pacemaker delivers continuous low-voltage electrical impulses to the targeted part of the brain. These impulses block the abnormal firing of nerves, reducing tremor and dystonia. The goal of DBS is to reduce muscle tone, improve function and prevent the progression of movement disorders such as essential tremor.

Imagine putting your arms out and your leg pops up, even though you didn't intend it to. Or trying to make your left arm raise your right leg, but it doesn't happen.

DBS surgery can reduce and, in many cases, restore movement, helping our patients to overcome lifelong obstacles. Now, we are the first pediatric hospital in the nation to offer DBS on sleeping patients.

Beyond surgical procedures, the diagnostic portion of the suite has been helpful in ongoing epilepsy patient care and research.

Cook Children's has successfully completed hundreds of surgeries using the iMRI. This technology has drastically reduced risk of a reoperation. The technology also lets the surgeon take images of the surgical site in the brain before completing the surgery to see easily.

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Leading the way in advanced treatments includes deep brain stimulation (DBS).

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High-Resolution Intraoperative MRI

Cook Children's is the first independent pediatric hospital in the United States, and the only hospital in the state of Texas, to build a high-resolution iMRI suite specifically tailored for pediatric patients. The Extraordinary Advanced Neurological Imaging Research (EANIR) suite is available to our patients at no extra cost, allowing us to better serve children with complex conditions.

The iMRI suite is part of the hospital's Advanced Neuroscience Program. The technology is revolutionary and allows our team to clearly differentiate the tissue targeted for removal whether resecting for tumor or epilepsy. Using the iMRI allows us to clearly differentiate the tissue targeted for removal whether resecting for tumor or epilepsy.

Teamwork is everything in the care of children with these complex neurological disorders and Cook Children's has an environment where every member of the multidisciplinary team respects their contributions. There is a collective focus on the child and everything is centered on the needs of the child. The team consists of the child, the parent and the caregivers. We approach every child as a whole, not just a disease or disorder.

Advanced neurological imaging is made possible by Cook Children's and the Extraordinary Advanced Neurological Imaging Research (EANIR) team.