

Neurosurgery

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The Division of Neurosurgery is a regional, national, and international destination for newborns and children with disease, trauma, or malformation of the brain, spine, or nervous system.

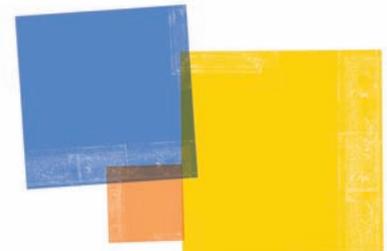
Hundreds of procedures are performed every year, with excellent outcomes.

Children's National neurosurgeons define the standard of care by integrating into all procedures advanced neuro-imaging and neurophysiological monitoring. Our neurosurgeons routinely use minimally invasive strategies when appropriate.

All aspects of neurosurgical consultation and treatment are offered with appointments available as rapidly as possible.

Diagnostic services and treatment are offered for all conditions requiring pediatric neurosurgery, including:

- Brachial plexus reconstruction
- Brain and spinal cord trauma
- Brain and spinal cord tumors
- Cerebrovascular disorders
- Chiari malformations
- Craniofacial disorders
- Epilepsy - surgical therapeutics
- Hydrocephalus
- Movement disorders – including spasticity
- Neurofibromatosis
- Peripheral nerve reconstruction
- Skull base disorders including craniocervical disorders
- Spinal dysraphism – including spina bifida/tethered cord
- Tumors – brain and spinal cord



Neurological Problem	Signs and Symptoms	Children's Innovative Approaches
Brain Tumors	<ul style="list-style-type: none"> ■ Increased intracranial pressure, headache, visual changes, nausea/vomiting ("persistent flu") ■ Macrocephaly, splayed sutures, full fontanelle ■ Delay or loss of developmental milestones ■ Gait / coordination difficulties ■ Changes in personality/alertness /school performance ■ Focal deficits: weakness, numbness ■ Worsening or change in seizures 	<ul style="list-style-type: none"> ■ Seamless, multidisciplinary inpatient and outpatient care ■ Inpatient rehabilitation when necessary ■ Minimally invasive intervention ■ Intraoperative MRI, image guidance, endoscopic and skull base approaches ■ Gamma Knife radiosurgery ■ Non-invasive evaluation with functional MRI, PET scan, MEG ■ Member of the Pediatric Brain Tumor Consortium ■ Convection chemotherapy, antiangiogenesis, molecular genetically based therapy, biologic therapy - cellular signaling agents, anti-growth factor agents
Spinal Cord Tumors	<ul style="list-style-type: none"> ■ Back pain ■ Spasticity ■ Changes in arm / leg function and control ■ Bowel and bladder changes ■ Delay or loss of motor skill development ■ Weakness, numbness, gait disturbance, swallowing difficulties 	<ul style="list-style-type: none"> ■ Intraoperative motor and somatosensory evoked potentials ■ Laser and radiofrequency tissue ablation ■ Osteoplastic laminotomy to restore bony integrity ■ Focused, minimally invasive surgery using intraoperative MRI ■ Inpatient rehabilitation when necessary ■ Expert neuroradiology
Craniofacial Disorders Craniosynostosis	<ul style="list-style-type: none"> ■ Sutural ridging ■ Skull asymmetry ■ Associated genetic abnormalities ■ Increased intracranial pressure ■ Head growth deceleration 	<ul style="list-style-type: none"> ■ Multidisciplinary team: Neurosurgery, Plastic Surgery, Genetics ■ Advanced surgical techniques ■ Absorbable hardware, external distractors, bone morphogenetic protein ■ Intracranial pressure monitoring

Neurological Problem	Signs and Symptoms	Children's Innovative Approaches
Epilepsy	<ul style="list-style-type: none"> ■ Intractable seizures (not controlled by medicines) ■ Lesional epilepsy ■ Tumors, cortical dysplasia, mesial temporal sclerosis, TS ■ Non-lesional epilepsy 	<ul style="list-style-type: none"> ■ Multidisciplinary team: Neurosurgery, Neurology, Psychiatry ■ Invasive grid monitoring for cortical mapping and seizure localization, intraoperative MRI ■ Intraoperative MRI ■ Non-invasive functional neuroradiology (functional MRI, PET, MEG) ■ Comprehensive surgical management <ul style="list-style-type: none"> – Lobectomy and topectomy – Callosotomy and Hemispherectomy ■ Innovative drug trials / ketogenic diet ■ Epilepsy summer camp / extensive support infrastructure
Functional	<ul style="list-style-type: none"> ■ Spasticity: Spastic diplegia and quadraparesis ■ Dystonia and other movement disorders ■ Brachial plexopathies 	<ul style="list-style-type: none"> ■ Deep brain stimulation ■ Intrathecal baclofen pump and selective dorsal rhizotomy ■ Spasticity / Brachial Plexus multidisciplinary clinics ■ Intraoperative spinal cord and nerve monitoring ■ Concomitant soft tissue release, rhizotomy, botox/phenol injections ■ Inpatient rehabilitation when necessary
Hydrocephalus	<ul style="list-style-type: none"> ■ Head growth acceleration ■ Full or tense anterior fontanelle ■ Splayed cranial sutures ■ Headache, vomiting, sunsetting eyes ■ Delayed development 	<ul style="list-style-type: none"> ■ Endoscopic shunt insertion ■ Endoscopic third ventriculostomy ■ Image-guided endoscopic cyst fenestration
Chiari Malformations	<ul style="list-style-type: none"> ■ Occipital headaches ■ Exertional neck pain ■ Swallowing difficulty, apnea, excessive drooling ■ Gait disturbance, sensory, or motor deficits ■ Scoliosis (associated with syringohydromyelia) 	<ul style="list-style-type: none"> ■ Intraoperative spinal cord and cranial nerve monitoring ■ Realtime intraoperative imaging with ultrasound and MRI

Neurological Problem	Signs and Symptoms	Children's Innovative Approaches
Spina Bifida Tethered Cord	<ul style="list-style-type: none"> ■ Midline cutaneous markers: dermal sinus, "fawn's tail", hemangioma ■ Back pain ■ Leg or foot pain, discomfort, asymmetry, fatigue ■ Weakness, numbness, bowel/bladder changes ■ Scoliosis 	<ul style="list-style-type: none"> ■ Multidisciplinary care: Neurosurgery, Orthopaedics, Urology ■ Intraoperative spinal cord and nerve monitoring ■ Intraoperative ultrasound and MR imaging ■ Laser and radiofrequency tissue ablation
Cerebrovascular	<ul style="list-style-type: none"> ■ Arteriovenous malformations, cavernous malformations, aneurysms ■ Intracerebral hematoma ■ Subarachnoid Hemorrhage ■ Acute neurologic deficit ■ Sudden new onset headache ■ Stroke 	<ul style="list-style-type: none"> ■ Image guidance for intraoperative localization, intraoperative MRI ■ Interventional neuroradiology ■ Embolization for preoperative reduction / cure ■ Gamma Knife radiosurgery for inoperable lesions

