Comprehensive Neurosurgical Services

With a team of leading pediatric neurosurgeons and neurosurgery nurse practitioners, our program offers world-class expertise. We're part of Nationwide Children's Hospital, which means we're home to a level-I pediatric trauma center, signature services like our nationally ranked oncology division, and a comprehensive inpatient rehabilitation program. In addition to offering a leading medical team, Nationwide Children's holds Magnet designation-the ultimate benchmark in nursing excellence. We also provide access to state-of-the-art technology and the latest minimally invasive techniques, and conduct groundbreaking clinical research through The Research Institute at Nationwide Children's and our academic partner, The Ohio State University.



Lance S. Governale, MD

Dr. Governale obtained his medical degree from Harvard Medical School and completed his neurosurgical residency training at Brigham and Women's Hospital and pediatric neurosurgical fellowship training at Children's Hospital Boston. His clinical interests span all facets of pediatric neurosurgery with special expertise in minimally invasive neurosurgery (including endoscopic treatment of hydrocephalus, craniosynostosis, pituitary disease, and skull base disease), brain / spinal cord tumors, arachnoid cysts, and cavernous malformations.



Ronald T. Grondin, MD, MSc, FRCSC

Dr. Grondin completed his neurosurgery residency at the University of Calgary, and completed a pediatric neurosurgery fellowship at Children's Hospital Boston and Harvard Medical School. His clinical interests span all facets of pediatric neurosurgery with special expertise in the surgical treatment of epilepsy, neuroendoscopic management of hydrocephalus and craniosynostosis, and the treatment of complex spinal injuries.



Eric M. Jackson, MD

Dr. Jackson completed his neurosurgery residency at the University of Pennsylvania, during which he spent time training at Derriford Hospital in Plymouth, England, and the Children's Hospital of Philadelphia. He then completed a pediatric neurosurgery fellowship at Children's Hospital Boston and Harvard Medical School. His clinical interests span all facets of pediatric neurosurgery with special expertise in the surgical treatment of brain tumors, pediatric neurovascular disease and the treatment of complex spinal injuries.



Scheduling and Referrals

Online: NationwideChildrens.org/Neurosciences Fax: (614) 722-4000 Phone: (614) 722-6200 or 1-877-722-6220 Call for urgent cases. We will see urgent patients within 24 hours.



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Headaches in Children and Adolescents



Pediatric Neurosurgery

NATIONWIDE CHILDREN'S When your child needs a hospital, everything matters.^{ss}

Headaches in Children and Adolescents

Types of Headaches

Headaches are very common in the pediatric population. Over a third of children suffer from recurrent headaches, greater than once a month. Most primary episodic headaches (without definable cause) are tension type. Migraines are less common, with a prevalence of five to seven percent. Migraines are usually more frequently occurring in families with a genetic component, and are associated with nausea and/or vomiting, photophobia, phonophobia, and are aggravated by physical activity. The pain is usually more severe than tension headaches and characterized as throbbing or pounding and made worse by physical activity. Tension headaches do not occur with nausea or vomiting and are usually less severe than migraine. Oftentimes, children will manifest with both types of headaches.

Evaluation

In evaluating children or adolescents with headaches, a careful history and physical/neurologic examinations are important. Most secondary headaches associated with nervous system abnormalities are associated with neurologic examination abnormalities and pain is usually difficult to characterize and oftentimes occipital in location. (Tension and migraine headache pain is usually in the frontal or temporal part of the head or more diffuse.) Children in whom secondary headaches are suspected should be referred for imaging study (such as MRI) and neurological evaluation.

Management

Managing migraine or tension headaches first concentrates on lifestyle/physiologic issues which worsen these headaches (dehydration, lack of sleep or sleep disorders, emotional stressors, hormonal changes in adolescent girls). Psychological issues are also common in children and adolescents and are more prevalent with more frequent and disabling headaches. Depression and anxiety disorders are most common. Treatment of underlying sleep disorders and psychological issues is very important in order to achieve optimal management of the headache disorder. Often psychological modalities such as cognitive behavioral therapy and biofeedback/ relaxation therapy can be of enormous benefit in managing recurrent headaches.

Over the counter analgesics, such as ibuprofen, acetaminophen or naproxen sodium, can be quite helpful. Newer therapies such as the triptans which are approved in adult migraine can also be helpful but are not approved by the FDA for the pediatric population. Sumatriptan nasal spray (Imitrex) and rizatriptan (Maxalt[®]) have been studied the most in the pediatric migraine population.

About a third of children with recurrent headaches will require a preventive medication to ameliorate headache frequency and severity. With increasing disability from the headaches, such as missing school, work and social activities - and frequency of three or more times per month - it may be reasonable to consider some of the following for prophylactic therapy. Again, none are approved by the FDA for use in pediatrics:

- Topiramate
- Divalproex
- Amitriptyline
- Cyproheptadine
- Propranolol
- Levetiracetam

Topiramate and amitriptyline are probably most commonly used in migraine prophylaxis in children and adolescents.

Headaches: When to Consult with a Pediatric Neurosurgeon

Watch for Secondary Symptoms and Behaviors

Consultation with a pediatric neurosurgeon and subsequent MRI scan are recommended when specific indications arise with headache associated with raised intracranial pressure.

Associated Symptoms

- Bradycardia
- Clumsiness of hands or gait
- Diplopia
- Hypertension
- Lethargy
- Neurologic symptoms or signs
- Papilledema
- Personality change

Headache Behaviors

- Distinct onset less than 6 months or distinct change in pattern of preexisting headache
- Headache worsened by lying down, coughing, laughing, or Valsalva
- Nocturnal awakening with headache or headache at awakening in morning
- Occurs in the morning, but not later in the day
- Posterior location of the headache
- Progressive worsening over time
- When headache is new and it interferes with food intake

Conditions that May be Present

Headache resulting from raised intracranial pressure and associated with the signs and symptoms above may indicate the following conditions. A pediatric neurosurgeon can conduct a complete assessment, establish a diagnosis and schedule surgical intervention when appropriate.

- Brain abscess
- Brain tumor
- Cavernous malformation
- Chiari malformation
- Hematoma
 - Epidural hematoma
 - Intracerebral hematoma from AVM rupture
 - Subarachnoid hemorrhage
 - Subdural hematoma
- Hydrocephalus
- Pseudotumor cerebri

• Vomiting associated with headache, often in the morning, often with temporary relief afterwards