

COMMON DIAGNOSTIC STUDIES



Computed Tomography (CT) Scan

This is a test that uses x-rays to make pictures of structures inside the body, such as the brain. CT scans show general structure abnormalities, aneurysms, brain tumors, bleeding in the brain, nerve injury, infections of the brain, and strokes. A CT scan is much faster than an MRI, typically taking 20 minutes. Sedation can be necessary and radiation exposure is present with this technique.

Magnetic Resonance Imaging (MRI)

MRI uses magnetic fields (rather than radiation) to create detailed pictures of the structures inside the body, such as the brain. MRIs show better details of brain structure than CT scans. MRIs of the brain can look for general brain structure abnormalities, brain tumors, aneurysms, bleeding in the brain, nerve injury, infections or inflammation of the brain, and strokes. Sedation is often necessary, as the child must hold completely still for about one hour.

Electroencephalogram (EEG)

An EEG measures and records the electrical activity of the brain. Special sensors are attached to the patient's head with wires that are hooked to a computer. The computer is able to record your brain's electrical activity as wavy lines. These wavy lines are interpreted by a neurologist or epileptologist to identify seizures and diagnose epilepsy.

Electromyogram (EMG) and Nerve Conduction Study (NCS)

EMG measures the electrical activity of the muscles in the body at rest and during contraction. NCS measure how well and how fast the nerves send electrical signals to one another. These tests are often helpful to diagnose diseases in patients with numbness, weakness, paralysis, and muscle twitching.

Sleep Study

This is a group of tests that record what your body and brain do during sleep. This testing is done to find out what may be causing a patient to have sleep problems. It can help diagnose problems such as sleep apnea, narcolepsy, insomnia, abnormal body movements during sleep or problems with sleep stages.

Muscle Biopsy

This is a test that removes a small piece of muscle tissue using local numbing medication and sometimes sedation. The muscle sample is then studied to identify possible connective tissue disorders, infections that affect the muscles, metabolic defects of the muscle, and muscular disorders such as Muscular Dystrophy.

Lumbar Puncture (LP) with or without Opening Pressure (OP)

An LP (or "spinal tap") is a procedure that looks at the cerebrospinal fluid (CSF) by carefully inserting a needle into the spinal canal low in the back. Cerebrospinal fluid is the fluid that surrounds the brain and the spinal cord. An LP is done to look for infections, cancer, bleeding and is often the best fluid sample to test for certain diseases. During an LP the opening pressure (OP) may be measured. The OP measures the pressure of the spinal fluid. If the pressure is too high, there is too much fluid around the brain, and if it is too low there is too little. Each of these conditions can cause specific neurologic symptoms.

Single Photon Emission Computerized Tomography (SPECT)

This is a nuclear imaging test that allows doctors to analyze the function of internal organs, such as the brain. It uses a radioactive substance and a special camera to create 3D pictures that can show which areas of your brain are most active or least active. SPECT scans are particularly helpful for seizure patients who are considering surgery options.



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Functional Magnetic Resonance Imaging (fMRI)

fMRI is a type of MRI that measures brain activity. It works by detecting the changes in blood oxygenation and flow that occur in response to brain activity. fMRI can detect patterns in blood flow and assist in mapping out areas of the brain that are used in certain brain functions. It is a very useful technique prior to some brain surgeries.

Wada (also known as Intracarotid Sodium Amobarbital Procedure)

Wada is named after the physician who first performed this test, Dr. Juhn Wada. A Wada test is performed prior to brain surgery, to help the care team know which side of the patient's brain controls language and memory. During a Wada test, each side of the brain is temporarily put to sleep while testing the patient's language and memory to figure out which side is responsible for language and which is better at controlling memory.

Magnetoencephalography (MEG)

MEG is a noninvasive procedure that uses highly sensitive sensors to detect and record the magnetic fields associated with electrical activity inside the brain. A MEG can precisely locate areas of the brain that are functioning normally versus areas causing seizures. This is highly detailed diagnostic study which can help surgeons create a "roadmap" of areas to avoid during surgery to maintain normal language, and motor skills.

Neuropsychological testing

This is a formal assessment of mood, personality and cognitive abilities (i.e., thinking, understanding, learning, attention and memory). It can aid in diagnosis, guide treatment options, and provide information on how injury or disease has affected brain function.

Audiology testing

An audiologist measures the child's ability to hear sounds. Evaluation of hearing is important in children with learning problems and developmental and speech delays.

Ophthalmology Evaluation

A series of tests that assess vision and the overall health of your eyes. During the evaluation the ophthalmologist will examine vision and eye muscle function. They will also put eye drops in the eye to dilate the pupils. Using a special device while the pupils are dilated they will examine the structures in the back of the eye. Ophthalmology evaluations are particularly helpful for patients with chronic migraine headaches, or visual problems.

