Pediatric Patient Education™
Expert advice from the American Academy of Pediatrics

Imaging Tests: A Look Inside Your Child's Body

Imaging tests are used to "look" inside the body. They can help diagnose injuries and illnesses from broken bones to cancer. Some tests can find problems before symptoms appear. Here is information from the American Academy of Pediatrics (AAP) about imaging tests .

Why does my child need an imaging test?

Sometimes imaging tests are the only tests that can help diagnose certain illnesses. Your child's doctor can then find out the best treatment options, avoid other tests or surgery, and improve your child's health.

Who gives imaging tests?

Radiologists are doctors trained to give imaging tests. They also study the results and make diagnoses. Some radiologists have special training and a lot of experience working with children. If your child needs an imaging test, your child's doctor will refer you to a radiologist. The radiologist will share the results with your child's doctor. In many cases, a technician (not a doctor) gives the test. The technician usually cannot give you any information about your child's test. The radiologist needs to see the test results before any information can be shared.

How safe are imaging tests?

The amount of radiation used in imaging tests is very low. In fact, no direct harm has been shown from the levels of radiation used in the imaging tests mentioned in this publication.

We are all exposed to small amounts of radiation daily from soil, rocks, air, water, and cosmic radiation. Most people are exposed to more radiation from the environment than from many of these tests.

Special steps are taken to make sure your child is exposed to the smallest amount of radiation possible during imaging. The AAP belongs to the Alliance for Radiation Safety in Pediatric Imaging, which follows the following medical radiation safety guidelines:

- Imaging is to be used only if there is a definite medical benefit.
- Use the lowest amount of radiation possible for the test based on the size of the child.
- Imaging only includes the parts of the body that need to be evaluated.
- Use studies that don't involve radiation, like ultrasonography (also known as *ultrasound*) and magnetic resonance imaging (MRI), when possible.

If you have questions about imaging and your child's safety, talk with your child's doctor or radiologist.

What types of imaging tests are there?

Types of imaging tests include

X-rays. During an x-ray, electromagnetic waves (a form of light) pass through the body and create a 2-dimensional image on film. This image is called an *x-ray* or *radiograph*. X-rays are usually used to see bones, muscles or organs (like the heart or liver), and air inside the body. Metal objects also can be seen.

Computed tomography (CT) scan. A CT scan is a special type of x-ray that uses computers to create 3-dimensional detailed images of the body. A rotating x-ray tube that surrounds the patient takes pictures of organs and tissues from many angles. Hundreds of images can be created in a short time.

A CT scan is very useful because it can create more detailed pictures than an ordinary x-ray. It is often used to find tumors, infections, or evidence of injury in different parts of the body.

Magnetic resonance imaging (MR imaging or MRI). An MRI uses a large and powerful magnet, radio waves, and a computer to create very detailed images of the inside of the body. An MRI is very helpful in studying the brain and spinal cord, the soft tissues of the body, and the joints. An MRI is often used to detect birth defects, inflammation, infection, tumors, and injury.

Nuclear imaging scan. A nuclear imaging scan (sometimes called *radionuclide scanning*) shows the structure of a body part as well as how it works. Before the scan, a radioactive substance called a *tracer* is injected or given by mouth. A machine called a *gamma camera* used outside the body then detects the rays of energy given off by the tracer, and an image is created and shown on a computer screen. Organs including the kidneys, liver, heart, lungs, and brain are often studied using this test. Bone scans may show trauma, infection, or a tumor before any problems are seen with x-rays.

Fluoroscopy. Fluoroscopy is a type of x-ray that creates a real-time "x-ray movie" of the inside of the body. An x-ray beam placed on a specific area of the body creates images that are shown on a TV-like monitor. Fluoroscopy is mainly used to diagnose illness of the stomach and intestines, lungs and airway, or bladder. Fluoroscopy is also used to help guide instruments or devices into the body, such as a catheter for feeding tubes.

Ultrasonography (ultrasound). Ultrasonography uses sound waves to create images of the body. The sound waves enter the body and the returning echoes are captured as images. These images are called *sonograms*, *echocardiograms* (*heart echo*), or *ultrasound scans*.

Ultrasonographic tests can help diagnose illnesses of the kidneys, bladder, and uterus; the heart (called an *echocardiography*); and the liver, spleen, gallbladder, and pancreas. Ultrasonography is also used to look at the brains of young newborns and infants, especially preterm babies. It is best used for looking at parts of the body that are either solid (like the liver) or fluid filled (like the gallbladder).

For More Information

American Academy of Pediatrics
www.aap.org and www.HealthyChildren.org

American College of Radiology
www.acr.org

Health Physics Society
http://hps.org

Image Gently
www.imagegently.org

National Cancer Institute
www.cancer.gov

RadiologyInfo.org
www.radiologyinfo.org