Imaging Exams

A medical imaging department has access to a number of methods that use different energy sources to create images of the human body. The doctor who sees your child will decide on the best technology to use according to what he or she wants to see. Here are the imaging techniques used:

- Conventional Radiography
- Computed Tomography (CT)
- Magnetic Resonance Imaging (MRI)
- Ultrasonography (echography)
- Fluoroscopy

How do they work?

Each imaging method works in a different way. X-rays are used in conventional radiography, fluoroscopy and CT, while high-frequency sound waves are used in ultrasonography. MRI technology uses a magnetic field.

Is there a risk for my child?

The radiation doses that children receive during a radiological exam are usually very low. It is important to know that the dose administered is proportional to the volume of the patient, meaning that less radiation is used to X-ray a child than to X-ray an adult. What's more, radiology technologists are professionals who know a great deal about radiation and who limit the radiation dose to the required minimum. As for other forms of energy, such as sound waves and magnetic fields, no risk has yet been found.

What methods do technologists use to reduce radiation doses?

- The equipment in our department is at the cutting edge of technology
- The dose administered is the lowest possible in order to produce quality images (ALARA principle, or "**A**s **L**ow **A**s **R**easonably **A**chievable")
- The body area to be X-rayed is limited to the minimum required
- The more vulnerable parts of the body that do not need to be X-rayed are protected by lead shielding, as X-rays cannot penetrate lead
- The person who stays with the child in the exam room must wear a lead apron

What does your child have to do during the exam?

Your child must **remain still**. This will prevent us from having to repeat the procedure, thereby keeping the amount of radiation to a minimum.

A description of each method used in our Medical Imaging Department:

CONVENTIONAL RADIOGRAPHY

In conventional radiography, X-rays pass through a bodily structure or organ and are captured on a plate on the other side of the patient. This plate is then inserted in a machine that proces produce an X-ray image.

CT

A CT scanner is equipped with X-ray emitters and detectors. The detectors measure the intensity of the rays after they pass through the body, and a computer analyzes this data. The patient lies down on a table, which moves a few millimetres at a time as the X-rays move around the table. This creates images of a different area of the body each time the table moves. CT scans produce cross-sectional “slices” of the body as opposed to X-ray images, which show structures stacked on top of each other.

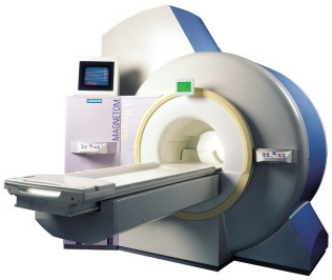
ULTRASONOGRAPHY

This technology does not use radiation. Instead, it uses high-frequency sound waves and a computer to construct images of the different organs of the human body.

During the exam, the technologist moves a probe over your child's skin. As the sound waves emitted from the probe travel through the body, they are reflected back from the layers between different tissues that have different densities. The sound wave that is reflected back is called an echo, hence the term “echography.” The probe then transmits this “echo” to a computer, which analyzes the data to produce an image.

MAGNETIC RESONANCE IMAGING (MRI)

MRI technology does not use radiation. A powerful magnetic field, radio waves and a computer are used instead to produce very precise images. Your child lies on a table inside a machine that has a magnetic field. The cells of the body react to the magnetic field and the radio waves, which produce a signal that is analyzed by a computer to produce images.



FLUOROSCOPY

This technology also uses X-rays. The difference between fluoroscopy and conventional radiography is that fluoroscopy provides a moving image of the X-rayed region. You could say that fluoroscopy is to X-ray technology what cinema is to photography. We sometimes need to “film” the movement of a dye (or contrast agent) to get a good view of certain organs.

A radiation beam passes through your child’s body and strikes a fluorescent screen. This screen is hooked up to a monitor and gives a moving image of the structure being examined.