

What are alternatives to CT scans?

CT scans may be the best way to get the imaging information needed to make decisions about your care. In some cases, your doctor may decide it is safer to simply observe you before committing to a CT scan.

Waiting may be difficult for you and your family, but may result in the same outcome without exposing yourself to unnecessary radiation. Ultrasound and MRI are imaging techniques that do not use radiation. Sometimes these imaging methods can provide similar diagnostic information and can be useful alternatives. You should ask your doctor and radiologist whether alternative exams are appropriate for your situation.

If I am concerned about radiation exposure, whom should I speak with?

If you have any concerns about your radiation exposure, you should first talk to the doctor who is requesting your exam.

At Dartmouth-Hitchcock, we make sure to carefully review every CT scan request to ensure that the exam is medically needed, and that radiation-free (MRI, ultrasound) or other low-dose options cannot be used instead. We test all higher-dose radiographic equipment on a monthly basis—this is well above and beyond the annual testing required by the state. We adhere to the more comprehensive and stringent—but voluntary—guidelines established by the American College of Radiology and the Joint Commission. Our staff Diagnostic Physicist makes sure that the equipment is performing as it should and assists in the equipment installations and the control of radiation hazards. Our Radiation Safety Officer is responsible for the safety and protection of those using radiologic materials and keeps detailed records to ensure safety and compliance with local, state and federal laws.

More information

The Alliance for Radiation Safety
in Pediatric Imaging
www.imagegently.org

The Alliance for Radiation Safety
in Adult Medical Imaging
www.imagewisely.org

National Cancer Institute
[www.cancer.gov/cancertopics/
causes/radiation-risks-pediatric-CT](http://www.cancer.gov/cancertopics/causes/radiation-risks-pediatric-CT)

American College of Radiology
www.acr.org

Health Physics Society
hps.org

Radiological Society of North America
www.rsna.org

Radiology Info for Patients
www.radiologyinfo.org



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CT Scan

Information for Patients



201407-201



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What is a CT scan?



A CT scan uses X-rays generated from an energy source (an X-ray tube) that

is rotated around the body to create a three-dimensional image of the patient. A CT scanner looks like a large donut. You need to remain very still on the scanner table while the table moves you through the “donut hole.” The study is quick and painless. Because of the size of the machine, some children may be afraid of the CT scanner. We encourage parents to stay with their child during the study. If a patient is feeling nervous or anxious, his or her provider will sometimes provide sedation to help the patient stay still while the scan is being performed.

What can I expect before the CT scan?



Before having a CT scan, you may be asked to drink an oral contrast. This drink will help to highlight the bowel and stomach so the doctor can see it better. An IV may also be placed in your arm for an IV contrast injection. The IV contrast allows the doctor to see organs and blood vessels with more detail. You are likely to experience a hot flash, and sometimes a metallic taste, when the contrast is injected. These feelings go away in less than a minute.

Patients with severe kidney problems may not be able to have IV contrast because the contrast gets removed from the body through the kidneys. It is very rare for patients to have allergic reactions from the contrast. Before you are given an IV contrast, we will ask you about unusual allergies or kidney problems. It is important for you to discuss these issues with your doctor prior to the study being performed.

Who performs the CT scan?



A radiologic technologist will perform your CT scan. All radiologic technologists at Dartmouth-Hitchcock are registered with the American Registry of Radiologic Technologists (ARRT). The ARRT provides ongoing testing and certification of radiologic technologists. It administers continuing education and ethics requirements for the required annual registration and maintenance of radiologic technologist credentials.

How much radiation is used in a CT scan?

We all are exposed to small amounts of radiation daily from soil, rocks, building materials, air, water and cosmic radiation. This is called “naturally occurring background radiation.” The following examples compare the amount of radiation used in X-rays and CT scans to the background radiation we are exposed to daily.

Radiation source	Background radiation equivalent
Background	1 day
Chest X-ray (single)	1 day
Head CT scan	up to 8 months
Abdominal CT scan	up to 20 months

*from www.imagegently.org, “What Parents Should Know about CT Scans for Children. Medical Radiation Safety.

How do we minimize radiation risk?



There are ways to ensure that you are exposed to the smallest amount of radiation possible during an imaging study. Dartmouth-Hitchcock supports the

Image Gently and Image Wisely Campaigns, which promote optimal scanning strategies for children and adults. To minimize radiation exposure, we:

- Image only when there is a clear medical benefit
- Use the lowest amount of radiation for adequate imaging based on the size of the patient
- Image only the indicated area
- Avoid multiple scans
- Use alternative diagnostic studies, such as ultrasound or magnetic resonance imaging (MRI), when possible