

# COMPUTED TOMOGRAPHY (CT SCAN)



**Patient:** What is CT scan?

**Doctor:** CT scan is a non-invasive medical imaging procedure that utilizes computer-processed X-rays to produce tomographic images of specific areas of the body.

**Patient:** What is it for?

**Doctor:** It is used for diagnostic and therapeutic purposes in various medical disciplines. It has more recently been used for preventive medicine or screening for disease, for example CT colonography for patients with a high risk of colon cancer, or full-motion heart scans for patients with high risk of heart disease.

**Patient:** What are some preparations before the scan?

**Doctor:** You should wear comfortable, loose-fitting clothing to your exam. You may be given a gown to wear during the procedure. Metal objects, including jewelry, eyeglasses, dentures and hairpins, may affect the CT images and should be left at home or removed prior to your exam. You may also be asked to remove hearing aids and removable dental work. Women will be asked to remove bras containing metal underwire. You may be asked to remove any piercings, if possible. You may be asked not to eat or drink anything for a few hours beforehand, especially if a contrast material will be used in your exam. You should inform your physician of all medications you are taking and if you have any allergies. If you have a known allergy to contrast material, or "dye," your doctor may prescribe medications (usually a steroid) to reduce the risk of an allergic reaction. These medications generally need to be taken 12 hours prior to administration of contrast material.

**Patient:** How does the procedure work?

**Doctor:** In many ways CT scanning works very much like other x-ray examinations. Numerous x-ray beams and a set of electronic x-ray detectors rotate around you, measuring the amount of radiation being absorbed throughout your body. At the same time, the examination table is moving through the scanner, so that the x-ray beam follows a spiral path. A special computer program processes this large volume of data to create two-dimensional cross-sectional images of your body, which are then displayed on a monitor. For children, the CT scanner technique will be adjusted to their size and the area of interest to reduce the radiation dose.

**Patient:** How is the CT scan performed?

**Doctor:** The technologist begins by positioning you on the CT examination table, usually lying flat on your back or less commonly, on your side or on your stomach. Straps and pillows may be used to help you maintain the correct position and to help you remain still during the exam. Depending on the part of the body being scanned, you may be asked to raise your arms over your head. If contrast material is used, it will be swallowed, injected through an intravenous line (IV) or administered by enema, depending on the type of examination. Next, the table will move quickly through the scanner to determine the correct starting position for the scans. Then, the table will move slowly through the machine as the actual CT scanning is performed. Depending on the type of CT scan, the machine may make several passes. You may be asked to hold your breath during the scanning. Any motion, whether breathing or body movements, can lead to artifacts on the images. This loss of image quality can resemble the blurring seen on a photograph taken of a moving object.

**Patient:** What will I experience during and after the procedure?

**Doctor:** CT exams are generally painless, fast and easy. Though the scanning itself causes no pain, there may be some discomfort from having to remain still for several minutes and with placement of an IV. If you have a hard time staying still, are very nervous or anxious or have chronic pain, you may find a CT exam to be stressful. The technologist or nurse, under the direction of a physician, may offer you some medication to help you tolerate the CT scanning procedure. If an intravenous contrast material is used, you will feel a pin prick when the needle is inserted into your vein. You will likely have a warm, flushed sensation during the injection of the contrast materials and a metallic taste in your mouth that lasts for at

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most a minute or two. You may experience a sensation like they have to urinate; however, this is actually a contrast effect and subsides quickly.

**Patient:** Are there adverse effects?

**Doctor:** Yes, There is a small increased risk of cancer with CT scans. The ionizing radiation, in the form of x-rays, used in CT scans is energetic enough to directly or indirectly damage DNA. This and other types of DNA damage are occasionally not corrected properly by cellular repair mechanisms. Such damage to the DNA occasionally leads to cancer. In the United States half of CT scans involve intravenously injected radio contrast agents. The most common reactions from these agents are mild, including nausea, vomiting and an itching rash; however, more severe reactions may occur. Overall reactions occur in 1 to 3% with nonionic contrast and 4 to 12% of people with ionic contrast. Skin rashes may appear in 1 to 3% within a week. The contrast agent may also induce contrast-induced nephropathy

### QUESTIONS:

1. In your own words, can you tell me how the test is performed?
2. Is CT scan a very accurate test? Why? Why not?
3. Why do we need to remove jewelries and other things during the scan?