

Computed Tomography (CT): Questions and Answers

Key Points

- Computed tomography (CT) is a diagnostic procedure that uses special x-ray equipment to obtain cross-sectional pictures of the body (see Question 1).
- In cancer, CT is used to detect a tumor, provide information about the extent of the disease, help plan treatment, and determine whether the cancer is responding to treatment (see Question 2).
- A CT scan uses slightly more radiation than a chest x-ray, but the benefits generally outweigh the risks (see Question 4).
- A total body CT scan, which creates images of nearly the entire body, has not been shown to have any value as a screening tool (see Question 6).

1. What is computed tomography?

Computed tomography (CT) is a diagnostic procedure that uses special x-ray equipment to obtain cross-sectional pictures of the body. The CT computer displays these pictures as detailed images of organs, bones, and other tissues. This procedure is also called CT scanning, computerized tomography, or computerized axial tomography (CAT).

2. How is CT used in cancer?

Computed tomography is used in several ways:

- To detect or confirm the presence of a tumor;
- To provide information about the size and location of the tumor and whether it has spread;
- To guide a biopsy (the removal of cells or tissues for examination under a microscope);
- To help plan radiation therapy or surgery; and
- To determine whether the cancer is responding to treatment.

3. What can a person expect during the CT procedure?

During a CT scan, the person lies very still on a table. The table slowly passes through the center of a large x-ray machine. The person might hear whirring sounds during the procedure. People may be asked to hold their breath at times, to prevent blurring of the pictures.

Often, a contrast agent, or "dye," may be given by mouth, injected into a vein, given by enema, or given in all three ways before the CT scan is done. The contrast dye can highlight specific areas inside the body, resulting in a clearer picture.

Computed tomography scans do not cause any pain. However, lying in one position during the procedure may be slightly uncomfortable. The length of the procedure depends on the size of the area being x-rayed; CT scans take from 15 minutes to 1 hour to complete. For most people, the CT scan is performed on an outpatient basis at a hospital or a doctor's office, without an overnight hospital stay.

4. Are there risks associated with a CT scan?

Some people may be concerned about the amount of radiation they receive during a CT scan. It is true that the radiation exposure from a CT scan can be higher than from a regular x-ray. However,



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not having the procedure can be more risky than having it, especially if cancer is suspected. People considering CT must weigh the risks and benefits.

In very rare cases, contrast agents can cause allergic reactions. Some people experience mild itching or hives (small bumps on the skin). Symptoms of a more serious allergic reaction include shortness of breath and swelling of the throat or other parts of the body. People should tell the technologist immediately if they experience any of these symptoms, so they can be treated promptly.

5. What is spiral CT?

A spiral (or helical) CT scan is a new kind of CT. During a spiral CT, the x-ray machine rotates continuously around the body, following a spiral path to make cross-sectional pictures of the body. Benefits of spiral CT include:

- It can be used to make 3-dimensional pictures of areas inside the body;
- It may detect small abnormal areas better than conventional CT; and
- It is faster, so the test takes less time than a conventional CT.

6. What is total or whole body CT? Should a person have one?

A total or whole body CT scan creates images of nearly the entire body—from the chin to below the hips. This test has not been shown to have any value as a screening tool. (“Screening” means checking for signs of a disease when a person has no symptoms.)

The American College of Radiology (as well as most doctors) does not recommend scanning a person’s body on the chance of finding signs of any sort of disease. In most cases abnormal findings do not indicate a serious health problem; however, a person must often undergo more tests to find this out. The additional tests can be expensive, inconvenient, and uncomfortable. The disadvantages of total body CT almost always outweigh the benefits.

For more information about whole body scanning, please visit the U.S. Food and Drug Administration’s Web site at <http://www.fda.gov/Radiation-EmittingProducts/RadiationEmittingProductsandProcedures/MedicalImaging/MedicalX-Rays/ucm115317.htm> on the Internet.

7. What is virtual endoscopy?

Virtual endoscopy is a new technique that uses spiral CT. It allows doctors to see inside organs and other structures without surgery or special instruments. One type of virtual endoscopy, known as CT colonography or virtual colonoscopy, is under study as a screening technique for colon cancer.

8. What is combined PET/CT scanning?

Combined PET/CT scanning joins two imaging tests, CT and positron emission tomography (PET), into one procedure. A PET scan creates colored pictures of chemical changes (metabolic activity) in tissues. Because cancerous tumors usually are more active than normal tissue, they appear different on a PET scan.

Combining CT with PET scanning may provide a more complete picture of a tumor’s location and growth or spread than either test alone. Researchers hope that the combined procedure will improve health care professionals’ ability to diagnose cancer, determine how far it has spread, and follow patients’ responses to treatment. The combined PET/CT scan may also reduce the number of additional imaging tests and other procedures a patient needs. However, this new technology is currently available only at some facilities.

9. Where can people get more information about CT?

Additional information about CT is available from the CT Accreditation Department of the American College of Radiology, 1891 Preston White Drive, Reston, VA 20191-4397. The toll-free telephone number is 1-800-227-5463 (1-800-ACR-LINE). The CT Accreditation Department can be reached by e-mail at ctaccred@acr.org. The American College of Radiology Web site is located at <http://www.acr.org> on the Internet.

Information about diagnostic radiology, including CT, is also available on the Radiology Info Web site at <http://www.radiologyinfo.org> on the Internet. Radiology Info is the public information Web site of the Radiological Society of North America and the American College of Radiology.

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Related NCI materials and Web pages:

- National Cancer Institute Cancer Imaging Program Web Page (<http://imaging.cancer.gov/imaginginformation/cancerimaging>)
- *What You Need To Know About™ Cancer* (<http://www.cancer.gov/cancertopics/wyntk/cancer>)

How can we help?

We offer comprehensive research-based information for patients and their families, health professionals, cancer researchers, advocates, and the public.

- **Call** NCI's Cancer Information Service at 1-800-4-CANCER (1-800-422-6237)
- **Visit** us at <http://www.cancer.gov> or <http://www.cancer.gov/espanol>
- **Chat** using LiveHelp, NCI's instant messaging service, at <http://www.cancer.gov/livehelp>
- **E-mail** us at cancergovstaff@mail.nih.gov
- **Order** publications at <http://www.cancer.gov/publications> or by calling 1-800-4-CANCER
- **Get help** with quitting smoking at 1-877-44U-QUIT (1-877-448-7848)

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