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ELE482
3/7/05

Advance CT Scanners for Better Imaging of the Heart

CT is a diagnostic procedure using specialized x-ray equipment to obtain image data from numerous angles around the body, then uses computer processing of the information to show cross sectional pictures of the body.

In cancer patients, CT is used to detect tumors, provide information about the severity of the disease, help plan treatment, and determine whether the cancer is responding to treatment.

CT scans require a bit more radiation than chest x-rays, but the benefits usually outweigh the risks.

There are five generations of CT scanners. The first generation consists of a single x-ray source and x-ray detector cell collect all the data for a single slice. This source-detector combination measures parallel projections, one sample at a time. The whole process takes about 4 minutes per section.

Second generation CT consists of a single source which illuminates a bank of detectors with a narrow fan beam of x-rays. This then measures a certain number of parallel projections simultaneously, all taking about 20 seconds.

Third generation CT has a fan beam that is made large enough to cover the whole field of view. This assembly can rotate continuously and the data is gathered in 4-5 seconds.

Fourth generation CT uses a stationary ring consisting of approximately 1000 detectors. Only the source rotates and it takes about 0.1 seconds to gather data.

Fifth generation CT has no moving parts. The target of the x-ray tube follows the shape of a circular arc of about 210 degrees. The patient is in the center of the arc and the effective source of x-rays moves due to the scanning of electron beams around the target. This process takes only milliseconds.

Spiral CT consists of an x-ray machine that rotates continuously around the body to make cross sectional pictures of the body. It provides a faster scan and higher resolution images than conventional CT.

Multidetector CT is the latest technology and many companies are competing to create the best one. Philips, GE healthcare, Siemens, and TOSHIBA are all working on similar products.

The machines are quite expensive ranging from $1.5 to $2 million dollars and each test costs about $700.

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