

# Table Top Emission Scanner

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# Overview

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# What is a Computed Tomography Scanner?

- “CT (computed tomography), sometimes called CAT scan, uses special x-ray equipment to obtain image data from different angles around the body, and then uses computer processing of the information to show a cross-section of body tissues and organs.
- CT imaging is particularly useful because it can show several types of tissue-lung, bone, soft tissue, and blood vessels-with great clarity. Using specialized equipment and expertise to create and interpret CT scans of the body, radiologists can more easily diagnose problems such as cancers, cardiovascular disease, infectious disease, trauma, and musculoskeletal disorders. CT of the body is a patient-friendly exam that involves little radiation exposure.

Allan M. Cormack

Godfrey N. Hounsfield

# Source Choice

- First nine days now only a few seconds
- X-rays vs. Protons

# Picture Quality

- “Picture matrix. The picture is made up of a series of absorption values appearing as a grid of equally spaced squares, the number of squares in the vertical and horizontal lines being the matrix size (e.g., 320 x 320).
- Spatial resolution. This term defines the clarity of the picture and is determined by the matrix size. It could also be defined as the spatial distance between the squares of the matrix.
- Picture accuracy. This is the accuracy to which the absorption value of each picture square can be calculated.
- Sensitivity. Sensitivity is a measure of the contrast of the picture (I.e., the width of the range of absorption values or window of values) which reproduces the tones between black and white displayed on the picture.”

# Four Generations of Scanners

- 1<sup>st</sup> generation
- 2<sup>nd</sup> generation
- 3<sup>rd</sup> generation
- 4<sup>th</sup> generation



# Setup

# Calculations

# Goals