

The circular container (28 cm in diameter, 1 cm thick) is loaded with 10 mCi of ^{241}Am .

A second multichannel collimator is placed on top of the source for producing a beam of parallel gamma rays. The 60 keV gamma rays of ^{241}Am have rather selective absorption in bone.

The good quality transmission image of the chest is obtained. But the image quality of

polaroid film is inferior to that of photo-recording.

The patient receives less than 0.1 mR/h to the examined area.

The method has been applied to scintiscanning of the lungs, liver, brain and bones and to the scintiphotos of the chest, brain and pelvis.

Scintigraphic image processed by memory unit

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There are many methods for recording scintiscan data. We have used the 4096-channel memory unit for digital recording in which all information is accumulated in original forms. The system consists of the 4096-channel memory unit, ADC, display unit and tape punch.

The scanner is a commercial type with NaI(Tl) crystals 5 in. diameter.

The collimator is an 85-hole focusing hexagonal type. The scanner is equipped with the potentiometers which yields positional signals.

A scanner must deliver the following signals. An analog voltage proportional to the X travel. X limit signals (start and end of line), producing the Y increment. Output pulses from the detector after pulse height selector. The scanning format is 64×64 . The scanning area is 128×128 mm (pitch size 2 mm) and 256×256 mm (pitch size 4 mm).

The digitized information is fed into the 4096 channel memory unit and then analyzed variously.

These systems have the following advantages.

1. The distribution of the tracer activity in the organ is stored in digital form. This means it can be processed easily with the

digital computer.

2. With the oscilloscope display unit, "islands" of low or high concentration can be shown up during or after the examination without the data being destroyed.

So we can get "rescan" effect. A circular phantom with "cold" bulbs (6-mm-30 mm in diameter) is constructed to evaluate this method.

The phantom contains 100 ml of ^{131}I -1 mCi. The following are the scanning displays compared.

1. multi-dot recording
2. photographic recording
3. digital image
4. computer processed image

The system used is HITAC 5020. Here 10 levels are represented by typed symbols.

Every display can detect "cold" bulb of 6 mm in diameter. But the computer processed image delineates the simulated tumor most completely.

Naturally the image quality of dot recording is not good.

This digital recording method has been applied to scintiscanning of the lungs, thyroid glands, liver and bone.