ray images with a great reduction of radiation dose to the patient.

The image chamber is cylindrical and measures about 70 cm in diameter. The X-ray generator and a line-shaped scintillation detector are rotated around the imaging chamber by a digital servo-drive system. The X-ray generator of this instrument is essentially an electron microscope equipped with heavy metal target. Electron beam is generated from an electron optical lens onto the target. The beam is acceralated by high voltage up to 140 kV, and impinge onto the tungsten target of 140 mm diameter as a fine focal spot. Before hitting the target, the electron beam is rapidly and accurately deflected by a coil in accordance with positional instructions from a computer or a scan generator. High intensity X-rays pass through a pinhole and form an X-ray microbeam. Transmitted X-rays through the patient body are detected by sodium iodide scintillation crystals. Beside the line-shaped crystal, a large round crystal of 16 inch diameter is equipped for the two-dimenstional scanning X-ray images.

Clinical Evaluation of Domestic High-Resolution Scinticameras

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The purpose of this study is to evaluate the superiority of the new domestic high-resolution scinticameras to the ordinary ones in the quantitative data handling of their dynamic images. Toshiba Jumbo GCA-401 and Hitachi RC-1C-1635DL were so far available.

Toshiba camera along with a high-resolution collimator (46,000 holes) have the resolution of 3.2 mm in the bar phantom study which was achieved by the circuitry revision. Hitachi camera with a high-resolution collimator (67,000 holes) gave the resolution of 2.0 mm, which was achieved by lessening the thickness of sodium iodide crystal from —12.7 mm to 9 mm.

These high-resolution cameras were proved to be useful for the radionuclide angiography of the brain (including Moyamoya disease), heart (initial pass studies and gated studies), and transpanted kidneys.

On the Performances of Image Display Processor Model IDP-2

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The Image Display Processor Model IDP-2 is a hard-wired device which performs the recording of scintigrams on the cassette tape and displays processed scintigrams by simple push-button or dial operation.

The recording of scintigram and display of it after processing are carried out simultaneously, and the otpmum scintigram can be obtained by repeating the playback for several photo-recording conditions. Also patient code can be recorded in cassette tape with scintigram for the convenience of searching data for a patient to be studied.

Image is displayed on X-ray film(14s × 17s at maximum) and CRT (5s × 4s) with maximum two hundred image elements for one scanline. Every element has couts accumulated in every 1.5 or 3.0mm interval.

The Processor has such functions as the addition and the subtraction of data from upper and lower detectors, 3 or 9 points smoothing, isocount display, and R.O.I. selection.

The photo-scintigrams on X-ray films can be obtained under such various recording conditions as Cut off, Contrast Enhancement, and Information Density. The loss of the information of scintigram displayed on X-ray film is less compared to the one on CRT or hard copy display because the image is displayed in life-size and the film has wide dynamic range of photo-density. Reduced-size scintigram of whole body scan can be also obtained. CRT which performs profile or histogram display is also useful as monitor at record and playback.

Because this device has such performances as getting various scintigrams under defferent photo-recording conditions, significant processing with simple operation, and the image display device using conventional X-ray film, we consider it to be useful in routine clinical diagonosis.

Spatial Frequency Filtering of Scintigram (3) High Pass Filter

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The spatial frequency filtering in scintigraphic reproduction can be performed by several method. The basic feature of the spatial filtering studied is the coherence of He-Ne Laser. We used a high pass filter.

The small circular diaphragm is placed at the fraunhofer spectrum corresponding to the scintigram. The quality of the filtering image was separated into two parts. One consisting of a higher dot part was changed to non structural area and the other, lower dot part, was no changeable. We could draw the outline of a certain dot level and see a improvement of the signal to nose ratio in liver scintigram.

Evaluation of a Correction Method for High Count-rate Quantitative Studies

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In high count-rate quantitative studies with the scinticamera and recording system, a count-rate correction must be made to compensate for dead time. In this point, we designed and composed a apparatus correcting count-losses analogously by means of analytic method, and evaluated the performance of apparatus experimentally and clinically. Then, the following results were obtained:

1. The lineality between radioactivity and corrected count-rate was investigated with Tc-99m sources of 14 different radioactivities until 0.37 to 30.0 mCi, and was significantly satisfied within 40 Kcps of observed count-rate.
2. The flow-rate of a special designed dynamic phantom, which was able to mixed completely in the region of left ventricle and to change the flow-rate, was measured with corrected dilution curve recorded on a semilogarithmic chart, and could be measured accurately with error of $\pm 5\%$.
3. Clinically, the apparatus was considerably useful to measure the cardiac out-put and so on because this correction method was not only accurate but non-expensive and convenient.
4. It was a demerit that the dead time was need to measure previously in different detecting conditions.