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APPRECIATION OF DIGITAL IMAGES IN THE NUCLEAR MEDICINE FIELD (1).

Y.Fujiki, N.Kumano (Toshiba, Nasu)
H.Siozaki, N.Kido, J.Matuoka (Saga Medical College)

The image on the digital gamma camera is a digital image by the video imager and is essentially different from the conventional analog image.
In this report, the digital image and analog image simultaneously radiographed have been compared with each other by adding an analog output unit to Digital Gamma Camera Model GCA-90A to appreciate both images.
In this unit, the digital image is of 512 x 512 matrix and the analog image is an image output by a 16-bit DA converter for X and Y.
Both images have been appreciated by resolution, uniformity, linearity and vision.
The digital image has been almost the same as the analog image, but excellent in contrast, which characterizes the digital image.

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APPRECIATION OF DIGITAL IMAGES IN THE NUCLEAR MEDICINE FIELD (2).

A.Habara and T.Ichihara.
(Nasu, Toshiba Corp.)

There are two means to record obtained diagnostic images in nuclear medicine image diagnosis; one is radiography on film by the conventional gamma imager and the other is radiography on film by the video imager.
There occurs a difference in the images radiographed by both means because the characteristics of the video imager differ from those of the gamma imager.
Therefore,the Toshiba Digital Camera Series have a function of controlling the image output brightness on the monitor for the optimum display.
Toshiba Video Imager GMI-50A has attained images superior to those of the gamma imager by making the film density by the gamma imager resemble that by the gamma imager.
A program that allows the data acquired under the same conditions to be radiographed under the same conditions at all times, automatically setting the upper limit and lower limit window and gray values according to the count value within the disignated ROI, has been prepared to facilitate a comparison between data.

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APPRECIATION OF DETECTOR PERFORMANS IN THE DIGITAL GAMMA CAMERA.

T.Ichihara, T.Kihara. (Toshiba, Nasu)

At present, the NEMA standard is availavle as a unified standard for appreciating the performance of nuclear medicine equipment.
However, large-scale equipment and time are required to make all measurements, and it is hard to carry them out in general hospitals.
Toshiba has developed a digital gamma camera as new series nuclear medicine equipment, which can acquire images in 512 x 512 matrix and is equipped with a calculator as standard.
Toshiba has lately developed measurment and appreciation programs based on the NEMA standard, which make measurement easier and will facilitate quality contorol in hospitals.
The developed programs are:
(1)Intrinsic spatial resolution
(2)Intrinsic spetial linearity
(3)Intrinsic energy resolution
(4)Intrinsic flood field uniformity
A report will be made on the results of measurement about Toshiba GCA-501S / 601A / 90B, and also on the results of simulation about calculation errors by data acquisition matrix sizes.

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ATTEMPT TO MAKE PICTORIAL IMAGE OF CORONAL AND SURGITAL IMAGES WITH A SPECT (TOMOMATIC64)

EISHI ARISAKA.Ohkawara Neurosugery Hospital

Tomomatic 64 is an ECT apparatus for exclusive use in the diagnosis of cerebral blood flow.
The detector consists of four groups of NaI crystallizations.and each group contains 16 pieces of crystallizations. A square-shaped arrangement is employed for these groups.and each two groups face each other.
The distinctive feature of this detector is that because each NaI crystallization has three collimators and a photoelectron amplifying tube,one scanning allows the simultaneous obtaining of three slices.
The examination is performed by means of the 1.5-min Xe-133 gas absorption method. Then 3 min and 1 min will be taken to get a total of four sheets of ECT images from which an ECT image of the cerebral blood flow in the limited area can be obtained by means of the Kanno and Lassen method. The directing areas are OM-2cm,OM-6cm,and OM-10cm;the distance between the centers of slices is 4cm.

In other words,the amount of information that could be provided by the conventional detector was only three slices. To eliminate such a shortcoming, this time we attempted to make a pictorial image from the coronal and surgital images.

Aside from the detector capable of providing up to a 6-point pictorixal image, for both the coronal and surgical images, the experimental detector is designed to provide to 16 pictorial images by staggeringone matrix each, up 10 to 25 matrices of the coronalimage and up to 8 to 23 matrices of the surgical image, respectively,in the 32 matrices pictorial images.