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## IMPROVEMENTS OF SPECT IMAGE WITH ROTATING-CAMERA SPECT BY NONCIRCULAR ORBIT.

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Recently, rotating-camera SPECT has been used increasingly for clinical applications. However, it is doubtful that the image quality of SPECT is enough to satisfy the need for routine clinical use. This report suggests a way to improve the image quality of rotating-camera SPECT.

In SPECT imaging with circular orbit using conventional rotating-camera SPECT system, the diameter of rotation is determined by the body width of patient. Therefore, although the collimator is close to patient when detector faces the patient's sides, the gap between collimator and patient is increased when detector faces the patient's front or back, which results in decreasing of SPECT resolution. And, the projection images to produce the tomographic image in the specified slice are sampled on the same regions in the field of view of camera, which results in appearance of central-ring artifacts in SPECT image caused by the systematic nonuniformity of projection sensitivity.

A solution of this problem is to perform the elliptical detector orbit by a combination of rotational and translational motions. We attempted to modify the conventional system to perform the elliptical orbit and made the experiments using the phantoms. The result was that the image quality of SPECT with elliptical orbit is clearly improved, compared with a circular orbit.

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## RECTANGULAR FIELD OF VIEW DIGITAL GAMMA CAMERA GAMMA VIEW-D

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This is a comprehensive nuclear medicine diagnostic equipment with a large rectangular detector and a unique detector supporting mechanism, and meets the diagnostic needs from ordinary imaging to just one pass whole body imaging and emission computed tomography. The position detecting circuit in this camera has a function that corrects energy uncertainty and nonlinearity on real time basis, and provides an image improved in uniformity and linearity.

This camera further encompasses a powerful micro-computer which controls data acquisitions, corrections and even ECT reconstruction. For the setting of acquisition conditions, the protocol method in which the setting is performed only by an input of the menu number on key board of operation console is adopted, and has achieved an extremely easy-to-operate system. When a nuclear medicine computer is provided for clinical studies, acquisition and data analysis can be executed independently for the maximum efficiency.

## GAMMA VIEW-D features :

- (1) Rectangular field of view :  $50 \times 36 \text{ cm}$
- (2) Spatial intrinsic resolution of FOV : 4.5 FWHM
- (3) Uniformity :  $\pm 5 \%$
- (4) Linearity :  $\pm 0.5 \%$
- (5) Hand operable detector supporting mechanism using an unique parallelogram link : Max. 4kg

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## CARDIAC CAMERA: SMALL-SIZED GAMMA CAMERA FOR CARDIAC STUDIES. H. Kishi, N. Shibahara. Shimadzu Corporation, Kyoto.

The Cardiac Camera is a newly designed small-sized gamma camera for cardiac studies, and is a lightweight, exceptionally mobile gamma camera, providing mobility to go right to the patient's bed side. The operator can easily transport and maneuver the Cardiac Camera, using the rear-mounted push bar and hand brake. The detector up/down drive movement is motorized and is mounted on long yoke arms to allow over-the-patient lateral positioning. The detector is balanced so that only a light manual touch is required to rotate and tilt the detector head into position. The control panel is conveniently situated on the side of the column and a second set of operating controls is mounted on top of the detector cover, permitting the system to be controlled from either side of the patient's bed. The detector encloses ZLC circuit providing excellent linearity, uniformity and resolution ( $< 3.7 \text{ mm FWHM}$ ). The maximum count rate is over 200 Kcps. The compact detector permits easy positioning for all views and particularly with stress equipment. The lightweight insert collimators are quickly and easily exchanged by hand.

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## HIGH PERFORMANCE CAMERA ROTATION SPECT SYSTEM MAXICAMERA 400AC/T. T. Nakayama. YOKOGAWA MEDICAL SYSTEMS.

The MaxiCamera 400AC/T System is a newly development gamma camera which engineered specifically for closed proximity tomographic brain imaging. The specially contoured design facilitates positioning of the detector in close proximity to the patient's head, without shoulder interference. A thinner layer of tungsten shielding is used on the cutoff portion of the camera. For body scan, PBC (Programmable Body Contour) table scan system is developed, the concept used to obtain the minimum patient-detector distance involves moving the table in X and Z directions to keep the patient in the full field of view of the detector at every detector position. While the table is moving, the camera detector simultaneously rotates in a circular fashion at 360 degree around the patient to collect the data. Resolution is improved with no loss in sensitivity, resulting in high quality tomographic brain images with less than 1 cm resolution at the axis of rotation. In addition, because the field view remains a full 390 mm, the system is ideal for all types of general purpose imaging.