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CARDIOVASCULAR NUCLEAR MEDICINE DATA FILE SYSTEM USING TOSHIBA GMS-55A. K.Hayashida, T.Nishimura, T.Uehara, T.Kozuka, and Y. Nisawa*. Dept. of Radiology, National Cardiovascular Center and Toshiba Medical*.

Toshiba data processor (GMS-55A) was utilized for data collection and analysis in cardiovascular nuclear medicine.
Large volume of findings from cardiac pool imaging, myocardial imaging and cardiac catheterization is need to file for daily examination and prospective study.
According to patient ID, patient name and disease name, these findings were filed in floppy disk (1MB) contained up to 900 patients directory.
Filing items from cardiac pool imaging were LVEF, RVEF, LVEDV from LVEDC; those from myocardial imaging were location of perfusion defect, uptake rate of lung, size of ventricular chamber; those from cardiac catheterization were chamber pressure, LVEF and cardiac output.
We can easily not only list up patient and disease name but also search patient name which we will want to use in prospective study.
Data filing system in Cardiovascular Nuclear Medicine will be very useful in future study.

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EVALUATION OF THE EJECTION FRACTION USING A HEART MOTION SIMULATOR. K.Ogawa, T.Sanmiya, T.Yamamoto, Y.Okano, Y.Shimada, Y.Takagi, A.Kubo, S.Hashimoto, H.Yamazaki, Y.Ando*, T.Kobayashi* and S.Kosuda**. Keio University School of Medicine, Tokyo. *Hiroo metropolitan Hospital, Tokyo. **Ohkura National Hospital, Tokyo.

Calculated ejection fractions with different computer systems vary according to their data aquisition system (hardware) and data processing method (software). Therefore it is difficult to evaluate a calculated value in terms of its reliability and reproducibility. In relation to the problem, we produced a heart motion simulator, named "HEARMOS I", by way of trial, and made some experiments for heart motion parameters. In HEARMOS I, a heart motion is simulated using an isotope-filled chamber and motions of two lead plates, which have a curve on one side. In other words, a change of passable area of -rays, which is produced by two lead plate, is equivalent to a heart motion. The simulator has many capacities including (1) alteration of a heart rate, (2) alteration of a speed of the plate in the diastolic phase and systolic phase individually, (3) insertion of a premature beat in the diastolic phase and selection of a phase and interval of its appearance, (4) alteration of a pattern of a heart wall, (5) safety for contaminations, etc. From experiment data using HEARMOS I, it is shown that ejection fractions change from 66% to 88% depending on the data aquisition method and data processing algorithm.

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FULLY AUTOMATED LEFT VENTRICULAR CONTOUR DETECTION FOR GATED RADIONUCLIDE ANGIOGRAPHY. M.Hosoba*,H.Wani*,M.Hiroe**and K. Kusakabe**. *Shimadzu Corporation. Kyoto. **Tokyo Women's Medical College. Tokyo.

A fully automated method has been developed to detect the left ventricular (LV) contour for gated pool studies. Computing Ejection Fraction and volume curve from LV gated pool images has some difficulty in reproducibility and accuracy if manual ROI selection is performed. To process gated images and achieve the precise identification of the LV outline in a fully automated manner, computer programs have been described and installed for clinical use. Points of the method are summarized as follows: 1. Optimal design of filters for pre-processing images with various noise level. Two dimensional Fourier domain filters are created to reject the noise and enhance images. 2. New algorithm which use the cosine and sine transform images obtained by Fourier analysis of the gated images in the temporal direction. Cosine transform shows well the left and right ventricles and can be used to eliminate the auricles and find out the centroid of LV. From the LV-center, radial profiles are calculated and fitted by Fourier series and first and second derivative curves are generated. Points corresponding to the first local maximum of the first or second derivative along each radial profiles are identified as edge. 3. Evaluation of results by cine mode display of computed LV contours superimposed on original gated images.

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CLINICAL APPILCATION OF A NEW FULLY AUTOMATED PROGRAM FOR GATED BLOOD POOL IMAGING Michiaki Hiroe,Yukiko Kawasaki,Takafumi Nishioka,kiyoko Kusakaba,Hajime Arai,Takashi Kikegaww,Tokiko Shigeta,Minoru Hosoba, Nobuyuki Wani.Dept of Radiology,Tokyo Women's Medical College,Tpkyo,Shimazu Corporation.

In 46 patients with various heart disease, the clinical utility of a fylly automated computer program for gated radionuclide ventriculography using a slant collimator was evaluated.This new processing system successfully detected left ventricular contour from the I6 frames in 9I% of the patients. In particular, the region of the interest(ROI) in the endo-diastolic phase was excellent,while the ROI in the end-systolic showed a slight prominence in the upper site of the lateral segment due to overlapping of the left pulmonary artery during systole. Best separation between the left atrium and left ventricle was ontained by a slant collimator.The left ventricular ejection fraction by the program closely related to that of contrast ventriculography(r=0.90).

This present method is expected to be reliable and valuable for quantitative analysis of left ventricular function.