Three dimensional multigated left ventricle images were taken in 16mm movies to observe their movements. Some clinical studies are shown here and their evaluations are discussed. The method to reconstruct three dimensional images was reported in our "Synchronous Dual-Camera Recording and analysis Technique" in the last annual meeting of JSNM. In the case of normal healthy ventricles, it can be observed that whole left ventricle walls are regularly constricted and dilated between apex and valve entrance, and axis of left ventricles is twisted little. Though in the case of hypertension, there are no special findings in constriction movements, in the case of myocardial infarction, deformity, akinesis or diskinesis could be clearly observed in conformity with the portions of foci, and twisting of long axis is often seen. According to our moving image studies, the twirling of long axis, the constriction waves from apex to entrance valve and the portions of diskinesis or akinesis are remarkably observed just like in the beating heart. Three dimensional image expression is a new technique to observe left ventricle and displays not only the shape in three dimensions but also the spacial relations in the chest cavity. In addition, this moving image technique will be sure to increase the abilities of diagnosis.

We have newly developed the Moving Imaging System for the clinical nuclear medicine. The system includes NOVA3 minicomputer, 24 MW disk, magnetic tape and reflect type 14 inch variable color CRT with color encoder for VTR recording. Characteristics of MIS are as follows: 1) Cine mode display in real time, compressed time and expanded time. 2) Variable color display. 3) Colored contour display of selected level. 4) Superimposing fixed edge of end diastole image on colored contour display of gated image. By this method, ventricular wall motion abnormalities could be accurately detected. 5) Simultaneous ventricular volume curve display. 6) ROI setting on moving image. 7) Direct VTR color recording for clinical and educational use. All the data manipulations are easily performed using only one letter command.

The moving image system was developed and used to evaluate the global function and regional wall motion of the ventricle. ECG gate method was applied to the first pass study in RAO projection and the equilibrium study in LAO projection. Using moving image system, sequential images of the cardiac motion were constructed to the real time moving image and were displayed on color CRT. On the moving image obtained by first pass study in RAO position, asynery of anterobasal segment, anterior wall, apex, inferior wall and posterobasal segment of LV was detected easily. Right ventricular ejection fraction and RV wall motion were also detectable on the image in RAO position. On the other hand, the equilibrium study had an advantage of capability of repeat studies. Therefore, comparison of left ventricular functions at rest and during stress was possible on the moving image in the equilibrium study. On the moving image of the myocardium obtained with thallium and the gate method, detection of ischemic lesion was more sensitive than the conventional static myocardial image.