Reflex to inferior vena cava (IVC) or hepatic vein (HV) was observed in 9% of the cases on which the radionuclide heart angiographies were performed. The reflex is affected by the state of relevant vessels, the intrathoracic pressure, the pulsation or the shape of bolus. The time activity (T/A) curve generated over the ROI of IVC and HV varies with pulsation and/or with respiration. With the use of ECG and respiration monitor we can determine which is the main cause of periodic change of reflex. In order to clarify the interaction between the reflex and the right heart system, the phase image is constructed from the first pass ECG gated images of the right heart system including IVC and HV. There is no phase difference between IVC system and the right atrium (RA) for the patients with tricuspid regurgitation. The phase difference of 180° between the IVC and RA is suggestive of contraction-timing-failure between RA and right ventricle. Quantitative evaluation is carried out with the Fourier transformation of the T/A curve of reflux normalized by the T/A curve of RA divided by the number of pixels. With this method the pulsation and the inspiration components can be treated separately.

Kr-81m is suitable for the measurement of the right ventricular and pulmonary functions because of its ultra-short half life (13 seconds) and less exposure dose, and is therefore applicable for repeated examination. In 75 patients with mitral stenosis, atrial septal defect (ASD), coronary heart disease and chronic obstructive disease (COLD), the measurement of right ventricular function, ejection fraction, was performed by double first-pass method using two Rb-81-Kr-81m generator to maintain high radioactivity in the heart. The reproducibility of this method was sizable (r=0.93) and the correlation between Kr-81m RVEF and Tc-99mHAS RVEF was significant, (r=0.86) RVEF in mitral stenosis, ASD, COLD, decreased significantly comparing with normal cases.

Right ventricular ejection fraction (RVEF) is one of the most suitable index of right ventricular function. RVEF calculated from the initial passage of Tc-99m injected rapidly was compared with mean pressure of pulmonary artery (m-Pa) obtained from the examination of cardiac catheter in valvular diseases. As the result, RVEF decreased according to the increase of m-Pa in the mitral valvular diseases which gave pressure overload to the right ventricle, and the correlation coefficient between RVEF and m-Pa was R=0.75 (n=49). On the other hand, although the increase of m-Pa (the pressure overload to the right ventricle) was scarcely shown in the aortic valvular diseases, the value of RVEF was significantly low. However, RVEF correlated well with left ventricular end diastolic volume index (LVEDVI) (r=0.87) in 8 patients with aortic regurgitation and m-Pa under 15 mmHg. The decrease of right ventricular contraction seems to be derived from right ventricular compression and deformity according to left ventricular enlargement.