This new type of gamma camera has a square detector with a large field of view and employs the data processing function as the basic composition. It is an effective, total nuclear medicine diagnostic system capable of performing from acquisition to processing on ordinary imaging, whole body imaging and single photon ECT imaging. The detector is a square type with a large effective field of view (35cmx35cm), and a CEL mechanism for correcting the energy level and linearity in real time. The unit has the basic performance of uniformity (integrated value) of ±5%, linearity (absolute value) of 1.0mm, intrinsic resolution of FWHM 4.8mm (99mTc), and maximum counting rate of 200k cps (40%), as measured with CFDV by the measuring method according to NEMA.

Unlike the conventional system consisting of a gamma camera and data processor, with this gamma camera setting of energy conditions by spectrum display, setting of data acquisition conditions, image display during and after data acquisition, and processing after data acquisition can all be performed by observing the monitor of the operator console. Conditions frequently used can be set as a protocol, thereby facilitating operations.

Chemical and biologic study revealed that 99mTc-PMT has excellent properties as a hepatobiliary imaging agent; a) rapid blood clearance, b) fast hepatobiliary transit, c) no intestinal reabsorption, d) low urinary excretion, e) stent resistance to serum bilirubin and f) low toxicity.

Its clinical studies are now in progress and the data published at present indicate that 99mTc-PMT is a promising hepatobiliary agent, and are summarized as follows: 1) excellent hepatobiliary image can be obtained because of its extremely low urinary excretion ratio (2-3% in normal), high hepatic uptake ratio and rapid blood clearance. 2) time needed for a study is shorter than former products. 3) successful imaging of hepatobiliary system is possible even in high serum bilirubin patients who cannot be studied with other agents, which means expansion of the clinical application. 4) no adverse reaction has been reported and it confirms safety of the study.

The radiation dose estimated by the MIRD technique based on human metabolic data will also be discussed.

I-123 OIH is expected to be an ideal reagent for the evaluation of both renal morphology and function. Because of its suitable physical characteristics (T1/2: 13 hr, γ-ray energy: 159 KeV, no β-ray), superior image can be obtained using scintillation camera compared with I-131 OIH, with less radiation dose to the patient. In addition, combining with computer, it is possible to calculate various parameters easily, and also to evaluate the regional renal function by regional renogram (cortex and pelvis) and functional image (T max, T1/2).

No adverse reaction was reported in 383 patients who were injected I-123 OIH.