Adult instruments are usually used for pediatric experimentation. To obtain good results in infants and children, however, there are many drawbacks. In SPECT examination using rotation-type gamma camera, the size of normal bed is so wide for children. The efficiency is not satisfactory. We made an ECT bed which was 20 cm wide, and had 7 cm smaller radius than that of the normal bed. and was attached an instrument for fixing the children. Using this new SPECT bed we could get better SPECT image and shorten the time of the examination.

For the purpose of applying a human gamma camera to small animals such as rats or mice, simple and easy improvements were brought on a pinehole collimator, for example a small pinehole lead block (the pinehole was 1.5 mm in diameter) was attached to the inside of a human pinehole collimator. In basic experiments using To-99m sodium pertechnetate, a small circled hot images of at least 1.0 mm in diameter could be shown clearly. And two slender tubes (outer diameter was about 0.9 mm), which were laid at intervals of 2.0 mm, could be distinguished.

Furthermore, bone scintigraphy, salivary gland scintigraphy and thyroid scintigraphy in rats and mice were attempted using this collimator improved. Clear images of all were obtained.

In addition, the experiments using the radionuclide emitted higher energy gamma rays were attempted.

Abdominal scintiscan has some problems due to the motion artifact induced by breath-natured shift of abdominal viscera. And the instrument also worked well by using it as a patient's breathing observation monitor and we have already reported that we studied through the experiment mentioned above. Patient's breathing have been monitored through air-bag detector and have been transduced to electric signal (out put max 1 V). Out put signal level were divided into 100 steps and it was planned to be able to take the trigger as in Figure 1. In trigger level 150 mV, the liver shadow and the contour of the liver become more clearly. Furthermore, the distribution of radio-active isotope in liver could be observed more clearly. We will discuss the usefulness of the breathing monitor of the liver scintigrams in this paper.

The 13C-breath test is useful for clinical diagnosis of detecting some malabsorption syndromes. In the condition of bacterial overgrowth, administrated glycine-1-13C-cholate are dejugulated 1-13C-Glycine in the intestine and it flows out to 12CO2 Expired air after absorbed and metabolized. This time we bring this test to a 53 years old female patient who was diagnosed Progressive Systemic Sclerosis (P.S.S.) with Sjögren's syndrome, had chie comlains of costipation and dysuria, manifested anemia, hypoalbuminemia and hypcholesterinemia. During fasting time, we measured the 13CO2 in expired air after administrated glycine-1-13C-cholate 310mg at 30 min interval. The 13CO2 expired curve after administrated 13C-compound demonstrated flat line. Clinical symptom and laboratory data of this patient was indicated bacterial over growth in alimentary tract. But we could not detect bacterial over growth in this case. This result may be due to the problem of expired air collection and the hypokinesia of the alimentary tract in this patient.