IS-14 COMPARISON ON TWO-DIMENSIONAL AND THREE-DIMENSIONAL IMAGING CHARACTERISTICS OF A WHOLE-BODY PET SCANNER

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To evaluate the clinical utility of three-dimensional imaging of a whole body PET scanner, the imaging characteristic of a new whole-body PET scanner (SET2400W, Shimadzu) in three-dimensional (3D) mode was investigated and compared to two-dimensional (2D) mode. Line-source measurements are performed to determine spatial resolution over the scanner FOV, and cylindrical phantom distributions are used to determined the sensitivity, scatter fraction and count rate performance of the system. Phantom and 18F-FDG patient studies are used to evaluate image quality with 2D and 3D reconstruction algorithms. The kinetic analyses of 18F-FDG clincial brain and whole-body studies shows improvements in 3D over 2D.The results demonstrate that, with regard to sensitivity, there are significant gains in the physical performance of this tomography when operating in 3D compared to 2D mode and that the quantificant of PET studies using 3D data reflects this.

IS-15 Distribution of Whole-Body Glucose Uptake During Running Shown by ^{18}F-FDG PET

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3D FDG PET visualized whole-body energy consumption with a reduced exposure of radiation to subjects. We investigated distribution of glucose uptake during running using PET data obtained from 7 healthy male volunteers who ran before and after injection of FDG, followed by PET examination. The ROI data of each organ was compared with 5 controls.

Brain and heart showed unchanged glucose uptake, while muscles in lower limbs showed significant increase. Liver and intestines showed significant decrease in glucose uptake during running. It is suggested that the energy demand is partly compensated by lowering the energy consumption in the abdominal region during exercise. PET may be a powerful tool to investigate whole-body energy metabolism at physiological level.

IS-16 MEASUREMENT OF SERUM CA19-9 TUMOR MARKER LEVELS BY NEW METHOD AND COMPARISION WITH CONVENTIONAl KIT.

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MSW-113 monoclonal antibody was used in new CA19-9 kit. MS-113 recognizes sialyl-le* like NS19-9, but its recognition epitope of the oligosaccharide is a little biased to sialic acid residue.We examined the basic and clinical usefulness of newly developed CA19-9 Kit(Dai ichi R).The intra and interassay reproducibility was 3.80% and 7.90% respectively. The mean recovery rate was close to 100%. There was no effect of dilution on CA19-9 serum values. The normal range of CA19-9 values in serum of 60 normal volunteers were 4.49--11.31. Although a significant correlation (Y=0.38X+10.16 r=0.80) was observed between this CA19-9 new kit and conventional one, the CA19-9 values measured by the new kit seem to be lower than those by conventional kit.The measurement of serum CA19-was useful for evaluation of pathological function and seemed to be helpful in management of patients with malignancies.

IS-17 MULTI CURIE FLUOR-18 IN IBA TARGET.

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The growing number of PET and coincidence SPECT cameras have increased the popularity of 2-[F-18]fluoro-2-deoxy-D-glucose. As a result, there is a growing demand for this compound. To start the synthesis, [F-18]fluoride is requested. A new [F-18]fluoride target design has been tested. These experiments have been conducted on the two PET-IBA cyclotrons, the Cyclone-10/5 and the Cyclone-18/9. The target can produce 5 Ci after two hours bombardment with a target current which can be raised to 40 μA at 18 MeV with 97% enriched [O-18]water. The same target tested at 10 MeV can support 70 μA and produces after 120 minutes bombardment 3.9 Ci. The radioactivity is doubled with a dual beam irradiation. The new targets reduce the irradiation times to get sufficient amounts of radioactivity. The cyclotron is quickly ready to start new productions.