

### IS-29 Evaluation of diagnostic efficacy of Non Attenuated FDG whole body PET images for tumors. M.B. Imran, K. Kubota, H. Fukuda, M. Ito, T. Fujiwara, S. Yamada, K. Yamada. (IDAC, Tohoku Univ., Sendai, Japan)

We aimed at comparison of diagnostic efficacy of non attenuated and attenuated PET images with reference to their lesions to background ratios (L/B).

Whole body F-18 FDG PET study was performed using Shimadzu SET 2400W PET scanner on 18 fasting subjects with various organ tumors. Reconstructed attenuated and non attenuated images were displayed simultaneously and relative FDG uptake in lesions and corresponding background areas were evaluated by ROI method. Attenuated and non attenuated images were also compared with X-CT scans and conventional nuclear medicine scans for diagnostic efficacy.

While all the lesions were differentiated on non attenuated images, 62% of these (predominantly malignant mediastinal lesions) demonstrated high L/B ratio ( $1.42 \pm 0.32$ ) on non attenuated images. Non attenuated FDG PET images are equally good for evaluation of malignant lesion and will suffice the purpose of staging the lung cancer, differential diagnosis of mediastinal lesions and lymph node lesions in the routine clinical practice.

### IS-30 Performance Comparison of a High Resolution Animal PET —Now and Six Years Before—

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The PET system (SHR-2000) for animal studies has been described and its performance now and six years before is evaluated. Six years before, the reconstructed radial resolution (ramp filter) ranged from 3.3mm FWHM at the center of the FOV to 4.3mm FWHM at an 7.5cm radius. The tangential resolution ranged 3.7mm FWHM at the center of the FOV to 4.1mm FWHM at an 7.5mm tangentially. Axial resolution averaged 4.4 and 4.9mm and sensitivity averaged 56 and 89cps/kBq/ml for direct planes and cross planes. Total sensitivity was 483cps/kBq/ml including the scatter component. The average large angle scatter ratio for all slices was 15.7%. Now we did the experiment again in the same method. It showed almost no change comparing the data before and is suitable for animal PET study.

### IS-31 Value of Attenuation & Scatter Correction in Perfusion Imaging: Results of a Multicenter Study

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A new method incorporating attenuation and scatter and resolution compensation (AC) (Vantage ExSPECT) was examined in 96 patients with documented coronary disease (CAD) and 74 subjects ("normals") at low likelihood for CAD. Sensitivity was 76% for uncorrected SPECT and 78% using AC. The confidence of interpretation was also improved. Normalcy rates rose from 89% with uncorrected SPECT to 96% with AC. Therefore, AC substantially improved normalcy rate ("specificity") without a reduction in sensitivity.

### IS-32 The Effect of Downscatter Correction on Scanning Line Source Attenuation Correction (AC).

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With AC, downscatter of 140 keV Tc<sup>99m</sup> photons into the 100 keV Gd-153 transmission window may result in undercorrection of inferior walls. We used an anthropomorphic phantom to evaluate downscatter correction (DSC). For Tc<sup>99m</sup>, AC alone compensated well in all walls but the inferior (-13%). With DSC, undercorrection improved to 06%. Septal lesion contrast improved with AC, and to a lesser degree with DSC. We conclude that DSC improves inferior wall correction, but improves lesion contrast to a lesser degree than AC alone. However, resolution recovery methods may help restore lesion contrast with DSC.

### IS-33 OUR APPROACH TO DATA ACQUISITION, PROCESSING AND MANAGEMENT IN IN VITRO LABORATORIES. REVIEW OF OUR ORIGINAL SOFTWARE "xIA"

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We developed software *xIA* as MS Windows<sup>®</sup> (3.xx, 95 and NT) application using MS Visual C++<sup>®</sup> development kit. This PC based software is dedicated for on line data acquisition from different *in-vitro* devices (Gamma counters, Fluorometers, Luminometers, etc.), data processing, data managing and data exchanging.

During measurement from *in-vitro* devices, software *xIA* enables data processing with interactive method, choice of appropriate standard curve fitting (LSQ, Bezier's curve, B-spline, Q-spline) and solving concentrations of unknown samples. Software *xIA* has user friendly user interface with flexible graphic solutions for standard curve correction and edition of all relevant data concerning patients and accomplished measurements. Implemented data base enables patients notification, automatic setup of control visits as well as patients managing waiting lists and analysis of results in a chosen time interval. This software supports LAN so that the data exchange between different users is possible. In addition, *xIA*'s implemented options simplify its using and diminish the possibility of mistake during data processing.

The first experience with the software *xIA*, described here, has shown, that it is a flexible, user friendly tool for data acquisition, data processing and data managing in *in vitro* labs.