

## Summary

### Investigation of the Resolution and Count Recovery Coefficients of a Whole-Body PET Scanner (Shimadzu SET-2400W) in 2D and 3D Mode Image

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We measured the resolution and count recovery coefficients (RC) of the SET-2400W whole-body PET scanner (Shimadzu Co., Japan) in the 2D and 3D clinical modes. *Method:* The 3D images were reconstructed by using the full 3D image reconstruction method (3-D reprojection algorithm: 3DRP) and the Fourier rebinning method (FORE). The 2D images were reconstructed with conventional filtered back-projection method (FBP). The measurements of resolution and recovery coefficient were according to JRIA (Japan Radioisotope Association) protocols. *Results:* The transaxial resolutions of all methods were better than 7 mm FWHM at a radius of 10 cm with  $1.25 \text{ cm}^{-1}$  cutoff frequency. The average slice width of 2D FBP, 3DRP and FORE are 5.8 mm, 8.0 mm and

6.8 mm respectively at the center of transaxial field of view. The RC values were measured in a range from 10 mm to 27 mm at 6 cm from the center with the cylindrical and spherical hot area phantoms. In all methods, RC values at 27 mm diameter were nearly 1.0 in both type of hot area. RC values at 10 mm diameter in 2D FBP, 3DRP and FORE of cylindrical hot area were 0.69, 0.72, 0.73 and those of spherical hot area were 0.52, 0.51, 0.53 respectively. *Conclusion:* At the SET-2400W, resolution and recovery coefficient of 3D mode image under the clinical mode showed the value which did not differ from the 2D mode image.

**Key words:** PET, Recovery coefficient, Resolution, 3-dimensional.