

## Quantitative renography with the organ volume method and interoperative background subtraction technique

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When quantification of renal activity is performed by planar imaging, many correction factors must be considered. To obtain quantitative renal images and renogram, we have examined our proposed method by using the organ volume for scatter, attenuation, and background activity, and the interoperative background subtraction (IBS) technique in phantom and clinical studies. A renal phantom study was performed by varying the renal depth from 3 to 11 cm and the kidney-to-background activity concentration ratio from 5 to 80. Planar images were properly corrected for scatter, attenuation and background activity by our method and the corrected images were compared with the images obtained by the conventional method for the estimation of true renal activity. Clinical Tc-99m DTPA dynamic data for both a good and a poor renal function were also corrected by our method and volume-corrected renograms were obtained. For the phantom study, depth-independent images were obtained and these images gave a good estimation of the true count rate. In the clinical study, the conventional renogram was especially modified to allow for oversubtraction of background counts in the early phase (0–4 min). In conclusion, our proposed correction method can assess renal function qualitatively and quantitatively in both static and dynamic planar renal imaging.

**Key words:** planar scintigraphy, renal activity quantification, interoperative background subtraction, Tc-99m DTPA