Dynamic Performance of Scintillation Camera-Computer System and Correction for Counting Loss due to Resolving Time

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Dynamic image data obtained with Anger camera-computer system are often inaccurate due to finite resolving time of camera and computer sy stem. The resolving times of a delayline type scintillation camera and on-line computer system (TOSBAC 3400 Model 31 DAC system) were measured separately and overall correction methods for counting loss are established using the experimental equations. Resolving time of the camera was determined with fitting a curve of display countingrates vs. relative intensity of radioactive source with the following equation : $N=RN_0 \exp(-T_c N_0)$ where N is the display counting-rate, $N_.$ is the total detection event rate, R is ratio of display event to the total event and T_c is the apparent resolving time of the camera. Since the true counting-rate, N_t, is equal to R No, the above equation is rewritten as follows : $N=N_t \exp(-T_c N_t/R)$. R is determined by pulse height analysis of z signal of the camera calculating the ratio of area under peak of interest to total area of whole spectrum. The resolving time of the computer system was determined by measuring the collected counting-rates (M) as a function of the display counting-rates (N). Experimental curves were well fitted by the following equation : $N=M/(1-MT)$ where T is the system resolving time. Performance of computer system was also limited by the data transfer speed from core memory to magnetic disc. Overall counting-rate performance of camera-computer system is derived from above two experimental equations and future improvement is suggested.

Clinical Evaluation of Computer Data Correction System on Scintillation Camera

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Recently digital computer system is commonly used for scintillation camera data processing. Correction of scintillation camera field inequality is one of important problem. But, clinical evaluation of the correction system is not enough established.

The system we used consists of a on line digital computer with 8 K memory and delay line type scintillation camera with 20, 000 hole collimeter. Tc-99 m flood field souce of 30 cm diam, and many small phantoms (1—50 mm diam) were used for this study. The 11.5-in-