

PERFORMING ^{18}F BONE SCANS ON THE GAMMA CAMERA

In the May 1972 *Journal of Nuclear Medicine*, Fink, et al (1) report the difficulties that they have encountered when attempting to perform ^{18}F bone scans on the gamma camera. A number of points are worthy of comment.

In this unit we have been performing scans on the Nuclear-Chicago Pho/Gamma camera using ^{18}F since 1967 and over this period have performed well over 500 scans. The central artefact is certainly a major problem. Meticulous correction of uniformity, which is checked every week, is essential. If good uniformity at the 140-keV level is maintained, very much better pictures can be obtained than those seen in their illustration.

We do not use the pinhole collimator for two principle reasons. At the normal working range the pinhole collimator has a lower sensitivity for a given resolution than the conventional collimator. In addition the pinhole collimator has an intrinsically non-uniform field response with a very marked central hot spot. If this is added to the uniformity hot spot the result is a picture which is undiagnostic. We use the 1,090 hole, 3-in.-thick, medium-energy collimator which is bolted to the 1,090 hole, 1½-in.-thick, low-energy collimator. This produces a compound

collimator 4½-in. thick. Although under these circumstances there is considerable septal penetration at 510 keV, in practice we find results not inferior to those obtained with a collimator with 8-mm-thick septa.

We have recently reviewed our results using the Ohio-Nuclear scanner with twin 5-in. detectors and the Nuclear-Chicago gamma camera. One important finding is that if rectilinear scans are performed at a count density lower than 360 counts/cc² at the area of maximum counting rate, lesions will be missed in a clinically important percentage of patients. At the higher count density, adding a skeletal survey to the bone scan makes very little difference to the case pickup rate. The tendency in some centers to perform bone scans as rapidly as possible is to be deprecated.

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REFERENCE

1. FINK DW, WILCOX FW: Field uniformity distortion with the pinhole collimator on the scintillation camera. *J Nucl Med* 13: 338-339, 1972