compact bone that profoundly influences the CT results. Second, the trabecular bone of the limbs does not reflect changes in the axial skeleton; it has been characterized as metabolically inactive.

It might be difficult for readers to reconcile the latter point with Hosie's contention that there is a good correlation between trabecular bone density of the distal radius and that of the spine. In the first report cited by Hosie (*3*), the CT determinations in both locations were made on macerated specimens from normal subjects. Even with one highly deviant case excluded, the predictive error was 10–15%. In the second study (*5*) the predictive error appeared to be closer to 20%, or about the error one sees in predicting vertebral density from compact bone. In another study by Bydder et al. (*6*) the predictive error again was 15–20%. Moreover, there was a far lower correlation, with a considerably different (and lower) slope, in osteoporotics compared with normals. This closely parallels the findings in our report. Prospective studies have shown that several drugs used in osteoporosis positively influence the axial skeleton without concomitant effects on the distal radius.

Given the relatively high cost of specially constructed CT scanners, their technical problems, and the apparent differences between axial and appendicular trabecular bone, it would be prudent for interested investigators to await further reports from existing units using this exciting but unproven method.

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Re: Improved Intrinsic Resolution: Does it Make a Difference?

The recent paper by Hoffer et al. (*1*) suggests that an improvement in the intrinsic resolution of an Anger camera from <4.9 mm FWHM at 140 keV to <3.8 mm FWHM has no observable effect on lesion detection in liver or bone images. The authors use ROC analysis to compare observer performance. We have used ROC analysis in our department to compare hard-copy imaging formats (*2*). In an unpublished part of our study we compared analog (Polaroid) images from a Union Carbide Cleon 720 Anger camera (intrinsic resolution 5.3mm FWHM at 140 keV) and a Nuclear Enterprises Mark 4 (intrinsic resolution 7.1mm), each fitted with a high-resolution low-energy collimator. The images, each of 1 million counts, were formed by placing an absorber (20mm diam) between the Anger camera face and a flood source for different periods of time and at different sites to simulate photon-deficient lesions of varying contrast. Seven observers studied a set of 100 images from each camera, and ROC and LROC curves wer produced. Using the methods detailed in our paper (*2*), we derived from these curves two sets of seven areas for each camera. The areas were then compared using the Wilcoxon Matched Pairs Signed Ranks test. No significant difference was found in observer performance between the images from the two Anger cameras.

This study shows that improved intrinsic resolution from 7.1mm to 5.3mm FWHM did not significantly improve detectability for the size of photon-deficient lesion selected for investigation. Whereas metastatic lesions in the liver are likely to be of varying size and at varying depths, it has been observed at autopsy that superficial lesions are present in 90% of cases, and in 70% of cases the lesions are greater than 20mm in diameter (*3*). Thus for practical purposes, improvements in intrinsic resolution from 7mm to 5mm or so would not be expected to have a major effect on lesion detectability. The results of our simple study, however, lend support to the more detailed investigations of Hoffer et al. (*1*). The findings are also in keeping with an impression that recent advances in instrumentation and radiopharmaceuticals have not improved the diagnostic accuracy of conventional radionuclide liver imaging (*4*).

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Reply

While the results obtained by Eadie and Hilditch are certainly compatible with our own, we do note that two different imaging instruments were used in their study. These instruments may have differed not only in intrinsic resolution, but also in energy resolution. Although both were equipped with "high-resolution" collimators, we have also observed marked differences in performance characteristics of collimators designated as "high-resolution" by various manufacturers. Moreover, and most importantly, the 20-mm test "lesion" used by Eadie and Hilditch would definitely militate against the observation of any difference in lesion detection between two systems with intrinsic resolutions of 7.1 and 5.3 mm FWHM.

Although we feel that the importance of improvement in intrinsic resolution has perhaps been overemphasized, it should not be disregarded. There is obviously some point at which degradation