patients were asymptomatic, and the remainder had known stable angina or some other noncardiac-pain syndrome without evidence of any ongoing myocardial necrosis. None of these patients died, and many were not hospitalized but were simply asked to undergo repeat scintigraphy as part of the research protocol. All those patients hospitalized during the period of scintigraphy were discharged shortly thereafter, following complete evaluation of their pain syndrome or following coronary bypass graft surgery. Certainly, ischemic disease was in a relatively benign, quiescent phase in all patients studied during the period of examination, and it would be surprising indeed if a large percentage of these patients demonstrated pathologic evidence of myocardial necrosis. The second point involves the distribution of radioactivity in persistently positive scintigrams. Our study and those of Malin et al. (*4*) and others (*5*) document the frequent occurrence of the 2+ and diffuse pattern of radionuclide uptake in persistently positive scintigrams. Although the exact reason for this, and for the 2+ diffuse pattern of uptake in general, remains in doubt, we and others (*6,7*) have established the nonspecificity of such scintigraphic findings. In the current study, we observed such 2+ diffuse uptake in nine of 11 patients with persistently positive scintigrams. This distribution of uptake cannot easily be explained in terms of ongoing myocardial necrosis, especially in a group of patients with minimal or totally absent symptoms. Indeed, the seven patients with persistently positive scintigrams studied pathologically by Buja et al. (*1*) have shown a relationship between pathologic and scintigraphic localization. However, in each of these cases, scintigraphy showed discrete, well-localized myocardial uptake, and the pathologic correlate of the 2+ diffuse pattern of uptake remains to be defined. Although we agree, then, that continued myocardial necrosis may be one explanation for persistently positive Tc-PPi scintigrams, the evidence to date is suggestive but incomplete, and leaves a fertile area for future investigation.

Possibly more important are the areas of general agreement noted in the studies thus far performed evaluating the frequency and clinical significance of persistently positive scintigrams. Paralleling other studies (*4,5*) we have noted the occurrence of persistently positive scintigrams that often are found in patients who have suffered large infarctions and, frequently, aneurysm formation. This is consistent with past findings relating persistently positive scintigrams with an increased frequency of complications following infarction (*1*). Most observers would also agree that persistently positive scintigrams are frequently of low intensity—generally less intense than in an earlier study performed in the same patient. Furthermore, many of such persistently positive scintigrams demonstrate a 2+ and diffuse pattern of uptake. Unless this pattern is further clarified by the findings of serial scintigrams, our current study supports our previous findings (*6*), indicating the lack of diagnostic specificity of this 2+ diffuse scintigraphic pattern. However, from the findings in our current study and from those related in the literature and in the letter by Dr. Datz, it appears that the discrete pattern of Tc-PPi scintigraphy remains a satisfactorily specific indicator of acute myocardial necrosis, even at a time remote from the event.

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A Clinical Comparison of Tc-99m HEDP and Tc-99m MDP

Drs. Fogelman et al. have published a very useful clinical comparison of the performance of Tc-99m-tagged HEDP and MDP in patients with bone metastases (*1*). In their Table 1, the bone image quality on a 1-3 scale is determined by three observers and expressed as the mean. In Table 2, the numbers of detected metastases per patient are again tabulated as the mean. Taking arithmetic means of small numerical values can unknowingly mask a pattern of differences among numbers making up the mean. Despite the correlation coefficients presented, there could be significant interobserver difference in the image-quality scores and the numbers of bone lesions determined. This becomes important when a small laboratory is choosing between competitive products for the same clinical indication: it is often necessary for one person to compare products objectively. That single evaluator would not necessarily know what to expect should he repeat the authors' study.

In Tables 1 and 2, therefore, if the statistical analyses were performed on each observer's findings individually, would the results be consistent among the observers and qualitatively as published?

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REFERENCE

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Reply

We thank Drs. Coupal and Kim for their interest in and comments on our paper. We accept their implied criticism that a scan-quality scale of only 1-3 is rather coarse for precise intercomparison, although we do not believe that a more precise subjective judgment of scan quality is valid. It was for this reason that we took the three observers together, giving an effective seven-point scale of 3-9, thereby removing a good proportion of the tied scores between imaging agents. The lesion count was also aggregated over the three observers, although