REPLY: We are interested to learn that Spinelli et al. (1) concur with the results of our study (2) that 4-hr 99mTc-HMPAO leukocyte scanning has too many false-positive results due to physiologic bowel uptake for it to be used as a routine method for localizing intraabdominal sepsis. The purpose of our study was to determine whether 99mTc-HMPAO leukocyte scanning could replace 111In-leukocytes for detecting intraabdominal sepsis. One of our conclusions was that serial 99mTc imaging starting earlier than 4 hr after reinsertion should be evaluated. Consequently, we were also interested to read of their experiences with these earlier imaging times.

Compared to 111In-leukocytes, imaging with 99mTc-HMPAO leukocytes suffers from the disadvantage of physiologic uptake in the bowel, gall bladder, kidneys, and bladder (3); but unlike 111In, 99mTc imaging has been shown to have adequate sensitivity for localizing abdominal infection at 4 hr after reinsertion (2). Therefore, the presence of physiologic abdominal uptake of 99mTc-leukocytes and their rate of migration to acute and chronic abdominal abscesses before 4 hr will dictate the acceptability of earlier 99mTc imaging for routine use. In this context, some of the points in the letter of Spinelli et al. (1) warrant further comment.

Although Vorne et al. (4) reported abnormal 99mTc uptake at 0.5 hr in all their patients with inflammatory or infectious disease, minimal (i.e., at least some) activity in the bowel was also reported up to 4–6 hr. From the point of view of early imaging, 99mTc-HMPAO leukocytes offer no advantage over 111In-leukocytes for the evaluation of inflammatory bowel disease, since the latter will also be taken up by inflamed bowel within 2 hr after reinsertion (5). In addition to obscuring uptake of 99mTc in case 1 of Spinelli et al., there appears to be uptake in the left and right kidneys, and the abnormal uptake in the right hypochondrium could be interpreted as physiologic uptake in the ascending and transverse colon. Moreover, the obscuring uptake in the right iliac fossa is in the same anatomic region as the false-positive uptake at 4 hr in Fig. 2A of our own study (2). Although other abnormal areas of uptake cannot be discerned in cases 2 and 3 of Spinelli et al., only one in four false-positive 24-hr 99mTc scans were also false-positive at 4 hr in our study. In their case 3, it would have been interesting to know how much of the intense abscess uptake was due to coincidental Crohn's disease.

Before 99mTc-HMPAO leukocyte scanning earlier than 4 hr after reinsertion can be adopted as the routine method for detecting intraabdominal sepsis, the following points must be proved:

1. Physiologic bowel uptake is never present at this time.
2. Technetium-99m scans of abdominal infection will always be positive by this time regardless of the rate of leukocyte migration to the abscess (i.e., degree of chronicity of the infection).

Further to the second point, nuclear medicine services must be confident that there is no point in continuing to scan at later times when physiologic bowel uptake is bound to be present. Serial imaging would restrict the use of the gamma camera for other patients, and, thus, for a busy imaging service, some of the benefit of 99mTc-leukocytes over 111In-leukocytes would be eliminated.

These points can only be answered by studying a large number of patients, and they are not satisfied by the anecdotal data presented by Spinelli et al. Therefore, there is a need for a prospective evaluation of 99mTc-HMPAO labeled leukocytes in intraabdominal sepsis at imaging times earlier than 4 hr after reinsertion, preferably in comparison with the existing technique of 111In-leukocytes. Until the results are known, we repeat our original conclusion that 111In-leukocyte imaging should remain the method of choice for investigating intraabdominal sepsis.

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A New Radiochemical Method to Determine the Stability Constants of Metal Chelates Attached to a Protein

TO THE EDITOR: A recent contribution in the Journal (1) discusses what is reported to be a new method for the determination of the stability constants of metal chelates attached to a protein. We read this article with interest, however, we believe that there are many problems which will negate stability constants measured by this new approach.

The basic Equations 1 and 2 reported to represent the reactions disregard several facts:

1. Fe(III) does not exist as an aquo ion above pH 2 and the In(OH)4 would precipitate above pH 4.
2. Fe(III) complexes are several orders of magnitude more stable than In(III) complexes.

Equations 1 and 2 assume that protonated complexes do not exist. At pH values where Fe(OH)3 will not precipitate, protonated complexes become important. Equations 3 and 4 also neglect species that will be present. Much of the Fe(III)-NTA will be converted to hydrolysis products, particularly the hydroxo complex Fe(OH)NTA2⁻, and the μ-oxo dimer, [NTAFe-O-FeNTA]2²⁻, depending on the concentrations. It should also be noted that:

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