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Reply

We have reanalyzed the patient data from our left-ventricular volume study (*1*) using the method of Hutton et al. (*2,3*) and have made the following observations:

1. In eight of the 12 patients, a well-defined end point to the volume-time curve obtained from the gated phase of the study could not be found. This is presumably due to fluctuations in heart rate occurring during the gated phase of the study. We were thus unable to determine the mean transit time needed to apply their method.

2. In the four patients in which a well-defined end point was found, the two methods yielded values for left-ventricular volume that differed by no more than 5%. The mean deviation was 2.8%.

In 16 additional patients, we have obtained similar results, which were not included in our original study.

Our model assumes that the time-averaged left-ventricular activity is the average of systolic and diastolic activities. While this may not be theorically justified, experience has shown that in practice the two averages are very nearly equal.

The use of RBCs labeled in vitro has a distinct advantage over in-vivo-labeled cells in that left-ventricular volumes and cardiac outputs may be found as percentages of total blood volume when this has not been determined. We have found a strong correlation between the cardiac output expressed as a percent of total blood volume and the conventional cardiac index. It may thus be possible to obtain an index of cardiac output without any wet-lab procedures.

While our model may not be theoretically perfect, it presents a conceptually and computationally simpler method for obtaining useful clinical information.

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Re: Normal Appearance and Reproducibility of Liver-Spleen Studies with Tc-99m Sulfur Colloid and Tc-99m Microalbumin Colloid

An ample and occasionally excellent literature documents the significance of specific imaging patterns in diagnosing hepatocellular disease (*1,2*). Inhomogeneity, bone-marrow uptake, enhanced splenic uptake, and lung uptake all have certain discriminant value in detecting disease. As expected, normal individuals imaged by Klingensmith et al. with sulfur colloid and with albumin colloid showed no such findings, except "normal" variability (*3*). Nevertheless, the authors reached a general conclusion about the relative clinical utility of these two RES-imaging agents. The process of inference demands more, and such a conclusion appears premature.

The work of Kloiber et al.—cited to support conclusions on differences in background—was performed with an agent quite different in character from that used by the authors (*4*). Further, the reference to higher background in albumin colloid images is not borne out by the authors' own data. They show comparable blood levels for the two agents at 30 min after injection, slightly faster hepatic extraction of albumin colloid, and essentially similar regional ratios otherwise (*3,5*). Finally, as indicated by labeling efficiency of 99%, any thyroid uptake seen over unmarked overexposed albumin colloid images is negligible. Such activity reflects the biodegradable nature of the new imaging agent and does not significantly enter dosimetry considerations.

Nonetheless, this technically well-performed trial is important to clinicians in re-emphasizing the wide variability in normal spleen-to-liver (S:L) uptake ratios of colloidal imaging agents. The S:L ratios of 0.97 ± 0.29 and 0.98 ± 0.33 obtained from sulfur colloid and albumin colloid, respectively, confirm earlier data of Wasnick et al. showing normal sulfur colloid S:L ratio and variability of 0.77 ± 0.2 (*6*).

As to the clinical utility of the albumin colloid kit, the article omits mention of the two technical reasons it was developed. First, the kit is "instant," requiring only the addition of technetium generator eluate. This eliminates the need for boiling or multiple chemical additions and reduces radiation exposure incurred in preparation. Second, unlike sulfur colloid, albumin colloid is biodegradable.

The agent was designed to simplify current clinical practice, not to change it. Indeed, the clinical studies of Klingensmith et al. confirm the essential equivalence of biodistribution of the two colloids. Data collected during clinical trials of albumin colloid in patients, in which the authors participated, document the utility of the new agent in detecting hepatocellular disease as well as space-occupying lesions.*

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FOOTNOTE

* Data on file, New England Nuclear Corp.

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