# LETTERS TO THE EDITOR

## Spleen Scanning with Tc-99m-Labeled Red Blood Cells (RBC)

We read with great interest the paper on, "A Simplified Method of Selective Spleen Scintigraphy with Tc-99m-Labeled Erythrocytes," by Armas et al. (*1*). We routinely use the Brookhaven National Laboratory (BNL) RBC kit (*2*) heated for 10–15 min in a controlled-temperature (49.5°C) waterbath, and obtain high-quality splenic images (Fig. 1). In our experience:

1. Using the BNL kit one can reinject the labeled RBCs within 20–30 min of the time blood is drawn from the patient. In the method described by Armas et al. (*1*), one has to inject the PPi-tin-containing material, wait for 30 min, incubate with pertechnetate for another 35 min, and begin scanning 1–2 hr later. In all, it is a procedure that may take 2–3 hr, whereas using the BNL kit one can start imaging 0.5 hr after injection. It is our impression, therefore, that there is no gain in time by using the procedure proposed by Armas et al.

2. It seems to us that the 35-min heating time is unnecessarily long. We have shown that 10–15 min suffices to induce the changes in RBC that will increase splenic uptake (*3*). We notice in their images that liver uptake is prominent, probably because of overheating and fragmentation of RBCs (*3,4*).

3. We also notice visualization of lungs, kidneys, and the outline of large vessels, which may be due to in vivo labeling of RBCs and vascular endothelium by excess pertechnetate in the presence of circulating tin. Moreover, the injected tin may persist in the circulation for a long time and thus may interfere with subsequent radionuclide studies as well as possibly causing hemolysis.

4. We consistently get over 95% labeling yield using the BNL kit. We note, however, that there is no quality-control procedure yet reported that will determine the percentage of damaged cells in the entire population of labeled red cells.

It seems to us, therefore, that the additional steps necessary with the BNL kit are outweighed by the drawbacks of the proposed method.

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**FIG. 1.** Splenic images in patient with Tc-99m-labeled heat-treated red blood cells. Spleen is enlarged, with two areas of infarction.

REFERENCES

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2. SMITH TD, RICHARDS P: A simple kit for the preparation of $^{99m}$Tc-labeled red blood cells. *J Nucl Med* 17:126–132, 1976
3. SOM P, ANSARI AN, OSTER ZH, et al: Effects of heating on the size-distribution and differential uptake of Tc-99m-red blood cells (RBC) by spleen and liver. *J Nucl Med* 21:P44, 1980 (abst)
4. WAGNER HN, JR, RAZZAK MA, GAERTNER RA, et al: Removal of erythrocytes from the circulation. *Arch Intern Med* 110:90–97, 1962

## Reply

We appreciate the interest Drs. Som and Oster have expressed in our paper on "Simplified Selective Spleen Scintigraphy" (hereafter called S$^4$), and we hasten to assure our Brookhaven colleagues that we believe the Brookhaven kit provides the very best way to label RBCs with technetium-99m. Alas, the radiopharmaceutical representatives who frequent our laboratory tell

**TABLE 1.**

| Step no. PPi | Time S$^4$ | Time BNL |
|---|---|---|
| 1. Inject cold PPi and wait | 20–30 min | 0 |
| 2. Label and heat cells | 45 min | 30 min |
| 3. Sequestration time | comparable | — |
| 4. Physician time to fill out IND patient forms | 0 | 30 min |
| 5. Imaging time | comparable | — |
| | Total 65–75 min | 60 min |