term "angiogram", your malpractice insurance premium may suddenly increase.

Why not avoid this dilemma by using a descriptive term which is not as open to criticism? I propose the term *"perfusion distribution study"*. This may not be very euphonious, but at least it calls a spade a spade and does not appropriate terminology used in other fields. If we in nuclear medicine agree on one suitable term and use it consistently, we may find it easier to communicate with our colleagues.

JAN K. SIEMSEN
Los Angeles County-University of Southern California Medical Center
Los Angeles, California

TECHNETIUM-LABELED RED CELLS

In a recent publication, Korubin and coworkers reported on "The evaluation of technetium-labeled red cells for determination of red cell volume in man" (*1*).

The authors labeled two different aliquots of red blood cells (RBC) with ^{51}Cr-chromate (^{51}Cr) and ^{99m}Tc-pertechnetate (^{99m}Tc), respectively; a mixture of equal amounts of both aliquots was reinjected intravenously. In blood samples taken serially thereafter, the authors determined a constant ^{51}Cr specific activity (SA) of the RBCs; in contrast, the ^{99m}Tc SA of the RBCs decreased gradually. The authors concluded that gradual elution of ^{99m}Tc from RBC occurs in vivo.

This conclusion cannot necessarily be derived from the published data: Eckelman, et al (*2*) have shown that treatment of RBCs with tin chloride ($SnCl_2$) in high doses (0.5 mg $SnCl_2$/ml RBC) leads to their rapid splenic sequestration. Therefore, it seems possible that treatment of RBCs with low doses of $SnCl_2$, as used by Korubin, et al (*1*) during the ^{99m}Tc-labeling procedure might induce low-grade splenic sequestration of RBCs as well. The decreasing SA of ^{99m}Tc-labeled RBCs may then be due to such splenic sequestration of the $SnCl_2$-treated RBCs rather than in vivo elution of the red cell label.

Using a method almost identical to that of Korubin, et al (*1*), we (*3,4*) performed similar studies to evaluate the usefulness of ^{99m}Tc-labeled RBCs for the determination of the red cell volume in man. When we labeled two different aliquots of RBCs with ^{51}Cr and ^{99m}Tc, respectively, we obtained results very similar to those reported by Korubin, et al (*1*). To evaluate whether the decreasing SA of ^{99m}Tc-labeled RBCs in vivo is due to their splenic sequestration or to in vivo elution of the label, a second series of experiments were performed with RBCs labeled with ^{51}Cr and ^{99m}Tc simultaneously. After reinjection of these double labeled RBCs, we again found a decreasing ^{99m}Tc SA of the red cells while their ^{51}Cr SA remained constant. These results confirm that the dose of $SnCl_2$ used in our ^{99m}Tc-labeling procedure (0.01 mg/ml RBCs) does not induce splenic sequestration of ^{99m}Tc-labeled RBCs but that in vivo elution of ^{99m}Tc from RBCs is responsible for their decreasing SA.

We agree with Korubin and coworkers (*1*) that ^{99m}Tc is a useful RBC label to determine the red cell volume in man. Compared with radiochromium, it often may be advantageous, as it is readily available, can be used repeatedly in short intervals, represents a much lower radiation burden to the patient, and does not interfere with other ^{51}Cr studies often used in hematological examinations (e.g., platelet or white cell labeling studies).

H.-P. LOHRMANN
National Cancer Institute
Bethesda, Maryland
H. HEIMPEL
University of Ulm
Ulm, Germany

REFERENCES

1. KORUBIN V, MAISEY MN, MCINTYRE PA: Evaluation of technetium-labeled red cells for determination of red cell volume in man. *J Nucl Med* 13: 760–762, 1972

2. ECKELMAN W, RICHARDS P, ATKINS HL, et al: Visualization of the human spleen with ^{99m}Tc-labeled red blood cells. *J Nucl Med* 12: 310–311, 1971

3. LOHRMANN H-P, HEIMPEL H: Blutvolumenbestimmung mit ^{99m}Tc-Pertechnetat-markierten Erythrozyten (blood volume determination with ^{99m}Tc-pertechnetate-labeled red cells). Presented at 10th Annual Meeting of German Society of Nuclear Medicine, Freiburg, September 27–30, 1972

4. LOHRMANN H-P, HEIMPEL H: The use of ^{99m}Tc-pertechnetate for the determination of red cell volume. *Klin Wochenschr* 51: 141–142, 1973

THE AUTHOR'S REPLY

I have read with interest the results of Drs. Lohrmann and Heimpel and am pleased to find that they have corroborated our findings as previously published in the *Journal of Nuclear Medicine*. I think their results and our continued experience with the use of ^{99m}Tc-labeled erythrocytes indicate that this is a very useful agent for the measurement of red cell mass in man and, because of the lower radiation

dose, probably should be the method of choice for the majority of patients referred for such studies. However, because of the relatively early elution rate of technetium from the red cell, this method of red cell mass determination probably should not be used in patients who can be predicted to have delayed mixing times, i.e., patients who do not have complete mixing of the labeled, infused cells by 30 min postinjection (patients with markedly severe polycythemia and giant splenomegaly).

PATRICIA A. McINTYRE
Johns Hopkins Medical Institutions
Baltimore, Maryland

^{203}Pb: A POTENTIAL RADIONUCLIDE FOR SKELETAL IMAGING

The metabolism of lead is well known to be similar to calcium and therefore is a bone seeker. However, no attempt has been made so far to use radioactive lead isotopes for bone imaging. The radionuclide ^{203}Pb decays completely by electron capture to stable ^{203}Tl with a half-life of 52 hr (*1*). The primary radiations in the decay are 280-keV gamma rays (80%) and thallium K x-rays (90%) with an average energy of about 75 keV. The carrier-free ^{203}Pb-acetate is obtained (from New England Nuclear Corp.) at a moderate cost with a radiometric purity greater than 99%. About 800 μCi of this solution has been injected intravenously in an adult rabbit. A whole-body image, shown in Fig. 1, has been obtained with a scintillation camera (Nuclear-Chicago Pho/Gamma HP) in three exposures with 280-keV gamma rays.

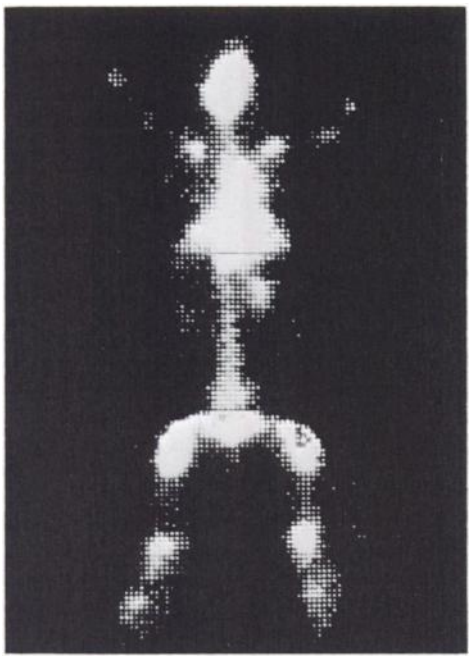

FIG. 1. Whole-body posterior image of rabbit taken 3 days after intravenous administration of 800 μCi of ^{203}Pb-acetate. Localization in skeleton can be noted as well as some residual activity in liver and kidneys.

The radiation dose from 100 μCi of ^{203}Pb to the whole-body and skeleton is estimated to be 0.03 and 0.06 rad, respectively (details of these calculations and the biological distribution in animals will be presented in later publications). The activity in the liver and the kidneys may be reduced by using chelates with intermediate stability constants (for example HEDTA) as suggested by O'Mara and Subramanian (*2*). The convenient shelf-life of 2.2 days, relatively low radiation dose to the patient, and the ready availability of this radionuclide makes it interesting to consider for bone studies.

DANDAMUDI V. RAO
PAUL N. GOODWIN
Albert Einstein College of Medicine
Bronx, New York

ACKNOWLEDGMENTS

This work is supported by the American Cancer Society Institutional Research Grant IN-28M.

REFERENCES

1. LEDERER CM, HOLLANDER J, PEARLMAN I: *Table of Isotopes,* 6th ed, New York, John Wiley, 1967, p 371

2. O'MARA RE, SUBRAMANIAN G: Experimental agents for skeletal imaging. *Sem Nucl Med* 13: 38–49, 1972

EFFECT OF INHIBITOR CONCENTRATION ON RADIOIMMUNOASSAY OF PLASMA RENIN ACTIVITY

We refer to the article by Chervu, et al (*1*) on the "Determination of plasma renin activity by radioimmunoassay: comparison of results from two commercial kits with bioassay" and note with interest that the authors used 10 μl of the inhibitor Dimercaprol for the Schwarz-Mann Kit even though the amount recommended was 2 μl. We are in the process of conducting trials with a similar kit manufactured by SORIN. During the trial, SORIN changed the constituents of their kit, the main difference being an increase from 2 to 6 μl in the amount of Dimercaprol used. We compared results using both