

TO THE EDITOR: The abstract entitled "Radiation Dosimetry of Indium-111-Labeled Granulocytes", published in *JNM* (1994; 35:159P) and presented at the 41st Annual Meeting of the Society of Nuclear Medicine, contained certain errors relating to incorrect estimates of lung and renal masses. The corrected radiation dosimetry values for these and other organs are listed in Table 1.

We apologize for these errors and for any inconvenience

TABLE 1
Dosimetric Values for Indium-111-Granulocytes

| Organ | Dose (mGy/MBq) | Dose (rads/mCi) |
|-------------|----------------|-----------------|
| Kidney | 0.51 ± 0.10 | 1.88 ± 0.38 |
| Lungs | 0.42 ± 0.09 | 1.55 ± 0.34 |
| Liver | 1.58 ± 0.45 | 5.85 ± 1.68 |
| Bone marrow | 0.78 ± 0.23 | 2.90 ± 0.83 |
| Spleen | 4.11 ± 1.77 | 15.2 ± 6.6 |
| Testes | 0.021 ± 0.009 | 0.078 ± 0.03 |
| Ovaries | 0.13 ± 0.02 | 0.49 ± 0.06 |
| Whole body | 0.17 ± 0.03 | 0.65 ± 0.12 |

caused to you and to readers of *JNM*.

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Fast Acquisition for Technetium-99m Sestamibi SPECT

TO THE EDITOR: DePuey et al. (1) reports the rapid acquisition of myocardial SPECT images with ^{99m}Tc-MIBI. The authors have shown that the imaging time can be reduced to 8 min for stress studies and 10 min for rest studies with a single-head camera without sacrificing image quality. The study, however, used a 2-day protocol, which is inconvenient for patients and delays the diagnosis when compared to a 1-day protocol.

We previously reported our early results in 20 patients who had both rapid and conventional MIBI SPECT studies using a 1-day rest/stress protocol (2). We used 7 mCi MIBI for the rest studies compared to the 22 mCi used by DePuey et al. The stress dose was 23 mCi. Patients were scanned in the morning for 10 min and again for 30 min 1 hr after injection at rest. The order of the studies was randomized. Patients returned in the afternoon and were scanned for 5 min and again for 30 min one-half hour after stress imaging in the same order as the morning acquisitions. The 5- and 10-min images were acquired with a general, all-purpose collimator using continuous acquisition over a 180° arc. The images were processed with a 0.35/5 Butterworth filter. The 30-min images were acquired in step-and-shoot mode using a high-resolution collimator. Rest images were processed with a 0.40/5 Butterworth filter and stress images were processed with a 0.52/10 Butterworth filter. Images were read without knowledge of the clinical history

or imaging protocol. Scans were correlated with the results of coronary arteriography in all cases. Stenoses ≥50% were considered significant.

On a vessel-by-vessel basis, the sensitivity and specificity of the rapid protocol was 18/33 (55%) and 21/27 (78%), respectively, whereas the values for the conventional protocol were 12/33 (36%) and 24/27 (89%). The lower sensitivity for the conventional protocol was surprising, but it may be due to the small sample size. We are currently analyzing the results in the first 40 patients. We have found that the quality of images acquired with the rapid protocol is excellent in nonobese patients. Image quality is progressively degraded by attenuation and scatter as weight increases. We have switched from thallium to MIBI for all of our routine myocardial perfusion studies because of the great savings in time. Obese patients, however, are still imaged for 30 min. Depuey et al also measured the chest circumference of their patients but did not correlate image quality with body habitus. It would be interesting to know whether a 2-day protocol with a higher resting dose of MIBI results in sufficiently good image quality to allow the rapid technique to be used in obese patients.

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TO THE EDITOR: A 37-yr-old woman was referred for ¹¹¹In-DTPA cisternography to investigate a possible cerebrospinal fluid (CSF) leak subsequent to an earlier automobile accident. The patient was a nursing mother with an 8-mo-old child. Potential radiation dose to the child was a concern due to activity in the breast milk. Therefore, a review of the literature regarding ¹¹¹In-DTPA in breast milk was made.

A recent radiopharmaceutical textbook, under the heading precautions for cisternography during breastfeeding and pregnancy, states that "... it is not known whether this radiopharmaceutical is excreted in human breast milk" (1). The literature disclosed additional studies involving ^{99m}Tc-DTPA (2,3), ¹¹¹In-leukocytes (4) and ^{113m}In chelate complex (5) in breast milk for various nuclear medicine procedures, but none for ¹¹¹In-DTPA cisternography studies.

Consideration of plausible kinetic pathways for the radiopharmaceutical, however, allowed reasonable conjecture concerning the ultimate fate of the radioactivity. If there was no leak, the radioactivity would be confined to the mother's CSF. If there was a leak, the DTPA would be cleared by the mother's kidneys. If the ¹¹¹In dissociated from the DTPA, the ¹¹¹In would be expected to concentrate in the mother's liver and spleen.

Because of the relative small amount of radioactivity (500 μCi) used in the normal diagnostic dose, the likelihood that large quantities of radioactive indium would appear in the breast milk was

considered small, and the patient agreed to the study. Breast milk samples were obtained two times after injection to estimate the radiation dose to the child.

Five hundred microcuries of ^{111}In -DTPA were injected intrathecally. Breast milk was pumped and a sample counted at 3 and 20.5 hr postinjection. The gamma well counter had a system sensitivity of 1.38×10^6 cpm/ μCi using a $0.5\text{-}\mu\text{Ci}$ ^{111}In standard and an energy window with a lower level discriminator set at 140 keV with the upper level discriminator wide open. Count rates were 60 cpm/ml at 3 hr and 35 cpm/ml at 20.5 hr. Therefore, the breast milk had an approximate specific activity of 4.3×10^{-5} $\mu\text{Ci/ml}$ at 3 hr and 2.6×10^{-5} $\mu\text{Ci/ml}$ at 20.5 hr.

We assumed that all of the radioactivity appearing in the breast milk was conjugated to DTPA and was absorbed instantaneously from the child's gastrointestinal tract into the blood pool. The child's dose per unit ingested activity was calculated using the DTPA pharmacokinetic model of McAfee et al. (6). The newborn phantom of Cristy and Eckerman (7) was also used. Assuming a 2-hr urinary bladder voiding interval, estimated radiation dose to the bladder wall was 6.4 rads/mCi (i.e., rads per millicurie ingested by the infant). All other organs received between 0.2 and 0.6 rads/mCi. Using Cristy and Eckerman's 1-yr-old model (8) and a 2-hr bladder void, the estimated bladder wall dose was 2.7 rads/mCi. All other organs received between 0.1 and 0.25 rads/mCi.

To estimate the total dose from the episode, the ingested activity was calculated. Assuming the amount of radioactivity follows a monoexponential pattern for decrease, the two data points yielded an effective half-life for ^{111}In -DTPA in the breast milk from cisternography of approximately 24 hr. Assuming 8 oz of milk per feeding, a 4-hr interval between feeds and an uninterrupted feeding schedule, the ingested activity would be approximately 1 μCi . Thus, the highest target dose estimate organ—to the bladder wall using the newborn model—would be less than 1 mrad. This is comparable to the whole-body dose arising from naturally occurring isotopes ^{14}C and ^{40}K ingested from organic foodstuffs.

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Unilateral Iodine-131 Uptake in the Lactating Breast

TO THE EDITOR: We read with interest the article by Robinson et al. (1) on ^{131}I content in breast milk following therapy for thyroid carcinoma. Up to nearly 30% of the administered amount of ^{131}I can appear in breast milk (2). There are various aspects which should be considered before administration of a diagnostic or therapeutic amount of ^{131}I :

1. As described by Robinson et al. (1), the infant effective dose and infant thyroid dose is extremely high and would require discontinuation of breast feeding for about 2 mo. In a study on the excretion of various radiopharmaceuticals in human breast milk, Robow et al. (3) stated that breast feeding is contraindicated after ^{131}I administration, even when the activity is given for diagnostic purposes (40 MBq).
2. The radiation exposure to the breast itself is high, resulting in an increase of the effective dose of the treated women in addition.
3. Iodine-131 uptake in the breast can cause difficulties in the evaluation of whole-body scintigraphy in patients suffering from thyroid carcinomas, particularly if the uptake pattern is irregular (4) and mimicks lung metastases. Bakheet and Hammami (4) described asymmetries in the majority of their patients. Unilateral uptake was observed in a patient with mastitis (4).

Under normal circumstances, breast feeding is not a major problem in women being treated for thyroid carcinoma, since they have normally discontinued feeding before admission to the hospital for surgery. We present an uncommon finding of excessive ^{131}I uptake in the left breast with nearly no visible activity on the contralateral side (Fig. 1). This 41-yr-old woman underwent a second treatment with 3.7 GBq ^{131}I for papillary thyroid carcinoma (pT2). The treatment was interrupted after the first therapy because the patient became pregnant about 2 mo after the first treatment. For 4 yr, further therapy with ^{131}I was refused by the patient. At admission, she did not mention that she was breast feeding her now 4-yr-old son. Whole-body scintigraphy was performed 2 and 7 days after ^{131}I administration. Both scans showed intense uptake of ^{131}I in the whole left breast and only a small amount of activity in the right breast. When questioned about breast feeding, she said that she has been feeding her son with only the left breast since about 3 yr. After comparison of the early and delayed scans, no shifting from the breast to the thyroid remnant, as described by Bakheet and Hammami (4), was observed in this patient. The patient was advised to discontinue breast feeding, to increase fluid intake and to use a milk pump to reduce radiation exposure.