rest in segments with normal function is not important for viability assessment but is highly predictive of significative coronary stenosis (*1,2*). In patients with coronary artery disease and wall motion abnormalities, this may affect the detection of transient ischemia as well as that of viability, thus limiting the clinical usefulness of sestamibi studies in these patients.

The solution to this problem is not represented by the potential evaluation of flow distribution and function. We previously developed several quantitative protocols for simultaneous assessment of perfusion and wall motion by using gated sestamibi imaging (*3*). However, in patients with previous myocardial infarction, the presence of multiple defects and ventricular dilatation results in wall thinning that represents an intrinsic limitation of the partial volume effect underlying this analysis. I do not believe that assessment of global function by first-pass studies may provide a perfusion-contraction match on a regional basis; on the other hand, gated SPECT studies did not yet provide definite results and require long acquisition time.

Our statement that ^{201}Tl uptake is less dependent upon the degree of regional dysfunction has been confirmed by a subsequent study from our group (*4*): it demonstrated that sestamibi showed the highest rate of false-negative (false-necrotic) results when compared with ^{201}Tl and dobutamine echocardiography. In this study, postrevascularization recovery of function was used as a gold standard for viability. An underestimation of viability by sestamibi as compared with ^{201}Tl has been also reported by Cuocolo et al. in a different study population (*5*).

The data published by Bonow et al. (*6*) do not refer to regional function and are relative to a stress-redistribution-reinjection ^{201}Tl protocol. "Fixed" mild or moderate ^{201}Tl defects (range 50%–84% of peak activity) may not even fill-in at reinjection but represent viable tissue as confirmed by the PET study. I believe that the percent uptake of ^{201}Tl at the end of a viability protocol (reinjection, late redistribution or rest study) rather than the occurrence of fill-in, should be used as an index of viability.

Dr. De Geeter refers also to the problem of the definition of normal limits. Our thresholds were defined according to 2.5 s.d. below normal values calculated in myocardial areas unrelated to coronary stenoses or wall motion abnormalities. This cutoff value (55% of the peak) was chosen on the same basis used for several ^{201}Tl studies. In a second comparative study (*4*), ^{201}Tl and sestamibi activity in normal segments averaged 77 ± 9 and 81 ± 9 of the peak, respectively. As a consequence, cutoff values were almost identical for both tracers and were similar to those reported by others that used an arbitrary cutoff around 50% of maximal uptake (*6,7*).

ROC analysis could theoretically contribute to defining the optimal cutoff level; however, I believe that the limited number of patients studied (*14*) and dyssynergic segments (73/182) limit this application; yet confidence intervals might be helpful (*4*).

In summary, the science behind the use of sestamibi for detecting viability and for predicting improvement after revascularization is in its infancy. Since its publication in 1992, this paper has remained the only one that compares sestamibi uptake and postrevascularization recovery of function. On the other hand, many abstracts recently pointed out the need for complex combined analysis of flow/function by gated planar and SPECT imaging or nitrate administration to improve sestamibi's predictive accuracy. Do we need sophisticated technology or simply the right tracer for myocardial viability?

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Rapid Diagnosis of Hyperthyroidism with Technetium-99m-MIBI

TO THE EDITOR: We have evaluated 20 patients (10 euthyroid, 10 hyperthyroid by clinical features and blood chemistry) using the method of Kao et al. (*1*) by substituting 74 MBq (2 mCi) of ^{99m}Tc-pertechnetate for ^{99m}Tc-MIBI as described previously by Atkins (*2*). Fifteen minutes after intravenous injection, the thyroid was imaged with a gamma camera (Elscint SP6 HR) using a pinhole collimator; Counts (100,000) were acquired at 7 cm from the neck surface. Data are summarized in Table 1 (euthyroid patients) and Table 2 (hyperthyroid patients). Hyperthyroid patients had a significantly higher 15-min thyroid uptake than euthy-

TABLE 1
Technetium-99m Thyroid Uptake in Patients with Euthyroidism

Patient no.	Sex	Age	15-min ^{99m}Tc thyroid uptake
1	F	46	6.87
2	F	42	5.88
3	F	69	5.45
4	F	22	5.09
5	F	66	4.60
6	F	33	4.07
7	M	47	4.07
8	M	54	4.04
9	F	66	4.04
10	F	62	4.00

TABLE 2
Technetium-99m Thyroid Uptake in Patients with Hyperthyroidism

Patient no.	Sex	Age	15-min ^{99m}Tc thyroid uptake
1	F	45	40.94
2	M	23	40.44
3	F	42	37.55
4	M	42	36.49
5	F	38	30.46
6	F	55	29.50
7	F	44	26.30
8	F	51	26.00
9	F	29	16.20

roid patients: 29.99 ± 2.88 (s.e.m.) versus 4.81 ± 0.31 (s.e.m.), $p < 0.00.1$ using the Mann-Whitney U-test.

Since the patients were not pharmacologically suppressed (*3*), we fail to understand the recommendation to use ^{99m}Tc-MIBI when similar diagnostic information can be obtained with ^{99m}Tc-pertechnetate at less expense.

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Dosimetry of Technetium-94m-Teboroxime

TO THE EDITOR: We wish to comment on a few issues regarding a recent paper in the *Journal* by Nickles et al. (*1*)

- The use of "substitute" or "mock" S-values for internal dose calculations should be avoided. Although S-values are not published for all radionuclides that might be encountered in a study, calculating S-values from decay data and published absorbed fractions is straightforward. Alternatively, our center is happy to provide such information as needed. We recalculated many of the authors' estimates, using their residence times and S-values that we calculated from data in the recent MIRD decay data compilation (*2*) and absorbed fractions for the adult male phantom of Cristy and Eckerman (*3*). Our dose estimates were 0 to +75% different for ^{94}Tc, −24% to +8.5% different for ^{94m}Tc, −44% to +57% different for ^{95}Tc, +13% to +85% different for ^{95m}Tc, and +5.5% to +120% different for ^{96}Tc (Table 1). In almost all cases, our values were lower than those of Nickles et al. It is good that the published values are conservatively high, but the differences are significant in many cases, and this could have been avoided.
- The paper did not clearly show all of the residence times employed in the calculations. Although the authors stated that a remainder of the body residence time was calculated, it was not shown in the tables. Authors should *clearly* show all residence times and the methods used, if the results are to be useful to others.
- The authors neglected to calculate the radiation dose to the gallbladder wall, believing that it is small, but they did not explain how this was determined. They stated they had used the *ICRP 30* tract model (*4*), but this model does not include a liver or gallbladder. The gallbladder is a relatively small organ and can receive a significant radiation dose with even a relatively small residence time.

Table 1
Comparison of Dose Estimate Values by Nickles et al. and RIDIC

Isotope	Organ	Residence Time (hr)†	Radiation dose* (mrad) Nickels et al.	RIDIC	% Difference‡
^{94}Tc	Liver	0.18	35	20	+75
	SI	0.18	49	33	+48
	ULI	0.21	57	44	+30
	LLI	0.15	51	40	+28
	Gonads (ovaries)	—	44	29	+52
	Marrow	—	17	17	0
	Remainder	4.62	—	—	—
^{94m}Tc	Liver	0.174	236	225	+4.9
	SI	0.084	212	223	−4.9
	ULI	0.024	157	154	+1.9
	LLI	0.002	64	59	+8.5
	Gonads (ovaries)	—	52	68	−24
	Marrow	—	52	61	−15
	Remainder	1.06	—	—	—
^{95}Tc	Liver	0.18	55	35	+57
	SI	0.5	94	78	+21
	ULI	1.17	125	105	+19
	LLI	1.18	133	120	+11
	Gonads (ovaries)	—	45	80	−44
	Marrow	—	50	46	+8.7
	Remainder	24.5	—	—	—
^{95m}Tc	Liver	0.125	15	8.1	+85
	SI	0.0625	17	14	+21
	ULI	2.5	17	12	+42
	LLI	5.0	17	15	+13
	Gonads (ovaries)	—	17	15	+13
	Marrow	—	17	13	+31
	Remainder	1800	—	—	—
^{96}Tc	Liver	0.182	409	186	+120
	SI	0.545	552	379	+46
	ULI	1.78	630	408	+54
	LLI	2.75	752	511	+47
	Gonads (ovaries)	—	425	403	+5.5
	Marrow	—	343	273	+26
	Remainder	118	—	—	—

* Radiation dose from amounts of isotope assumed to appear with 1 mCi of ^{94m}Tc (100 μCi ^{94}Tc, 170 μCi ^{95}Tc, 0.8 μCi ^{95m}Tc, 77 μCi ^{96}Tc).
† Residence time as stated in Nickles et al (*1*).
‡ % difference of Nickles et al. from RIDIC.