Therefore it would be appropriate to state that decreased perfusion in inflated areas is the primary event, resulting in redistribution of blood flow (hyperperfusion) through nonventilated areas.

Overall, we agree that, besides PE, the possibility of PEEP-induced abnormalities also should be considered when ventilatory-dependent patients undergo lung scintigraphy, and we appreciate the confirmation of the generality of findings described by us and others (*1–3,12*).

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Preparation of [^{99m}Tc]HM-PAO

TO THE EDITOR: Technetium-99m d,l-hexamethyl propyleneamine oxime ([^{99}Tc]HM-PAO) is a new radiopharmaceutical that is being used extensively in regional cerebral perfusion studies (*1*) and in labeling of blood cell elements (*2*).

The efficient use of this radiopharmaceutical is often limited because the technetium labeling of a freeze-dried HM-PAO kit produces an assortment of impurities (pertechnetate, reduced-hydrolyzed technetium, and secondary complex), which change with time.

Kit instructions recommend a maximum of 1.11 GBq (30 mCi) of pertechnetate; eluate eluted <2 hr previously from a generator eluted no more than 24 hr before, and utilization of the [^{99m}Tc]HM-PAO within 30 min of reconstitution (*3*).

We have noted that, along with the economical and practical problems associated with these instructions, 30 min after preparation the radiochemical purity is not >85%.

To avoid these problems, we offer an alternative preparation which begins by dissolving the freeze-dried vial with physiological saline solution, and then separating the resulting liquid into fractions for labeling just before to use.

On four different occasions, four vials of exametazime (Amersham UK) were diluted with 5 ml of saline solution and separated into five fractions of 1 ml. At the same time, the generator eluate was separated into five doses of 0.92–1.30 GBq (25–35 mCi). Pertechnetate was added for labeling as the fractions were prepared: at 0 min (Fraction 1), at 30 min (Fraction 2), at 60 min (Fraction 3), at 120 min (Fraction 4), and at 180 min (Fraction 5).

Five minutes after each of the fractions was labeled, the lipophilic [^{99m}Tc]HM-PAO was calculated by means of the chloroform extraction method (*4*). While this process was performed on each of the fractions, the lipophilic [^{99m}Tc]HM-PAO of Fraction 1 also was calculated in order to obtain a reference of its radiopharmaceutical instability.

Table 1 compares radiochemical purity to the time elapsed between the separation of the fractions and the labeling. Better results were obtained when the fractions were refrigerated (4–8°C) for up to 240 min (Table 2).

The labeling of HM-PAO with freshly eluted technetium within 180 min and 240 min of their separation into refrigerated fractions gave 95.8% ± 1.6% and 94.0% ± 2.0% (n = 5) of [^{99m}Tc]HM-PAO lipophilic, respectively.

We conclude that the dissolving of the freeze-dried vial with saline and its separation into refrigerated fractions, which are not labeled until just prior to use, is an alternative method of preparation of [^{99m}Tc]HM-PAO with the benefit of high radiochemical purity and reduced cost.

TABLE 1
Radiochemical Purity Results

	Times				
	0 min	30 min	60 min	120 min	180 min
% [^{99m}Tc]HM-PAO Lipophilic	(Fraction 1) 95.0 ± 2.7	(Fraction 2) 94.1 ± 4.2	(Fraction 3) 92.0 ± 5.1	(Fraction 4) 84.1 ± 7.0	(Fraction 5) 74.0 ± 20.9
% [^{99m}Tc]HM-PAO Lipophilic	(Fraction 1) 95.0 ± 2.7	(Fraction 1) 78.5 ± 5.0	(Fraction 1) 73.5 ± 7.4	(Fraction 1) 54.2 ± 6.9	(Fraction 1) 40.5 ± 10.1

TABLE 2
Radiochemical Purity Results with Refrigerated Fractions

	Times				
	0 min	60 min	120 min	180 min	240 min
% [^{99m}Tc]HM-PAO Lipophilic	(Fraction 1) 97.0 ± 0.7	(Fraction 2) 96.6 ± 0.4	(Fraction 3) 92.6 ± 1.6	(Fraction 4) 89.0 ± 5.2	(Fraction 5) 79.8 ± 9.9
% [^{99m}Tc]HM-PAO Lipophilic	(Fraction 1) 97.0 ± 0.7	(Fraction 1) 82.6 ± 10.3	(Fraction 1) 68.9 ± 17.5	(Fraction 1) 47.8 ± 8.7	(Fraction 1) 31.5 ± 12.2

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Radioactivity Variations in Cobalt-57 Cyanocobalamin Capsules

TO THE EDITOR: In a letter published recently in the February 1989 issue of the *Journal of Nuclear Medicine*, concern was raised about the variation in radioactivity between cobalt-57 cyanocobalamin capsules.

The U.S. Pharmacopeia Drug Standards Division and the U.S.P. Radiopharmaceutical Advisory Committees brought this information to the attention of the Food and Drug Administration (FDA), Division of Drug Quality Evaluation, Office of Compliance. We have been told that the current standards are adequate for good manufacturing practices of cyanocobalamin, although a letter dated August 11, 1989, from the Compendial Operations Branch of the FDA Center for Drug Evaluation and Research, indicates that "it would certainly be advisable to assay each capsule prior to use."

10 CFR 35.53 now requires dose calibrator assays of photon emitting doses only in excess of 10 μCi. We have been informed that the FDA will propose to the NRC a modification of 10 CFR 35.53 to require a dose calibrator assay of all photon emitting human doses, regardless of the amount of activity.

We bring this to your attention, so that your readers might know that the U.S.P. and Society of Nuclear Medicine Pharmacopeia Committee will respond to all concerns expressed in this area.

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