

thermore, it is noteworthy that Drs. Siegel and Maurer and their co-workers found that the TF calculated individually by this means were often at considerable variance with the TF determined by their buildup factor technique. (5). We have some reservations in accepting the notion that use of the buildup factor technique should supplant techniques using only the LAO image. The buildup factor method requires obtaining an LAO image and an orthogonal right posterior oblique (RPO) image and calculations of net counts in both ventricular regions of interest. Isolation of the left ventricle from other structures, especially an enlarged left atrium, and accurate definition of the left ventricular region of interest in the RPO view is apt to be difficult in some patients, even with the help of a first-pass RPO image as applied by the Temple group. Background subtraction is required from both views in this technique; thus, errors from background subtraction might be further amplified. The extra time required for the two RPO images is a major practical disadvantage. The laborious calculation requiring computer assistance is also a practical disadvantage, albeit a minor one. We hope that active investigation and spirited discussions in this area of interest continue. Accurate determination of ventricular volumes by an easily applied noninvasive technique is so important that the search for the best possible technique should continue.

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Cerebral Perfusion Imaging

TO THE EDITOR: Little is known about the mechanism of retention of the "chemical microspheres" for cerebral perfusion imaging with single photon emission computed tomog-

TABLE 1
Stability of [²⁰¹Tl]DDC and [^{99m}Tc]HM-PAO in Chloroform

Minutes after extraction	% Bound*	
	[²⁰¹ Tl]DDC† N = 6	[^{99m} Tc]HM-PAO N = 5
0‡	94.6 ± 1.1	88.6 ± 2.6
2	31.8 ± 16.4	92.6 ± 5.7
5	12.9 ± 5.8	94.5 ± 2.8
10	10.8 ± 3.2	85.9 ± 8.5

Each value is mean ± s.d. for N determinations.

* Determined by chromatography using methods described in Refs (2) and (4), respectively.

† Results from Ref. (3).

‡ Bound in aqueous solution before extraction.

raphy: iodine-123 iodoamphetamine ([¹²³I]IMP), [¹²³I]N,N,N'-trimethyl-N'-(2-hydroxy-3-methyl-5-iodobenzyl)-1,3-propanediamine, thallium-201 diethyldithiocarbamate ([²⁰¹Tl]DDC), and technetium-99m (^{99m}Tc) HM-PAO. Hypotheses have included an amine receptor, pH-shift trapping, and a change in chemical form, either metabolic or spontaneous (1).

In their recent paper, van Royen et al. (2) speculate that "the [²⁰¹Tl]DDC complex falls quickly apart in vivo and distributes as the ²⁰¹Tl ion." We have obtained in vitro evidence which supports this suggestion (3): when [²⁰¹Tl]DDC is extracted into chloroform, it decomposes rapidly (half-time <2 min) and spontaneously into a polar species which behaves like the ²⁰¹Tl ion on chromatography (Table 1). [²⁰¹Tl]DDC is quite stable in aqueous solution but appears to fall apart rapidly in lipid medium.

It has also been suggested that technetium-99m d,l-hexamethylpropyleneamine oxine ([^{99m}Tc]HM-PAO) (4) is retained in the brain due to a rapid change in chemical form (1). However, we have shown that [^{99m}Tc]HM-PAO undergoes little decomposition when extracted into chloroform (unpublished results from this laboratory). In fact, the behavior of [^{99m}Tc]HM-PAO is the opposite of that of [²⁰¹Tl]DDC: [^{99m}Tc]HM-PAO decomposes fairly rapidly in aqueous solution but is quite stable in lipid medium. Therefore, it seems unlikely that the trapping of [^{99m}Tc]HM-PAO in the brain is due to rapid spontaneous decomposition, and thus may alternatively involve metabolic alteration or receptor binding.

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