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REPLY: We appreciate the careful study of our paper by Mr. Mullani, an experienced and innovative PET researcher. We believe the points raised in his letter do not affect the conclusions drawn in our paper. Each of his points are addressed below.

1. The "resolution frequency" is an ill-defined concept for a blurring function, such as a Gaussian, which tapers off continuously. Thus, we chose not to use that concept in our paper. Instead, we computed the correct integrals exactly and left it to the reader to draw conclusions from the graphical data. The fact that our results are expressed in units of full-width at half maximum (FWHM) does not mean that this measurement was assigned any special significance. Data derived from Mullani's phantom do not refute our conclusions.

2. The frequency-domain characteristics of a bar and a sphere are indeed different. The case of a flat object, such as a myocardial wall lying in the transaxial plane, can be treated by analysis of a "slab" of activity with infinite extent in the transaxial plane and finite axial dimension. Thus, the integral expressions reduce to the simple one-dimensional form. Figure 1 shows a new analysis for this case presented along with the three-dimensional data from our paper. Note that the uncertainty in the recovery coefficient (E_{rc}) is actually less for the one-dimensional case than for the sphere, a result apparently opposite to that suggested by Mullani. This finding is intuitively plausible if one considers that the maximum activity in a sphere declines with increasing axial offset because of transaxial blurring of the progressively smaller cross-sectional area of the sphere. The infinite slab has constant activity as a function of offset except near the edge of the bar. Note that the recovery coefficient for a sphere will be lower than that for a bar of the same thickness; however, our analysis refers to the *variability* of the recovery coefficient with position, not its actual value. Results for the aliasing measure (Q_a) are also very similar for the slab and the sphere.

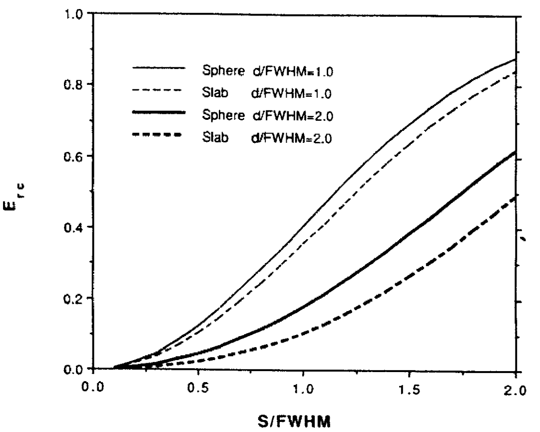

FIGURE 1
The measure of variation in the recovery coefficient, E_{rc}, is shown as a function of the ratio of slice spacing-to-resolution (S/FWHM). Results are shown for the two ratios of object size-to-resolution (d/FWHM) for a sphere and a slab.

3. We agree that the acceptable sampling error depends on the application. That is the reason we presented complete graphical data; the investigator or tomograph designer can choose the appropriate slice spacing according to the imaging situation. Note that variability in the recovery coefficient only falls to zero for infinitely close spacing.

In summary, we believe our principal conclusion, slice spacing should be approximately one-half the full-width at half-maximum, is valid. We believe we are in basic agreement with Mullani. In fact, his great practical experience with tomograph design strengthens our shared opinions.

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Geometric Methods for Determining Left Ventricular Volume

TO THE EDITOR: The article "Left Ventricular Volume Calculation Using a Count-Based Ratio Method Applied to Multigated Radionuclide Angiography" by Massardo et al. (*1*) adequately delineates the disadvantages of geometric methods for determining left ventricular volume by radiocardiography and describes the limitations of heretofore reported count-proportional nongeometric methods. The authors describe the theory and application of a "count-proportional reference volume" method for determination of left ventricular volumes. They imply that this method avoids the pitfalls of geometric methods and retains the advantages of a nongeometric count proportional technique without the need for blood sampling and attenuation correction.

I suggest that this implication is erroneous. The method described is nothing more than a geometric model employing a sphere and an indirect measurement of its diameter rather than the more sophisticated prolate ellipsoid as described by Dodge et al. (*2*) for contrast angiocardiography and as applied to radiocardiography by Strauss et al. (*3*).

Consider the prolate ellipsoid representing the left ventricle (LV) generated by rotation of the ellipse

$$\frac{X^2}{\left(\frac{L}{2}\right)^2} + \frac{Y^2}{\left(\frac{S}{2}\right)^2} = 1,$$

where L and S are the long- and short-axes, respectively.