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REPLY: We thank Dr. Shaffer for kindly pointing out that the time per frame information is stored in the MDS image study. Indeed, all the MUGA studies we evaluated were acquired on the Siemens systems and the time per frame information was not available in version 6.2, and thus had to be calculated as we described. It must be emphasized that the only way to obtain an accurate frame duration is by storing it with the patient data at the time of image acquisition. There is no reason for a commercial supplier of MUGA software to ignore this parameter either at the time of image acquisition or during subsequent analysis. Other points of concern discussed by Shaffer should be clarified.

1. The dominant frequency that we describe is Fourier frequency one or the first harmonic, which corresponds to one complete cardiac cycle per R-R interval.
2. Our primary interest in this study was evaluation of diastolic parameters, and thus the cutoff frequency guidelines for these parameters as prescribed by Bacharach et al. (*1*) were used. It was not our intention to describe an optimal noise reduction filtering technique. To avoid "ringing" artifacts associated with using a strictly truncated Fourier series, the Fourier transform of the ventricular volume curve was modified with a Hann filter window starting at one harmonic below the prescribed cutoff frequency and extending to one harmonic above the cutoff frequency. Lower frequency components were unaltered.
3. We used a three-frame preprocessing 1-2-1 temporal filter with wrap around at the boundaries. This is a rather moderate filter when applied to 32-frame MUGA studies and does not significantly affect our results. The temporally filtered images provide for greatly improved reproducibility in edge detection. The cutoff frequency of this filter is at the Nyquist frequency, and its magnitude falls only by 22% at frequency 6, which is the maximum cutoff frequency used in our analysis.
4. The ventricular volume curve was replicated to form three consecutive cardiac cycles with the first and third cycles scaled so that there are continuous boundaries between each cycle. Low-pass filtering, the derivative curve, and interpolation were all done on the replicated curve. The middle cycle was then extracted for analysis. The introduction of false high frequencies as pointed out by Shaffer is most significant at the endpoints and not at the center of the filtered data set. Thus, such effects are at a minimum for the middle cardiac cycle.
5. Shaffer is correct that the method of filtering can alter ventricular parameter results, and may affect reproducibility of measurement. This is one area that we did not discuss in detail and perhaps should have. A measurement of statistical certainty in the data such as that suggested by Bacharach by computing a signal to noise index to determine the appropriate degree of filtering should be included in any analysis.

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Corruption of Brain SPECT Studies Caused by Error in Uniformity Correction Algorithm

TO THE EDITOR: We wish to bring to the attention of the readers a problem with the reconstruction of brain SPECT studies on a commercial SPECT system (400 AC Starcam, General Electric, Milwaukee, WI). The standard technique for the acquisition of such studies employs a 64 × 64 matrix with a zoom of 1.6 and an offset so that the lower portion of the field of view is imaged. In our institution, the uniformity correction map for this system is generated from a 30-million count 128 × 128 matrix flood image obtained using a cobalt-57 (^{57}Co) sheet source. Application of the uniformity correction map to the brain SPECT images is done by interpolating the appropriate part of the correction map. It was recently discovered that this interpolation is either not performed or performed incorrectly leading to distortion of the corrected planar data and resulting in the generation of ring artifacts in the transaxial slices. Because of the nonuniform distribution of activity in the brain, recognition of these artifacts is extremely difficult from examination of the tomographic data alone.

This problem was discovered when a "hot" spot in the superior portion of the cerebral cortex was seen on several SPECT HM-PAO brain scans. Because a hot spot in this location is unusual and because of its close proximity to the center of the matrix, it was suspected that this was an artifact and related in some manner to improper uniformity correction. A complete review of the quality control tests on the system showed that the uniformity correction, center of rotation correction, energy correction, resolution, and linearity were all within acceptable limits. To test this further, two new uniformity correction maps were acquired, one a 90-million count unzoomed flood and the second a 45-million count zoomed flood that used the same offset parameters as used for the brain SPECT studies. The brain SPECT studies were then reconstructed using these new correction maps. Review of the transaxial slices showed that data reconstructed using