TABLE 1           Dose Calibrator Readings of <sup>89</sup> Sr Residual Vial Activity			
Number of vials*	Average μCi of empty vials (range)	Average μCi of same viais plus 4 mi volume (range)	Percent difference (±1 s.d.)
12	134 (110–171)	105 (82–137)	22.5% (±2.6%)

beta-emitting radionuclide, before medical use. Licensees may also use any available instrumentation to assay patient dosages containing pure beta-emitters, to satisfy this requirement.

In conclusion, accurate measurement of pure beta-emitting radionuclides with a dose calibrator is readily accomplished with proper attention to all aspects of geometric variation.

## William C. Porter Laura Eck

Henry Ford Hospital, Department of Diagnostic Radiology, Divisions of Nuclear Medicine and Medical Physics and Engineering Detroit, Michigan

## **REFERENCES**

- Herold TJ, Gross GP, Hung JC. A technique for measurement of strontium-89 in a dose calibrator. J Nucl Med Technol 1995;23:26-28.
- US Nuclear Regulatory Commission, Information Notice: IN 94-70, Issues associated with the use of strontium-89 and other beta-emitting radiopharmaceuticals. Washington, DC: NRC; September 29, 1994.

**Reply:** Although we do not dispute the fact that there are limitations inherent in using a dose calibrator to measure <sup>89</sup>Sr activity, we still believe that the technique we used provides a good means of measurement to confirm the volumetric calculation. Multiple lots of <sup>89</sup>Srchloride injection (Metastron<sup>®</sup>, Amersham Healthcare, Arlington Heights, IL) were used in the performance of our studies (1,2), and the small percentage of variability which we found indicates that the problem of <sup>85</sup>Sr impurity in the <sup>89</sup>Sr preparation may not be as large as was indicated in the comments from Ms. Dell. Recently, the National Institute of Standards and Technology has determined a dial setting for measuring <sup>85</sup>Sr with a dose calibrator, so that correction can be made for the amount of <sup>85</sup>Sr impurity in the <sup>89</sup>Sr sample (3).

We have evaluated a Beta C<sup>®</sup> counter (Capintec Inc., Ramsey, NJ) in our institution and have found it to be superior to the dose

calibrator for the measurement of <sup>89</sup>Sr activity in the 37-MBq (1-mCi) range; however, we have found a lower variability using the dose calibrator technique for the 74, 101 and 148-MBq (2, 3 and 4-mCi) ranges (2).

We agree that there may be some variability which exists among the ionization chambers of different dose calibrators, which is why we recommend that calibration factors be determined for each dose calibrator used for measurement of <sup>89</sup>Sr (1). Also, while the Beta C counter may be less expensive than a dose calibrator, this advantage is negated by the fact that the dose calibrator has a greater usefulness and is required equipment in all nuclear medicine departments.

We concur with the points raised by Dr. Porter and Ms. Eck. We would also remind the reader to be mindful of the limitations of dose calibrator measurement for <sup>89</sup>Sr which were presented in our original article (1).

> Thomas J. Herold Gary P. Gross Joseph C. Hung Mayo Clinic Rochester, Minnesota

## **REFERENCES**

- Herold TJ, Gross GP, Hung JC. A technique for measurement of strontium-89 in a dose calibrator. J Nucl Med Technol 1995;23:26-28.
- Gilster BG, Chadbourn DG, Herold TJ, Hung JC. Comparison of the dose calibrator and Beta C counter in the measurement of strontium-89 [Abstract]. J Nucl Med Technol 1995;23:126.
- Radioactivity Group. More notes on the use of SRM 4426A, strontium-89. Gaithersburg, MD: National Institute of Standards and Technology; 1995.