# Letters to the Editor

## HAZARDS OF I-131 USE

Miller, Bott, Velkley, et al. (*1*) are to be commended for reminding us of the potential hazards associated with the administration of therapeutic levels of I-131. The precautions that they suggest are most complete but I feel it is necessary to make a small criticism arising from Fig. 5.

In the text the authors suggest that "careful surveying with an appropriately calibrated ion chamber" should be carried out. In Fig. 5 they show an example of a patient having received 150 mCi of I-131 giving rise to an exposure dose rate of 56 mR/hr at 3 ft. Since the specific gamma ray constant gives a dose rate of 22.4 mR/hr at 1 m from a 100-mCi source, this number would suggest either that the ionization chamber is poorly calibrated or that the patient actually received 250 mCi.

One might assume that the disagreement in values is attributable to poor geometry. Indeed, the 1- and 3-ft readings display a considerable divergence from the inverse square law. However, the 3- and 6-ft readings are in close agreement, which tends to refute that argument.

When making any measurement, one should always have a feeling for the result to be expected so that errors can be quickly recognized.

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Reference

*1.* Miller KL, Bott SM, Velkley DE, et al: Review of contamination and exposure hazards associated with therapeutic uses of radioiodine. *J Nucl Med Technol* 7:163–166, 1979

## REPLY

The numbers listed on the form in Fig. 5 were to illustrate use of the form only and do not represent an actual patient survey. The approximate radiation level at various distances from an unattenuated 150-mCi point source of I-131 are as follows:

| Distance (ft) | Exposure Rate (mR/hr) |
|---|---|
| 1 | 351 |
| 3 | 39 |
| 6 | 10 |

Altered geometry and patient attenuation will cause a decrease in these levels.

Dr. Cradduck is correct and very astute in pointing this out.

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## FLOOD IMAGES UNDER CLINICAL CONDITIONS

I would like to comment on the letter published in the December 1979 *JNMT* entitled, "Acquisition of Camera Flood Images under Clinical Conditions."

I agree wholeheartedly with Mr. Caprio's premise: quality control procedures on Anger cameras should be performed under conditions closely approximating those experienced in the clinical situation. However, the use of total counts as a criteria to measure camera performance is, in his example, invalid. The appropriate criteria would be the use of "information density." In fact, the information density or counts-per-unit area obtained with the 500 K count clinical image (i.e. brain, liver, lung, etc.) would be equal to, if not greater than, the 1,000 K count uniformity flood image obtained on the standard field-of-view camera.

One must remember that uniformity flood counts are obtained across the entire field of view of the camera and accumulated through every square centimeter of the detector surface. In contrast, clinical images frequently occupy a small portion of the detector's surface area and while their total counts may be less, their information density or counts-per-unit area of the detector are significantly higher.

Thus one can see the necessity for taking flood field uniformity tests of 1,000 K or even as much as 2,000 K counts in the case of large field-of-view cameras. While there are few if any clinical imaging situations that will approximate this total count, the information density obtained will be, in many cases, equivalent to that of the 500 K clinical image. Even a bone scan image, which would appear to occupy most of the field of view of an LFOV camera, actually places count information in only a portions of the camera's active surface.

We cannot know exactly where on the detector's field the clinical image will be obtained; therefore we must uniformly flood every square centimeter of the camera surface with an information density approximating the clinical image—in order to ascertain camera performance (resolution, uniformity, and linearity) at all locations within the field of view. This will usually require total counts on the order of 1,000 K to 2,000 K or more, depending on the size of the camera's field of view.

The recent advent of Anger cameras capable of information density-controlled imaging will go a long way towards alleviating the confusion with regard to this important aspect of camera quality control. Information density is the ideal figure to use since it is independent of camera size, organ size, or image location in the field of view.

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