PLASMA-VOLUME AND RED-CELL MASS DETERMINATIONS

I read with interest the paper entitled "Simplified Method for Simultaneous Determinations of Plasma Volume and Red-Cell Mass with ^{125}I-Labeled Albumin and ^{51}Cr-Tagged Cells" by E. Grable and J. A. Williams (*J. Nucl. Med.* **9**:219, 1968).

It gave me pleasure to learn that these investigators finally have accepted the fact that the F_{cell} ratio is important and that both plasma and red-cell volume should be measured separately to measure total blood volume accurately (*1*). It is also pleasant to find that the "Unitag" bag I developed (*2,3*) is finding its place and that banked O-Rh-negative tagged cells are utilized (*4*). In recent years we have modified the Unitag technique so that it is simpler and much more economical. We use sterile plastic gradient beads for rapid separation of red cells from plasma.

We have always condemned the use of precalibrated syringettes containing radioactive iodinated albumin, and I am glad to read that the authors feel the same way about this.

Very few readers are aware that we were the first to develop an automated blood-volume computer (*5–7*). I am sure that in due time the authors will realize that it is more economical and better practice to use a twin-scaler system and a sophisticated calculator, both of which cost less than an automated instrument. The twin-scaler system is more versatile and reliable.

As to the simplicity of the technique described, we have some reservations because we went through such a phase in the past few years. It is worth remembering that errors in technique multiply as the number of steps in the procedure increase. The technique we described in the *Journal of Nuclear Medicine* (*8*) is simple, practical and economical. The two tracers, ^{51}Cr and ^{125}I are measured simultaneously on whole blood in syringes.

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CHOICE OF ISOTOPE FOR THYROID SCANNING

In a recent *Journal of Nuclear Medicine* article, Atkins and Richards demonstrated the value of ^{99m}Tc-pertechnetate for thyroid scanning (*1*). We feel, however, that their conclusions, "the use of ^{99m}Tc-pertechnetate is recommended both for physiological and anatomic studies of the thyroid," may be premature if routine clinical use is contemplated because they compared pertechnetate with ^{131}I and not with an iodine radionuclide that is preferable for rectilinear scanning, namely, ^{125}I. Using equipment designed for ^{131}I, we showed that the resolution obtained with ^{125}I was superior to that with ^{131}I (*2*), and our results have been duplicated in numerous laboratories (*3*). When collimators and crystals are used which are specifically designed for the low-energy x-rays emitted by ^{125}I, the superiority of this nuclide is even more convincing (see Figure).

In the past two years, such a low-energy collimator has become commercially available (*4*). If the aluminum "can" housing the standard 3×2-in. sodium iodide crystal is modified to take a 10-mil window, the counting rate over the thyroid gland with ^{125}I using this collimator is approximately 4 to 5 times the counting rate obtained with an equivalent dose of ^{131}I. Thus if a patient with a 24-hr radioiodine uptake of 20% is given 100 μc of ^{125}I, an epithyroid counting rate of approximately 15,000 cpm is usually obtained. Although this is only half the counting rate reported by Atkins and Richards with pertechnetate (using their specially constructed collimator), a speed of 50 cm/min with this counting rate will produce a scan of high technical quality.

Our experience with pertechnetate for thyroid scanning has been limited, but we have been impressed with the high neck background, not normally a feature of ^{125}I scans. Although this back-

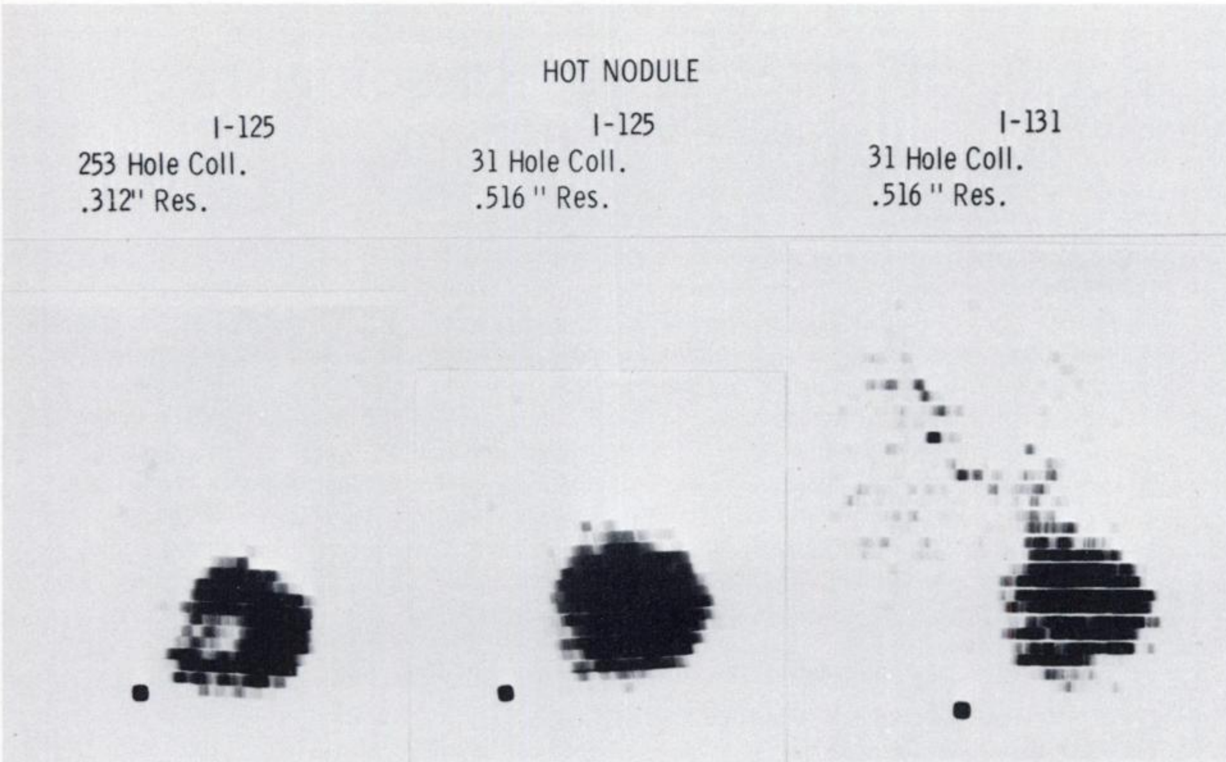

FIG. 1. Autonomous ("hot") thyroid nodule scanned with ^{125}I and "low-energy" collimator (*7*) (left); ^{125}I and 31-hole (^{131}I) collimator (center); and ^{131}I and 31-hole collimator (after *I*-T-3) (right). Note that the central area of degeneration is strikingly seen only in (left). Optical resolution of collimators is given in fractional inches.

ground can be "blended away" (*1*), there is some evidence that this may result in the "blending away" of useful information as well (*5*).

In one study pertechnetate did not delineate nonfunctioning nodules as well as ^{125}I did (*6*). Before pertechnetate can be recommended for routine thyroid scanning, further intercomparison with ^{125}I will be necessary since ^{125}I in our opinion is still the radionuclide of choice for this purpose and will be until ^{123}I becomes generally available.

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WEIGHTING AND LEAST-SQUARES FIT

In the August, 1967, issue of the *Journal of Nuclear Medicine,* our Letter to the Editor contains an unfortunate typographical error in line 7, page 624. The correct line 7 is "ment is sufficiently high so that the Poisson error is negligible (*4*). The errors . . ."

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