

cific nature of radioimmunotherapy. A set of parameters that are optimum under one set of conditions usually do not apply in general. The advantages of using antibody fragments to improve antibody targeting of solid tumors, for example, are not evident in targeting of micrometastatic disease since extravasation and diffusion of the antibody through the interstitial space are not required for targeting (4). One may anticipate that the currently popular radionuclide for radioimmunotherapy, ^{90}Y , will be inappropriate for targeting micrometastatic disease due to its long-range emissions. It is this case-specific nature of radioimmunotherapy that calls for the development of mathematical models and the application of computer simulations. By incorporating the salient features of a particular treatment protocol and accounting for the known biological parameters of a particular tumor and antibody-antigen combination, mathematical modeling analyses may help guide the experimental work and thereby reduce the scope of necessary human experimentation.

As the focus turns towards targeting of micrometastatic disease, mathematical modeling will become increasingly important in providing an assessment of potential therapeutic efficacy. Since it is not clinically feasible to determine the antibody concentration or the radioactivity associated with a microscopic cluster of metastatic cells, analytical techniques will be necessary to estimate antibody uptake and cell cluster absorbed dose, given the range of expected cluster sizes, their position relative to the vasculature (luminal versus interstitial) and blood pharmacokinetics.

Administering radiolabeled antibodies to patients that have no objective evidence of disease and without the ability to verify antibody targeting in vivo through external imaging may be unsettling to those accustomed to radioiodine therapy of thyroid disease or radioimmunotherapy of solid tumors. The potential for successful radioimmunotherapy in such a setting, along with the observation that chemotherapeutic trials have been undertaken with significantly less theoretical and experimental justification, should help overcome such reservations. Ultimate assessment of adjuvant or prophylactic radioimmunotherapy in the treatment of occult disease will require randomized trials with a 5-yr to 10-yr follow-up. Patience will therefore be required. The radioimmunotherapy community is well qualified in this regard.

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Diuretic Renography

TO THE EDITOR: The paper entitled "The Well Tempered Diuretic Renogram" (1), presented by the Society for Fetal Urology and the Pediatric Nuclear Medicine Council, appeared earlier in a

more expanded form (2). In both presentations, one cannot quite distinguish whether the purpose is to explain the theoretical (physiopathological) basis for a procedure or to report on a technical methodology (e.g., region of interest (ROI) placement) which has been shown empirically to be superior to other methods. In the absence of either theoretical or empirical argumentation, on what exactly was consensus based?

For example, what is the physical meaning of a two-pixel wide background ROI? Even if we assume that the digital matrix will be in a 128×128 format, as recommended, two pixels would cover different sized regions, depending on detector size, zoom factor and the modulation transfer function of the imaging system.

It would have been useful to rationalize why separate sampling over the collecting system is necessary: if the collecting system is full, and if the compliance of the system has been exhausted, the obstruction must result in delayed cortical clearance, since fluid is not compressible. What interpretation is offered if cortical transit time and or diuretic response are normal, but are abnormal in the collecting system?

Third, to the extent that the kidney acts as a delay line, or even a mixing compartment, one should expect that clearance of the tracer from the kidney (or the output function) also reflects plasma clearance (or the input function) and not exclusively the transit function through the kidneys. This point has been made often and well (3), and its neglect in the discussion of interpretation is surprising.

Finally, the authors fail to describe what are or should be the criteria for success or failure of the test. Merely mentioning that there would be follow-up is hardly sufficient.

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REPLY: Dr. Goris raises some interesting technical questions regarding our paper on "The Well Tempered Diuretic Renogram." His queries offer an opportunity to expand upon the reasons for and purpose of the Consortium report on the discussions which transpired during our initial meeting in 1989.

The Consortium of Nuclear Medicine Physicians was convened at the request of the Society for Fetal Urology (SFU). Members of the SFU had raised the concern that the diuretic renogram in the neonate as performed at their various institutions often did not correlate well with surgical findings. SFU members suggested that this might be related to variable methods of performing diuretic renography in their individual institutions.

The paper therefore is essentially a proceedings report from the meeting, which derived a consensus on the various methods of quantitatively measuring diuretic renogram response. The suggested methods should be utilized to gather data that eventually can be correlated with outcome and perhaps indicate which is the