REFERENCES

1. Reisinger I, Bohuslavitzki KH, Brenner W, et al. Somatostatin receptor scintigraphy in small-cell lung cancer: results of a multicenter study. *J Nucl Med* 1998;39:224–227.
2. Berenger N, Moretti J-L, Boaziz C, Vigneron N, Morere J-F, Breau J-L. Somatostatin receptor imaging in small cell lung cancer. *Eur J Cancer* 1996;32A:1429–1431.

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Role of Health Economics in Nuclear Medicine

TO THE EDITOR: I read with interest the invited commentary by Gambhir (*1*) regarding the role of health economics in nuclear medicine. We have just completed an economic appraisal of the question, "Does PET have a clinical role?" We sought to determine the economic and clinical arguments for introducing a PET scanning facility in the West Midlands Region in the United Kingdom (*2*).

Effective cost-effectiveness analysis (CEA) stems from a common alliance among health economists, physicists and clinicians such that the cost-effectiveness of diagnostic imaging technology can be truly determined. This requires each to have a role in enumerating the relevant costs and benefits. The key point in a CEA is the treatment algorithm of both cost and benefits (*3*), not merely the costs. If the CEA is to be meaningful, costs and benefits should not cease to be enumerated at the end of diagnosis but continue through treatment. We sought to find the costs for treatments at each arm after the implementation of a diagnostic strategy, in an effort to more clearly link this to the outcome of life-years saved. CEA is not merely the evaluation of a single piece of technology. It is the relationship of a new or existing technology compared to its alternatives. We sought to compare the cost per life-year of clinical PET in a number of areas to conventional diagnostic technology in each area.

A word of caution surrounding the use of decision tree technology. In our work, we used TreeAge (TreeAge Software, Inc., Williams, MA). Although extremely useful for structuring the problem, decision tree packages are not a substitute for the hard work required to model the diagnostic and treatment algorithms. Indeed, it should be noted that once constructed, such trees are highly demanding of data upon which to furnish the model.

REFERENCES

1. Gambhir SS. Cost-effectiveness analysis in nuclear medicine. *J Nucl Med* 1998;39:17N–18N.
2. James M, Hunt K. Diagnostic imaging in cancer the economics of positron emission tomography. *Eur J Cancer* 1997;33:5–6.
3. Drummond MF. *Principles of economic appraisal in health care*. Oxford: Oxford University Press; 1980.

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Sigmoidal Curves

TO THE EDITOR: Zanzonico and Sgouros (*1*) would have us believe that a sigmoidally shaped curve "characteristic of nonstochastic radiogenic effects" (Fig. 1) is necessarily deterministic. Not so. The most familiar example would be the cumulative Gaussian frequency distribution, which is the paradigm of stochasm yet is sigmoidal.

The nub of the problem goes deeper, however. In biomedicine, the behavior of the elements of a set ("compartment") can be described in either of two ways: deterministically, in which case each element behaves according to some rule; or stochastically, in which case each element behaves independently, but the overall behavior of the set can be described by a central tendency (the mean) and a spread (the variance). For exponential transfer, it turns out that the mean of the stochastic approach is identical to the deterministic rule (*2*), so that first-order transfer can be described either way. For example, radioactive decay is usually thought of in probabilistic terms, but one looks up decay tables to find the "true value" for some half-life of interest. In the Poisson distribution (a classic stochastic formulation), the probability of a nonoccurrence is unity multiplied by an exponential, which can be interpreted deterministically. In the physical world, a photon can be considered as a "packet" or a wave, again depending on the context.

So it is with sigmoidal curves—it depends on the context and one's viewpoint.

REFERENCES

1. Zanzonico P, Sgouros G. Predicting myelotoxicity in radioimmunotherapy: what does dosimetry contribute [Editorial]? *J Nucl Med* 1997;38:1753–1754.
2. Thakur AK. Some statistical principles in compartmental analysis. In: Robertson JS, ed. *Compartmental distribution of radiotracers*. Boca Raton, FL: CRC Press, Inc.; 1983:143–176.

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REPLY: In our Editorial, we ignored the subtleties discussed by Dr. Charkes and concentrated on the derivation of clinically useful (i.e., predictive) dose-response relationships for planning radioimmunotherapy. We had no intention of claiming that a sigmoidal dose-response function is necessarily indicative of a deterministic effect. If such a claim were inferred, however, we stand corrected. We thank Dr. Charkes for the opportunity to emphasize that a sigmoidal dose-response function does not necessarily imply a deterministic effect.

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