Cost-Effectiveness of Lung Scanning

We welcome the application of cost-effectiveness studies to lung scanning spearheaded by McNeil et al. (1). However, we think that this article also illustrates the difficulties of getting sufficient information to calculate accurately the true-positive and false-positive ratios. In more than half of the cases in her series, no diagnosis was ever made. Biostatisticians do not commonly extrapolate findings from a small proven group to a large unproven group and then draw conclusions about the larger group. There is no reason to believe that there were not emboli in the large unproven group since their findings were not different from the group with emboli, as shown in Table 1 of McNeil’s article. In fact, 35 of the 77 “nonembolus patients” had abnormal scans. From Table 1 we must conclude that the physical findings in young patients with emboli are no different than those in normal patients. Thus, it is difficult to see how including physical findings increases the true-positive ratio in Fig. 1. The author does not supply the joint contingency tables upon which Fig. 1 is based.

A postoperative true-positive ratio of 0.45 (Table 2) seems rather high, until one reflects that this whole group was selected by a diagnostic suspicion of embolus sufficient for the physician to have ordered a lung scan. It seems difficult to draw conclusions about lung-scan efficiency in such a highly selected group.

Giving the perfusion lung scan the label of “specific” in the young age group, instead of merely “sensitive,” might serve to increase the number of scans ordered for various chest complaints, thus increasing the cost per lung scan which is actually effective in helping the patient.

**REFERENCE**


Reply

The above comment regarding the difficulty of getting sufficient information for calculating cost-effectiveness ratios is a valid one. In the case in point, we attempted to define a general method for determining the value of a diagnostic procedure in a particular clinical setting. For this purpose, we studied the value of the lung scan and other diagnostic modalities in patients presenting with pleuritic chest pain.

Two types of data were necessary for this study. First, in order to develop criteria for calling lung scans high probability, low probability, or indeterminate for pulmonary embolism, we used data from another study (1), comparing the accuracy of the lung scan in patients who had subsequent pulmonary angiography. For the high-probability lung scans, we used the criteria that were associated with a posterior probability for pulmonary embolism of approximately 95–100%. We have no reason to assume that this figure does not apply to our current investigation on patients under 40 years of age presenting with pleuritic chest pain. Thus, the fact that only 14 out of 20 patients had angiographic proof is probably not critically important in evaluating the lung scan in this situation. We used similar data for the low-probability lung scans; if, in fact, any of these patients had microemboli not identified by our diagnostic criteria, they were clinically insignificant, as indicated by the good state of health of these patients 1 year later. Clearly, patients with indeterminate scans (12/97) correspond to neither high- nor low-probability estimates of pulmonary embolism.

The second type of data we used in this study was unique and involved measuring the value of several historical, physical, laboratory, and radiographic findings. Here we were particularly careful to indicate that these findings in patients with angiographically proven pulmonary embolism were essentially identical to those with pulmonary embolism diagnosed clinically (Table 5). Admittedly, the small number in this study requires that extrapolation to larger groups be done with caution.

The above letter indicates that Drs. Guter and Goldsmith seem to have misunderstood Table 1. It represents the average values of the physical findings and laboratory data indicated therein. In Fig. 1 we talk about other physical findings not included in Table 1 but indicated in Table 2.

It is not clear to us from our investigations whether the strategy we outlined will lead to an increase or a decrease in the number of lung scans ordered for various chest complaints. We find it difficult, therefore, to hypothesize on the magnitude of subsequent cost-effectiveness calculations.

**REFERENCE**


Monitoring Releasing Renal Grafts with 99mTc-Sulfur Colloid

We read with great interest the paper by Frick et al. (1) on the accumulation of 99mTc-sulfur colloid (TSC) by renal transplants. We then analyzed the data they reported by the decision-matrix method (2) to determine the sensitivity and specificity of the procedure in the authors’ laboratory (Table 1). Excluding repeat examinations in patients with acute tubular necrosis, rejection, or sepsis, the sensitivity of TSC scanning in detecting rejection was 92% (true-positive ratio) and the specificity was 84% (true-negative ratio),