

gravity, in the upright position (2). Both of these gradients are eliminated with the subject supine. A \dot{V}/\dot{Q} ratio calculated from a supine Q distribution but an upright V distribution is physiologically faulty.

Second, the implicit assumption made by the authors in dividing regional V as a percentage of total V by regional Q as a percentage of total Q is that the overall \dot{V}/\dot{Q} of the lung is 1 (i.e., 100% divided by 100%). This may be nearly true in normal subjects, but is definitely not the case in most forms of lung disease (3). The meaning of \dot{V}/\dot{Q} ratios derived using this assumption is physiologically unclear.

Third, the authors show, in Fig. 2D, that the derived \dot{V}/\dot{Q} line in normal subjects is essentially equal to 1 uniformly from apex to base. Again, basic studies by West (2) have shown that the regional \dot{V}/\dot{Q} varies from apex to base, because the ventilation gradient is less severe than the perfusion gradient. At the apex, the normal \dot{V}/\dot{Q} ratio is close to 3, while at the lung base it is normally 0.3. Uniform \dot{V}/\dot{Q} ratio is close to 3, while at the lung base it is normally 0.3. Uniform \dot{V}/\dot{Q} ratios of 1 from apex to base, as shown by the authors, have never been seen in normal man.

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Reply

We agree, of course, with Dr. Horn's synopsis of the physiological determinants of ventilation and perfusion in the normal lung. It would be surprising if we didn't, since he has simply reiterated the last two paragraphs of our paper's discussion section.

Of course, we agree that the results we present are not "physiological." The investigation we seek to interpret is not physiological. If, however, Dr. Horn feels that because a lung image is not physiological it should not be used to aid diagnosis, then we disagree. Few radionuclide investigations satisfy strict physiological criteria, but it would be unwise to ignore them;—or does Dr. Horn feel that it is valid to interpret images but invalid to make measurements from them? If so, he would reject an imposing array of measurements, for example in cardiac and renal, as well as respiratory medicine.

The method we describe works perfectly well if both studies are done erect, but in this hospital and many others, lung-image patients are injected with pertechnetate while supine in order to improve visualization of the upper zones (because the distribution of Q while prone is almost exactly the same as the distribution of V erect, something that has been known in nuclear medicine for years).

The point of our paper, and of this letter, is that the combined krypton and Tc-MAA lung study contains an enormous amount of information that is routinely discarded. The distribution of radionuclides in lung disease is the result of pathophysiological processes, and those processes can be measured much more accurately by mathematical analysis than by simply looking at the pictures.

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**Southwestern Chapter
Society of Nuclear Medicine
30th Annual Meeting**

March 28-31, 1985

Sheraton New Orleans

New Orleans, Louisiana

The Southwestern Chapter of the Society of Nuclear Medicine will hold its 30th Annual Meeting March 28-31, 1985, Sheraton New Orleans Hotel, New Orleans, LA.

The program will include submitted papers, invited speakers and teaching sessions covering areas of current interest in nuclear medicine. The program will be approved for credit toward the AMA Physicians Recognition Award Continuing Medical Education Category 1 through the Society of Nuclear Medicine.

Scientific and Commercial Exhibits will be shown at this meeting.

The Southwestern Chapter annual nuclear medicine refresher course will be held March 28, 29, 1985. The course will include reviews of basic science, instrumentation, radiopharmaceuticals and in vitro and diagnostic imaging techniques. Nuclear medicine scientists, technologists and physicians interested in a state of the art review are invited to attend.

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