

## COMMENTARY

## MAGNITUDE ESTIMATION IS COMING

No, not another new thing to hamper Nuclear Medicine. Two hundred years ago, the cry was "The British are coming. . . the British are coming."



Robert E. Henkin, MD

More recently, the cry has been "The RVS is coming." As you have read in these pages before, there is a successor to the Radiology RVS known as the "Resource Based Relative Value Scale" (RBRVS). This attempt to "level the playing field" among physicians, by estimating physician work and basing reimbursement upon effort, on the part of physicians, will probably lead to as much controversy as the Radiology RVS has.

The controversy however, will be throughout medicine and not just within the imaging specialties. All medical specialties are currently being surveyed by William C. Hsiao, PhD, an epidemiologist at the Harvard School of Public Health. Certain measurements are being made that will equate physician work within the specialty, and then attempt, through a process called "cross-linking," to match procedures in one specialty area to those in other specialty areas.

It is too soon to tell whether this entire process will be successful. There is great sympathy for this process within the Federal Government, and in fact, Dr. Hsiao is operating under a Federal grant. While it is not Dr. Hsiao's aim to create a reimbursement system, it is the aim of those in Washington to use Dr. Hsiao's data to create a reimbursement system. In order to understand what has happened and what will happen, we need to very briefly deal with a couple of issues that are pertinent to nuclear medicine.

As with all other medical specialties, nuclear medicine has several representatives on the RBRVS panel. They are Philip Alderson, MD, of New York, Oscar Powell, MD, of Pennsylvania, Larry Heck, MD, of Indianapolis, and me. We have all been "to school" on the RBRVS and understand how it operates. There is one thing that now appears clear, the RBRVS can measure physician work. In order to do this a technique known as magnitude estimation is employed.

Magnitude estimation is a technique borrowed from the

social sciences. It is relatively simple to understand in terms of how it works, although it is somewhat complex to execute. Some nuclear medicine physicians will shortly be receiving a magnitude estimation study from the Harvard School of Public Health. In order to construct data, the Harvard group will select physicians from American Medical Association listings of those individuals who identify themselves as primary nuclear medicine physicians and survey those people with regard to a number of nuclear medicine procedures, asking them to rank these procedures in a number of categories.

Those selected to participate in the survey will be presented with a series of scenarios (clinical situations), and they will be asked to rank the difficulty of these situations against a reference situation or procedure. The reference procedure selected is a procedure that is neither the most difficult nuclear medicine procedure to perform nor the most complex. Generally, it is considered somewhere near the middle of the field in terms of complexity. Additionally, it will be a procedure that is understood and familiar to everyone. This procedure will be assigned a value of 100 and all other clinical scenarios will be rated against this procedure. For example, if a clinical scenario is considered to be twice as difficult as the base scenario, it would be assigned a value of 200. Likewise, a procedure that is half as complex as the base scenario would be assigned a value of 50.

Life would be simple if this only had to be done once. It is necessary to rate each set of scenarios on several criteria. The areas to be rated include time involved, mental effort, physical effort, judgement, technical skill, and psychological stress. In each case, these scenarios will be compared to the base or reference system.

The data from the physicians surveyed will be compiled and the relationships among the various scenarios established. From these relationships, all nuclear medicine procedures will be assigned values. This mathematical technique has been proven to be reliable (1,2).

The role of surveyed physicians in the magnitude estimation process is critical. It is imperative that those selected adhere to the directions given in writing and to those given by phone. Those surveyed will receive a written packet of information, and then a follow-up phone call at which time the ratings will be done. We strongly urge that the process not be seen as trivial and that significant thought be put

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into each rating. How much time and effort do these procedures take? How much emotional or mental stress do they create? How much follow-up time is required? How much preparation time is required? How are you going to factor quality control into this system? How can you factor the issues of supervision and concurrent care into these ratings?

We cannot attempt to, nor would we want to tell you how to rate procedures. However, it is vital to the future of nuclear medicine that you carefully consider the ratings you will give to each procedure. How does it relate to the base procedure, and how does it relate to other procedures on the list? Honest ratings of these procedures are essential. This cannot be dashed off quickly. We urge that significant thought be given to the ratings by those contacted.

Careful attention to this survey will help avoid the errors in the data base that plague the Radiology RVS. We

would like to avoid all the problems we have encountered during the recent Radiology RVS by having our practitioners understand and accurately complete the Harvard RBRVS questionnaire.

Full cooperation with the Harvard group is required to enable them to gather data that will be valid for use in structuring the nuclear medicine RBRVS.

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### References:

1. Hsiao WC, Braun P, Yntema D, Becker ER. Estimating Physicians' Work for a Resource-Based Relative Value Scale *NEJM* 1988;319:835-841
2. Hsiao WC, Braun P, Dunn D, Becker ER. Resource-Based Relative Values—An Overview *JAMA* 1988;260:2347

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device will be by the side of every surgeon at the operating table.

Another novel approach to instrumentation is the study from Ulm, FRG, by Henze et al. (No. 444), who have provided quantification techniques to tell the dentist or the radiologist looking at dental x-rays the metabolic activity associated with various structural abnormalities in the mandible and the maxilla.

### Pharmaceutical Research Centers

The combined use of PET/SPECT imaging and magnetic resonance spectroscopy (MRS) offer a whole new approach to drug design, development, and evaluation. Wolf et al. from the University of Southern California and Siemens Medical Systems demonstrated how MRS with fluorine-19 5-fluorouracil can be used to select specific patients in whom therapy with this drug is likely to be effective (No. 352). They found

that when there was trapping of un-metabolized drug, there was a better response than when this did not occur.

The use of PET/SPECT in pharmacology raises the question of dedicated animal scanners. A group from Brookhaven National Laboratory, Hammatsu Photonics, University of Massachusetts, Worcester, and Jiangsu Institute of Nuclear Medicine, Peoples Republic of China, is developing a device to look at iodine-125, but problems of sensitivity must still be solved (No. 280). Digby and Hoffman from UCLA presented design considerations and simulation studies of an animal PET scanner with a spatial resolution of 2.5 mm (No. 688).

### The Future

Three decades ago, we began to use rectilinear scanners, with three to five inch crystals in order to obtain anatomical information about organs such as the thyroid, kidneys, spleen,

and liver that could not be seen in x-rays. This meeting documents the tremendous progress that has been made since that time.

In 1668, John Locke said: "Anatomy is absolutely necessary to a surgeon, but that anatomy is likely to afford any great improvement in the practice of physics, I have reason to doubt. All that anatomy can do is show us the gross and sensible parts of the body." When we are able to map the entire human genome, we will have the ultimate in anatomy, but it still will be only anatomy.

Almost 500 years ago, Paracelsus said: "The body is a conglomeration of chemical reactions. When these are deranged only chemical medicines can correct them." Imaging *in vivo* chemistry remains the most fundamental principle of nuclear medicine. Why not?

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