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# We Are Training Our Future

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As we look to the 21st century, our eyes can only be dazzled by the unique potential for the tracer method in biology and medicine. Yet we cannot help but be concerned with the direction nuclear medicine practice is taking in America. Doug Maynard has accurately and perceptively explored these concerns in his SNM lecture to the Society and has identified the forces driving these changes.

The central problem, as Dr. Maynard points out, is an aging and unreplenished population of nuclear medicine specialists, a void that has developed over two decades. This most lethal problem we have failed utterly to solve. Nuclear medicine is, however, much too powerful a method to tolerate a vacuum and will be consumed by organ specialists if we do not train a cadre of talent capable of populating the field.

What has made the problem so difficult to solve is a paradox unique to the U.S. Jobs in the full-time practice of nuclear medicine are nonexistent outside of academia and the VA system. Virtually all private practice opportunities require certification in diagnostic radiology. Yet radiology has not been an effective nurturing ground for our training programs in nuclear medicine and nuclear radiology.

Why do so few radiologists go into nuclear medicine? Perhaps nuclear medicine is fundamentally different from diagnostic radiology. Perhaps the medical student that selects radiology as a career is predestined to it because of a natural gift for the spatial, for visual perception and for dexterity, while nuclear medicine and the tracer method require a gift for the quantitative and for the abstract. Perhaps, as higher technologies such as MRI and ultrasound become more quantitative and physiological, the talent pools entering radiology and nuclear medicine will become more alike, but that

is for the future. For today, these radical differences in style, aptitude and interest may account for the boredom emanating from nuclear medicine reading rooms where radiology residents pass their time fulfilling their board requirements. Perhaps the failure to replenish even academic nuclear medicine jobs with radiologists (less than a quarter of the nation's academic nuclear medicine faculty are diplomats of the American Board of Radiology) has left a lack of mentors to kindle whatever flickering interest radiology trainees have in nuclear medicine.

The problem will not be solved in academic departments by carving nuclear medicine into pieces and feeding it to organ-based radiologists. The trend to organ subspecialists is commendable for many reasons. The referring physician has an expert radiologist to consult for his patient whether the problem is a renal mass or pulmonary nodule. The radiologist can master the structure and function of a particular organ and speak with depth about the diseases that affect it. But someone must see to the continued development of nuclear medicine and other imaging technologies. Who will be interested in becoming a technical supervisor in nuclear medicine without the responsibility for clinical decision making? Who will see to innovations that cross organ boundaries or involve technology development. No one interested in academic practice to be sure. However, for thousands of private practices facing a major manpower shortage of nuclear radiologists, organ-based divisions of labor will probably compete with other make-shift solutions, such as off-site electronic interpretation and the continued reliance on radiologists with 3-6 mo of nuclear medicine training. These stop-gap measures have serious consequences. The practitioner will limit the range of nuclear medicine practice to what is most familiar and what lends itself to automated production schedules. Thus, techniques at the cutting edge will have greater difficulty becoming common practice and the quantitative and the physiological will continue to take a back seat to the visual interpretation of images. We will be at even greater risk to turf battles with image oriented organ specialists in cardiology, neurology and oncology, who will win more than they will lose because they will be better trained and better motivated.

The solution to the manpower crisis must focus first on the recruitment of academically oriented nuclear medicine trainees to replenish and rejuvenate our train-

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ing programs. Maynard is correct to propose a five year training program in radiology because his proposal would attract bright young men and women who may be passed over in a highly competitive but often capricious screening process for diagnostic radiology positions and would replenish programs with radiologists who would serve as mentors and who would attract other radiologists into the field. It would allow us to compete for trainees on an even playing field, at the time most specialties compete, rather than two years afterwards when we scour for the discontented and the uncommitted.

The radiology pool, however, will not be large enough for us to meet even the needs of our academic programs. No program aimed at radiology trainees will bring into the field sufficient numbers quantitative and abstract thinkers who have been so critical to the development of our field.

We must be willing to experiment further. We must

continue training clinical specialists who are committed to nuclear medicine, but we must also expand our programs to permit longer periods of training within nuclear medicine programs in order to provide the breadth of experience that will be needed in imaging and clinical skills. Three and four year programs modeled on the experience at Albert Einstein and elsewhere will allow us to begin recruiting in the medical school rather than later.

We must be careful. Physicians who have competence only in nuclear medicine must understand that their career choices are limited to academic programs. Moreover, they must be fully conversant with other imaging methods so that patient care is handled efficiently and effectively. These physicians must have enough clinical training to understand disease process and patient management (Table 1).

Finding funding for such programs will be difficult and finding training positions outside of nuclear medicine which are not branded as "second class" or "observer status only" will be a challenge. However, the diversity of talent entering our field will be ample reward for the effort and will make nuclear medicine unlike any specialty in its range of experience and creativity. The diversity of genius that created our field will be needed to fully exploit its opportunities. Doug Maynard is right on target when he defines manpower as our critical need. Only one small ingredient is needed to create these training programs, to recruit talented trainees and to replenish our facilities—the will to do it.

**TABLE 1**  
The Four Year Nuclear Medicine Curriculum

Year 1	Internship (medicine or transitional)
Year 2-4	12 mo: Imaging rotations
	2 mo: MRI
	2 mo: CT/US
	2 mo: Chest and bone imaging
	6 mo: Clinical rotations
	2 mo: Cardiology
	2 mo: Neurology/Nephrology
	2 mo: Oncology
	18 mo: Nuclear medicine rotations