

Medical Imaging in the Nineties: New Directions for Nuclear Medicine

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Does medical imaging in the nineties imply that new directions are needed in nuclear medicine? It is obvious from the title of my presentation that I believe the answer is a resounding YES! I am sure that comes as no surprise to most of you. Nuclear medicine, since its beginning, has been an ever-changing specialty, adapting to the advances in the field of medical imaging and rising to the challenges of other competing specialties.

I believe that during the next 10 yr the field of nuclear medicine will be challenged as never before. I would like to offer my reasons for this belief and suggest some things we as a specialty need to do to meet these challenges. Specifically, I address two questions:

1. Where will nuclear medicine fit in the whole area of medical imaging in the next decade?
2. What can we do to see that nuclear medicine continues to play an important role in diagnostic medicine?

First, I believe it only appropriate to give a little history of my involvement with nuclear medicine so my comments can be taken in the context of my own experiences and biases.

My first contact with what was to become the specialty of nuclear medicine was as a sophomore medical student in 1956 when I assisted the chairman of the Bowman Gray Department of Radiology, Dr. Isadore Meschan, with a research project as part of a physiology course. It was an attempt to develop a tracer labeled with radioactive zinc and manganese to image the pancreas. We were totally unsuccessful, and I was not overcome with the potential usefulness of these techniques.

My next exposure to nuclear medicine was in 1964 as a radiology resident. I was fortunate to train under Dr. James L. Quinn III (who later became president of this society), and this time I was captivated by the potential of radiotra-

cer techniques for diagnostic imaging. While on my normal resident rotation through what was then called the Radioisotope Laboratory (we spent 3 mo in nuclear medicine then), Dr. Quinn accepted the position of Director of Nuclear Medicine at Northwestern University. I was left as a resident in charge of the clinical service since I knew more about the subject than any other radiologist on the faculty. I was aided by Dick Witcofski, a physicist on our staff, whose knowledge of nuclear medicine surpassed that of all the rest of us. With his guidance, encouragement and friendship, I made it through. This event changed my life.

The early sixties were very exciting for nuclear medicine. Technetium-99m was introduced by Powell Richards of Brookhaven National Laboratory, turning a 2.50-hr, two-view brain scan study (Fig. 1) into an acceptable four-view, 1-hr procedure (Fig. 2). We no longer had to draw the outline of the skull around a ^{203}Hg -chlormerodrin study to determine where abnormal uptake was located within the brain. As a resident, I vividly remember a scanner salesperson telling me that the way one could determine whether a ^{203}Hg brain scan was abnormal was by finding two dots in a row!

The introduction of compounds labeled with $^{99\text{m}}\text{Tc}$ for imaging many other organs quickly followed. At one time, Mannie Subramanian was writing and talking about so many new $^{99\text{m}}\text{Tc}$ -labeled compounds that many of us thought he had a twin brother helping him out. Shortly thereafter, Hal Anger introduced the Anger camera which, coupled with the characteristics of $^{99\text{m}}\text{Tc}$, moved our field rapidly forward. I believe that those two single events probably had more to do with establishing nuclear medicine as a field than anything else.

During the next 10 yr, I became totally submerged in the rapid expansion of nuclear medicine, the excitement of new discoveries, the fun associated with the rapid movement of procedures from the research laboratory to the clinical arena, the camaraderie that evolved among those caught up in this field and the friendships that developed and have been maintained to this day. At that time, I was very active in this society.

My colleagues from that time later became the "who's who" of nuclear medicine: John McAfee, Dick Holmes, Henry Wagner, Wil Nelp, Bill Blahd, Merrill Bender,

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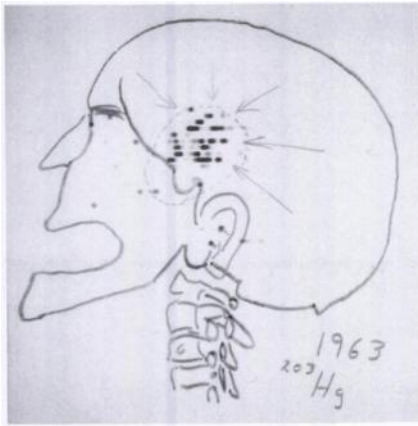


FIGURE 1. Lateral view of a ^{203}Hg -chloromerodrin brain scan performed in 1963. Note the need to outline the skull.

George Taplin, Joe Ross, Bill Hendee, Lenny Freeman, Don Blaufox, Bill Briner, Craig Harris, Bob O'Mara, Dick Reba, Gerald and Sally Denardo and many more.

In 1977, I was asked by my medical school dean to become chairman of the Department of Radiology at Bowman Gray. I accepted and still hold that position today. Nuclear medicine is a major section within our department. Bob Cowan, who had trained with us, assumed the directorship of the nuclear medicine program and recently John Keyes joined us as director of the PET facility we opened in February 1992.

When I assumed the chairmanship of the Department of Radiology, I expected to continue to be as active as ever in nuclear medicine. However, I soon discovered that the problems in the nuclear medicine section would pale in comparison to those throughout the rest of the department. My time for the "fun and games" of nuclear medicine was greatly diminished. It was inevitable that the rest of radiology would take over my life. To illustrate, of our current \$60 million departmental annual budget, nuclear medicine represents only 5%. In spite of my change in perspective, I never lost the sheer joy of the field and those people in it.

My experiences and background have shaped my own opinions, but I realize that we all see the world from different perspectives. My view is unique to me and ob-

viously not the only valid one. I believe developments in the next decade will have a dramatic impact on our field. How we embrace these developments will determine the fate of our specialty.

NUCLEAR MEDICINE PRACTICES

Where will nuclear medicine be positioned in the evolving diagnostic work-up? It is important to look at current patterns of practice and see who provides most of the nuclear medicine clinical care in our present environment. Geographic differences aside, I believe three major scenarios now exist for the delivery of nuclear medicine: radiology groups, nuclear medicine programs and incorporation into a clinical specialty.

The most common practice is one where nuclear medicine is practiced by a radiology group as part of its overall delivery of imaging services. Studies are supervised and interpreted by radiologists who have received their nuclear medicine training, consisting of 4–6 mo, as part of a diagnostic radiology residency program. Often a member of the group who is interested in nuclear medicine "runs" the service, but others in the group are involved in the interpretation of studies. In some cases, the individual has had additional training in nuclear medicine and may also have additional certification.

The second type of practice pattern is associated with most training programs. In this situation, nuclear medicine is operated as a separate, independent unit, usually within the radiology department, but occasionally as a separate department. Here the individual physicians are often full-time and have additional training in nuclear medicine. Their background usually includes training in radiology or internal medicine.

The third pattern is the incorporation of nuclear medicine procedures into the practices of other broadly based specialties such as cardiology. During the last few years, considerable efforts have been made among cardiologists to incorporate nuclear cardiology into their practices. Echocardiography, electrophysiological studies and cardiac angiography have already been incorporated on a

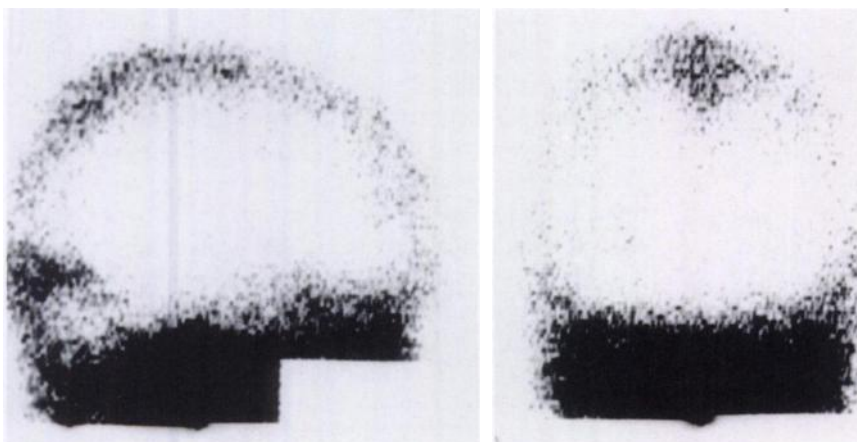


FIGURE 2. Anterior and lateral view of a $^{99\text{m}}\text{Tc}$ -pertechnetate brain scan performed in 1963. A small arteriovenous malformation is identified in the left frontal area.

fairly widespread scale. This type of practice pattern is growing rapidly and is much more common in office practices and outpatient centers than in the hospital setting. According to the Health Care Financing Administration, half of the nuclear medicine studies performed in these outpatient environments in 1989 were performed by specialists other than radiologists or nuclear medicine physicians, whereas only 10% were performed within the hospital setting (Jonathan H. Sunshine, PhD, Director of Research, American College of Radiology, *personal communication*).

Will these three patterns continue or will they change substantially during the next decade? Evolving forces seem to indicate potential revolutionary changes occurring in how nuclear medicine is delivered in the future. An article by Bill MacIntyre and Ray Go from the Cleveland Clinic in the November 1991 issue of *Administrative Radiology* (1) raises many of the points I feel are important for the future of nuclear medicine.

CHANGES IN PRACTICE

The rapid integration of some of our studies into other specialties of medicine could substantially change these practice plans. The best example is the importance that cardiology is placing on the desirability of having all imaging studies under its domain. Over the years, cardiologists have become the main providers of other imaging studies such as echocardiography and cardiac angiography, and they are moving to assume the dominant role in magnetic resonance imaging and PET studies. They advocate special training in all nuclear cardiac studies for cardiology fellows, including interpretation as well as indications and clinical applications. Although in many practices today a relationship exists between cardiologists and nuclear medicine physicians, more and more cardiologists are going it alone. Recent decreases in reimbursement by Medicare and other third-party payors may accelerate this movement as individuals move to protect their incomes. Other specialists are also looking at medical imaging as a means to enhance their practices. Neurologists are increasingly interested in becoming more involved in all types of neuroimaging.

Another change that could significantly affect these traditional practices is occurring in the field of radiology. For many years, radiology has been considered a general practice specialty. An individual was trained in all aspects of the field and then practiced a broad spectrum of radiology services. With the expansion of the scope of radiology to include nuclear medicine, ultrasound, computed tomography, magnetic resonance imaging and interventional radiology in addition to general radiology, the field has moved slowly toward subspecialization. Currently more than half of all radiology residents are choosing to take additional training beyond their required 4 yr in such areas as neuroradiology, cardiovascular/interventional radiology, cross-sectional imaging, pediatric radiology and

abdominal imaging. This trend has been driven by private practice groups that need to add new technologies to their practice as well as provide expert consultation. Subspecialized training is becoming necessary so individuals can meet their responsibilities as consultants to other highly specialized physicians.

To meet this demand, training programs have developed 1-yr specialized fellowship programs. After many years of operating as unofficial fellowships in neuroradiology, pediatric radiology, and cardiovascular/interventional radiology, these subspecialty programs are now being accredited by the Accrediting Council for Graduate Medical Education. Other subspecialty areas such as genitourinary radiology, gastrointestinal radiology, musculoskeletal radiology and pulmonary radiology are likely to follow suit.

In 1991, the Board of Trustees of the American Board of Radiology agreed to offer subspecialty examinations to individuals who will complete these accredited programs in the near future. Until that time, the only subspecialty in which the American Board of Radiology offered an examination was in nuclear radiology.

It is important to note that the new fellowships being considered are in organ systems. This movement toward organ system fellowship programs is likely to have a significant impact on the way nuclear medicine is practiced in the future. Organ system radiology fellowships will undoubtedly include exposure to all pertinent imaging techniques, including those in nuclear medicine. As individuals complete these fellowships and enter practice over the next two decades, it seems likely that many of them will want to participate in the performance and interpretation of nuclear medicine studies. From a clinical correlation standpoint, it seems only logical that one imaging consultant will be involved in the interpretation of all studies associated with a particular organ system whether the technique employed in obtaining the images is ultrasound, computed tomography, magnetic resonance imaging or, for that matter, nuclear medicine.

Since cardiologists have seen the need to be involved with all cardiac imaging studies, these organ system imaging specialists will presumably wish to acquire expertise in all modalities that are applicable to their specialties. Otherwise, there could be a negative impact on the development of nuclear medicine procedures since they would presumably be done by the recognized imaging specialists in that particular organ system. Specialists who are not familiar with nuclear medicine imaging procedures are not likely to advocate their use!

This trend is already causing large radiology departments to consider changing their organizational structure. Last year, our department started to reorganize along organ system divisions. We believe this realignment will ultimately provide the best integration of all imaging modalities for the more accurate, efficient use of imaging studies for the benefit of the patient as well as giving our subspecialty clinicians better consultations (they are al-

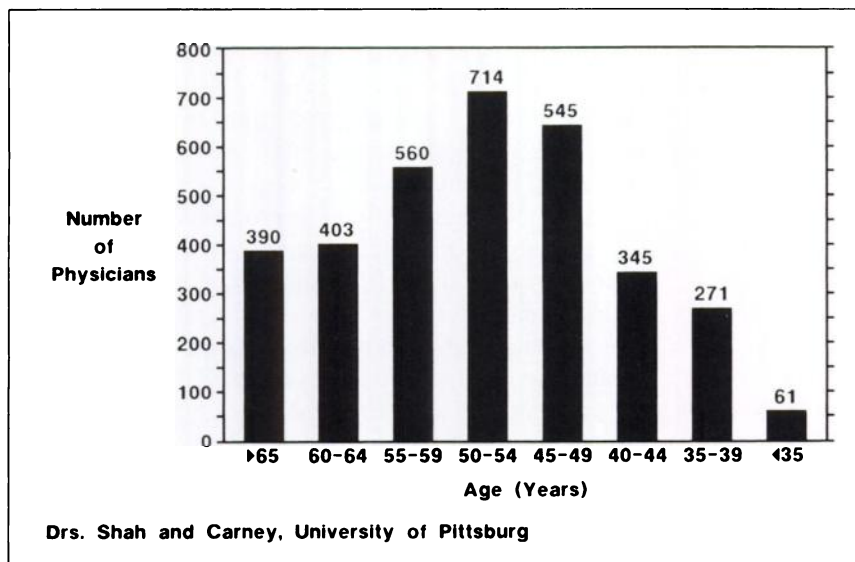


FIGURE 3. The population of nuclear medicine physicians is getting progressively older with very few efforts in place to recruit residents to replenish the field.

ready aligned this way, neurosurgeons-neurologists, orthopedic surgeons-rheumatologists). It will also establish an environment in which medical students and residents can see the proper integration of imaging studies for the establishment of a diagnosis.

We created sections of neuroradiology, pediatric radiology, cardiovascular/interventional radiology, abdominal imaging (to include genitourinary and gastrointestinal radiology), pulmonary radiology, musculoskeletal radiology and nuclear medicine. The ultrasound, magnetic resonance imaging and computed tomography sections were all dismantled. We have yet to determine how to integrate nuclear medicine adequately. It is the only technique section remaining. Although we have terminated clinical technique sections, we have designated certain faculty members to keep up with the advances in specific techniques as one of their main functions. They also reside in one of the various organ system sections. Although this approach has not been easy nor has it been totally successful, we firmly believe it is the best approach for our institution. How to include nuclear medicine in this type of organization has yet to be resolved, but it must be done during the next decade. Nuclear medicine is too important to be left out of the mainstream of medical imaging. Its integration within an institution will be aided by the introduction and use of high-speed digital networks and generic workstations (PACS), which provide for the dissemination of images throughout an institution.

PHYSICIAN CERTIFICATION

Another area that is most likely to have the greatest impact on our future is the shortage of physicians interested in the field of nuclear medicine as a specialty. We need to replace physicians who have been the mainstay of our field for the past 25 yr but will be retiring during the next decade.

According to a manuscript written by two doctors at the University of Pittsburgh School of Medicine, a large number of nuclear medicine physicians will be retiring within the next decade (2). The authors surveyed physicians certified by the American Board of Nuclear Medicine (ABNM). As of 1989, 3,729 physicians were certified by the ABNM. Of the 3389 who responded to the survey, 41% were over the age of 55 and 62% were over the age of 50 (Fig. 3). It is apparent that we are not training enough nuclear medicine specialists to replenish the field.

Currently, there are two methods for the certification of nuclear medicine physicians. The ABNM certifies individuals who have had 2 yr of approved nuclear medicine training along with 2 yr of training in a variety of other specialties. The board recently reduced the requirement to 1 yr of training in another discipline before the 2 yr in nuclear medicine. The American Board of Radiology (ABR) provides a certificate in Special Competence to individuals who have participated in an extra year of nuclear medicine training in addition to 4 yr in diagnostic radiology.

Programs leading to board certification through these two methods are not attracting the applicants needed. Statistics show that the number of trainees in nuclear medicine programs is declining (Table 1). In 1984, there were 298 trainees in nuclear medicine programs, with 210 in primary nuclear medicine programs and 88 in special

TABLE 1
Nuclear Medicine Trainees*

	1980	1984	1991
Nuclear medicine	176	210	156
Nuclear radiation	48	88	32
Total	224	298	188

*JAMA—August 1989, 1991.

Diagnostic Radiology with Special Competence in Nuclear Radiology (Candidates)

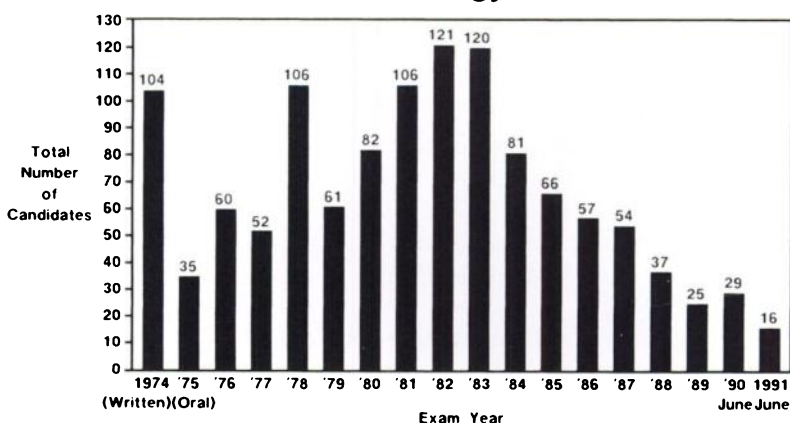


FIGURE 4. The number of applicants for the Nuclear Medicine Special Competence exam has shown a sharp decline in the past decade.

nuclear radiology programs (3). By 1991, this number had declined to 188, with 156 in nuclear medicine programs and 32 in nuclear radiology programs (4).

This decrease in the number of individuals in training is reflected in the number taking certifying examinations. The ABR has seen a dramatic decrease in the number of individuals requesting the Nuclear Medicine Special Competence examination (Fig. 4). When the examination was introduced in 1974, 104 individuals took it. By 1982 and 1983, 120 took it. Since then, there has been a steady decline in those taking the exam as well as those passing the exam. In June 1992, only 16 individuals were examined in nuclear radiology (Kenneth L. Krabbenhoft, MD, Executive Director, American Board of Radiology, *personal communication*).

The ABNM has also seen a decline in applications (Fig. 5). In recent years, the number seems to have stabilized at about 70 applications per year. The ABNM certified some

3800 physicians through January 1992 (Joseph F. Ross, MD, *personal communication*). Of considerable interest is the declining number of individuals who are taking the ABNM exam after first being certified by another board. Between 1972 and 1982, 73% had earned other board certification. Since 1983, only 40% have done so, and 60% of the candidates have come from straight nuclear medicine programs. Whereas in earlier years many radiologists also took the ABNM examination, a noted change is that most ABNM examinees with previous specializations now come from the field of internal medicine. Interestingly, some ABNM diplomates move on to radiology residency programs and take the diagnostic radiology board examination. Fifteen such individuals took the examination this year. The *American Board of Medical Societies Registry 1990-1991* lists over 3600 individuals who have been certified by the ABNM (Table 2) (5). That number can be broken down roughly into three subgroups: those with

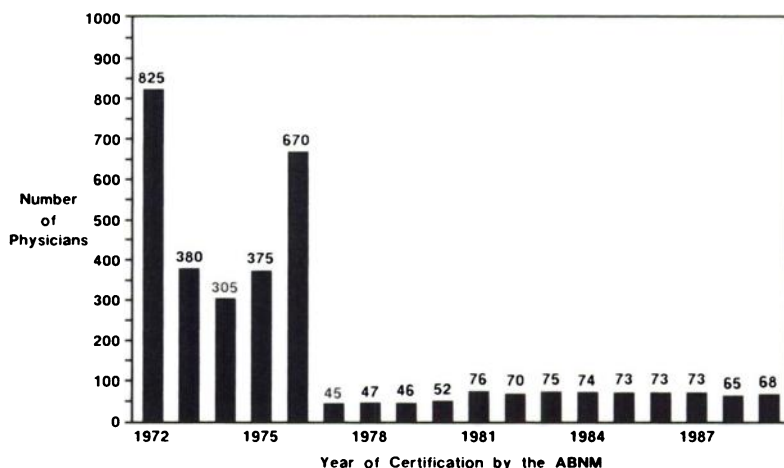


FIGURE 5. The American Board of Nuclear Medicine had seen a rapid decline in the number of applications, with the number in the past decade staying well below 100 every year.

Drs. Shah and Carney, University of Pittsburgh

TABLE 2
1990-1991 ABMS Directory

ABNM certification	3666
Additional certification radiology	1742
Additional certification internal medicine/pathology	767
ABNM only	1071

additional radiology certification (approximately 50%); those with either internal medicine or pathology board certification (approximately 25%); and those with primary boards in nuclear medicine (approximately 25%). It is also important to note that approximately 25% are foreign-trained.

These numbers raise many unanswered questions. How many of these individuals are still in the practice of nuclear medicine? How much time are they spending in the field? How many of them practice in foreign countries? In a manpower survey conducted by Dick Holmes for the SNM in 1986 (6), only 26% of the respondents worked full-time in nuclear medicine. There is no question, however, that a considerable percentage of nuclear medicine is being practiced by diagnostic radiologists with no additional nuclear medicine training and by cardiologists with no broad nuclear medicine training.

Between 1980 and 1990, there were fewer than 1000 certified nuclear medicine specialists added to the field. Radiology and cardiology are adding nearly that many to their specialties each year.

THE NEW GENERATION

Our challenge is to recruit the next generation of physicians truly interested in the advancement of our field!

We must make sure that nuclear medicine continues to play an important role in diagnostic medicine. This will be an easy task provided our field is staffed with many more bright, intelligent, innovative, well-trained, far-sighted individuals. We need to produce people who are devoted to nuclear medicine and who are capable of interacting with the other individuals who see nuclear medicine techniques as a part of an organ system work-up of a patient or as a procedure that complements the clinical assessment. We need people with the capacity to develop new techniques to enhance the application of nuclear medicine and to visualize that our future is different now from what it was 25 yr ago. Our field's strength is in procedures that can measure and display function rather than anatomy. A major concern facing us now is recruiting the best and the brightest for careers in nuclear medicine. I know that many in our field have discussed the problem in the past, but it is time to take a new look.

First and foremost, we must get the attention of both medical students and residents in other disciplines. In spite of the trends previously discussed, I believe the most fertile field we have to draw from is radiology residents. Since these individuals have already decided on careers in med-

ical imaging, all we have to do is show them the reasons for selecting our field from the medical imaging possibilities!

Last year, as chairman of the Commission on Nuclear Medicine for the American College of Radiology (ACR), I asked the ACR staff to consider developing a brochure to be sent to all radiology residents in an attempt to get them to consider taking an extra year in nuclear medicine after their 4-yr residency. The staff of the ACR felt that before we developed a brochure, we should find out why radiology residents were not selecting nuclear medicine as a career. They surveyed residents attending the Armed Forces Institute of Pathology (AFIP) course in Washington. While attending that course, groups of 60 residents, representing a broad geographic area, visited the ACR office in Reston, Virginia for a day. We surveyed two successive groups. There was good news and bad news. Of the two groups, less than 10% suggested that they were considering nuclear medicine as a career. If we could get that percentage of all radiology residents to commit to nuclear medicine careers, the future of nuclear medicine would be in great shape. The bad news was the reasons the rest gave for not considering nuclear medicine a viable option. They found it to be, in their words, "less interesting," "boring," "too simple," "lowly regarded by other faculty," "nonspecific," or "not challenging." The challenge ahead of us now is to work on changing these misconceptions about our exciting and challenging field.

The residents said that they were most influenced in subspecialty selection by faculty, practicing physicians, their peers and job availability. The problem seems to be the lack of adequate, comprehensive exposure to nuclear medicine during their rotation through our sections, the need for better role models and the lack of information about the job market. These problems can be easily corrected.

SOLUTIONS

The first step is to stop worrying about whether nuclear medicine is a 3-mo or a 6-mo rotation. Instead, we must provide radiology residents with the most challenging, all-encompassing exposure available on any of their subspecialty rotations. Residents must be totally submerged in nuclear medicine during their rotation. They should be exposed not only to routine nuclear medicine procedures, but to all aspects including newer techniques and research. They must be given responsibilities so that they are vital to the everyday operation of the section, not just interlopers who show up for daily reading sessions. Some say that radiology residents don't have enough time to learn all the complexities of nuclear medicine. That may be true, but they should not leave our rotations thinking there is nothing to it. We must think quality of time, rather than length of time! We need to get them so excited they want to come back for more!

The second step is to get positive, energetic faculty role

models. The Society of Nuclear Medicine should take the lead in this area. An outline of a model rotation for a radiology resident should be developed through either the Academic Council or the Society of Chairmen of Academic Nuclear Medicine Sections (SCANS). This effort could easily encourage existing faculty to be better role models. We need to make nuclear medicine as exciting and important as ultrasound, magnetic resonance imaging and computed tomography. We need to get a significant number of radiology residents to stay for an additional year in nuclear medicine. More than 50% of all radiology residents are now taking an additional year, but we need to attract our share.

Finally, we must publicize the availability of jobs. Good jobs are now available in both academic positions and private practice. A radiologist with subspecialty training in nuclear medicine is a valuable commodity now and the future is going to be even brighter!

How can we get medical students to consider nuclear medicine? Today many students who have been stimulated by the excitement of a career in medical imaging are not getting accepted into radiology training programs. Last year, 280 individuals failed to match in radiology. We need to convince them that nuclear medicine is part of the larger medical imaging community. We made a significant step in this direction four years ago when we combined our nuclear medicine training positions into our radiology program. We then offered a 5-yr combined program in diagnostic radiology and nuclear medicine as a separate position through the match. We have accepted residents into this position for the last 4 yr. In 1991, we had 30 applications for the one slot and we interviewed 10. Upon completion of our program, residents are eligible to take board examinations in diagnostic radiology, radiology with added competence in nuclear medicine, and the American Board of Nuclear Medicine examination. If we could get 100 radiology programs in the country to offer similar programs, we would quickly begin to solve our manpower problem. We need to start by contacting nuclear medicine specialists who chair a number of departments of radiology. If we could get agreements from 50 departments and get them in the national matching program (currently there are only three programs), we could then advertise their availability to all medical students seeking careers in medical imaging.

How to get medical students to go directly into nuclear medicine as a primary specialty is not clear, but that is where we are currently getting the most applicants for the ABNM examination. This number is not growing and many end up eventually taking radiology boards as well. Nuclear medicine is part of a larger imaging community and some students may find it more difficult to fit into imaging departments in the academic world as well as in private practice with only nuclear medicine training. The ABNM is looking at ways to attract more candidates. I wish them well, but I do not believe that shortening the

training program will help. I believe a better way is a combination with radiology.

The scientific and political organizations representing our field need to tone down their differences in order to attract individuals into nuclear medicine. During the past 10 yr, there has been considerable controversy between our respective organizations. In addition to the Society of Nuclear Medicine, we have three colleges that represent us: the ACR, the American College of Nuclear Medicine (ACNM) and the American College of Nuclear Physicians (ACNP). Our interests in most situations are similar, but too often we seem to accentuate our differences rather than our similarities. The recent problems associated with the relative value system are one of many examples.

Lately, we seem to be doing a better job of communicating, thanks in part to the efforts of many individuals, including Ken McKusick, Naomi Alazraki, Barry Siegel, Larry Neck, Phil Alderson and Leon Malmud. The ACR is currently reorganizing to better address the needs of radiology subspecialties. It is attempting to better represent nuclear medicine, as well as other subspecialties, and to coordinate with the other nuclear medicine groups. Many cross-links are now developing between the ACR leadership and the leadership of the ACNP and the SNM. This effort can be successful if we keep the best interests of nuclear medicine foremost. We must approach such agencies as the Nuclear Regulatory Commission, Food and Drug Administration, Department of Energy, Health Care Financing Administration as well as other specialties with a united front.

Having two examinations for nuclear medicine certification does not help us with prospective recruits into our field. Certainly, the dual pathway has made it possible for individuals with broader backgrounds to enter our field and that has been good for us. I do not see how both a subspecialty and a primary examination process can result in a single examination, but we should explore ways in which this could be achieved. As long as we have the two pathways, we need to keep the relationship between the two boards cordial and cooperative.

I would be remiss if I did not at least mention the impact that changes in reimbursement could have on our practice during the next 10 yr. There are many more questions than answers: What will third parties cover? Will payments be adequate? How will health care be rationed? Who will decide? Will outcome research include nuclear medicine procedures so that their true value will be determined? Will laws to control self-referral impact greatly on who can perform our procedures? Will cardiologists, neurologists and other clinical specialists be prevented from performing nuclear medicine studies on their own patients or those of their partners? Will PET studies be reimbursed? Will overall reimbursement be adequate to encourage pharmaceutical companies to develop and introduce new radiopharmaceuticals, or is our volume too low to warrant adequate research and development by industry? Will

support for training be diminished? These questions, although quite important, are still secondary to our first priority: physician recruitment.

CONCLUSION

In closing, let me address my two initial questions regarding nuclear medicine. Where will nuclear medicine fit in the whole area of medical imaging in the next decade? I believe that there will be an increase in the number of clinical specialists performing nuclear medicine procedures as part of their practice. Subspecialization in radiology will accelerate, and organ system radiologists will perform nuclear medicine tests as part of their involvement in the imaging work-up of the patient. The need will increase for individuals who devote most of their practice to nuclear medicine, and these individuals will be responsible for advancing the technical aspects of our specialty, staffing the PET facilities, testing new radiopharmaceuticals, introducing new software and developing new instrumentation. They will serve as key individuals to bridge the gap between the other groups and the technology. They will be the glue of our field, but they must clearly fit into the broader imaging world.

What can we do to see that nuclear medicine continues to play an important role in diagnostic medicine? Our challenge is a very simple one. We have got to develop an aggressive plan to recruit individuals into our field. We must tone down organizational squabbles. I believe that the SNM should take the lead in preparing a plan of action to accomplish this. I believe radiology residents taking

additional training in nuclear medicine and medical students being attracted to a career in medical imaging are our best bets. MacIntyre and Go (1) predicted that radionuclide procedures will show a continual increase in demand, utilization and growth, but the future of nuclear medicine physicians is less clear.

It is up to us to keep this from happening. I pledge that from my position in radiology I will try to do my part but I cannot do it alone. Nuclear medicine has had a great past. It should also have a great future. Let us roll up our sleeves and get to work! The SNM, however, needs to lead the way.

ACKNOWLEDGMENT

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