AJNR

An Enduring Legacy

Robert I. Grossman

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PERSPECTIVES

Transitions

There are exciting developments at the *AJNR.* Our journal has a new managing editor, Karen Halm, who has enjoyed a long career in publishing. She is a photojournalism graduate of Northern Illinois University, where she also earned a Master of Arts in journalism. Karen holds 2 certificates from the University of Chicago Publishing Program. Previously, she was the managing editor of the *Journal of Emergency Nursing* and the editor of *Journal of Property Management.* Her experience is extensive and spans the creative aspects of design and editorial direction to manuscript development and copyediting. We are most fortunate that she accepted our offer and are certain that *AJNR* will benefit significantly from her talents.

Most journals undergo periodic revisions in design to appear fresh, keep pace with improvements in journalistic style, and manage publication costs. Our latest changes involve implementation of a new *AJNR* typeface called Minion (9.5 point) that improves readability and enables more characters to be set per line. Other changes that you may discern include a reduction in reference type size, expansion of the page grid with a narrower center gutter, and slight enlargement of the column width. Articles will begin at the very top of the page with text wrapping around figures to avoid blank space at the sides of uneven arrays. We will provide tabs to cue the reader to topics and similar types of articles. The net effect of these modifications will be a more contemporary look with a flexible layout and improved navigation while enabling the publication of more articles per year by using fewer pages.

We have had some changes in senior editors: with Bob Quencer and Bill Ball stepping down and the volume of submissions doubling, we have expanded our roster. Bill Dillon and Charlie Strother will continue in their positions as senior editors for head and neck and interventional neuroradiology, respectively. In addition we have recruited 4 new senior editors: Mauricio Castillo, Harry Cloft, Jeffrey Ross, and Pamela Schaefer.

Mauricio Castillo, MD, FACR, is professor of radiology and chief and program director for neuroradiology at the University of North Carolina School of Medicine. He is a graduate of University of San Carlos School of Medicine, Guatemala, and was a resident in radiology at the University of Miami. Mauricio was previously a deputy editor of the *AJNR* (1995–1997) and has many interests in neuroradiology, including pediatrics.

Harry Cloft, MD, PhD, is a graduate of Wayne State University School of Medicine. He was a resident in radiology at the University of Michigan and a fellow in diagnostic and interventional neuroradiology at the University of Virginia. He is currently associate professor of radiology at the Mayo Clinic College of Medicine, with a focus on interventional neuroradiology.

Jeffrey Ross, MD, is professor of radiology and section head of radiology research at the Cleveland Clinic, Lerner College of Medicine, Case Western Reserve University. He received his MD from the Medical College of Ohio at Toledo. He was a radiology resident and neuroradiology fellow at the Cleveland Clinic Foundation. His research interests are focused on the spine and spinal column.

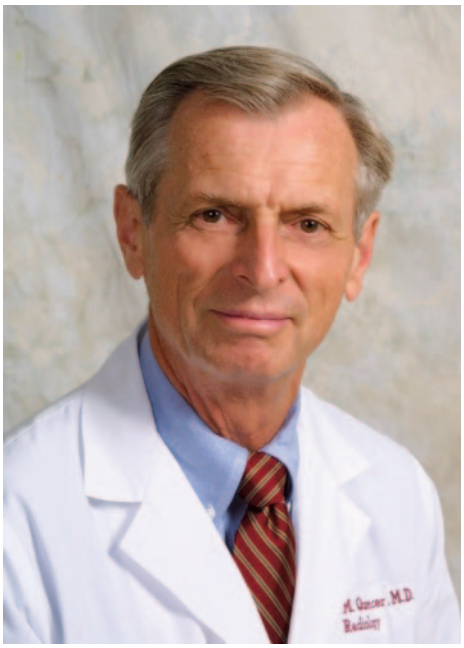
Pamela Schaefer, MD, is associate professor of radiology at Harvard Medical School and clinical director of MR imaging at Massachusetts General Hospital. She is a graduate of Johns Hopkins University School of Medicine and trained in diagnostic radiology and neuroradiology at the Massachusetts General Hospital. Her interests are in general neuroradiology.

As editor-in-chief I hope to continue the strong traditions of scientific journalism, an editorial heritage that includes Juan Taveras, Michael Huckman, and Bob Quencer. We will try to provide a forum for discussion of pertinent and controversial issues. We wish to be advocates for neuroradiology and embrace the needs of the practitioner while publishing the highest-quality science. We will endeavor to encourage more review articles, which will include both technical and disease-specific subjects. Commentaries on particularly important manuscripts will be solicited from experts in the field. Case reports will still be accepted, but on a very limited basis. The *AJNR* is a most dynamic periodical. It is hoped that alterations to the *AJNR* improve its vitality while maintaining the high quality that our readers have enjoyed through the years. We aspire to grow the legacy.

Robert I. Grossman, MD

TRIBUTE

An Enduring Legacy



Robert M. Quencer, MD

Bob Quencer has been either deputy editor (1984–1997) or editor-in-chief (1998–2005) of the *AJNR* from 1984 to 2005, distinguishing him as the Cal Ripkin, Jr., of major league scientific journalism! Under his stewardship the *AJNR* has thrived. In terms of its impact, the journal now ranks second to *Radiology* among clinical radiology journals. Electronic usage is extraordinary, with more than 900,000 full-text HTML hits from January 2005 to August 2005 alone. Our subscriber base is more than 5000, and we remain consistently profitable in an increasingly

challenging business environment. Because of Bob's diligence, the highest standards in scientific journalism and editing are the norm. Those who have experienced his editorial handiwork are fortunate; he can turn a mediocre piece of writing into a first-rate article. The clarity of his thoughts, his integrity, and his work ethic are nonpareil. Bob has lived and breathed *AJNR.* It is because of his purposeful single-mindedness that the *AJNR* has flourished.

By any metric Dr. Quencer has had a remarkable career. After obtaining his undergraduate and graduate degrees from Cornell University and his MD from Upstate Medical Center, Syracuse, he completed his radiology residency at Columbia-Presbyterian Medical Center (1968–1971), followed by a neuroradiology fellowship (1971–1972) at the Neurologic Institute of New York. His academic endeavors began at Downstate Medical Center (1972–1976). In 1976, he moved to the University of Miami, where he was section chief of neuroradiology and director of MR. Since 1992, he has been professor and chairman of the Department of Radiology at the University of Miami and chief of radiologic services at Jackson Memorial Hospital. He now also holds the Robert Shapiro Professorship and is professor of neurologic surgery and ophthalmology. Dr. Quencer has published more than 200 original manuscripts, has proffered more than 200 invited presentations worldwide, has served on numerous national committees, and is considered one of the preeminent world experts on spinal cord diseases. He has been the principal investigator of an NIH-sponsored investigation on the injured spinal cord. He also served the American Society of Neuroradiology as vice president (1992–1993), president-elect (1993–1994), and president (1994–1995).

On a personal basis Bob is highly intelligent, extremely well-read, and as thoughtfully engaging a person as one could have the pleasure to meet. He has a beautiful family, with a wonderful wife, Chris, and 2 spectacular children, Keith, a medical student at the University of Florida, and Kevin, a law student at Washington and Lee University Law School. Bob and Chris are outstanding golfers and sports aficionados. They truly enjoy their lives together and are a model for living the good life.

As the new editor-in-chief, I am reluctant to let Bob just retire to the nineteenth hole. His talents and experience are far too valuable to the journal. He has graciously agreed to become the book editor of the *AJNR.* More important, his wisdom will be just a phone call away, and I plan on availing myself of his judgments frequently. The journal and the society owe him a tremendous debt of gratitude. For me he will always be the "gold standard," and I feel most privileged to follow in his gigantic footsteps.

Robert I. Grossman, MD

COMMENTARY

Maintenance of Certification: A Rocky Start to an Important Initiative

With the first few administrations of the neuroradiology maintenance of certification (MOC) examinations now complete, here are a few thoughts on the program. The concept of maintenance of competence is unassailable and critical to the credibility of physicians' commitment to lifelong learning. Because it is new, we may expect the examinations to require us to do things, and to document activity, that we have not done before. Reports that many eligible neuroradiologists have declined to participate in the MOC process are troubling, and an examination of the details suggests some possible reasons. The initial implementation has had startup problems in 4 major areas: communication, cost, convenience, and content. There is a risk of failure of compliance by radiologists, which may lead to loss of public confidence.

Communication

Few radiologists understand what the MOC process does or how they should participate. This formal need to demonstrate ongoing learning is new, and we need much more information on what is happening and why. The structure of the programs, the methods by which we document our expertise, the testing requirements, the reasons for the exorbitant cost and inconvenience, and the regularity with which these activities must take place are opaque to most radiologists. The American Board of Radiology (ABR) should undertake an educational initiative to raise the general level of awareness and understanding within the profession. The information posted on the ABR site leaves many important questions unanswered.

Cost

The $1400 "reduced" fee and the $270 annual ongoing expense appear excessive. If they truly reflect necessary expenses to support recordkeeping and generating the examination, this must be explained to radiologists. The computer-based examination does not require a large cadre of examiners to come to a central location, eliminating one large component of expense compared to the diagnostic radiology oral board examination. Neuroradiologists submit the cases themselves on-line or on CD at little or no expense, further reducing the cost of creating this examination. The ABR requires that "You must remain *current* with your payments throughout the MOC cycle." Why? During the 10-year periods between examinations, radiologists are required to participate in lifelong learning activities, including traditional continuing medical education and self-assessment modules (SAMs). Each of these involves its own costs, beyond the annual fee to the ABR. What are we getting for our $270 per year? These fees do not cover the educational activities, because radiologists pay these directly to the entities that provide them. What if one does not remain current with these payments to the ABR? Does this reflect on professional competence or participation in SAMs? The ABR should carefully review its costs, and provide explanations for the high price of recordkeeping. I discuss below another element of cost, the need to travel to distant test centers.

Convenience

Although those practicing neuroradiology continuously for the past 10 years are unlikely to fail the examination on multiple repeat attempts, for those who do, the ABR includes the following provision: "If you have not passed the exam 3 years after the expiration of your certificate, you will be required to repeat the primary oral exam to regain your certification." Similarly, those who elect to permit their certification to lapse,

then wish to recertify (perhaps in response to state or local requirements for a recent certification) also will be required to repeat the primary oral examination." Why? Is the oral examination a better assessment of competence than the computerized examination? If so, is the computerized examination valid? If the computerized examination is valid, is the requirement of repeating the oral examination simply a device to coerce radiologists into ongoing participation?

Traveling to one of 3 test sites to take a computerized examination is unnecessary and perhaps the most irritating aspect of the MOC process as it is currently configured. Current ABR guidelines require that the MOC examination be "proctored and secure," but this does not require offering the examination only at limited sites and times. Test centers across the nation routinely administer other examinations with fees a tiny fraction of that charged for the MOC examination. These test centers provide security at least equivalent to the requirements of presenting an admission ticket and displaying some form of identification, as currently employed for the MOC. Elaborate identification and biometric schemes are not employed and are not necessary. Although the need for high-quality images exists in principle, the images presented at the MOC examination were of limited quality, on conventional computer monitors, without the ability to adjust windows or levels. These demands are within the capabilities of widely available desktop computers. If higher-quality image chains really are necessary, these are available throughout the nation in hospitals and radiology practices. These sites could provide the examinations with local proctors. Either solution would eliminate the expense of dedicated computers for this examination. The costs of travel, hotel, and time away from practice are prohibitive for most radiologists, and many will forgo MOC for these reasons. The ABR should establish a high priority on offering the examination in as many sites as possible across the nation. At a minimum, it should articulate a near-term goal of offering the examination in every state and in every major city. Longer term, it should anticipate that all neuroradiologists will be able to take the examination in their home communities. A stopgap measure might include offering the exam in conjunction with major medical meetings. I am sure the ASNR would work with the ABR to offer the examination at its annual meeting. This would save extra costs of travel and hotel at the expense of requiring the radiologists to miss several hours of the meeting.

Content

The ABR should revise the examination to emphasize study interpretation and consultation. In its current form, there are many hypothetical questions with ambiguous wording. The examination could benefit from proofreading by an English-major copyeditor. The examination was overly simplistic and narrow in content. The test ignored many important areas, such as trauma, and required only superficial knowledge of critical pathologies such as stroke and neoplasia. There was very little advanced imaging, with nearly no diffusion studies, nearly no spectroscopy, and no perfusion imaging. Far from requiring ongoing education, this examination could have been passed by someone who, competent 10 years ago, had ignored all subsequent progress in neuroradiology. These omissions challenge the sincerity of the stated goal of ensuring that neuroradiologists remain current in their field.

Compliance

Many eligible neuroradiologists have failed to sign up for the MOC examination or the ongoing MOC process. Are they wrong? These physicians have time-unlimited ABR certificates in radiology or diagnostic radiology. Do they need to participate in MOC? From an altruistic point of view, it is important to radiology that the lay and medical publics see radiologists engaging in the formal MOC process. Although other physicians will realize that these formalities cannot actually ensure ongoing competence, they will appreciate the noble intent. The public probably will attribute failure of the MOC process to lack of commitment to lifelong learning on the part of neuroradiologists. This could encourage unqualified physicians to practice radiology to an even greater extent than they already do. This would be unequivocally bad for patient care. We may not like being in this position, but as neuroradiologists we have a collective responsibility to endorse appropriate standards of care. We now confront a logic-of-collective-action problem. All neuroradiologists recognize the need for successful MOC, but few individuals will benefit directly from their own participation. Few of us face state licensing requirements for MOC. Third-party payors compensate neurologists for interpreting imaging studies and cardiologists for stenting carotid arteries. Obviously, the payors are not concerned with evidence of high-level expertise. Hospitals vary widely in their credentials requirements and some may require MOC specifically or other ongoing evidence of competence. Because this is a moving target, it may be difficult to predict whether more hospitals and health care entities will impose such requirements or, if MOC fails, whether those with these requirements may drop them. Those who passed their neuroradiology CAQ 10 years ago, and have unlimited certificates in diagnostic radiology, may simply decide that they do not need a current neuroradiology subspecialty certification. If rising trainees see their faculty mentors or senior colleagues in practice abandoning MOC, the fellows may decide to accept jobs practicing neuroradiology, but without obtaining subspecialty certification. Under this doomsday scenario, both MOC and subspecialty certification could fade away if neuroradiologists decide they are more trouble than they are worth. Such an extreme outcome would be unfortunate, but it could arise if the MOC process remains too opaque, expensive, and time-consuming.

Conclusion

To preserve this important initiative, the ABR should: (1) establish better communication and more transparent goals, (2) reduce the cost of MOC, (3) make test centers widely available, and (4) make the content more closely related to modern clinical study interpretation and consultation.

David B. Hackney, MD

Editor's note: *The trustees of the American Board of Radiology were offered an opportunity to respond and chose not to.*

COMMENTARY

Strategy and Economics: An Overview of the Neuroradiology Education and Research Foundation and Its Activities

The Neuroradiology Education and Research Foundation (the Foundation) was founded in 1996 with the goal of strengthening the field of neuroradiology by supporting (1) the continuing education of practicing neuroradiologists, (2) training of neuroradiology fellows, (3) development, application, and reimbursement of neuroradiologic studies, and (4) support of outcomes research and basic research to help reach goals 2 and 3. These goals have been and continue to be pursued by a number of different means. The education of practicing neuroradiologists is supported through the annual meeting of the ASNR and the accompanying yearly Foundation-supported symposium, the posting of state-of-the-art lectures about all aspects of neuroradiology on the ASNR Web site (eCME), and the annual meetings and activities of established and emerging societies. Training of fellows is supported by reduced fees for the *AJNR,* annual meeting, and symposium; the awarding of training grants and fellowships; and by providing funding for the personnel and information systems required for eCME. The development and application of new studies is supported by the yearly sponsorship of research awards and fellowships. Our ability to realize reimbursement for new techniques/procedures is aided by the support of outcomes research, the results of which are used by the ASNR Clinical Practice Committee (CPC) to promote fair reimbursement for practicing neuroradiologists.

As new techniques and applications of these techniques are constantly being developed in neuroradiology, the work of obtaining fair reimbursement for them is an ongoing struggle, one in which the ASNR and the Foundation are constantly involved. Reimbursement for new neuroimaging studies (indeed, for all new techniques) always lags behind the ability to perform them; many studies that are the mainstays of modern neuroradiology were not reimbursed for several years after they were introduced and some (tractography, perfusion imaging, functional MR imaging [fMRI], sometimes proton spectroscopy [MRS]) are still not reimbursed. Why not? Why is this reimbursement process so difficult? To better understand this and how the ASNR and Foundation are involved in the process, it will be necessary to digress for a few paragraphs to very briefly discuss the processes by which new procedures are evaluated and reimbursements are determined.

For a new procedure to be reimbursed by Medicare (and hence by most other insurers), it needs to clear 3 major hurdles: the Current Procedural Terminology (CPT) Editorial Panel; the Relative Value System Update Committee (RUC); and the Center for Medicare and Medicaid Services (CMS). Whenever a new technique or application is developed and the performing physician wants to be reimbursed for it by an insurer, an application must be submitted for a new code. The technique is presented to the CPT Editorial Panel, where evidence must confirm that the procedure is efficacious, that it is performed in many geographically diverse areas, and that no existing code is suitable. The efficacy of the procedure must be demonstrated by the use of evidence-based medicine based on data that are published in the literature. The CPT Editorial Panel looks at the quality and quantity of supporting literature and, if the data demonstrate an impact on clinical decision making or patient outcome, designates the procedure as category 1. Without this designation, there will be no reimbursement by Medicare. Much of the data that are supplied to the CPT Editorial Panel for neuroradiologic procedures comes from projects supported by the Foundation. For example, an important set of fMRI codes will be coming before the CPT panel in the fall. The proposal required a significant commitment of time and effort to craft an application acceptable to all parties. In recent years, projects have been supported to begin to acquire data regarding the efficacy of endovascular treatment of intracranial aneurysms, quantitative diffusion tensor imaging (DTI) tractography in white matter diseases, perfusion MR in carotid stenosis, embolization of intracranial tumors, DTI and fMRI in traumatic brain injury, and characterization of atherosclerotic carotid disease by CT positron-emission tomography and by multidetector row CT angiography (CTA), among others. In addition, the Neuroradiology Education and Research Foundation Outcomes Research grants fund studies to determine the quality of the data supporting these tests and what additional tests are necessary to support designation of procedures as category 1. One such analysis has already been performed for the use of MRS in brain tumors and proposals are currently being received for a study of MR and CT perfusion in cerebral ischemia.

Once a procedure has been designated as category 1, the next step is to determine the value of the test; this is determined by the RUC. Some of the factors taken into account are the skill level necessary, the intensity of the work, the stress, and the amount of time required (for pre-exam, intraexam, and postexam activities). Accurate determination of these factors requires polling of physicians who actually perform the test. Many neuroradiologists have received questionnaires from the CPC regarding the amount of effort and time spent on neuroradiologic tests and procedures. The purpose of these questionnaires is to acquire data to support a request for fair relative value units (RVUs) for new neuroradiologic exams. The results of these questionnaires, and documentation of an adequate number of responses, are crucial in determining the RVU—remember that your responses to these questionnaires are extremely important for getting proper reimbursement, so please take the time to fill these out! Armed with these data, members of the CPC meet with representatives from other specialties and organizations to come up with a consensus for the new procedure and then give an oral presentation at the RUC meeting. These decisions can be difficult, because the net spending has to be balanced; if value is assigned to a new procedure, the value of another procedure must be lowered. This requires a great deal of preparation and political skills by the CPC representative. When the meeting ends, the CPC representative leaves with a recommended value for the RVU.

The value recommended by the RUC, however, is only a recommendation. It is the CMS that has the final authority to assign an RVU value. During the summer after the RUC meeting, the CMS proposes an RVU value for the new procedure; this value is typically lower than the submitting group/society

had requested. During the summer and fall comment period, the submitting group (in the case of neuroradiology, the CPC) has the opportunity to develop and present arguments as to why the value should be higher; again, this requires data from the membership and literature. The CMS needs to be persuaded before the new fee schedule is published in November for implementation in January. In addition, the CPC, working with other groups, must develop new ICD9 codes (disease or symptom-related codes) that correspond to the new procedure; if they do not, the CMS and regional carriers will do so and the list will likely be deficient.

It should be clear from this discussion that the Foundation, through its support of clinical research, outcomes research, informatics, and the CPC, is of critical importance in helping the practicing neuroradiologist to obtain adequate compensation. The Foundation strives to serve the field of neuroradiology in many ways; therefore, it needs to be positioned to deal with new challenges for our specialty as they arise. Among the many challenges currently facing neuroradiologists, the most acute is the rapidly increasing discrepancy between workload and workforce. To get an idea of the magnitude of this issue, an informal review of workload statistics during the past 5–10 years from 7 large practices (including 4 academic centers, 2 large private practices, and one large HMO) in different parts of the United States was conducted. The neuroimaging studies included CT and MR scans of the brain, spine, and head/neck. The average increase in number of studies among the 7 groups was 19% per year, with the largest increases being in one of the private practices (25%/year) and the HMO (30%/year). Significant increases were found in all categories of examinations, but the largest increases were in brain MR imaging and brain radiographic CT. In addition to the dramatic increase in the number of studies being performed, the complexity of the studies was also found to be increasing. Whereas 10–12 years ago, most CT studies included routine anatomic imaging in a single plane and MR studies included an average of 3 sequences (in 2 planes), current studies are longer and more complex. CT studies are often reformatted (see below) and MR studies average 5–6 sequences; one or more of the following sequences are included in >80% of studies: CTA, MR angiography (MRA) or venography, diffusion-weighted imaging (DWI) or DTI, diffusion tractography, MRS, CT or MR perfusion imaging, blood oxygen level–dependent imaging (fMRI), and multiplanar reformations (at several hospitals, the number of CT reformations has increased by a factor of 50 [5000%] during the past 10 years). All of these additional studies result in increased postprocessing time and an increased number of images that must be evaluated for each study, substantially increasing the time and effort required both for performing the exam and for proper evaluation of it. Although one might argue in rebuttal that many of these new exams replace exams (catheter diagnostic angiograms, myelography) that were more time consuming, the morbidity of the new studies is significantly lower and the resulting information so much more detailed that *many* more examinations are being ordered (sometimes for less-compelling indications). The sheer number of exams much more than compensates for the increasing speed of the techniques. In addition, the information supplied by these studies is often important for the evaluation of specific patients and all neuroradiologists want to be able to provide these studies and the information derived from them for their patients and referring clinicians.

Despite the rapid increase in the number and increasing complexity of neuroradiology studies being performed, the number of neuroradiologists being trained is increasing much more slowly. The size of the membership of the ASNR (the best measure of the number of North American neuroradiologists) increased by only 38% during the past 10 years; this is <30% of the increase in the number of studies. Another measure of the number of neuroradiologists being trained is the number of fellows in Accreditation Council for Graduate Medical Education-accredited neuroradiology fellowships. The numbers obtained by this method are almost identical to those obtained by looking at ASNR membership: the 124 new neuroradiology fellows starting accredited fellowships in 2005 will add 4% to the neuroradiology work force, even if these fellows train for only 1 year (and in the increasingly complex world of neuroradiology, 1 year hardly seems to be enough training). This increasing gap between the number of neuroradiologic procedures and the number of neuroradiologists creates significant problems in providing adequate care to patients, because it means that less-qualified people (those without sustained, dedicated training in neuroradiology) will be recommending, performing, and interpreting neuroradiologic studies. This will almost certainly lead to a decreased quality of diagnosis, decreased quality of care, more turf issues, and increased overall cost in the care of patients with neurologic disease. Payers now place greater emphasis on the quality of care, and pay for performance is becoming a reality. Therefore, more neuroradiologists must be trained. The question is how to accomplish this.

Neuroradiology fellows come from radiology residents, so an obvious first step is to increase the number of residents in radiology. This is not automatic or easy, because the number of residents authorized for a residency program is mandated by the Residency Review Committee and depends upon the academic caseload and environment of an institution. In addition, the program must figure out how to pay for the residency positions, because supplements from the government are limited. If enough residency positions are granted, one should remember that neurology residents with an interest in neuroradiology can become CAQ eligible by enrolling in a program of 2 years of neurology followed by 2 years of general radiology, and finishing with a 2-year neuroradiology fellowship. A similar process could be envisioned to develop more pediatric radiologists and radiologists in other subspecialties; this path could help to fill the void in radiology subspecialties. The problem with this approach is that such residents (for example, neurology residents) have to declare their intention when they apply for their residency. Thus, neurology residents who become disillusioned with their field do not have any route to neuroradiology other than applying to a radiology residency program and starting from the beginning. In light of the duration of medical training, it is not surprising that the number of physicians who add 2–3 extra years to their training by choosing this route is quite small. Another possibility would be to allow radiology residents to specialize earlier, for example by entering a fellowship after only 2 years. Such a 2–2 program would allow training of neuroradiology fellows (or pediatric radiology fellows, or musculoskeletal radiology, etc)

in 4 years instead of 6. The 2-year fellowship allows the extensive subspecialty training necessary to bring added value to the subspecialty radiology practice. This is essentially what has happened in internal medicine and pediatrics, where the initial residencies are short, but nearly every physician specializes. Indeed, problems such as this confront all of medicine and are currently being addressed at many levels. Other specialties encourage their trainees to stay in an academic center for fellowship training by delaying board eligibility until 1–2 years after completion of their residency.

Whether more radiology residents are trained or not, more neuroradiology fellows must be trained. To do this requires recruiting more attending physicians in neuroradiology, which can be difficult when the salary structures of academic and private practices diverge. As a result, there is a need to make academic practices appealing in ways other than financial. In general, this means giving the academic physician sufficient time to pursue research interests; however, for the academic practice to be financially sustainable, academic time must be purchased with fellowship or grant money. Obviously, the practice cannot afford to pay a member who does not support his or her salary. The Foundation helps the young academician to purchase such time with fellowships and grants. These awards have given a boost to young academicians for many years. A recent poll of former winners of research awards from the ASNR and the Foundation showed that, of the 47 winners of awards who could be contacted, 41 are still in academic practice. This group includes 9 chiefs of neuroradiology sections, 3 department chairs, and one hospital vice president. All of those polled stated unequivocally that their award gave a much needed boost to their confidence and their careers. These leaders in neuroradiology have used the research time provided by their awards to train more neuroradiologists and to pursue development of new techniques and applications. As stated earlier, these techniques and applications eventually come to the neuroradiology reading room and allow us to give the added value of neuroradiology training to our patients and referring clinicians while at the same time leading to higher reimbursements for the practicing neuroradiologist.

Another avenue to increasing the strength of neuroradiology might be to convince radiology groups to wait an extra 2 years until trainees are fellowship trained before bringing them into a practice. Ultimately, this is to the benefit of the practice, as the young neuroradiologist, fresh from training at a top academic institution, will bring new, state-of-the-art techniques to the practice and thereby improve the quality of diagnosis and care. For neuroradiology to prosper, the quality of care given by a practicing neuroradiologist must have *added value* compared with that of practices without trained neuroradiologists. This added value can be maintained or increased by several means, including hiring only fellowship-trained neuroradiologists (preferably after 2 years of training), having practitioners attend the annual meeting of the ASNR and the Neuroradiology Education and Research Foundation Symposium, by reviewing the eCME lectures on the ASNR Web site, and by routinely reading the *AJNR*. Without the added value supplied by excellent, focused training and continuing education, it would not be possible to compete with the much larger number of other physicians who would like nothing more than to incorporate neuroradiology into their practices.

This editorial has tried to summarize the ways in which the Neuroradiology Education and Research Foundation and the ASNR are working to benefit neuroradiologists and neuroradiology. In many ways, it also answers a question that is often asked of the leaders of the Foundation and the ASNR: where does our money go? The answer is that it goes many places. It goes toward the development of new imaging techniques and therapies and documents the efficacy of these methods and outcomes for patients so that neuroradiologists can be fairly reimbursed for their work. The money also goes toward training new neuroradiologists who will keep up the high standards originally set by the pioneers of our specialty, who created the field of neuroradiology by showing that value is added by physicians with a high level of training in the demanding and complex field of neurodiagnosis and therapy. This continual evolution and improvement of methods and the accompanying high standards enable young neuroradiologists to take our specialty forward with a sense of pride and empowerment and with confidence in the future.

A. James Barkovich, MD