

consistent with their practice standards, is less hassle, and results in less uncertainty about the value of the study. For interpreting physicians, economies of time can be achieved by limiting the scan to a single body region, which is consistent with practice guidelines. Decreased patient radiation exposure will also increase acceptance of the technology.

Nuclear medicine physicians and radiologists must educate referring physicians about the utilization of PET/

diagnostic CT. Adoption of this approach could have a profound, positive impact on clinical utilization of molecular imaging with PET.

*George M. Segall, MD  
VA Palo Alto Health Care System  
Stanford University  
Palo Alto, CA*

## Engaging and Nurturing Referring Physician Relationships

In the years since we received Centers for Medicare and Medicaid Services (CMS) approval for the first covered clinical indications for PET, we have overcome many of the barriers that prohibited widespread adoption of this modality. Today, the availability of unit-dose PET tracers; technical equipment advances in PET/CT; cost-effective entry options, including turnkey management solutions; mobile PET/CT access providing weekly service into rural communities throughout the United States; and broadened coverage by CMS have combined to make PET/CT more feasible and more readily adopted and utilized. Yet PET/CT procedures represent only 2.5% of the total oncologic CTs performed annually in the United States. Outside of academia, referring physician adoption of PET/CT as a routine clinical tool for patient management remains the final hurdle. My own perspective on the current state of referring physician adoption and utilization of PET/CT in the community setting, as well as experience-based strategies for nurturing and developing key referring physician relationships, will be the focus here. The role of the interpreting physician as a PET/CT consultant and champion will be reviewed, and case studies demonstrating successful techniques for broadening the referral base and increasing utilization will be discussed.

### Identifying and Crossing Barriers to Adoption

One of the greatest early barriers to clinical adoption of PET and PET/CT was limited access to technology, a problem that no longer is so daunting. We now have cost-effective mobile entry points for rural communities. In the western part of the country, where I work, PET/CT is available within 100–120 miles of every patient. In almost every community in which an oncologist practices, PET is available at least once each week. A broad network of commercial cyclotrons provides reliable supplies of unit-dose <sup>18</sup>F-FDG. Turnkey management solutions are now available, and all vendors

offer support for program implementation to help individuals surmount the barriers to getting started in PET and PET/CT imaging.

Another initial barrier to widespread adoption that remains challenging is limited coverage by CMS and private payers. On the positive side, we now have wider CMS coverage for diagnosis, staging, and restaging of 6 major cancers as well as conditional coverage for breast, cervical, and thyroid cancer. Moreover, access to any and all oncology applications through the National Oncologic PET Registry (NOPR) has been available for more than 2 y. As a result we have seen an 18%–20% increase in referrals from the same referral market. The NOPR mechanism has expanded the ability of referring physicians to use this beneficial technology to solve problems in a wide range of patients. Many if not most commercial payers are covering uses of PET and PET/CT beyond the CMS restrictions when medical necessity is demonstrated.

But the reimbursement news is not all good. The proposed Deficit Reduction Act changes in imaging reimbursement threaten to impact molecular imaging and, in fact, to have the most significant adverse effects on patients for whom access to these technologies has been difficult in the past. If services are provided by a mobile provider, for example, and the cost per scan exceeds reimbursement, the service cannot continue. If the cost for the pharmaceutical includes a \$600–\$1,600 charter air flight into rural areas and the FDG cost is bundled into the hospital reimbursement cost, there is no way to make up the difference. The biggest risk in widespread adoption of PET/CT as a clinically viable tool in the community environment is that it cannot be supported if adequate reimbursement is not available for the cost of distributing the radioisotope in those communities.

Another barrier in the past was the widespread view of PET as “unclear” medicine. PET provided limited anatomic correlation, a fact that sometimes made it difficult to

convince referring physicians of its value. The introduction of PET/CT had a broader effect on utilization than any of the coverage decisions to date. With the incorporation of a technique with which they were familiar, referring physicians could finally “see” what nuclear medicine physicians had known all along. The result was a 28%–30% increase in referrals. As a result of these enhanced capabilities, we are seeing more incorporation of PET/CT scanners as shared resources in rural community hospital settings. No longer are PET volumes alone needed to sustain throughput goals. PET/CT units are being installed in radiation oncology suites in small community hospitals, where routine use of the PET/CT simulator is used as part of justification for the technology.

We still have significant barriers to optimal PET/CT utilization that must be addressed and overcome. The first is a lack of understanding by oncologists and other referring physicians about the strengths and shortcomings of the technique. This leads directly to dissatisfaction with nuclear medicine physicians’ and radiologists’ interpretations and can result in poor decision making about appropriate patient selection for the modality.

When I meet with referring physicians, as I frequently do to see how we can positively affect adoption, I find that they are concerned as well as inadequately informed about optimal utilization. This situation is exacerbated when imaging specialists overestimate the accuracy of PET and its positive and negative predictive values in specific scenarios. Referring physicians’ confidence is further eroded in those instances in which incomplete information or a lack of clinical understanding by the nuclear medicine physician or radiologist leads to problematic interpretations. One example would be the following finding included in a PET/CT report to a referring physician: “This 84-y-old woman with lung cancer has uptake in the primary tumor and in a paratracheal node. She would be a good candidate for surgery.” No 84-y-old patient is a good candidate for surgery without the availability of additional quality of life information and certainly not a patient with a paratracheal node.

In the NOPR and American College of Radiology/Intersocietal Commission for the Accreditation of Nuclear Medicine Laboratories accreditation processes, we have also discovered a critical need for standardization in reporting. One of the largest barriers we see is in inconsistency in results presented to referring physicians. When a referring physician orders chest/abdomen PET/CTs, the reports may vary widely in length, specificity, and, when more than 2 interpretations are involved, the nature of findings. Precision in interpretation and consistency in presentation are crucial to advance referring physician confidence in molecular imaging.

### **Communication and Education**

One strategy to successfully engage the referring physician is to designate a PET/CT champion who can serve as a point person for communication and education. This person could be either a nuclear medicine physician or

a radiologist but must be willing and able to serve as a consultant. He or she should have regular and active participation in venues such as tumor boards, reviewing cases in which PET and PET/CT play a significant role in patient management as well as those cases in which nuclear medicine is less helpful. These settings can provide valuable opportunities to talk about how and when molecular imaging is appropriate in the clinical pathway. Such efforts, however, are prospective, in that the professional component of reimbursement does not reflect the effort involved in these outreach activities.

In my own work, we discovered that our role went beyond merely providing the radiopharmaceuticals. It was clear that mutual success depended on partnering with our PET centers to be able to make crucial connections with referring physicians and patients. One of our most successful efforts at Siemens in building these bridges is in a Web-based solution called MI LifeNet. This is an online portal that fosters links between imaging centers, patients, physicians, and our radiopharmacies. It features a comprehensive array of clinical applications, e-learning tools, lectures, case studies, and other information that imaging specialists in the community setting can share with referring physicians. One section of the site, MI University (which includes PET/CT University and SPECT/CT University), provides additional learning opportunities and also offers the “Call It with Confidence” feature for both interpreting and referring physicians. The Web portal is customized for each imaging site and also includes a patient portal that explains what PET/CT is and how it works. Other vendors have taken similar approaches to partnering with imaging providers in outreach. Cardinal Health offers a portal called PET Foundations, and IBA Molecular has created PETLinQ.

### **Taking the Molecular Imaging Message to the Street**

We have also looked to the pharmaceutical marketing model that targets 1-on-1 interactions and relationship sales models. This has involved broadening the skill sets that we would need to partner with our PET centers to be able to take their physician liaisons or whichever individuals would serve as their PET champions and focus them on getting the message out to referring physicians. This is an excellent strategy not only for PET but for any imaging practice.

In this process, we have identified a number of guiding principles. The first is the need to focus on the referring physician as a customer of the imaging center, with a goal of matching the needs of each physician and his or her practice with the specific benefits the imaging center or department has to offer. Second is the importance of relationship development and cultivation for maintaining current referring physicians, establishing new referral sources, and converting new physicians. Referring physicians and their staff want a point of contact in the imaging practice to answer questions and resolve problems—a role that will become even more important as diagnostic procedures become more complex.

In addition, coordination with technical operations is essential to ensure capacity and the ability to meet prospective demand. These principles are effective, regardless of the setting. Strategies for implementation, however, may differ depending on whether the market is rural or urban and on whether services will be delivered in hospital or outpatient venues.

Programs that successfully manage referring physician relationships share certain key characteristics. They are: focused and strategically driven, integrate measurable outcomes into their practice and relay these data to customers, have the full administrative and infrastructure support of their organizations, and are part of an environment that understands and values the physician's role in the referral process. Moreover, these programs have the clinical capability and expertise to meet patients' and referring physicians' needs; are ready to provide quality patient care, ease of access, and timely reporting of results; and are willing to embrace an approach based on the customers' needs. The best of these programs have liaisons or representatives who are solution oriented, focused on the referring physicians' practice and patient needs, and able to focus on specific needs; a single point of contact who is viewed as a trusted resource by the referring physician; a team of clinical specialists, radiologists, and administrators to provide depth of knowledge and coverage; and a perspective on issue resolution as an organizational process involving all participants. With these characteristics in place, the referring physician and his or her staff see a seamless operation ready to support the patient's best interest. The result can be long-term, loyal, and collaborative relationships with referring physicians.

An example from our work shows how impressive these results can be and points to specificity of message as another key element in success. In a review of annual referral patterns for 1 imaging center we found that the center was capturing

medical and surgical oncology referrals for lymphoma and colorectal and breast cancer. Lung cancer referrals accounted for only 18% of the total. Missing were referrals from pulmonologists, family practice and internal medicine physicians, and thoracic surgeons for solitary pulmonary nodes and initial staging of lung cancer. We realized that we could drive volumes by talking more specifically about PET/CT applications in a more targeted way. We developed targeted educational messages, flyers, and lunch-and-learn presentations to address the "gap" identified in referrals. Our customer service representatives were educated to deliver the content to key referring physicians. The results were immediate. In the first 5 mo, the center performed as many exams as they had in the entire previous year through capture of new referring physicians and increased awareness of the utility of PET in single pulmonary nodules and initial staging of non-small cell lung cancer.

A final important strategy is to work together to broaden the audience for our message. Efforts such as the molecular imaging education area and the SNM molecular imaging track at the annual meeting of the Radiological Society of North America are encouraging. We should expand efforts to place molecular imaging experts at meetings such as those of the American Society of Clinical Oncology and the American Society for Therapeutic Radiology and Oncology, as well as at other specialty meetings. We should also make our experts available to the National Comprehensive Cancer Network to provide input on appropriate utilization of molecular imaging during practice guideline development and review.

*Sue Minerich, BS, CNMT  
Siemens Medical Solutions USA  
Hoffman Estates, IL*

## Steps in Moving Molecular Imaging to the Clinic

I had the good fortune to be involved in initial PET imaging efforts in the San Diego, CA, area in 1999, when we brought a mobile van into my most recent site. Today 13 PET scanners are operative within 8 miles of my workplace. The technology has clearly taken off, but much remains to be done in raising our profile and in talking effectively and specifically with referring physicians.

### Engaging the Primary Care Physician

A number of familiar strategies have been used for years to engage the interest and attention of referring

physicians. We are all familiar with tumor boards, conferences, cases of the month, and dinner meetings. I would like to outline a few strategies that are somewhat different but have worked quite well.

The first of these is to target outreach to primary care physicians. Oncologists, neurologists, and cardiologists are, of course, important partners in molecular imaging and continue to be excellent sources of referrals. But if we look at the percentage distribution of different disciplines, we see that primary care, family medicine, general practice, and internal medicine physicians make up 67.8% of all