Rising Costs of Medical Imaging Spur Debate

By Karen Rowan

Medicare spending on medical imaging services reached $14 billion in 2006, more than double the 2000 spending, according to a report from the Government Accountability Office (GAO) released in June. The GAO also found that the proportion of spending on imaging services performed in physician offices rose from 58% to 64%, whereas the proportion of spending on imaging performed in hospitals dropped from 35% to 25% over that same period.

This shift from hospitals to outpatient settings, along with a substantial variation in spending per beneficiary in different regions of the country, has raised concerns that not all of the imaging being done is medically necessary, according to the report. The GAO recommended that the Centers for Medicare and Medicaid Services (CMS) manage the rising costs by implementing practices used by private health plans, such as requiring prior authorization.

Although many agree that spending on medical imaging has indeed risen dramatically and may need to be constrained, there are still different ideas about the best way to proceed. At the heart of the debate is the difficulty of pinning down the true benefits of imaging—its effect on diagnosis, treatment, and length of hospital stay, for example. Moreover, the rapidly advancing technology and ever-widening scope of diseases and conditions for which imaging is used are making it difficult to rigorously and thoroughly analyze the medical benefits, harms, and cost-effectiveness of imaging.

The GAO Report

The GAO investigated the rise in imaging spending after a 2005 report by the Medicare Payment Advisory Commission recommended limiting such spending, prompting reductions in physician fees for certain imaging services and leading to outcry from physicians, patient advocacy groups, and manufacturers of imaging equipment. Using Medicare Part B claims data from 2000 to 2006, the GAO analyzed the total spending on imaging services to look for trends. The categories included advanced imaging techniques, such as computed tomography (CT), magnetic resonance imaging (MRI), and nuclear medicine (i.e., positron emission tomography [PET]), and standard imaging procedures, such as ultrasounds and x-rays. The same data from Medicare were also used, along with interviews with physicians and private health care payers, to analyze the relationship between the spending growth and the provision of imaging services. The GAO also interviewed radiology benefits managers from 17 private health insurers to see if the private sector’s management practices offered lessons for Medicare and Medicaid.

The report found three specific trends in the data that, taken together, were cause for concern. Physicians increasingly received payments for both doing the actual imaging procedure and for reading the results; they received an increasing portion of their total Medicare revenue from imaging, and the 2006 spending per beneficiary varied almost eightfold across the states. Together, these trends indicate that Medicare’s policies may create financial incentives for physicians to overuse imaging services, wrote the report’s authors. Physicians who own or lease their own imaging equipment may have financial motives to refer patients to their own practices for imaging.

“We believe that once an imaging machine is obtained by a practice, the more it is utilized, the more profitable it becomes,” said Bruce Steinwald, a director of health care at the GAO, who worked on the report. The
amount of money that Medicare reimburses physicians for imaging services is based on an estimate of how often the machine will be used, and the Medicare Payment Advisory Commission has mentioned in the past that the estimate is too low, he said, which makes the reimbursement rate too high.

A follow-up GAO report issued in September addressed the issue of imaging costs in 2007. As of Jan. 1, 2007, Medicare had capped reimbursement for imaging services—specifically, physicians who performed imaging services at their own offices or at outpatient facilities were no longer reimbursed at a higher rate than physicians doing those same services at hospitals. This change meant that physicians doing their own imaging now receive less revenue from imaging than they did before 2007. Despite the cap, the GAO found that during 2007, use of imaging continued to rise, even as spending declined. “We would not have seen this growth” in imaging, Steinwald said, if it weren’t still profitable for physicians at the reduced reimbursement rates.

Also, the GAO June report noted, imaging services are sometimes of a low quality because of providers’ using second-rate equipment. Moreover, primary care physicians may not be aware of the most appropriate tests for patients and could order unnecessary tests, the report’s authors concluded.

To address the problem, the GAO pointed to practices used by private health plans to manage imaging costs. The most common is the prior authorization requirement, in which physicians must get the plan’s approval before ordering an imaging service. The other practices are privileging, in which only physicians of certain specialties are allowed to order certain imaging services, and profiling, which compares individual physicians’ orders of imaging to a set standard for their specialty.

**Different Solutions**
The American College of Radiologists (ACR), on the other hand, does not agree that implementing these practices would solve the problem. Instead, it proposes implementing a mandatory accreditation process in which physicians who perform imaging services would be required to meet strict quality and safety standards. The ACR accreditation could be one way that imaging services providers meet a mandate, required by legislation passed by Congress earlier this year, that they be accredited by 2012.

“That would improve the quality of care,” said James Thrall, M.D., radiologist in chief at Massachusetts General Hospital and chair of the ACR board of chancellors.

Accreditation alone would not necessarily eliminate financially motivated self-referral, Thrall said. However, he suggested that a computerized decision support system might help. Physicians could enter their criteria for ordering an imaging service into a computer program, which could score the criteria and decide whether the service was appropriate. If a physician disagreed with the computer, he or she could still proceed with the service. But if someone did so often, other doctors or supervisors could use the data to intercede, Thrall said.

“Accreditation is a partial solution,” agreed Barry Siegel, M.D., chief of nuclear medicine at Washington University in St. Louis. It would yield higher-quality imaging, better interpretation, and lower radiation exposure for patients, he said.

One problem that he envisions in hospitals, however, is that accreditation would force radiologists to act as gatekeepers. When radiologists receive referrals for services from other, nonaccredited physicians at their hospital that they suspect may not be necessary or may not be appropriate to answer the medical question being asked, “we look like we’re second-guessing the physician who really knows the patients best.” He said that about 10%–15% of referrals he receives raise questions in his mind and that he typically dissuades a moderate number of those physicians from ordering the service.

**Cost-effectiveness**
To address the spending problem, cost-effectiveness studies are needed, said Peter Neumann, Sc.D., director of the Center for the Evaluation of Value and Risk in Health at Tufts Medical Center in Boston.

“Without this information, management techniques are crude, blunt instruments,” he said. But there are challenges to doing this kind of analysis. For example, to examine the long-term health benefits of MRI scans, researchers would need to determine the increased chance of detecting a disease, the increased chance that a person would then receive treatment, and the increased chance that the treatment would work.

GAO’s Steinwald said that the agency’s study didn’t attempt to account for cost savings associated with imaging because the costs are so difficult to quantify and the GAO did not have all data needed to do such an analysis. But often, he said, imaging services yield false negatives and false positives, and following up on those requires additional costs. Therefore, the costs of imaging are not always offset by the improved results, he said. Instead, there might be additional costs as well. “There may be cost saving in some cases,” he said, but “it would be far fetched to say that happens on average.”

Insurance companies often look at imaging in isolation without taking into account other health care costs that are affected by accurate imaging, said Thrall. One of the few studies that attempted to look at the full scope of costs appeared in the New England Journal of Medicine in 1998. Researchers at Massachusetts General Hospital performed CT scans on 100 patients with symptoms of appendicitis and then compared the costs of imaging and treating these patients with the costs of following the standard procedure, which was to hospitalize the patients for observation or to remove the appendix. The results showed that the imaging eliminated the need for unnecessary hospital admissions and surgeries. People who needed surgery got it quickly, and those who didn’t need it didn’t get it. They found that the hospital saved an average of $447 per patient by performing the imaging.

In oncology, where imaging is used to diagnose cancers, determine the stage of the cancer, and monitor the effectiveness of treatments, the National Oncologic PET Registry (NOPR) has been collecting data since 2005 on how fluorodeoxyglucose (FDG) PET scans influence treatment. Through the registry, patients with cancers that are not already approved by Medicare for FDG PET reimbursement can receive this reimbursement as long as their doctor completes a form to
explain how the scan affected the patient’s treatment plan. As of July 2008, NOPR had collected data on nearly 90,000 PET scans and so far has released one study (published in the March issue of the Journal of Clinical Oncology) showing that, for more than a third of patients, the results of the scan changed the treatment plan.

On the basis of these data and several more reports to be published soon, NOPR has asked CMS to reexamine its coverage of these scans, and Siegel said the final decision is expected in April.

Benefits
In the meantime, defenders of imaging argue that the same technological advancements that are bringing increased imaging costs are also bringing better diagnoses and treatments to patients. Juri Gelovani, M.D., Ph.D., professor and chairman of the department of experimental diagnostic imaging at the University of Texas M. D. Anderson Cancer Center, pointed to new molecular imaging techniques as an example of advances that allow doctors to better predict responses to particular treatments and personalize treatment plans for their patients.

Imaging proponents also argue that scans that some might consider medically unnecessary sometimes are needed to put a patient’s or a doctor’s mind at ease about their cancer. “If I have a patient with subtle symptoms that [he or she has] been concerned about for months, I’ll order a test,” even if it’s possible that the test won’t find anything, said Julie Gralow, M.D., a medical oncologist at the University of Washington. There are definite health benefits to this approach because it reduces the patient’s stress and anxiety, she said. Worries about malpractice suits can also prompt doctors to order imaging services. “They ask, ‘What if MRI had been done?’” Gralow said, of cases where the delay of breast cancer diagnosis is the cause of a suit.

The amount of time required to develop and approve new drugs may also shrink thanks to imaging technologies. For instance, FDG PET, one type of molecular imaging, which uses a molecule similar to glucose to measure the amount of activity occurring in cells, can reveal the rapid growth that indicates a tumor. Currently, the U.S. Food and Drug Administration approves oncology drugs (with a few exceptions) only after a phase III study shows a benefit in overall or progression-free survival—which sometimes involves waiting years for survival data. If instead, it were accepted that FDG PET scans could be used to show that a drug is having a desired effect on a tumor, the time needed for approvals could be shortened, said Siegel.

The FDA has sometimes used imaging procedures to measure patients’ responses to drugs and has approved drugs on the basis of those responses. FDG PET offers an advantage over other types of imaging, such as MRI or CT. FDG PET can measure the activity level in cells—and this change in metabolism can occur before changes in tumor size and can occur even when there is no change in tumor size, said Siegel. This change in metabolism is also predictive of the long-term response to a drug, he said.

Ultimately, it is these costly imaging scans, such as MRI and PET, that are causing all the nervousness on the part of private health insurers and CMS, said Gelovani. But he argues that tightened controls on spending are impeding the technology from advancing. The technology-driven increases in the cost of these procedures were not anticipated properly, he said, and in the American health care system, which is renowned for technology-driven care, it is hard to contain the progressive techniques that require advanced equipment but also improve the diagnosis and monitoring of treatment. “To contain these by reducing costs or regulating their use will only be detrimental.”

© Oxford University Press 2008 DOI: 10.1093/jnci/djn430