

Utilization Management and Noninvasive Diagnostic Imaging

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Health care costs are rising at unprecedented rates in the United States, and a substantial contributor to these cost increases is a growing dependence on diagnostic imaging. Radiologists have become aware of the need for optimal use of imaging provided in a cost-effective and timely manner. This article describes a program that has reduced inappropriate imaging use by involving both community-based and academic radiologists in its precertification process.

Health care costs in the United States reached \$1.6 trillion in 2002—a 9.3% increase from 2001.^{1,2} In 2003, the Blue Cross and Blue Shield Association (Chicago) estimated that \$65 billion to \$75 billion was spent on diagnostic imaging in 2000, and predicted this figure will grow by \$18 billion to \$21 billion between 2000 and 2005.³

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Consequently, health care payers have intensified pressure on physicians to limit the use (and overuse) of noninvasive diagnostic imaging and, at the same time, to provide appropriate, high-quality examinations.³

WHY HAS UTILIZATION INCREASED?

The increased use of noninvasive diagnostic imaging is attributable to many factors. During the last decade, many costly imaging innovations were introduced into practice. New technologies, such as positron

emission tomography (PET), and mature technologies, such as computerized tomography (CT), have continued to evolve. It is difficult for referring physicians to keep pace with and integrate appropriate indications for both older and newer diagnostic imaging systems. As new imaging procedures become available, they are added to diagnostic workups. Older, more familiar studies are often requested as well.

Significant changes in the physician-patient relationship over the past decade have increased the use of diagnostic imaging. Physicians, under growing financial pressure resulting from reduced fees, have tried to compensate by seeing more patients.² In 2001, Murphy and colleagues⁴ published results of a study demonstrating deterioration in patient satisfaction with the physician-patient relationship in the areas of interpersonal relations, communication, and trust. Physicians, in turn, tried to enhance patients' satisfaction by yielding to their demands for more frequent and sophisticated procedures.² In patients with low back pain, Jarvik and co-workers⁵ found no significant difference in clinical outcomes between those who underwent magnetic resonance imaging (MRI) and patients examined by plain radiography. However, greater satisfaction was reported by the MRI group.

Another contributing factor to increased utilization is that clinicians have become more dependent on laboratory and imaging studies.⁶ Multiple, overlapping examinations are frequently ordered, without consideration of their influence on treatment decisions.

Economic pressures have encouraged physicians other than radiologists to acquire imaging equipment, and the resulting surge in imaging capability in community practices has also contributed to overutilization.² In a climate of decreasing fees, nuclear medicine (NM) imaging, bone densitometry, ultrasonography (US), CT, MRI, and even PET provide revenues beyond those gained from conventional radiography and fluoroscopy.^{2,7,8} Kouri and associates⁹ have identified self-referral as an important cause of the escalating use of imaging. It is estimated that 50% of the imaging studies now performed in the United States are self-referred, but they are rendered on equipment in nonradiologists' offices and therefore not in violation of the Stark laws.¹⁰

Maitino and colleagues¹¹ found that between 1993 and 1999, the Medicare part B imaging performed by radiologists decreased by 3.9%, whereas those performed by nonradiologists increased by 25.2%. Even more striking was the fact that the total relative value unit rose by only 6.9% among radiologists, but by 32.4% among nonradiologists. Others have also demonstrated that utilization is higher and quality lower when nonradiologists provide imaging services.²

Over the past 25 years, radiologists have become aware of the need to provide appropriate, timely, cost-effective imaging. In 1984, Baker and associates¹² described a study conducted in a radiology consultation service in a large, acute care teaching hospital. Their purpose was to educate physicians concerning the most appropriate imaging tests for specific clinical problems. In teaching hospitals, the regularity of conferences makes access to this type of service

easy and convenient. The study revealed that use of this service significantly decreased inappropriate imaging. Although the experience of this group was encouraging, the concept did not become widely popular, and most physicians are not currently trained in the importance of ordering the most appropriate and cost-effective examinations. Residents are not encouraged to use radiology colleagues as consultants. They are rarely taught algorithmic approaches to imaging or how to analyze the relative values of these tests in terms of diagnostic certainty or patient management.

Radiologists also contribute

indications alone have significantly and appropriately increased the use of CT. Consequently, diagnoses are faster, safer, and more accurate than in the past.

UTILIZATION MANAGEMENT

To control rapid growth in utilization and promote appropriate, cost-effective imaging, one company (CareCore National, Wappingers Falls, NY) introduced a clinical certification process for high-cost procedures. This program addressed NM, including cardiac NM, PET, CT, and MRI.

In this program, radiologists

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to the problem of overutilization. Although it is frequently appropriate for a radiologist to suggest an additional imaging test to clarify a diagnosis, their reports often suggest that additional examinations be performed "if clinically indicated." Referring physicians then believe they are obligated to obtain these extra tests. Dehn¹³ found that the rate of radiologist-recommended additional imaging is approximately 18%.

Clearly, the growth in imaging technology is not all wasteful. One of the best examples is the use of noncontrast CT of the abdomen and pelvis for urinary tract calculi, which has replaced intravenous urography. Although CT is more expensive, it is more accurate and safer, since iodinated contrast is not used. Also, CT has become the standard of care in diagnosing pulmonary emboli, diverticulitis, and appendicitis. These four

are involved at all levels of the process, since they understand the limitations of each technology and are most qualified to determine the appropriate use of both established and new technologies. The imaging specialist, the "gatekeeper" to high-cost procedures, assures patients the most appropriate study with the highest likelihood of benefit.

The foundation of the clinical certification system is the utilization management (UM) committee, which sets all UM policies. It includes active, board-certified radiologists from academic and community practices and the organization's medical directors, who are board-certified radiologists, internists, and PCPs. The UM committee uses a set of commercially available, proprietary imaging guidelines based on medical literature and augmented with criteria that expand the guidelines for many

of the Current Procedural Terminology (CPT) codes¹⁴ included in the commercial product. For codes that are not included in the commercial product, the UM committee writes standards. All criteria are reviewed at least annually, and any proposed changes pass through many review levels before implementation. Input is solicited from community-based and academic radiologists, other medical specialists, and each of the company's managed care clients.

The UM committee constantly reviews current literature and reevaluates certification criteria. This enables rapid reaction to changes in technology and clinical practice and ensures timely recommendations to clients concerning coverage.

The clinical certification process requires a balance between the convenience of referring physicians and patients and the reviewers' need for clinical information. The process begins with a request for an imaging procedure. Usually, the caller is a member of the requesting physician's staff. Only requests for cardiac NM stress tests are authorized at the intake level, if criteria are met. All other requests are discussed with a clinical nurse reviewer employed by the

organization who records the information and attempts to match it to the precertification criteria. If the request meets all of the criteria, the procedure is authorized, and the requesting physician's office is given a clinical certification authorization number. If the information does not meet the criteria, a medical director will review the request. Nurse reviewers do not deny requests.

It is impossible to write specific criteria to cover every clinical scenario. Therefore, before a request is denied, it is reviewed by a board-certified radiologist, internist, or PCP. For consultation, all of the medical directors may access radiologists on the organization's full-time staff, as well as community or academic participants of the UM committee. When indicated, the committee may suggest alternative (sometimes more sophisticated or expensive) imaging as part of the company's physician-education program.

Another important aspect of the clinical certification program is availability of a staff medical director to help requesting physicians select the most appropriate examination. In difficult or unusual cases, the medical directors have access to a network of radiologists in community practice and at tertiary care academic centers.

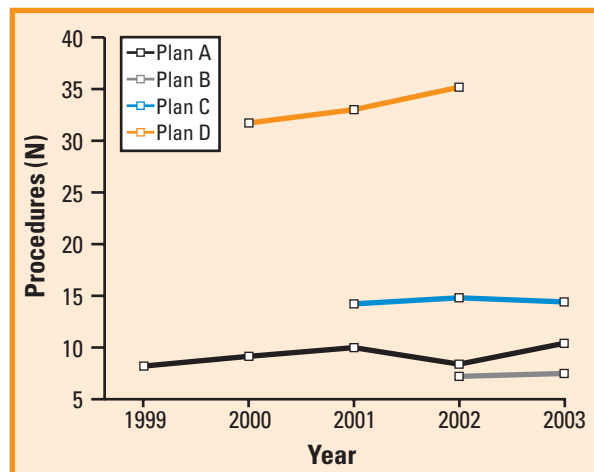


Figure 2. General nuclear medicine procedures/1,000 members. N = Number.

DATA ANALYSIS

Results (reported as procedures/1,000 members) obtained since 1999 for radiology management services (plans A and B) were compared with data from two unmanaged plans (plans C and D). All of the plans are in the same geographic area. During this five-year period, the managed radiology plans outperformed the unmanaged plans.

Plan A experienced a small increase in MRI utilization from 1999 to 2002, and both plans A and B had essentially no growth from 2002 to 2003. In plans C and D, MRI utilization rates were higher. In plan D, the growth rate in MRI utilization was far greater than that in the two managed plans (Figure 1).

In terms of NM, excluding cardiology and PET, managed radiology plans had utilization rates of 8.08–10.37/1,000 members for plan A from 1999 to 2003 and 7.21–7.49/1,000 members for plan B between 2002 and 2003. The unmanaged plan rates averaged between two and three times higher but were also relatively steady (Figure 2).

Cardiovascular NM imaging, mainly myocardial perfusion studies at rest or under stress, has been increasingly used nationwide. The rates for this set of exams (CPT codes 78465, 78478,

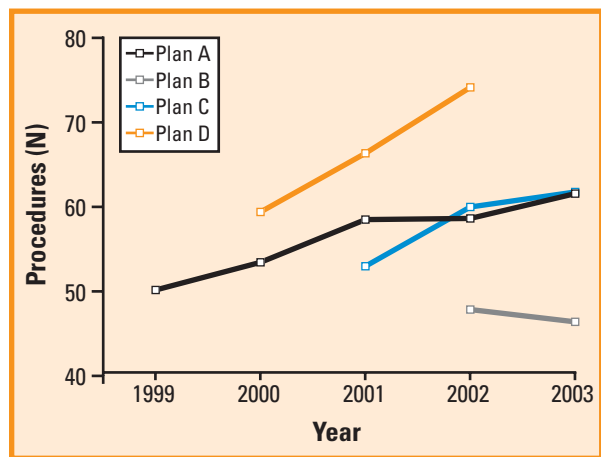


Figure 1. Magnetic resonance imaging procedures/1,000 members. N = Number.

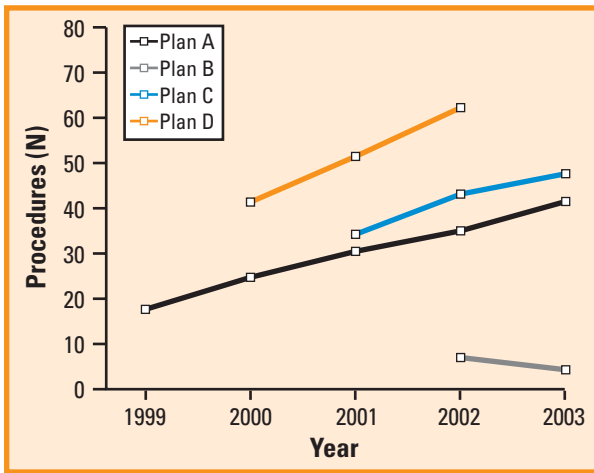


Figure 3. Cardiovascular nuclear medicine procedures/1,000 members. N = Number.

78480) rose from a low of 17.65/1,000 members in 1999 to a high of 41.50/1,000 members in 2003 for plan A. Plan B experienced a decrease from 7.00/1,000 members to 4.29/1,000 members between 2002 and 2003. In contrast, the rates in the two unmanaged plans ranged from a low of 34.24/1,000 members in 2001 to a high of 47.64/1,000 members in 2003 for plan C; plan D ranged from a low of 41.37/1,000 members to a high of 62.25/1,000 members (Figure 3).

Significant growth has also occurred in PET procedures over the last four years. However, this technology is still new, and the full potential has not yet been realized. In the two managed

gone considerable evolution in the past decade. With the introduction and increased availability of multidetector helical scanners, some currently view it as a new technology that has not yet reached its full clinical potential; expansion in its use is expected over the next few years. In the two managed radiology plans, the use of CT grew from 51.64 procedures/1,000 members in plan A between 1999 and 2003. It remained fairly stable in plan B (58.31–57.16 procedures/1,000) between 2002 and 2003. In the unmanaged plans, the number of procedures/1,000 members was extremely high, ranging from 83.97–101.29/1,000 members

plans, PET scans increased from 0.27 procedures/1,000 members in 1999 to 1.65/1,000 members in 2003 in plan A, and from a low of 0.82 to 1.19/1,000 members from 2002 to 2003 in plan B. The unmanaged plans experienced similar growth patterns (Figure 4).

Computerized tomography is an established technology that has under-

gone considerable evolution in the past decade. With the introduction and increased availability of multidetector helical scanners, some currently view it as a new technology that has not yet reached its full clinical potential; expansion in its use is expected over the next few years. In the two managed radiology plans, the use of CT grew from 51.64 procedures/1,000 members in plan A between 1999 and 2003. It remained fairly stable in plan B (58.31–57.16 procedures/1,000) between 2002 and 2003. In the unmanaged plans, the number of procedures/1,000 members was extremely high, ranging from 83.97–101.29/1,000 members

THE FOCUS ON QUALITY

Containing costs by curbing utilization must not be accomplished at the expense of quality care. In measuring practice quality, the managed radiology program focuses on appropriate use of medical imaging and the quality of imaging, rather than on physicians' ordering habits, because they are difficult to evaluate; these habits are subject to many variables and may not truly measure quality of care. Negative and positive imaging results may be equally important in overall patient management. Rather than retrospective outcome review, prospective indication reviews are conducted to assure appropriate imaging.

In addition to clinical certification, several other tools have been instituted, with the objective of improving imaging test quality while controlling cost. These include site credentialing, a coding rules bank, provider profiling, scheduling standards, nonradiologist privileging, and a quality program called the "Quality Imaging Index" (QII). This program provides financial

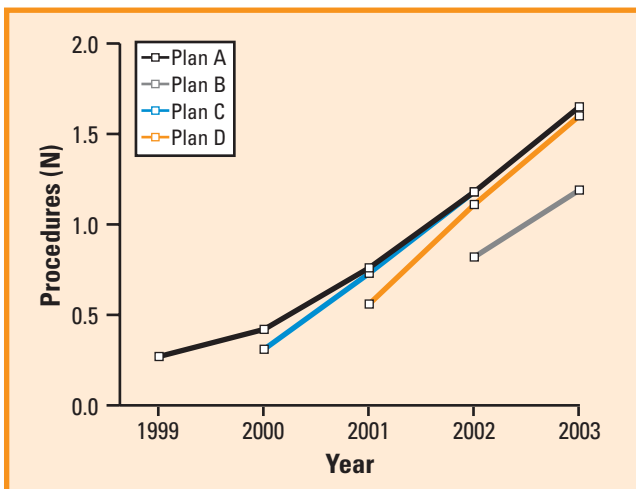


Figure 4. Positron emission tomography procedures/1,000 members. N = Number.

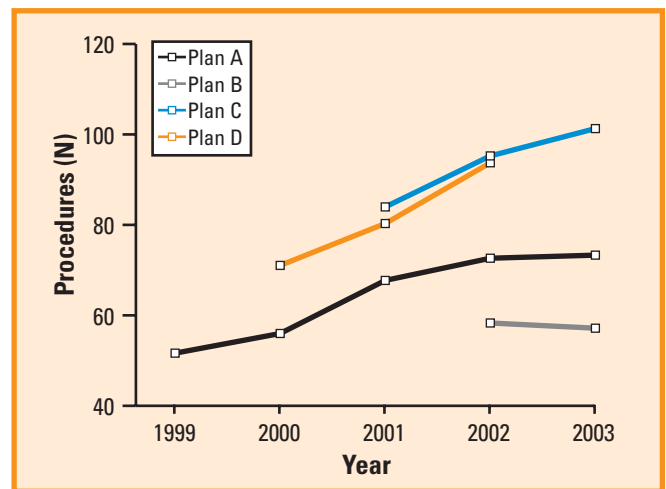


Figure 5. Computerized tomography procedures/1,000 members. N = Number.

incentives to radiologists who meet standards designed to improve practice efficiency, imaging quality, patient and referrer satisfaction, and to decrease the incidence of costly repeat or overlapping studies.

The QII program was developed in consultation with practicing radiologists. For risk contracts, compliance (partial or complete) with the QII program gives participating radiology practices the potential for a range of increased reimbursement. In this program, points are awarded for compliance with each of nine standards: (1) radiologist site coverage/day; (2) fellowship training; (3) provision of mammography services; (4) accreditation for CT, US, MRI, NM, and PET; (5) quality assurance compliance; (6) scheduling standards compliance; (7) patient and provider satisfaction; (8) extended hours; and (9) electronic claims submission.

Radiology practices that participate in risk contracts are subject to credentialing for every imaging modality performed at a particular site. In addition to national society accreditation, sites undergo a biennial image review of plain films, fluoroscopic procedures, and randomly

selected US, CT, MRI, and NM studies. Also, on-site visits are conducted every two years.

CONCLUSION

Clinical certification alone is not the answer to controlling diagnostic imaging costs. By encouraging the most appropriate use of high-cost, noninvasive imaging, continually evaluating certification criteria, and involving radiologists at all levels in the process, one program has made strides in controlling the growth of imaging costs and decreasing the number of unnecessary and redundant examinations.

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DISCLOSURE

Dr. Weiner and Dr. Komarow have indicated that they have no financial or commercial affiliations to disclose.

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