The Evolving Role of Radiologists within the Health Care System

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The traditional view of radiologists as physicians who add value to the health care system solely by generating and interpreting diagnostic images is outdated. Radiologists' roles have expanded to encompass economic gatekeeping, political advocacy, public health delivery, patient safety, quality-of-care improvement, and information technology. It is through these roles that radiologists will continue to find new ways to add value to the health care system.

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INTRODUCTION

Over the past 2 decades, a series of changes in medicine, technology, and national health care funding have significantly changed the role radiologists play in the health care system. Recently, the effects of these changes have become more conspicuous in the wake of increasing legislative scrutiny of diagnostic imaging and the ever increasing impact of information technology on all aspects of health care. The traditional image of radiologists as physicians whose role is to sit in dark rooms interpreting films and generating reports has become outdated, if not obsolete.

Although containing rising health care costs has long been an area of significant concern for the entire medical community, recent congressional action has significantly increased the attention focused on diagnostic imaging. On February 1, 2006, the US House of Representatives passed the Deficit Reduction Act of 2005, a budget-cutting bill with provisions to significantly reduce Medicare reimbursement for imaging services [1]. Although the Congressional Budget Office [2] has estimated that the imaging provisions will save $2.8 billion over 5 years, the American College of Radiology's (ACR) preliminary analysis indicates that these cuts could result in a $6 billion financial impact on radiologists over 5 years [1].

Two major provisions of the Deficit Reduction Act will affect radiologist reimbursement. Both provisions address the technical component of reimbursement without affecting the professional component [3]. The first provision, effective January 1, 2007, reduces the technical component of reimbursement for nonhospital outpatient settings to the lesser of the Hospital Outpatient Prospective Payment System payment or the Medicare fee schedule payment. Previously, the technical fee schedule for in-office imaging was higher than that for the hospital setting to offset the costs of physician ownership of the equipment and the involvement of staff members in the services [4]. This provision does not affect outpatient imaging performed in the hospital setting. The second provision, also effective January 1, 2007, reduces technical-fee reimbursement for certain diagnostic imaging procedures on contiguous body parts by 25% in 2007 for non–hospital-based imaging [3]. This recent series of events underscores the need for the radiology community to remain politically active to ensure the future of diagnostic imaging as an integral and viable component of the health care system.

This series of budget cuts was almost certainly influenced by the rapidly increasing costs of diagnostic imaging within the federal health care budget. According to a recent article by Kirby [5], imaging costs are considerably outstripping the growth of other sectors, accounting for nearly $100 billion annually, according to Medicaid and US Government Accounting Office data. Comparative analysis shows a threefold discrepancy in the growth of medical imaging compared with other medical services from 1999 to 2002 and a further increase by 16% in 2005. Medicare costs have increased by 30%, with imaging costs increasing by 50% [5,6]. Although a significant portion of this increase can be attributed to imaging performed by nonradiologists, there are several opportu-

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nities for radiologists to help prevent inappropriate utilization or overutilization of diagnostic imaging.

Advances in imaging and information technology have increased the importance of radiologists not only by increasing the utilization of diagnostic imaging but also by moving radiologists into a more central role in integrated patient care.

The increased utilization of diagnostic imaging significantly affects the use of funds, the systems operations of a health care system, patient safety, and a system's information infrastructure. Consequently, radiologists are assuming increasing responsibilities with respect to gatekeeping, quality-of-care improvement, patient safety, and information management.

In addition, advances in radiology are yielding more and better techniques for cancer screening. Therefore, radiologists are presented with new opportunities to expand their role as public health providers.

Although image generation and interpretation remain central to the practice of radiology, radiologists' role in the integrated health care system has expanded to provide significantly more value to the health care system.

THE RADIOLOGIST AS GATEKEEPER

Although the term *gatekeeper* has traditionally been applied to primary care physicians, radiologists can also have a role in ensuring that medical resources are utilized efficiently and appropriately. A gatekeeper can be defined as a person who is positioned between an organization and the individuals who wish to use the resources within that organization [7]. Although a primary care physician may be a patient's first contact in the medical system, a radiologist often becomes involved in the initial diagnostic workup. Moreover, the results of radiologic examinations may determine the need for additional diagnostic tests, specialist referral, or hospital admission.

One of the methods that radiologists can use to facilitate the appropriate allocation of resources is clinician education [8,9]. Performing the appropriate examination can save a patient both the cost and the ionizing radiation associated with unnecessary or unindicated examinations. Considering the rapid technologic advances in radiology, regular clinicoradiographic meetings and lectures could greatly enhance clinicians' ability to order the appropriate studies. Although the majority of studies ordered by clinicians are appropriate, occasionally, a radiologist may feel that there is a more suitable investigation for the clinical question. Communicating this concern to the ordering clinician can result in the collaborative selection of the appropriate study and a learning opportunity for both parties [8]. This type of collaboration between radiologists and clinicians can be taken a step further by jointly developing clinical decision rules or guidelines for imaging [9].

The gatekeeping strategies outlined in the previous paragraph are, unfortunately, time intensive and, in the case of contacting a clinician regarding the ordering of an inappropriate study, not proactive. Improving the processes by which studies are ordered and interpretations are rendered has the potential to significantly improve resource utilization without ongoing radiologist input. To this end, the increased use of information technology holds promise for reducing the overall cost of imaging in the integrated health care system. Simply by having reports easily available, clinicians can know which examinations have already been done, and unnecessary repeat examinations can be avoided [10]. The implementation of a computerized order entry system can assist clinicians in ordering the appropriate studies. For example, integrating a decision support program, which would allow clinicians to enter diagnoses or keywords and generate lists of appropriate imaging studies, could not only improve utilization but also decrease the amount of time spent contacting clinicians regarding inappropriate studies. Such an application could be based on the ACR Appropriateness Criteria®. In addition, computerized order entry can provide data on the ordering patterns of different providers and clinics. These data could then be used to ascertain whether imaging is being used appropriately and who would benefit most from clinicoradiographics meetings and lectures. Such a program has already been introduced in Kaiser Permanente Northwest's computer-based patient record system [9].

Radiologists can also assist primary care physicians in their gatekeeping role not only by recommending appropriate imaging follow-up but also by sometimes recommending the appropriate referrals to specialists [8].

Self-referral can greatly increase the utilization of diagnostic imaging and the associated costs. Hillman et al [10] found that depending on the clinical presentation, self-referral to one's own imaging facilities resulted in 1.7 to 7.7 times more frequent performance of imaging examinations than referral to radiologists. Maitino et al [11] demonstrated that between 1993 and 1999, the utilization of noninvasive diagnostic imaging in the Medicare fee-for-service population increased 3.8% with respect to the total number of examinations performed, while the amount of work associated with the imaging (ie, the relative value units) increased by 14.6% in the same population. During this same time period, the overall utilization (total number) of studies of noninvasive diagnostic imaging decreased by 3.9% among radiologists but increased by 25.2% among nonradiologists [12]. In addition, between 1993 and 1999, overall relative value unit rates increased by 6.9% among radiologists and by 32.4% among nonradiologists [12]. There-