

## The Growth in Diagnostic Imaging Utilization

The field of diagnostic imaging has advanced by leaps and bounds during the past 25 years. Diagnostic imaging allows doctors to “see” inside the body by obtaining pictures of bones, organs, muscles, tendons, nerves and cartilage. Diagnostic imaging includes MRI (magnetic resonance imaging), CT (computed tomography), and PET (positron emission tomography), as well as Ultrasound, nuclear medicine, picture archival communication systems, digital mammography, and molecular imaging. These technologies enable physicians to diagnose diseases at earlier stages while avoiding more invasive and costly diagnostic procedures.

While a significant technological advance, diagnostic imaging is also the fastest growing medical expenditure in the United States, with an annual 9% growth rate - more than twice that of general medical expenditures (4.1%) according to the American College of Radiology Web site (May 2004). The cost of diagnostic imaging is projected to increase 28% between 2000 and 2005 to nearly \$100 billion annually, according to a Booz Allen Hamilton analysis. This *FYI* examines the reasons for increasing utilization and costs, notes the benefits, and suggests strategies for purchasers.

### If You Build It They Will Come – The Link Between Availability, Utilization and Costs

**Proliferation of Imaging Equipment:** Many doctors - orthopedic surgeons, cardiologists, and neurologists, for example - are installing imaging equipment in their own facilities outside the hospital. General Electric, the largest supplier of MRI machines, expects the growth in MRI sales between 2001 and 2005 to occur outside the hospital. Rather than replacing older technologies, new equipment is being added to the health care system, and this can lead to excess capacity in the competition for business.

The increase in the availability of diagnostic imaging is associated with higher utilization and spending for these services. According to a web exclusive Nov. 2003 study in *Health Affairs*, the number of freestanding (non-hospital) MRI units in Pennsylvania increased 47% from 1999 to

2001. The same study found that more availability of free-standing MRI units is associated with a higher number of outpatient MRIs per person and more total spending. Similarly, increases in the number of freestanding CT units are associated with significant increases in the use of and spending on outpatient CT.

**Increased Utilization:** A proliferation of diagnostic imaging equipment may translate into too much imaging, duplication of services, and financial excess. The equipment itself comes with a high price tag: an average MRI machine costs approximately \$2 million to buy and install and \$800,000 per year to run. The high cost of acquisition may create pressure to increase the volume of imaging done; doctors with their own equipment may have a financial incentive to order more scans. The number of MRI scans increased from 9.3 million to 13.5 million between 1999 and 2001; this 45% increase is estimated to have cost \$3.4 billion, according to the Blue Cross Blue Shield Association. While the cost of scans varies widely, a typical PET costs about \$2,000, an MRI costs about \$700 to \$900, and a CT scan is about \$500 to \$700, according to National Imaging Associates (NIA). PHC4 data indicates that approximately 120,000 MRIs were performed in Pennsylvania hospitals in 2003 at an average charge of \$3,321. The PHC4 figure is based on charge data while the NIA figures are based on payment data. PHC4 data does not include information on MRIs performed in freestanding diagnostic imaging centers or doctors' offices.

**Physician Self-referral:** More than 20% of imaging studies are physician self-referrals, according to one survey by NIA. That is, the same physician who ordered the diagnostic imaging also performed the scan and interpreted the results. Self-referring physicians order two to eight times as many scans as other doctors, according to David Levin, National Medical Director of HealthHelp, a radiologist management company.

Another reason for increased utilization is the growth in the number of older Americans - the proportion of persons

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who have imaging tests increases with age. And, the fear of malpractice suits causes some physicians to practice defensive medicine, which includes ordering diagnostic imaging that may not always be clinically warranted.

Patients also contribute to higher utilization by requesting diagnostic imaging scans to relieve anxieties about their health. It is estimated that up to one-third of the nation's health care expenditures are consumed by the "worried well." Diagnostic imaging, pharmaceuticals and mental health treatment comprise the largest components of these expenditures. Direct-to-consumer marketing of patient-friendly technologies such as "open" MRIs (that minimize claustrophobia) and colonography (instead of the more invasive colonoscopy) may contribute to patient demand. Insured patients may not consider the high costs.

Studies have found overuse of diagnostic imaging and duplication of other types of scans that add little or no value. One NIA audit concluded that 30 to 40% of diagnostic imaging is inappropriate or, at best, noncontributory - i.e. its use did not help to make a diagnosis or treatment decision. In particular, CT and MRI are frequently used in an inappropriate or noncontributory manner, the NIA found.

### **Weighing the Costs and Benefits**

Certainly, advances in medical technology have produced important health and/or cost benefits. For example, CT scans are replacing the more costly and risky angiogram to diagnose clogged arteries. Three-dimensional imaging is estimated to cost 65 to 75% less than an invasive procedure, according to Elliot Fishman of the Advanced Medical Imaging Laboratory at Johns Hopkins Medical Institutions.

However, inappropriate medical imaging is a serious quality of care issue as well as an economic issue. Unnecessary or inappropriate tests not only incur excess expenditures, but may also expose patients to extra risk. For example, the radiation exposure of a CT scan can be several hundred times that of a chest X-ray. (FDA) Therefore, for both health and cost reasons, performing a CT scan could be inappropriate if an X-ray would suffice.

### **Controlling Costs**

There are several strategies to help control the soaring costs of diagnostic imaging, including:

*Utilization Management:* Some health insurers are using radiology benefit management firms, and are attempting to control diagnostic imaging costs through utilization management programs. This includes strategies to minimize

physician self-referrals, imposing credentialing criteria, using independent activities to assess providers' competency to perform diagnostic imaging services, and instituting pre-authorization programs for non-emergency outpatient CT, MRI and certain other diagnostic imaging studies.

*Physician Self-referral Restrictions:* Federal *Stark II* regulations generally prohibit physicians from referring Medicare patients to entities with which the physician or immediate family member has a financial interest. The regulations apply to diagnostic imaging procedures and are intended to prevent abusive referral patterns for federally funded insurance programs, but do not apply to private insurance programs. Some states have similar statutes that also regulate referral of private pay patients; Pennsylvania law requires providers to disclose to patients their financial interest in the equipment.

*Evidence-based Practice Guidelines:* One strategy is to develop and disseminate nationally recognized, evidence-based practice guidelines and to educate referring physicians about the proper use of diagnostic imaging. The American College of Radiology has developed appropriateness criteria for a number of common presentations and developed recommendations for tests that have been found to be particularly effective, and tests that are not as effective. Purchasers could link the criteria to reimbursements to help reduce unnecessary scans and costs.

*Patient Education:* Patient education campaigns, similar to those addressing inappropriate antibiotic use, may be effective in discouraging patients from seeking unnecessary tests. Patients need to know that utilizing the newest technology can be expensive, not always necessary, and may not result in better quality outcomes.

*Electronic Medical Records System:* Studies have found that at least 10% of diagnostic tests are retests because prior results were unavailable to the treating physician at the point of service. Retesting could be reduced with electronic records, and better communication and process management among the relevant parties.

### **Conclusion**

As payors and purchasers pursue ways to slow the growth of health spending, they may want to push for evidence that new technologies deliver better care for patients and more value for the dollar spent. Purchasers should also work with their health plans and providers to find ways to reduce or eliminate inappropriate use of services while insuring that patients who need the services receive them.

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