



# MITA

MEDICAL IMAGING  
& TECHNOLOGY ALLIANCE

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August 31, 2007

VIA HAND DELIVERY AND ELECTRONIC MAIL  
[www.cms.hhs.gov/regulations/eRulemaking](http://www.cms.hhs.gov/regulations/eRulemaking)

Mr. Herb Kuhn  
Acting Deputy Administrator  
Centers for Medicare and Medicaid Services  
U.S. Department of Health & Human Services  
Mail Stop: C4-26-05  
7500 Security Boulevard  
Baltimore, Maryland 21244-1850

**RE: [CMS-1385-P] Medicare Program; Proposed Revisions to Payment Policies Under the Physician Fee Schedule, and Other Part B Payment Policies for CY 2008; Proposed Revisions to the Payment Policies of Ambulance Services Under the Ambulance Fee Schedule for CY 2008; and the Proposed Elimination of the E-Prescribing Exemption for Computer-Generated Facsimile Transmissions**

Dear Acting Deputy Administrator Kuhn:

The Medical Imaging and Technology Alliance (MITA), a division of the National Electrical Manufacturers Association (NEMA), is pleased to submit comments regarding the proposed rule entitled "Proposed Revisions to Payment Policies Under the Physician Fee Schedule, and Other Part B Payment Policies for CY 2008."<sup>1</sup> MITA is the leading trade association representing companies whose sales comprise over ninety percent of the global market for medical imaging. We are pleased to provide the Centers for Medicare and Medicaid Services (CMS) our perspective on ways to enhance the physician payment system to ensure continued access to the transformative medical imaging technologies that are improving diagnostic and therapeutic interventions for Medicare beneficiaries.

Medical imaging encompasses X-ray imaging, computed tomography (CT) scans, radiation therapy, diagnostic ultrasound, and nuclear medical imaging, including positron emission tomography (PET) and magnetic resonance imaging (MRI). Imaging is used both to diagnose and treat patients with disease and offers physicians the ability to view soft tissue and organs, often reducing the need for costly and invasive medical and surgical procedures.<sup>2</sup> In addition, imaging equipment is used in some procedures to guide physicians as they carry out a medical or surgical intervention, such as device placement, to ensure high-quality clinical results for the patient.<sup>3</sup>

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<sup>1</sup> 72 Fed. Reg. 38122 (July 12, 2007).

<sup>2</sup> Multidetector-Row Computed Tomography in Suspected Pulmonary Embolism," Perrier, et. al., New England Journal of Medicine, Vol 352, No 17; pp1760-1768, April 28, 2005.

<sup>3</sup> Jelinek, JS et al. "Diagnosis of Primary Bone Tumors with Image-Guided Percutaneous Biopsy: Experience with 110 Tumors." *Radiology*. 223 (2002): 731 - 737.

MITA appreciates the opportunity to detail our concerns with the proposed rule and looks forward to continuing to work with CMS in the upcoming year. We ask CMS to consider the following comments regarding:

- Resource-Based Practice Expense (PE) Relative Value Units (RVUs)
  - Imaging Equipment Usage
  - Imaging Equipment Interest Rate
- RUC Recommendations for Direct PE Inputs and Other PE Input Issues For Specific Procedures
- Additional Codes for the 5-Year Review of Work RVUs
- Physician Quality Reporting Initiative
- Physician Self-Referral
  - Unit of Service Payments in Space and Equipment Leases

## I. Resource Based PE RVUs

### A. Equipment Usage

Currently, CMS utilizes a 50 percent utilization rate for all equipment. In the proposed rule, no proposals are made to revise the formula. As was cited in the CY 2007 Physician Fee Schedule Final Rule and the CY 2008 proposed rule, CMS determined that there were not sufficient empirical data to justify raising the equipment utilization rate.<sup>4</sup> We understand that a major oncology provider with over 80 sites of service in the United States recently conducted a utilization rate survey for PET and CT scanners in accordance with the CMS PE RVU calculations, and determined that its utilization rate for PET and CT was approximately 25 percent on average. The International Society for Clinical Densitometry also conducted a similar survey of utilization rate for DXA (dual energy x-ray absorptiometry) and VFA (vertebral fracture assessment) and found the utilization rate is 15 to 20 percent. As a result, MITA strongly agrees with CMS's decision to maintain the equipment utilization rate at 50 percent unless or until such time that CMS has conclusive data to substantiate an alternative rate.

In the June 2006 Report to Congress, the Medicare Payment Advisory Commission (MedPAC) surveyed providers in six markets (Boston; Miami; Greenville, South Carolina; Minneapolis; Phoenix; and Orange County, California) that performed MRI and CT services on Medicare beneficiaries to examine whether certain imaging equipment is used more than 50 percent of the time.<sup>5</sup> MedPAC's survey indicated that providers in those six markets used MRI and CT machines significantly more than 50 percent of the time they were open for business.

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<sup>4</sup> 71 Fed. Reg. 69624 (December 1, 2006) and 71 Fed. Reg. 38122 (July 12, 2007).

<sup>5</sup> Report to Congress: Keeping physicians' practice expense payment rates up to date, Medicare Payment Advisory Commission, June 2006, page 92.

The trade association, AdvaMed, commissioned United Biosource Corporation (UBC) to analyze and provide a report evaluating the survey done by MedPAC.<sup>6</sup> UBC determined that, "...the methods and sampling frame used [by MedPAC] were insufficient to reach a level of validity needed to use the results as evidence for policy and/or reimbursement decision-making on a national level." Also, surveys that focus solely on MRI and CT services do not capture the full range of imaging utilization rates for all imaging modalities.<sup>7</sup>

As outlined above, many sources were used to attempt to assess accurate equipment utilization rates. Neither CMS nor UBC were able to establish an appropriate methodology to determine equipment utilization rates across all imaging modalities and relevant settings. The array of modalities, the array of potential uses to which they can be applied clinically, and the array of sites in which they are employed create a highly complex set of usage algorithms. Therefore, MITA agrees with CMS that the empirical data are insufficient to validate an alternative methodology to determine equipment utilization rates for all imaging modalities. We stress to CMS that it is important to move cautiously in this area, and if an alternative methodology is considered, that the Agency allow the public the opportunity to comment on any proposed changes to the formula in a future notice of public rulemaking prior to implementation.

#### B. Equipment Interest Rate

In the proposed rule, CMS makes reference to the possibility of revising the equipment interest rate used in determining payment rates for physicians. After reviewing the Small Business Administration (SBA) data on loans and applicable interest rates, CMS found that interest rates were comparable to the current equipment interest rate utilized in the payment rate-setting methodology.

MITA agrees with CMS's decision to not propose an alternative equipment interest rate and maintain the equipment interest rate at 11 percent.

## II. Resource-based Practice Expense (PE) Relative Value Units (RVUs)

By submitting supplemental survey data to CMS, specialty societies play an important role in determining appropriate scaling factors used to calculate physicians' practice expenses. The primary purpose of these surveys is to ensure that Medicare payment for the indirect practice expenses of various specialties accurately reflect the indirect practice expenses of the various specialties.

In the proposed rule, CMS proposes to revise the practice expense per hour (PE/HR) values associated with radiology, based on an analysis presented by the ACR and reviewed by The Lewin Group which determined that weighting the ACR survey data by practice size more appropriately accounted for the small high cost entities in the final PE/HR. MITA believes that CMS has taken the right approach by modifying the weighting

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<sup>6</sup> This report may be found on the AdvaMed web site: <http://www.advamed.org/NR/rdonlyres/A91FD8B6-8A45-4B17-8633-FC3935035593/0/medpacsurvey062007.pdf>. (accessed on August 6, 2007).

<sup>7</sup> Id.

methodology used to integrate the ACR data into the fee schedule methodology, and we appreciate CMS's willingness to work with these societies to ensure accurate payment for radiology services.

MITA supports the use of the adjusted ACR supplemental survey data for radiology practice expense values.

### III. RUC Recommendations for Direct Practice Expense (PE) Inputs and Other PE Input Issues For Specific Procedures

At the February and April 2007 meetings, the American Medical Association's Practice Expense Review Committee (PERC) reviewed numerous CPT® codes to assist in recommending direct practice expense inputs for new and existing CPT® codes. These recommendations were reviewed by CMS.

MITA cautions CMS in adopting some of the recommendations suggested by the PERC. For example, we disagree with the PERC's recommendation for revisions to CPT® codes, 77080-77082, for dual energy x-ray absorptiometry (DXA), the clinical gold standard for detecting osteoporosis. A high level of skill and physician's time is needed to accurately interpret DXA scans; this is critical for accurate diagnosis and determining subsequent therapy for the patient.

Reimbursement for DXA is projected to drop to approximately \$36 a scan by January 1, 2010, a decline of 71 percent compared to 2006 levels.<sup>8</sup> Screening for bone density, such as DXA, is already underutilized. Most bone diseases disproportionately affect the elderly, many of whom already experience substantial problems with frailty, reduced functional capacity, and even life-threatening fractures that can lead to hospitalization and long-term care expenses. In fact, there have been a number of Federal initiatives that have attempted to target and increase the number of Medicare beneficiaries who are screened for osteoporosis, such as the United States Preventive Services Task Force, the National Osteoporosis Foundation, and the Surgeon General's Report on Bone Health and Osteoporosis. The universal promotion of screening with DXA is clearly at odds with both the changes to the Physician Fee Schedule and the objectives of the Deficit Reduction Act of 2005 (DRA), which takes aim at reducing the volume of all imaging services, except mammography.

Because most screenings are done in the physician's office, MITA is concerned that an additional reduction to direct practice expense (PE) inputs, by the PERC, may force physicians to no longer provide bone mass measurement screenings to Medicare beneficiaries, leading to higher fracture rates, more expensive hospitalizations and greater economic impact on the Medicare program. It is imperative that CMS properly value the current DXA technology utilized in physicians' offices and properly reflect those costs in the reimbursement rate.

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<sup>8</sup> According to the International Society for Clinical Densitometry:  
<http://www.iscd.org/Visitors/positions/publicpolicy.cfm> (accessed August 28, 2007).

We believe it is in the public's and the Medicare program's best interest to ensure that access to and promotion of screening services for bone mass measurement remain available and affordable. We ask that CMS reconsider its decision to implement the PERC's recommendation regarding bone mass density testing using DXA.

#### **IV. Additional Codes for the 5-Year Review of Work RVUs**

MITA is extremely concerned with CMS's proposal to package the Medicare payment for color flow Doppler, CPT® code 93325, into all echocardiography procedures. As noted in the proposed rule, CMS justifies this action by stating that color flow Doppler has become "intrinsic to the performance of other echocardiography services."

CMS's justification for eliminating additional payment for color flow Doppler is unsound. Although color flow Doppler may be done concurrently with other echocardiographic tests, it is not intrinsic to the performance of all echocardiography procedures. The performance and interpretation of color flow Doppler increases the sonographer time and equipment time that are required for a study, thereby adding additional resources to the procedure.

Currently, the CPT® coding system includes different descriptors for different types of ultrasound services, based on how and why ultrasound is performed by various clinical specialties. For example, color flow Doppler is treated as an "add-on" code in cardiac ultrasound, but not vascular ultrasound. After our review of the Medicare claims data, provided by a highly competent and reliable researcher through medical societies to CMS, MITA believes that it would be inappropriate to bundle color Doppler into all "base" echocardiography codes. Based on this review of Medicare claims data, it appears that color flow Doppler is not truly "intrinsic" to all echocardiography procedures. That review found that color flow Doppler is actually used less than 50 percent of the time concurrent with other echocardiographic procedures. This is not a sufficient linkage to determine that color flow Doppler is "intrinsic" to echocardiography services. In addition, CMS has not articulated a proposed definition or standard, or a clear threshold in regards to what would constitute appropriate bundling of this procedure.

It is our understanding that a proposal to potentially bundle adult transthoracic echocardiograms, color flow Doppler, and spectral Doppler into one CPT® code has been approved by the American Medical Association's (AMA) Editorial Panel. Thoughtful, selective and clinically appropriate bundling of services, as this may be, is a more supportable pathway over time. MITA supports the medical societies' rationale for not bundling color Doppler across the board on all base echocardiography codes, and we urge CMS to reconsider the proposed packaging of color flow Doppler scans into all echocardiography services.

#### **V. TRHCA -- SECTION 101(b): Physician Quality Reporting Initiative (PQRI)**

The Tax Relief and Health Care Act of 2006 - Medicare Improvements and Extension Act of 2006 (Pub. L. 109-432, also known as TRHCA or MIEA-TRHCA) requires that "as part of the publication of proposed and final quality measures for 2008 PQRI the Secretary

shall address a mechanism whereby an eligible professional may provide data on quality measures through an appropriate medical registry.”

MITA believes that use of registries for 2008 and beyond is of critical importance to the PQRI, as well as to physicians and other health care professionals. The use of clinical data residing in a registry or an electronic health record (EHR), without the need for special claims-based codes for performance measure numerators, will enhance clinical and billing workflow and increase the accuracy of the reported measures. MITA encourages an approach to data gathering and reporting through registries that does not impose burdens on physicians and other health care professionals who would be utilizing specific registry options to fully satisfy their PQRI obligations.

Furthermore, MITA asks that CMS issue the invitation to self-nominate in the testing of the registry-based quality data submission mechanism as soon as possible so that registries have a full opportunity to evaluate and prepare their responses, and to determine and implement any technical changes needed to meet CMS requirements under the PQRI program.

Looking to the future of the PQRI program, MITA urges CMS to propose measures with ample advance notice to give physicians and vendors sufficient time to plan for use of these measures, and to ensure that the necessary data collection, measure computation, and quality programs are in place.

Lastly, MITA asks that as CMS moves forward with the initial expansion of these quality measures, as well as future measures, that CMS be cognizant of the need for appropriate recognition of imaging technology within these measures. MITA is pleased that CMS has considered and incorporated imaging services within relevant quality measures. However, in doing so, we caution CMS to provide for ongoing innovation of imaging technology, and medical practice when adopting measures for various diseases and conditions. As technology advances and techniques for utilizing equipment improve, it is imperative that physicians be able to deploy the most advanced and medically appropriate imaging technology to diagnose and treat patients. Quality measures should focus on the range of modalities available in the context of the measure, while providing latitude to address emerging imaging advances. Imaging technologies are undergoing rapid specification advances that physicians should be able to incorporate based on their medical decision-making.

MITA looks forward to working with CMS and others as measures that involve imaging procedures are developed, adopted, or modified under the PQRI program.

## **VI. Physician Self-Referral Provisions**

In the proposed rule, CMS outlines several issue areas and a subset of actual proposals to regulatory policy broadly governed by the Omnibus Budget Reconciliation Act of 1993 (commonly referred to as the Stark Law)<sup>9</sup> that relate to physician self-referral rules. CMS

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<sup>9</sup> SSA §1877 codified at 42 U.S.C. §1395nn.

has proposed regulatory policies in several areas and invited comment on other related areas, without specific proposals on the latter. In general, MITA believes that it is highly inadvisable for CMS to propose significant new interpretations and policies regarding current physician leasing, and referral arrangements in the context of the Medicare physician fee schedule. Rather, MITA strongly urges CMS to develop any specific proposals governing permissible arrangements within the context of separate proposed rules promulgated to update the Stark Law requirements. That appears to be the more appropriate arena in which to propose changes in the policies that govern permissible arrangements, which in turn set the foundation upon which to propose modified reimbursement rules.

MITA notes that many of the proposals under discussion in this notice penetrate deeply into how physicians, and for that matter, hospitals, structure their working relationships. In fact, in one area under the “in-office ancillary services” discussion, CMS seems to be entering into an especially troubling area, which is to suggest setting policy regarding which types of physicians are qualified to perform which services. This is an area fraught with issues and which is impacted upon by state licensure and scope of practice laws, and individual physician training and acquired practice skills. We think it is not necessary for CMS to wade into those issues to advance its program objectives. Separately, it is not clear that CMS has adequately investigated the common leasing and interactive service contractual relationships in the market, which can be practical and cost-efficient, in compliance with Stark Law requirements, and not necessarily abusive or leading to excessive utilization of services. Therefore, we believe that it would be prudent to proceed cautiously and within the right legal framework for defining what is permissible and what is not, and then to determine how best to structure any Medicare reimbursement changes.

It appears that CMS’s underlying real concern is that many of the arrangements may be leading to inappropriate utilization of imaging services. In the CY 2007 Physician Fee Schedule Proposed Rule, CMS states that, “We [CMS] are concerned that allowing physician group practices or other suppliers to purchase...diagnostic testing services...may lead to patient and program abuse in the form of over-utilization of services and result in higher costs to the Medicare program.”<sup>10</sup> Although CMS expressed concern regarding the possible existence of arrangements that were not intended under the physician self-referral rules, it is important to note that self-referral is not a widespread practice in Medicare, and accounts for only a modest percentage of all referrals for imaging services.<sup>11</sup>

MITA commissioned a study utilizing CY 2005 Medicare claims data to examine self-referral rates. Based entirely on Medicare claims data, we found that the majority of referrals for imaging services are made by physicians who do not stand to realize any financial gain from making the referral.<sup>12</sup> These are physicians (usually family practitioners

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<sup>10</sup> 71 Fed. Reg. 49054 (August 22, 2006).

<sup>11</sup> According to an analysis by Direct Research, LLC of 2005 Medicare claims data. The full analysis is attached for CMS’s review.

<sup>12</sup> Id.

or doctors of internal medicine) who order the tests, but are in no way connected to the physicians who then perform the test. For example, referrals for CT, MRI, PET and SPECT services are made on average 94-percent of the time to physicians who do not order the tests. *The data show, in each imaging modality, that the physicians who most often perform the tests are radiologists, who typically are not in a position to refer or self-refer the imaging studies.* This clear separation between the ordering and performing physicians is illustrated, in our analysis, for each major imaging modality.

According to the MITA-commissioned analysis of the 2005 claims data, most imaging for Medicare patients is done in hospitals, primarily in hospital outpatient departments. For instance, 81.3 percent of CT imaging is done in hospitals (including outpatient facilities) whereas 16 percent is in physician offices. Most MRIs are also performed in hospitals; only 34 percent are done in physician offices. We have attached our detailed analysis for CMS's review.

With respect to selected other issues raised by CMS, MITA understands CMS's intentions of preventing inappropriate referrals within the Medicare system, but feels the definition of a "centralized building" needs to be outlined in a more concise manner to ensure that appropriate, cost-effective, mobile radiology services and teleradiology services are not disrupted. It is our view that if CMS has identified one or two clearly questionable situations, the Agency should act on those specific matters rather than propose broader-scope rules that may inadvertently disrupt legitimate service arrangements in imaging.

#### A. Unit of Service Payments in Space and Equipment Leases

In the proposed rule, CMS proposes to prohibit "time-based or unit-of-service-based payments to a physician lessor for services rendered by an entity lessee to patients who are referred by a physician lessor to the entity."<sup>13</sup> Specifically, section 1877(e)(1) of the Social Security Act provides an exception to the prohibition of physician referrals for space and equipment leases, but CMS has expressed their concern with these types of lease arrangements, and notes that the Agency believes that "such arrangements are inherently susceptible to abuse because the physician lessor has an incentive to profit from referring a higher volume of patients to the lessee..."<sup>14</sup> MITA recognizes CMS's concern, but it is our opinion that such arrangements may be clearly permissible under current statute and regulations, therefore, we believe CMS should conduct a further analysis prior to moving forward with any specific changes.

Although the proposed restrictions discussed above would not apply where the entity is the lessor, CMS also seeks comments regarding whether the Agency should prohibit time-based or unit-of-service-based payments to an entity lessor by a physician lessee. Based on Congress' intentions, as long as the lease arrangement meets the requirements, and the compensation is fair market value for services or items actually provided and does not vary during the course of the compensation agreement in any manner, it should continue

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<sup>13</sup> Id.

<sup>14</sup> 72 Fed. Reg. 38122 (July 12, 2007).

to be allowed.<sup>15</sup> For many solo practitioners, it may be difficult to justify purchasing expensive equipment for their office that may be used only on a part-time basis. Arrangements between physicians and facilities, such as the ones discussed above, also allow physicians to better extend their services to Medicare beneficiaries in rural areas, without adding significant cost to their individual practices. This ensures beneficiaries have access to state-of-the-art imaging equipment, yet the services remain cost-effective for all parties. MITA urges CMS to not prohibit these types of time-based or unit-of-service-based lease arrangements.

## VII. Other Issues

Although not formally discussed in the proposed rule, MITA continues to believe that application of the multiple procedure discount policy in the Physician Fee Schedule is redundant and excessive in light of the Deficit Reduction Act of 2005 (DRA) cap. Enacted January 1, 2007, the DRA provision caps the technical component reimbursement for non-hospital outpatient imaging to the lesser of the Hospital Outpatient Prospective Payment System (HOPPS) payment amount or the Medicare physician fee schedule payment amount. Imaging services affected by this provision include CT, MRI and ultrasound procedures.

MITA urges CMS to remove the multiple procedure discount policy from the Physician Fee Schedule for those services held to the “lesser of” rule. The HOPPS rates serve as the basis for the cap, and these rates already factor in the effects and economies of performing multiple imaging procedures during the same session. To apply the multiple procedure discount policy in the Physician Fee Schedule, and then to apply the DRA cap, is essentially “over-adjusting” payment levels to account for economies in multiple procedure imaging.

MITA also asks CMS for clarification regarding the extent to which the DRA cap will be imposed on procedures that are either (a) bundled into other principal procedures under the HOPPS system (e.g. ultrasound guidance procedures); or (b) only one component of a broader package that includes other items and services (e.g. myocardial perfusion (SPECT) procedures whose Ambulatory Payment Classification (APC) rates also include add-on services and radiopharmaceuticals. In the absence of guidance from CMS, we presume that the DRA “cap” will not apply to services, like ultrasound-guidance services and dependent ancillary services (i.e. “add-on” codes) that are not separately payable under HOPPS.

## VIII. Conclusion

In closing, we ask CMS to develop policy decisions that accurately recognize that the majority of the growth in imaging services emerges from the genuine medical benefit and clinical support that physicians recognize that they receive from employing imaging technologies in diagnosing and treating injury and disease. Many applications in use today did not exist a mere decade ago. MITA believes that these transformative imaging

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<sup>15</sup> 42 U.S.C. §1395nn.

technologies are major contributors to improvements in patient care, and over time are generating off-setting savings through less-invasive care, and quicker recovery and fewer complications for patients. These crucial benefits are often overlooked in assessments of growth in imaging spending. A better approach to managing this growing utilization is to rely upon sound evidence of clinical benefit and practice guidelines developed by physicians so that clinically optimal medical protocols are in place.

Imaging advocacy groups, such as MITA, also feel it is necessary to implement guidelines to promote proper equipment maintenance and utilization. MITA looks forward to sharing its ideas with CMS in the upcoming months. Finally, we urge CMS to look to the future, as developments in molecular, cellular, functional and genetic imaging promise a new era of prediction and prevention of disease, not just diagnosis and treatment.<sup>16</sup>

We strive to continue working with CMS on these matters under the Medicare Physician Fee Schedule. If you have any questions or would like to discuss these matters further, please contact me at 703-841-3279.

Respectfully Submitted,

A handwritten signature in black ink, appearing to read "Andrew Whitman". The signature is fluid and cursive, with a long horizontal stroke at the end.

Andrew Whitman  
Vice President

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<sup>16</sup> "Advances in Biomedical Imaging," Tempamy MC, McNeil BJ, *Journal of the American Medical Association*, 2001, Vol. 285: 562-567.



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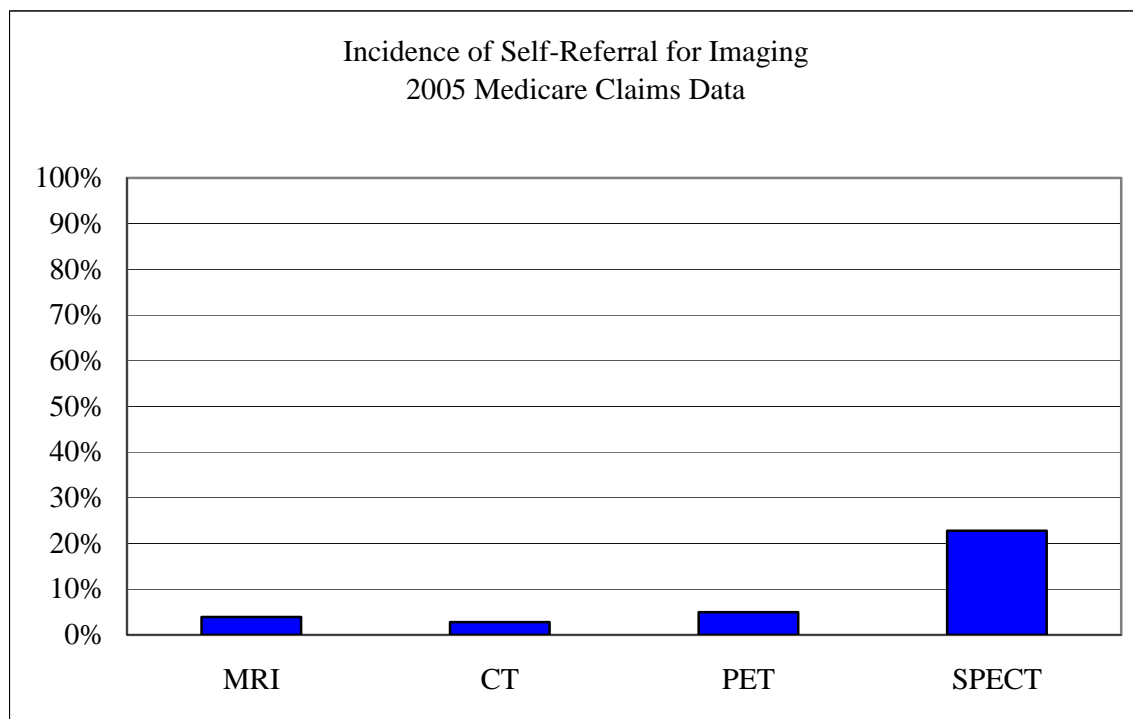
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## Medicare Data Analysis Self Referral Rates in Medical Imaging are Low

The term “self referral” is used to describe the practice whereby a physician performs a medical service that he or she has ordered. Although CMS recognized the validity of this practice when done as a part of the rest of the care that a physician provides to a patient in his or her office, discussions of whether the opportunity to self-refer leads to the provision of unnecessary imaging services continue.

According to an analysis by Direct Research, LLC of 2005 Medicare claims data; self-referral is not a widespread practice in Medicare, and accounts for only a modest percentage of all referrals for imaging services.

- The 2005 Medicare data suggest several conclusions about how imaging is used and by which physicians.
  - Referrals for CT, MRI, PET and SPECT are made on average 94% of the time to physicians who do not order the tests.
  - Most physicians who refer patients for imaging scans do not experience economic gain from the referral.
  - Self-referral is not a dominant trend in Medicare for medical imaging; in fact, it occurs in only a small percentage of cases.
- In 2005, the proportion of imaging studies in which the referring physician and the providing physician were one-in-the-same, i.e., in which physicians were self-referring, was 3.9% for MRI services, 2.8% for CT services, 5% for PET services, and 22.8% for SPECT services. On a weighted average basis, fully 94% of imaging studies cannot be described as self-referral.



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- The majority of referrals for imaging services are made by physicians who do not stand to realize any financial gain from making the referral, according to the 2005 Medicare data. These are physicians (usually family practitioners or doctors of internal medicine) who order the tests, but are in no way connected to the physicians who then perform the test. The data show in each imaging modality, that the physicians who most often perform the tests are radiologists, who typically are not in a position to refer or self-refer the imaging studies. This clear separation between the ordering and performing physicians is illustrated by the 2005 Medicare data for each major imaging modality.
  - Imaging is used for diagnosing, monitoring and guiding treating of common medical conditions, such as stomach pain, back problems, cancer, and heart disease.
    - Top CT procedures by volume are for diagnosing abdominal pain (12%) and lower respiratory diseases (8.2%).
    - Top MRI procedures are for back (27%) and joint disorders (7.3%).
    - Top PET procedures are for cancer (lung 22.2%; non-Hodgkin's lymphoma 13.3%)
    - Top SPECT procedures are for heart disease (38.8%) and chest pain (32%).
  - Most imaging for Medicare patients is done in hospitals, primarily in hospital outpatient departments, according to the analysis of 2005 Medicare data.
    - 81.3% of CT imaging is done in hospitals (48.5% of that in the outpatient setting); 16% is in physician offices.
    - 52.6% of MRIs are done in hospitals (34.4% in the outpatient setting); 34.1 percent of MRIs are done in physician offices.
    - 39.2% of PET scans are done in physician offices, while 38.9% are done in hospitals (34.2% of that is in the outpatient setting); 20.7% is done in independent diagnostic testing facilities.
    - 64.5% of SPECT scans are done in physician offices, while 34.3% are done in hospitals (20.3% of that in the outpatient setting).

## Memorandum

To: Andrew Whitman, Vice President  
Medical Imaging & Technology Alliance (MITA)  
From: Christopher Hogan, Direct Research, LLC  
Subject: Advanced Imaging Self-Referral Analysis

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This report briefly summarizes Medicare carrier-paid claims for MRI, CT, and PET/SPECT services in the US, for 2005 to determine the incidence of self-referral of imaging services as reported in the Medicare carrier-paid claims data.

### 1. Methodology

- Start from the Medicare 2005 5 percent sample standard analytic file, limited dataset version, carrier claims file.
- Summarize entire file by encrypted Unique Provider Identification Number (UPIN) and specialty to provider a roster of encrypted UPINs.
- Extract MRI and CT services, defined as claims lines with Berenson-Eggers Type of Service (BETOS) codes I1A, I2B (CT) or I2C, I2D (MRI). For PET/SPECT, the codes were extracted by CPT code, as they may be located in any of several BETOS categories.
- Match the UPIN registry to the claim line, by referring UPIN, to identify the specialty of the referring physician.
- Compare the beneficiary state of residence to the provider's state, to flag patients who crossed state borders for care.
- Match to patient counts from the 5 percent LDS denominator file to determine per-capita use rates. (Include only fee-for-service beneficiaries with Part B coverage.)
- Summarize line diagnosis by the Agency for Healthcare Research and Policy (AHRQ) Clinical Classification System (CCS) disease categories to show what the MRIs were used for.
- Define place of service as hospital inpatient, hospital OPD or ER, IDTF (independent diagnostic testing facility), physician office, and other.
- Exclude technical component only claims when counting services per capita.
- Summarize referring and performing specialty, diagnosis, and other aspects of care.

## 2. Results

This section presents the results of the analysis, with tables of data and conclusions. Results are presented in five tables.

Table 1 shows the most common specialties performing each type of advanced imaging service profiled here. The four advanced imaging services differ markedly in terms of performance by radiologists and freestanding radiology facilities. For MRI and CT, roughly 90 percent of services are performed by radiologists. For PET, if nuclear medicine specialists are included, about 80 percent of services are performed by radiologists. For SPECT, by contrast, cardiologists perform two-thirds of the services.

<b>Table 1: Medicare Advanced Imaging Claims, Most Common Performing Physician Specialties, 2005</b>		
	Service Count, 5% Sample	Percent of Claims
<b>CT</b>		
Total	1,062,351	100.0%
Diagnostic radiology	952,463	89.7%
Interventional radiology	28,748	2.7%
IDTF	27,330	2.6%
Radiation oncology	10,910	1.0%
Internal medicine	7,446	0.7%
General/Family practice	5,901	0.6%
Hematology/ oncology	5,245	0.5%
<b>MRI</b>		
Total	391,303	100.0%
Diagnostic radiology	300,767	76.9%
Independent Diagnostic Testing Facility (IDTF)	50,878	13.0%
Orthopedic surgery	9,239	2.4%
Interventional radiology	7,405	1.9%
Neurology	5,836	1.5%
Nuclear medicine	2,589	0.7%
General/Family practice	2,306	0.6%
Internal medicine	2,072	0.5%
Radiation oncology	1,852	0.5%
<b>PET</b>		
Total	4,814	100.0%
Diagnostic Radiology	2,296	47.7%
Independent Diagnostic Testing Facility (IDTF)	998	20.7%
Nuclear medicine	525	10.9%
Cardiology	505	10.5%
Hematology/ oncology	153	3.2%
Radiation oncology	70	1.5%

<b>Table 1: Medicare Advanced Imaging Claims, Most Common Performing Physician Specialties, 2005</b>		
	Service Count, 5% Sample	Percent of Claims
Interventional radiology	64	1.3%
Medical oncology	60	1.2%
Internal medicine	33	0.7%
Neurology	23	0.5%
<b>SPECT</b>		
Total	181,623	100.0%
Cardiology	124,503	68.6%
Diagnostic radiology	31,647	17.4%
Internal medicine	11,009	6.1%
Nuclear medicine	7,829	4.3%
Independent Diagnostic Testing Facility (IDTF)	2,087	1.1%
General/Family practice	1,363	0.8%
Interventional radiology	857	0.5%
Source: Analysis of 5% sample physician/supplier SAF, LDS version.		
Notes: CT defined as BETOS I1A, I2B. MRI defined as BETOS I2C and I2D. PET and SPECT identified by CPT codes for those services. Includes all carrier-paid bills (including TC-only bills)		

Table 2 gives the same breakout by the specialty of the referring (ordering) physician. Diagnostic radiologists ordered slightly more than 1 percent of PET scans. For the other three categories, diagnostic radiologists accounted for less than 1 percent of the services ordered.

<b>Table 2: Medicare Advanced Imaging Claims, Most Common Referring (Ordering) Physician Specialties, 2005</b>		
	Service Count, 5% Sample	Percent of Claims
<b>CT</b>		
Total	1,062,351	100.0%
Internal medicine	227,721	21.4%
Emergency medicine	169,350	15.9%
General/Family practice	141,493	13.3%
No UPIN match/Unk.	102,944	9.7%
Hematology/ oncology	61,405	5.8%
General surgery	42,131	4.0%
Urology	41,321	3.9%
Pulmonary disease	34,972	3.3%
Gastroenterology	28,701	2.7%
Medical oncology	28,192	2.7%
Cardiology	28,068	2.6%
Otolaryngology	13,821	1.3%
Neurology	13,459	1.3%

Neurosurgery	12,929	1.2%
Orthopedic surgery	12,037	1.1%
<b>Diagnostic radiology</b>	<b>10,775</b>	<b>1.0%</b>
Nephrology	9,663	0.9%
Radiation oncology	8,156	0.8%
Vascular surgery	7,822	0.7%
Obstetrics/ gynecology	7,124	0.7%
Thoracic surgery	5,628	0.5%
<b>MRI</b>		
Total	391,303	100.0%
Internal medicine	83,985	21.5%
General/Family practice	57,117	14.6%
Orthopedic surgery	46,852	12.0%
Neurology	42,817	10.9%
No UPIN match/Unk.	31,506	8.1%
Neurosurgery	13,485	3.4%
Hematology/ oncology	13,452	3.4%
Emergency medicine	8,617	2.2%
Cardiology	8,563	2.2%
General surgery	7,069	1.8%
Physical medicine and rehabilitation	6,146	1.6%
Otolaryngology	6,023	1.5%
Medical oncology	5,943	1.5%
Rheumatology	5,824	1.5%
Pulmonary disease	5,699	1.5%
Nephrology	4,170	1.1%
Gastroenterology	4,169	1.1%
Anesthesiology	3,352	0.9%
<b>Diagnostic radiology</b>	<b>3,267</b>	<b>0.8%</b>
Radiation oncology	3,009	0.8%
Podiatry	2,807	0.7%
Ophthalmology	2,752	0.7%
Urology	2,511	0.6%
Vascular surgery	2,483	0.6%
<b>PET</b>		
Total	4,814	100.0%
Hematology/ oncology	1,023	21.3%
Internal medicine	586	12.2%
Cardiology	541	11.2%
Medical oncology	482	10.0%
Pulmonary disease	318	6.6%
Neurology	290	6.0%
No UPIN match/Unk.	283	5.9%
General/Family practice	262	5.4%
Radiation oncology	167	3.5%
Otolaryngology	141	2.9%
General surgery	137	2.8%
Thoracic surgery	78	1.6%

Hematology	65	1.4%
<b>Diagnostic radiology</b>	<b>53</b>	<b>1.1%</b>
Gastroenterology	50	1.0%
Emergency medicine	34	0.7%
Psychiatry	26	0.5%
Cardiac surgery	23	0.5%
Critical care (intensivists)	22	0.5%
<b>SPECT</b>		
Total	181,623	100.0%
Cardiology	66,439	36.6%
Internal medicine	53,745	29.6%
General/Family practice	33,897	18.7%
No UPIN match/Unk.	8,736	4.8%
Emergency medicine	2,752	1.5%
Pulmonary disease	1,737	1.0%
General surgery	1,618	0.9%
Nephrology	1,332	0.7%
Orthopedic surgery	1,008	0.6%
Gastroenterology	962	0.5%
Nurse practitioner	670	0.4%
Endocrinology	664	0.4%
Vascular surgery	616	0.3%
<b>Diagnostic radiology</b>	<b>535</b>	<b>0.3%</b>
Source: Analysis of 5% sample physician/supplier SAF, LDS version.		
Notes: CT defined as BETOS I1A, I2B. MRI defined as BETOS I2C and I2D. PET and SPECT identified by CPT codes for those services. Includes all carrier-paid bills (including TC-only bills)		

Table 3 shows imaging by place of service, counting each bill (professional component, technical component, or total) as one service. SPECT is primarily an office-based service, with about two-thirds of services taking place in physician offices. Both PET and MRI have a significant volume in independent diagnostic testing facilities (IDTFs).

Col Pct	1:Inpatient	2:OPD/ER	3:Office	4:IDTF	5:Other	Total	Services, 5% Sample
1:CT	32.8%	48.5%	16.0%	2.6%	0.2%	100.0%	1,062,351
2:MRI	18.2%	34.4%	34.1%	12.9%	0.4%	100.0%	391,303
3:PET	4.7%	34.2%	39.2%	20.7%	1.2%	100.0%	4,814
4:SPECT	14.0%	20.3%	64.5%	1.2%	0.1%	100.0%	181,623
Source: Analysis of 5% sample physician/supplier SAF, LDS version.							
Notes: CT defined as BETOS I1A, I2B. MRI defined as BETOS I2C and I2D. PET and SPECT identified by CPT codes for those services. Includes all carrier-paid bills (including TC-only bills)							

Table 4 shows the diagnosis reported on the claim line for the service, grouped by the Agency for Healthcare Research and Quality Clinical Classification System (CCS) categories. The data clearly show the main uses for PET (cancer staging) and SPECT (assessment of cardiovascular problems). CT and MRI, by contrast, are more general purpose tools, used for a broad array of underlying problems.

<b>Table 4: Services by Clinical Classification System Diagnosis Category</b>			
CCS	CCS label	Services, 5% sample	Pct of Services
<b>CT</b>			
Total	Total	1,062,351	100.0%
251	Abdominal pain	127,377	12.0%
133	Other lower respiratory disease	87,226	8.2%
244	Other injuries and conditions due to external causes	35,874	3.4%
84	Headache; including migraine	34,027	3.2%
155	Other gastrointestinal disorders	33,445	3.1%
109	Acute cerebrovascular disease	32,245	3.0%
146	Diverticulosis and diverticulitis	27,459	2.6%
205	Spondylosis; intervertebral disc disorders; other back	27,402	2.6%
151	Other liver diseases	27,297	2.6%
259	Residual codes; unclassified	26,032	2.5%
<b>MRI</b>			
Total	Total	391,303	100.0%
205	Spondylosis; intervertebral disc disorders; other back	105,489	27.0%
204	Other non-traumatic joint disorders	28,395	7.3%
109	Acute cerebrovascular disease	20,670	5.3%
95	Other nervous system disorders	15,639	4.0%
84	Headache; including migraine	11,606	3.0%
211	Other connective tissue disease	11,415	2.9%
110	Occlusion or stenosis of precerebral arteries	11,361	2.9%
111	Other and ill-defined cerebrovascular disease	10,675	2.7%
225	Joint disorders and dislocations; trauma-related	9,780	2.5%
112	Transient cerebral ischemia	9,659	2.5%
<b>PET</b>			
Total	Total	4,814	100.0%
19	Cancer of bronchus; lung	1,067	22.2%
38	Non-Hodgkin's lymphoma	640	13.3%
101	Coronary atherosclerosis and other heart disease	498	10.3%
68	Senility and organic mental disorders	345	7.2%
133	Other lower respiratory disease	318	6.6%
14	Cancer of colon	284	5.9%
11	Cancer of head and neck	254	5.3%
15	Cancer of rectum and anus	201	4.2%
102	Nonspecific chest pain	153	3.2%
22	Melanomas of skin	119	2.5%

SPECT			
Total	Total	181,623	100.0%
101	Coronary atherosclerosis and other heart disease	70,437	38.8%
102	Nonspecific chest pain	58,059	32.0%
117	Other circulatory disease	16,665	9.2%
133	Other lower respiratory disease	10,750	5.9%
106	Cardiac dysrhythmias	5,412	3.0%
108	Congestive heart failure; nonhypertensive	2,843	1.6%
256	Medical examination/evaluation	2,040	1.1%
98	Essential hypertension	1,660	0.9%
104	Other and ill-defined heart disease	1,494	0.8%
237	Complication of device; implant or graft	1,427	0.8%
Source: Analysis of 5% SAF LDS physician/supplier claims, 2005			
Note: Disease entity is line diagnosis code crosswalked to AHRQ CCS category.			

Finally, Table 5 gives summary statistics on performance by radiologists (either diagnostic radiology or IDTF), self-referral, and services and service users per capita. SPECT stands out in terms of self-referral, presumably by cardiologists. For the other services, self-referral rates (as measure by matching UPINs for performing and referring physician) range from about 3 to 5 percent. Almost none of that is self-referral by radiologists -- as noted above, radiologists ordered 1.2 percent of PET scans and 1 percent or less of all other types of imaging.

In terms of users and services, about one in ten PET or SPECT users have multiple bills for those services (other than TC-only bills) during the year. For MRI, about a third of users have more than one (non-TC) MRI bill. For CT, almost two-thirds have multiple (non-TC) bills for CT services over the course of the year.

	1:CT	2:MRI	3:PET	4:SPECT
<b>Percent of carrier-paid bills with:</b>				
Radiologist or IDTF as performing physician	92.2%	89.9%	68.4%	18.6%
Radiologist or IDTF as referring (ordering) physician	1.0%	0.8%	1.2%	0.3%
With UPIN-based self-referral (referring UPIN matches performing UPIN)	2.8%	3.9%	5.0%	22.8%
<b>Services per capita and users per capita:</b>				
Total including TC	0.61	0.23	0.003	0.11
Total excluding TC	0.59	0.21	0.002	0.10
Fraction of carrier bills TC only	0.03	0.09	0.12	0.08
Users per capita, any service	0.235	0.126	0.0022	0.088
Users per capita with multiple services	0.142	0.046	0.0002	0.007
Source: Analysis of 5% SAF physician/supplier and denominator, 2005, LDS version				