

Department of Health and Human Services

**OFFICE OF
INSPECTOR GENERAL**

**PROVIDER RELATIONSHIPS
AND THE USE OF
MAGNETIC RESONANCE
UNDER THE MEDICARE
PHYSICIAN FEE SCHEDULE**



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E X E C U T I V E S U M M A R Y

OBJECTIVE

To determine (1) how magnetic resonance (MR) services paid under the Medicare Physician Fee Schedule (MPFS) are provided and (2) whether there is a relationship between utilization levels of services and how they are provided.

BACKGROUND

Previous Office of Inspector General work documented a more than fourfold increase in MR services paid under the MPFS between 1995 and 2005.

Medicare divides imaging services into two components: the technical component and the professional component. Medicare may pay separately for each or make a global payment to one provider as payment for both. In certain situations, providers may purchase either component and reassign their Medicare payments to other entities.

Each MR service may involve several roles, including the orderer of the service, providers of the technical and professional components, the billing provider, the payee, and equipment lessors and coowners. Each role may be played by the same or multiple parties. When multiple parties work together to provide MR services, they may be connected to one another through medical practice relationships and/or other business relationships.

This study relies on analysis of 2005 Medicare Part B claims data and projections of data from a sample of MR services. This study focuses on the provision of the technical component of MR services. It presents data about all MR services and two subgroups of MR services: (1) those ordered by high users of MR and (2) those in which the orderer of the service had a connection to one or more of the parties involved in providing the service (hereafter referred to as connected services). This study did not analyze the appropriateness or medical necessity of MR services.

FINDINGS

Certain characteristics were common to a majority of magnetic resonance services paid under the Medicare Physician Fee Schedule, regardless of whether they were ordered by high users.

Although providers worked together to provide services in a number of

ways, certain characteristics were common to a majority of services. For example, two-thirds of services were ordered by one of four specialties: internal medicine, orthopedic surgery, family practice, and neurology. Eighty-five percent of services were performed by the entity that was paid by Medicare. Most services were performed by the independent diagnostic testing facility (IDTF), multispecialty group, and diagnostic radiology provider specialties. Finally, MR claims were typically billed globally through a radiologist and had payment reassigned.

Connected services were provided differently than services that were not connected. One-quarter of MR services paid under the MPFS in 2005 were connected services, which were associated with high use. Compared to all other services, connected services were more likely to be ordered by orthopedic surgeons. Multispecialty groups performed and were paid for half of connected services, compared to only one-quarter of all other services. The IDTF and diagnostic radiology specialties played a smaller role in connected services compared to all other services. Finally, connected services were more likely than other services to have been billed as technical component only, to have had payment reassigned, and to have been billed through a provider other than a radiologist.

CONCLUSION

The findings in this report highlight the complex nature of how providers deliver MR paid under the MPFS. The large number of ways that various parties can perform and bill for services reduces the transparency of these transactions. Although the analysis in this report was limited to MR, it is possible that such complexity extends to other types of high-cost imaging paid under the MPFS. The complexity and limited transparency with which these services are provided warrants continued attention to ensure that services are reasonable, necessary, and compliant with Medicare statutes and regulations.

AGENCY COMMENTS

The Centers for Medicare & Medicaid Services (CMS) agreed with our findings and our conclusion that the complexity of MR services warrants continued attention. It outlined regulatory steps it has recently taken to address overutilization of diagnostic testing services. CMS also stated its commitment to examining the relationship between the utilization of advanced imaging services and the entities that order and bill for them.

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OBJECTIVE

To determine (1) how magnetic resonance (MR) services paid under the Medicare Physician Fee Schedule (MPFS) are provided and (2) whether there is a relationship between utilization levels of services and how they are provided.

BACKGROUND

Previous Office of Inspector General (OIG) work documented a more than fourfold increase in MR services paid under the MPFS between 1995 and 2005.¹ By 2005, 43 percent of all Medicare-covered MR services were paid under the MPFS.²

Overview of Magnetic Resonance

MR enables doctors to diagnose and treat patients by providing detailed images of tissues and blood vessels deep inside the body. MR is used to detect a number of conditions, including cancer, heart disease, damage to bones and organs, and brain disorders. Advances in technology continue to expand the number of clinical applications for MR and increase its availability in ambulatory settings covered under the MPFS, such as doctors' offices and imaging centers.

Payment for Magnetic Resonance Services Under the Medicare Physician Fee Schedule

Medicare covers MR as a diagnostic service under § 1861(s)(3) of the Social Security Act. Medicare generally covers specific imaging procedures if they are supported as efficacious in scientific literature and reasonable and necessary for the patient.³

Medicare divides imaging services into two components: the technical component, which is the taking of the image, and the professional component, which is the doctor interpreting the image. Medicare may pay for the components separately, to different providers, or it may make a global payment to one provider as payment for both components, even when different providers perform the technical and

¹ OIG, "Growth in Advanced Imaging Paid Under the Medicare Physician Fee Schedule," OEI-01-06-00260, October 2007.

² The remaining 57 percent were covered under the Hospital Outpatient Prospective Payment System and the Hospital Inpatient Prospective Payment System.

³ Centers for Medicare & Medicaid Services (CMS) "Medicare National Coverage Determinations Manual," Pub. No. 100-03 § 220.1.

professional components.⁴ In 2005, the average allowed charge for the professional component of the most commonly performed service, MR imaging of the spine without dye, was \$77. The average allowed charge for the technical component of the same service was \$463 and for the global payment, \$579.

Medicare allows providers to purchase either component of MR services from other providers.⁵ Thus, a provider may pay another provider to perform the service and then bill Medicare as if it had performed the service itself. However, specific rules apply to how and when providers may bill Medicare for each component.⁶

In certain situations, Medicare allows a doctor to reassign his or her Medicare payments to another entity.⁷ For example, a doctor might reassign payment for services performed to his or her group practice.

Roles Involved in Providing Magnetic Resonance Services Under the Medicare Physician Fee Schedule

Each MR service may involve a number of persons and entities playing different roles, which are defined in Table 1 below.

Table 1: Roles Involved in Magnetic Resonance Services	
Orderer	The doctor who orders the MR service, typically the doctor treating the patient
Performer	The provider that performs the technical component by operating the MR machine that produces images for interpretation
Reader	The doctor who provides the professional component by interpreting the images from the technical component performer
Biller	The provider under whose provider number the claim for the service is submitted to Medicare
Payee	The entity that receives payment from Medicare for the service
Lessor*	An entity that provides leased MR equipment used for the service
Coowner*	An entity that coowns MR equipment used for the service

* Not necessarily involved in every MR service.

⁴ For purposes of this document, we use the term “provider” to refer to Part B suppliers, which include doctors, group practices, imaging centers, and others.

⁵ Social Security Act § 1842(n), 42 U.S.C. § 1395u(n)(2005).

⁶ CMS “Medicare Claims Processing Manual,” Pub. No. 100-04, ch.1, § 30.2.

⁷ Social Security Act § 1842(b)(6), 42 U.S.C. § 1395u(b)(6).

These roles may be played by doctors, group practices, imaging centers, or other entities. In a given service episode, each role may be played by the same or multiple parties.

Provider Relationships Involved in Magnetic Resonance Service Delivery

When multiple parties are involved in a service episode, they may be connected to one another through medical practice relationships and/or other business relationships.

For purposes of this report, a medical practice relationship exists when parties share membership in a medical practice or when one party is a member of the other. An example of the former is a relationship in which the ordering and billing doctors are members of the same group practice (two individuals who own or are otherwise related to a third entity). An example of the latter is a relationship in which a group practice is a member of a larger health system. An entire service episode could occur within a single group practice: different practice members might play the roles of orderer, performer, and reader, with the practice serving as the biller and payee.

For purposes of this report, a business relationship exists when two parties have a shared business interest, such as shared investments or contracts with one another. For example, a radiology group and an orthopedic group may operate an imaging center through a joint venture. Alternatively, the radiologists within a multispecialty group practice might coown the MR equipment used by the practice and lease it to the medical practice. Contracts may include lease arrangements, whereby a provider leases space, equipment, and/or staff from an imaging center. An example is a block lease, whereby the payee leases a block of time from an imaging center during which the imaging center performs services on behalf of the payee.

All parties must ensure that their relationships for providing MR services comply with Federal prohibitions on self-referral, kickbacks, and the markup of tests purchased from other providers.⁸ These prohibitions are in place to protect the Medicare program and its beneficiaries from unnecessary and inappropriate use of services.

Medicare claims readily identify the orderer, biller, and payee for each service. The performer of the service and underlying arrangements

⁸ Social Security Act § 1128B(b), 42 U.S.C. § 1320a-7b(b); Social Security Act § 1877, 42 U.S.C. § 1395nn; Social Security Act § 1842(b)(6), 42 U.S.C. § 1395u(b)(6).

between providers of MR services, such as leases or coownership, may not be evident from the claims. As a result, and because there are many ways that providers can work together, it is difficult to identify all of the parties and relationships involved in providing each MR service.

METHODOLOGY

We based this study on analysis of Medicare claims data and a review of a stratified random sample of claims for MR. To review the claims in our sample, we conducted a survey of the providers that billed for them (i.e., the billers). We augmented claims and survey data with data from States, the unique physician identification number (UPIN) file, and the Internet. We also visited three MR providers to learn how they provide MR services. See Appendix A for a full discussion of our methodology.

Scope

This study is national in scope and focuses on the technical component of MR services paid under the MPFS in 2005, whether billed globally or for the technical component only. We did not evaluate the legality of the provider relationships we identified in our review of MR services. We did not evaluate the appropriateness or medical necessity of MR services. In studying reassignment, we focused on claims for which the biller's UPIN differed from the payee's UPIN. We did not evaluate whether claims were subject to a valid reassignment in accordance with all Medicare laws and regulations.⁹

Data Collection

We analyzed Part B data from Medicare's National Claims History (NCH) to create a population file of claims for MR services in 2005. Based on our analysis of the NCH, we assigned each service in the population to one of three strata: services ordered by doctors whose allowed charges for the MR services they ordered placed them at or above the 95th percentile among all doctors who ordered MR (high users); services ordered by doctors whose charges for all advanced imaging—MR, computed tomography, and positron emission tomography—placed them at or above the 95th percentile among all doctors who ordered these services; and services ordered by doctors who were in neither of the other two strata. Our population file contained 2,624,045 MR claims representing 2,629,061 allowed services and

⁹ Social Security Act § 1842(b)(6), 42 U.S.C. § 1395u(b)(6), CMS "Medicare Claims Processing Manual," Pub. No. 100-04, ch.1, § 30.2.

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\$1.8 billion in allowed charges. From this file, we drew a stratified simple random sample of 600 claims that were billed through 548 unique provider numbers. Because it was under investigation by OIG, we dropped one provider from our study, leaving 547 billers and 599 claims in our sample.

To learn about the MR services in our sample, we surveyed the biller for each service. We received completed surveys for 598 of the 599 claims in our sample, yielding a response rate of 99.8 percent. We used estimates from these 598 claims to project to the population.

We supplemented our survey data with business registration data from States, as well as data about providers from the UPIN file, the American College of Radiology Web site, provider Web sites, and Google Maps. We used these data sources to identify the performer of each service in our sample and to identify business owners, group practices, and practice members of the parties involved in each service.

We then identified relationships among the parties involved in each service in our sample. We identified medical practice relationships and business relationships. When the orderer or the orderer's group practice had a relationship with a party involved in providing the service, we referred to the orderer as a connected doctor and the service as a connected service.

We used data from the claims, including procedure code modifiers, provider numbers, and tax identification numbers, to determine whether services were billed to Medicare globally or for the technical component only. We also used these data to determine whether the payment was reassigned from the biller to the payee.

Analysis

We analyzed our data to describe MR services overall, those ordered by high users of MR, and those ordered by connected doctors. We compared services ordered by high users to services ordered by all other users, and we compared services ordered by connected doctors to services ordered by all other doctors.

Limitations

Data from our provider survey were self-reported. With the exception of questions related to where the service was performed, we did not independently verify these data.

Because of the proprietary nature of business arrangements that providers may use to provide MR services, it is unlikely that our review

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identified all of the business relationships among the parties involved with the services in our sample. To the extent that we could not identify all such relationships, our estimates of the number of connected services might be considered conservative.

Standards

We conducted this study in accordance with the “Quality Standards for Inspections” issued by the President’s Council on Integrity and Efficiency and the Executive Council on Integrity and Efficiency.



K E Y A N A L Y T I C C O N C E P T S

In this report, we present data on all MR services and on two subsets of MR services: those ordered by high users of MR and those ordered by connected doctors (connected services). Below, we introduce key concepts related to the findings of this study, including our definitions of high users and connected services, and how we used our data sources to draw conclusions about MR service delivery.

Services Ordered by High Users of Magnetic Resonance

For the purposes of this report, we defined high users of MR as doctors whose allowed charges for services that they ordered placed them at or above the 95th percentile among all doctors who ordered MR services in 2005. We identified the subset of services ordered by high users so that we could describe how they were provided and compare them to all other MR services. Table 2 below displays data about high users and all other users.

Table 2: High Users of Magnetic Resonance and All Other Users of Magnetic Resonance in 2005		
	High Users	All Other Users
Total number of doctors	11,434	217,262
Percentage of all doctors who ordered MR	5%	95%
Top three specialties	Orthopedic surgery Neurology Internal medicine	Internal medicine Family practice Orthopedic surgery
Total MR services ordered	1,016,918	1,607,127
MR services ordered, percentage of total	39%	61%
Total charges for MR services ordered	\$701,605,244	\$1,072,238,978
Charges for MR services ordered, percentage of total	40%	60%
Average number of MR services ordered per doctor	89	7
Average MR charges per doctor	\$61,361	\$4,935

Source: OIG analysis of 2005 Part B data, 2008.

Connected Services

We defined a connected service as one in which the orderer or the orderer’s group was connected—through either a medical practice or other business relationship—to one or more of the parties involved in providing the technical component of the service. Thus, when a doctor

who ordered an MR service was connected to the performer, biller, payee, lessor, or coowner, we referred to the doctor as a connected doctor and the service as a connected service. We identified the subset of connected services so that we could describe how they were provided and compare them to all other MR services.

Data Analysis and Appendixes

We analyzed two data files to draw our conclusions. One is a file of all Part B claims for technical and global MR services paid under the MPFS in 2005. We refer to the data in this file as the “population.” The other data source is a file with the results of our review of a sample of claims we selected from the population. We refer to these data as the sample.

We based our findings on MR services overall and those ordered by high users on both projections from the sample and analysis of the population. Specifically, our findings on the performer and whether payment was reassigned within the biller’s group rely on projections from the sample. The rest of our findings on services overall and those ordered by high users rely on analysis of the population.

We based our findings on connected services entirely on projections from the sample.

Appendix B contains supplementary diagrams that display aspects of MR service delivery and exceed the level of detail in the body of this report. Each set of diagrams contains data about all services, a comparison between services ordered by high users and services ordered by all other users, and a comparison between services ordered by connected doctors and services ordered by all other doctors. When the data in a box of a diagram are based on projections from the sample, corresponding confidence intervals appear in that diagram’s table of confidence intervals.

Appendix C contains tables related to our findings that rely on projections from the sample. When data in a finding are based on projections from the sample, corresponding confidence intervals appear in Table 1. Table 2 contains the results of statistical tests of sample projections.

► FINDINGS

Certain characteristics were common to a majority of magnetic resonance services paid under the Medicare Physician Fee Schedule, regardless of whether they were ordered by high users

In 2005, Medicare paid for about 2.6 million MR services under the MPFS. While providers worked together to provide services in a number of ways, certain characteristics related to how they

were ordered, performed, and billed were common to a majority of services. Services largely shared these characteristics whether or not they were ordered by high users of MR.

Two-thirds of services were ordered by one of four specialties

The doctors who ordered MR were concentrated among a small number of specialties. See Table 3 below for the total services ordered by each of the top four ordering specialties.

Table 3: Top Four Ordering Specialties, Magnetic Resonance Services Paid Under the Medicare Physician Fee Schedule in 2005

Specialty	Number of Services	Percentage of all Services
Internal medicine	543,727	21%
Orthopedic surgery	504,102	19%
Family practice	348,093	13%
Neurology	341,737	13%
<i>Total Top Four</i>	<i>1,737,659</i>	<i>66%</i>

Source: OIG analysis of 2005 Part B data, 2008.

Services ordered by high users of MR were also concentrated among these same ordering specialties. However, orthopedic surgeons and neurologists together ordered 51 percent of the services ordered by high users, compared to 20 percent of all other services.

Finally, the distribution of payee specialties varied little by the different ordering specialties. In other words, no ordering specialty was notably associated with any one payee specialty. The distribution of payee specialties was largely the same among services overall, those ordered by high users, and those ordered by all other users.

Most services were performed by the entity that was paid by Medicare

In 2005, the performer and the payee were the same for 85 percent of MR services. The other 15 percent of services were performed by

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another party on behalf of the payee. In these cases, the payee might have leased imaging capacity from an imaging center or purchased the service from another performer.

Three provider specialties—-independent diagnostic testing facility (IDTF), multispecialty group, and diagnostic radiology—comprised 88 percent of performers and payees.¹⁰ See Table 1 in Appendix C for confidence intervals for findings on performing providers.

Finally, no statistical differences existed in these percentages among MR services overall, those ordered by high users, and those ordered by all other users.

Magnetic resonance claims were typically billed globally through radiologists and had payments reassigned

Services for MR claims followed a consistent billing pattern, regardless of whether they were ordered by high users of MR. Claims for 47 percent of MR services paid under the MPFS in 2005 exhibited all three of these characteristics: billed globally, billed through a radiologist, and payment reassigned.

Seventy-eight percent of services were billed globally. Global billing consolidates the professional and technical components into a single claim for payment to a single provider. Globally billed services can be furnished in several ways. Examples include a single provider, such as an imaging center, a radiology group practice, or another group practice, furnishing both components; an agreement between a radiology practice, which provides the professional component, and an imaging center, which provides the technical component; and a radiologist working under contract to furnish the professional component of services performed by imaging centers and group practices.

Fifty-four percent of all services were billed through a radiologist's provider number. When a radiologist was the biller for the service, the radiologist could have provided either or both the technical and professional components of the test.

For purposes of this report, we classified a service as having had payment reassigned when the biller's UPIN differed from the payee's UPIN. We determined that payment was reassigned for 68 percent of services. Eighty-six percent of reassignments were from a doctor to his or her group

¹⁰ In Medicare claims data, IDTF and multispecialty group are considered nonphysician provider specialties. CMS, "Medicare Claims Processing Manual," Pub. No. 100-4, ch. 26.

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practice. For the remaining 14 percent of reassignments, we were unable to identify the connection between the payee and the biller. Payment for global bills was reassigned 71 percent of the time, while payment for technical component-only bills was reassigned 53 percent of the time. See Table 1 in Appendix C for confidence intervals for percentages of services with payments reassigned from a doctor to his or her group practice and those with payments reassigned to a provider with no identified connection.

Finally, billing for services largely reflected these characteristics whether or not they were ordered by high users of MR. Seventy-eight percent of services ordered by high users were billed globally, 52 percent were billed through a radiologist's provider number, and 68 percent had payment reassigned. These percentages are nearly identical to those for services ordered by all other users. In addition, no statistical differences existed in the percentage of payments reassigned within the biller's group among MR services overall, those ordered by high users, and those ordered by all other users.

Connected services were provided differently than services that were not connected

In our review, we found that one-quarter of MR services paid under the MPFS in 2005 were connected services. In these

services, the ordering doctor or the ordering doctor's group had a medical practice or other business connection to one or more of the parties involved in providing the service. All differences between connected and all other services (those that were not connected) that appear below were statistically significant at the 95-percent confidence level. See Tables 1 and 2 in Appendix C for corresponding confidence intervals and statistical tests.

Connected services were associated with high use

High users of MR ordered 55 percent of connected services, compared to 33 percent of services that were not connected.

Connected services were more likely to have been ordered by orthopedic surgeons

Orthopedic surgeons ordered 28 percent of connected services, compared to 15 percent of all other services. Among the four most prevalent ordering specialties—internal medicine, orthopedic surgery, family practice, and neurology—this is the only difference in the percentages of services each ordered that was statistically significant.

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Connected services were more likely to have been performed by multispecialty groups

Multispecialty groups performed and were paid for half of connected services, compared to only one-quarter of services that were not connected. The IDTF and diagnostic radiology specialties played a smaller role in connected services than in all other services. Specialties other than multispecialty group, IDTF, and diagnostic radiology played a significantly larger role in connected services than in all other services. See Tables 4 and 5 below for a comparison of top performer and payee specialties for connected services and those that were not connected.

Table 4: Top Specialties of Performers, Connected Services, and All Other Services

Performer Specialty	Percentage of Connected Services	Percentage of All Other Services
Multispecialty clinic/group	50%	26%
IDTF	13%	39%
Diagnostic radiology	7%	29%
All other specialties	30%	6%
<i>Total</i>	<i>100%</i>	<i>100%</i>

Source: OIG review of 2005 MR services, 2008.

Table 5: Top Specialties of Payees, Connected Services, and All Other Services

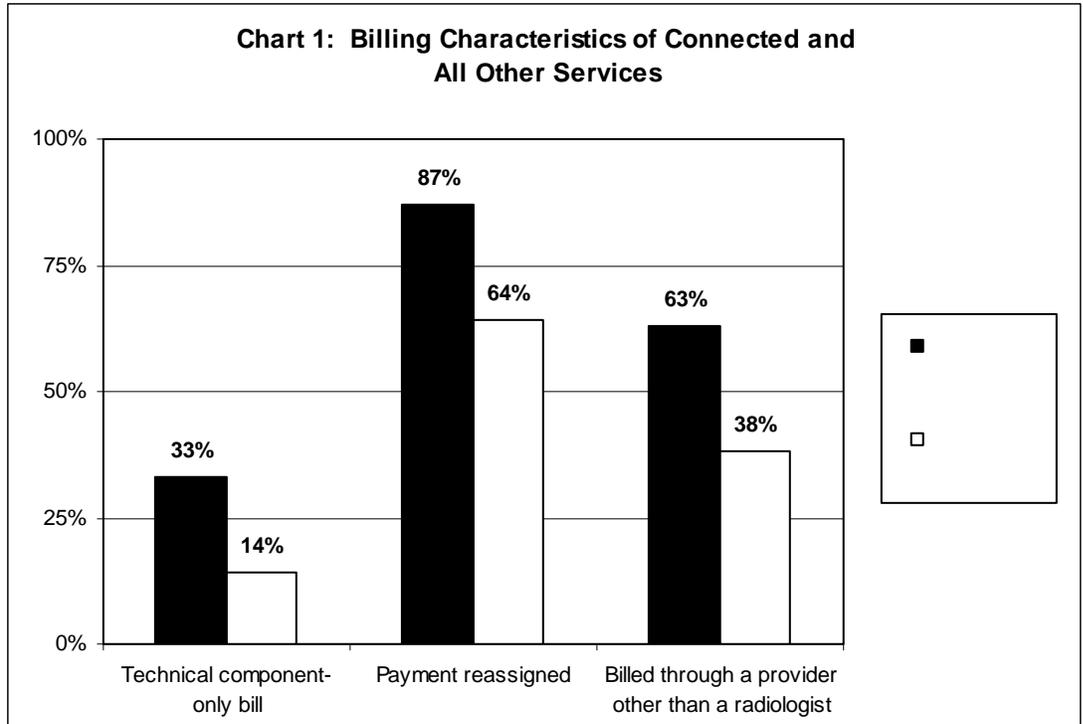
Payee Specialty	Percentage of Connected Services	Percentage of All Other Services
Multispecialty clinic/group	51%	26%
IDTF	11%	38%
Diagnostic radiology	7%	31%
All other specialties	31%	5%
<i>Total</i>	<i>100%</i>	<i>100%</i>

Source: OIG review of 2005 MR services, 2008.

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Connected services were more likely than all other services to have been billed as technical component only, to have had payment reassigned, and to have been billed through a provider other than a radiologist

See Chart 1 below for a comparison of the billing characteristics of connected services and all other services.



Source: OIG review of 2005 MR services, 2008.

► C O N C L U S I O N

The Medicare program has seen rapid growth in MR and other types of advanced imaging performed in doctors' offices, imaging centers, and other settings covered by the MPFS. As more services are performed in these settings, doctors are increasingly in a position to order services from parties with which they have a medical practice or other business relationship. In these circumstances, doctors may have conflicts of interest, financial or otherwise.

In this review, we sought to learn about how providers delivered MR covered under the MPFS and whether certain relationships among providers were associated with high use of services. In particular, we were interested in connected services, which are services ordered by doctors who were connected to the parties that provided them.

We found a relationship between connected services and services ordered by high users of MR, but we also found that the two subsets of services differed in several ways. We found that services ordered by high users of MR were largely similar to all other services in how they were furnished and billed to Medicare. However, this was not the case for connected services, which differed significantly from services that were not connected.

The findings in this report highlight the complex nature of how providers deliver MR paid under the MPFS. The large number of ways that various parties can perform and bill for services reduces the transparency of these transactions. Although the analysis in this report was limited to MR, it is possible that such complexity extends to other types of high-cost imaging paid under the MPFS. The complexity and limited transparency with which these services are provided warrants continued attention to ensure that services are reasonable, necessary, and compliant with Medicare statutes and regulations.

AGENCY COMMENTS

CMS agreed with our findings and our conclusion that the complexity of MR services warrants continued attention. It outlined regulatory steps it has taken to curb overutilization of diagnostic testing services. These include expanding the antimarkup provision to the professional component of services and seeking public comment on the in-office ancillary exception to the physician self-referral law. CMS also stated its commitment to examining the relationship between the utilization of advanced imaging services and the entities that order and bill for them. The complete text of CMS's comments appears in Appendix D.

Methodology

We based this study on analysis of Medicare claims data and a review of a stratified random sample of claims for magnetic resonance (MR). To review the claims in our sample, we conducted a survey of the providers that billed for them. We augmented our survey data with business registration data from States and data about providers from the unique physician identification number (UPIN) file, the American College of Radiology Web site, provider Web sites, and Google Maps. We also visited three MR providers to learn how they provide MR services.

Scope

This study is national in scope and focuses on the technical component of MR services paid under the Medicare Physician Fee Schedule (MPFS) in 2005. We focused on the technical component because it is the most costly component of MR services. We focused on MR because it has a wide range of clinical applications across ambulatory settings.

We used 100-percent Part B carrier claims data from Medicare's National Claims History (NCH) and data from a stratified simple random sample to describe MR services.

We did not attempt to make any judgments about the legality of the provider relationships we identified in our review.

Creation of Population File

The data source for our sample was Medicare's 2005 NCH, which contains all claims activity for Medicare fee-for-service beneficiaries. From this source, we created a population file of 2,624,045 Part B claims for MR services from which we drew our sample. We also used this population file in our descriptive analysis of how MR services were furnished and billed. Below are the steps we took to create this file and draw our sample.

Create a file of claims for global and technical component services. We extracted Part B carrier claims from the 2005 NCH to create a file of technical component and global claims for MR, computed tomography (CT), and positron emission tomography (PET). This file contained 6,009,091 claims reflecting \$3.3 billion in allowed charges.

We then excluded 172,585 records with invalid data for the UPIN of the ordering doctor or allowed charges under \$100. We did so because we needed valid UPIN data to profile ordering doctors and because claims

with allowed charges under \$100 were unlikely to be for the technical component of services. These represent 2.9 percent of the records in our original file and 2.9 percent of allowed charges.

The resulting file contained 5,836,506 claim records. Each record contained the Healthcare Common Procedure Coding System (HCPCS) code and modifiers, UPIN number and specialty of the biller, UPIN number of the orderer, tax identification number of the payee, and beneficiary identifier.

Create profiles of ordering doctors. We summarized our claims file by orderer's UPIN to create a profile record for each doctor who ordered one or more services. The resulting file had 284,105 records. Each record contained allowed charges for MR, CT, and PET ordered by the doctor in 2005—for each modality and for all three combined. Records also included percentile rankings based on those charges. Of the orderers in the file, 228,696 ordered MR. Based on analysis of the distributions of allowed charges in the file, we categorized each orderer of MR into one of three strata: doctors whose allowed charges for the MR services they ordered placed them at or above the 95th percentile among all doctors who ordered MR (high group); doctors whose collective charges for MR, CT, and PET services placed them at or above the 95th percentile among all doctors who ordered these services (collective high group); and doctors who were in neither the high nor the collective high strata (regular group).

Append profiles to MR claims and assign claims to strata. Our population file contained 2,624,045 MR claims representing 2,629,061 allowed services and \$1.8 billion in allowed charges. Next, we merged each orderer's profile with the claims for MR services that he or she ordered. This enabled us to assign each claim to a stratum based on whether its orderer was in the high, collective high, or regular group of MR users.

Sample Selection

From our stratified population file, we drew a stratified simple random sample of claims for services ordered by high, collective high, and regular users. The population and sample size for each stratum are shown in Table 1 on the following page.

Table 1: Population of Magnetic Resonance Claims and Sample Strata				
Stratum	Ordering Doctor's Use of MR	2005 Population	Allowed Charges	Sample Size
1	High	1,016,918	\$701,605,244	200
2	Collective High	19,695	\$15,526,233	100
3	Regular	1,587,432	\$1,056,712,744	300
Total		2,624,045	\$1,773,844,221	600

Source: Office of Inspector General (OIG) analysis of 2005 Part B data, 2006.

The 600 claims in our sample were billed under a total of 548 unique provider numbers. We used the UPIN file to locate the names and addresses of these billers and vetted them with our Office of Investigations. As a result of vetting, we dropped one provider from our study, leaving 547 billers and 599 claims in our sample.

Mail Survey

To learn about how MR services in our sample were provided, we surveyed the biller for each service. The survey contained 14 questions related to the biller’s relationship with the orderer of the service, the name and location of the performer, equipment ownership and leasing, and whether the provider had a business or medical practice relationship with any of the parties involved in providing the service. We tested the survey with four providers and vetted it within OIG.

To conduct the survey, we used express delivery to send each biller a package with a cover letter, a survey, a preaddressed prepaid return envelope, and an instructions page with information identifying the specific service about which we were asking. We instructed the biller to answer the survey only with respect to the technical component of the specific service identified. If a biller had more than one claim in our sample, we sent an instruction sheet and survey for each claim.

We received completed surveys from 546 of the 547 billers in our sample. We could not locate one biller that had retired from medical practice. The surveys we received covered 598 of the 599 claims in our sample, yielding a response rate of 99.8 percent.

Supplemental Data

To learn more about how MR services in our sample were provided, we supplemented our survey data with business registration data from States, as well as data about providers from the UPIN file, the

American College of Radiology Web site, provider Web sites, and Google Maps.

We used business registration data from States to identify owners of any business that played a role in providing a service. Such businesses included equipment leasing companies, imaging centers, and medical groups incorporated as professional corporations. We used the UPIN file to identify group practices and group practice members of all primary parties involved with the services. We also cross-referenced the payee tax identification number from each sampled claim with the UPIN file to identify the payee for each service in our sample. We used provider Web sites to identify practice members, locations, and affiliations with other providers. We used the American College of Radiology's Web site and Google Maps to aid in verifying performers' locations. Any time we identified an individual, group practice, or other provider associated with a claim, we searched the UPIN file by provider name and location to identify and record that provider's UPIN.

Identification of Relationships and Connected Doctors

We used both a computer program and a manual review to identify medical practice relationships and business relationships among the primary parties involved with each service in our sample. We defined medical practice relationships as a doctor who was member of a group practice or on staff at a hospital. Business relationships included shared participation as investors in a joint venture, one party having an ownership or managerial interest in the other, and contracts.

When we determined that the orderer or the orderer's group practice had a relationship with one or more of the parties involved in providing the service, we referred to the orderer as a connected doctor and the service as a connected service.

Description of Billing Attributes

We classified all claims in our population as bills for either global payment or for the technical component only and as either having had payment reassigned or not having had payment reassigned. To classify a service as billed globally or for the technical component only, we used the two HCPCS modifiers that were on the claim. To classify a service as having had payment reassigned, we used the UPIN numbers of the biller and the payee. When the biller's UPIN differed from the payee's UPIN, we classified the service as having had its payment reassigned. We did not determine whether other types of reassignments may have occurred.

When we classified services in our sample as having had payment reassigned, we used the UPIN file and our supplemental data to determine whether payment was reassigned within the biller's group. When the UPIN file or our supplemental data showed that the biller was a member of the payee, we classified the reassignment as within the biller's group.

Analysis

Findings and conclusions are based on analyses of data from the population file and from our sample.

We analyzed these data to describe MR services overall, the subset of those ordered by high users of MR, and the subset of those ordered by connected doctors. We compared services ordered by high users to services ordered by all other users and compared services ordered by connected doctors to services ordered by all other doctors.

We based our findings on MR services overall and those ordered by high users on analysis of both the sample and the population. Specifically, our findings on the performer and whether payment was reassigned within the biller's group rely on analysis of the sample. The rest of our findings on services overall and those ordered by high users rely on analysis of the population.

We based our findings on connected services entirely on analysis of the sample.

Limitations

Data from our provider survey were self-reported. With the exception of questions related to where the service was performed, we did not independently verify these data.

Because of the proprietary nature of business arrangements that providers may use to provide MR services, it is unlikely that our review identified all of the business relationships among the parties involved with the services in our sample. To the extent that we could not identify all such relationships, our estimates might be considered conservative.

We considered each claim in our population file to represent one MR service. However, our population file contained 3,219 claims for more than one service. We found that claims with more than one service had average allowed charges per service of \$566 and that those with more than two services had allowed charges per service of \$248. This compares to \$675 for claims with one service only. Instead of reviewing

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each of the claims with more than one service to judge whether their service counts were valid, we decided to count them as claims for one service only. The additional services that we did not count on these claims totaled 5,016 services, or 0.2 percent of our sample population.

Magnetic Resonance Service Delivery Diagrams

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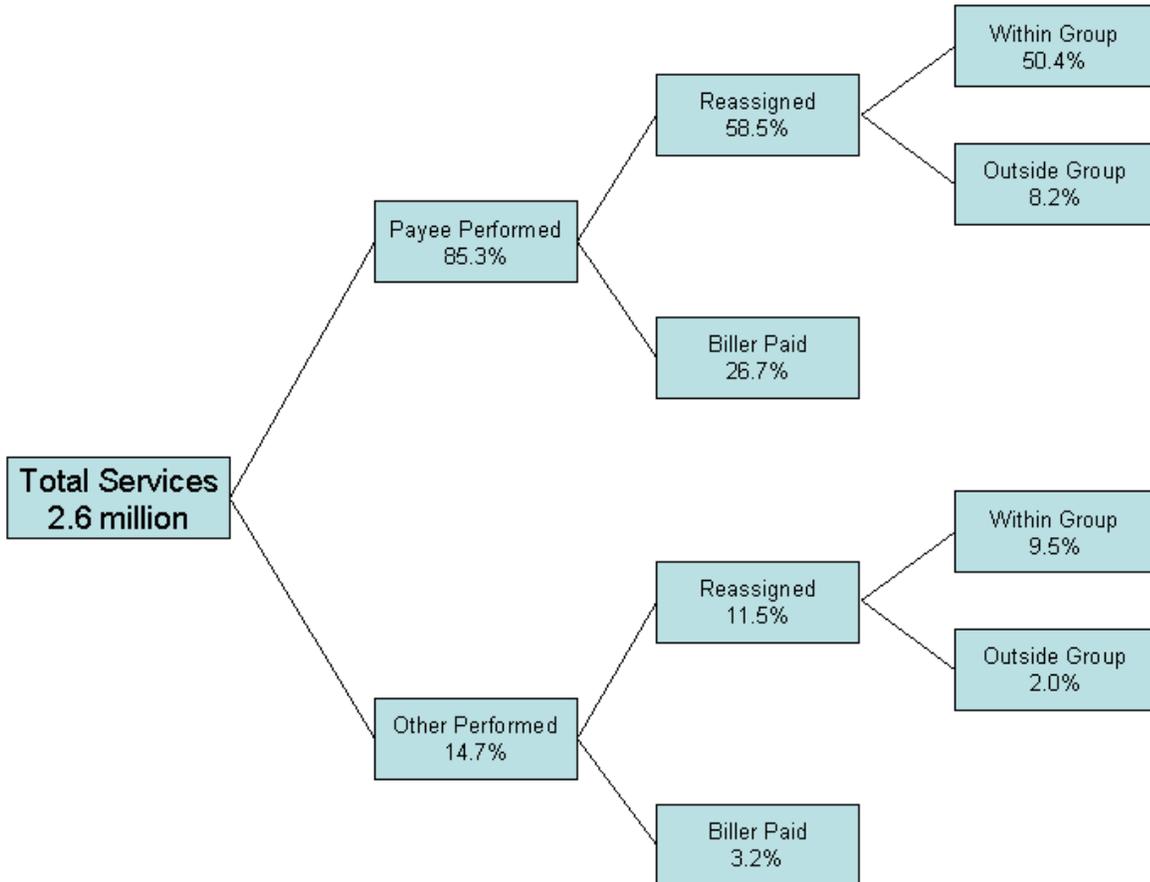
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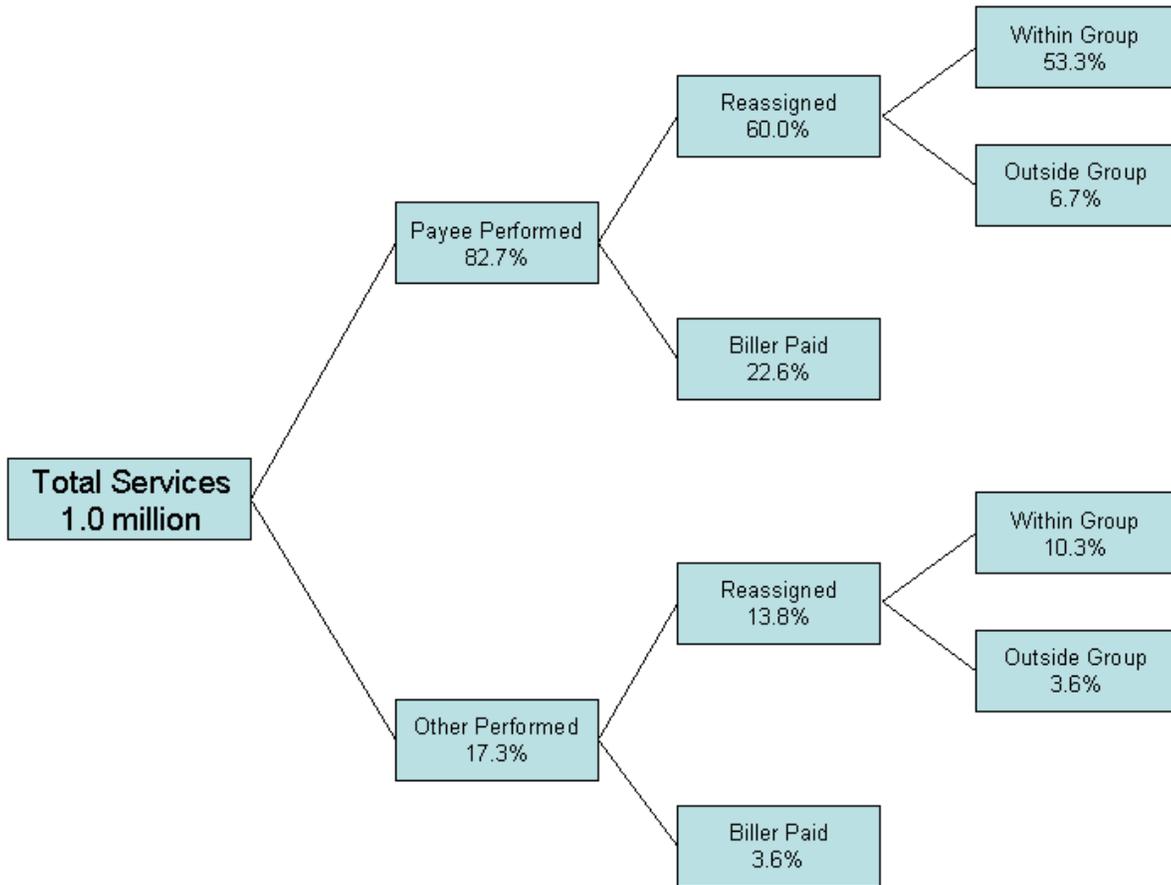
Diagram 1a: Service Delivery, All Services



Percentages in one column may not add to those in the preceding column because of rounding.

Source: Office of Inspector General (OIG) analysis of 2005 Part B data and OIG review of 2005 magnetic resonance (MR) services, 2008.
See Table 1a on p. 42 for confidence intervals.

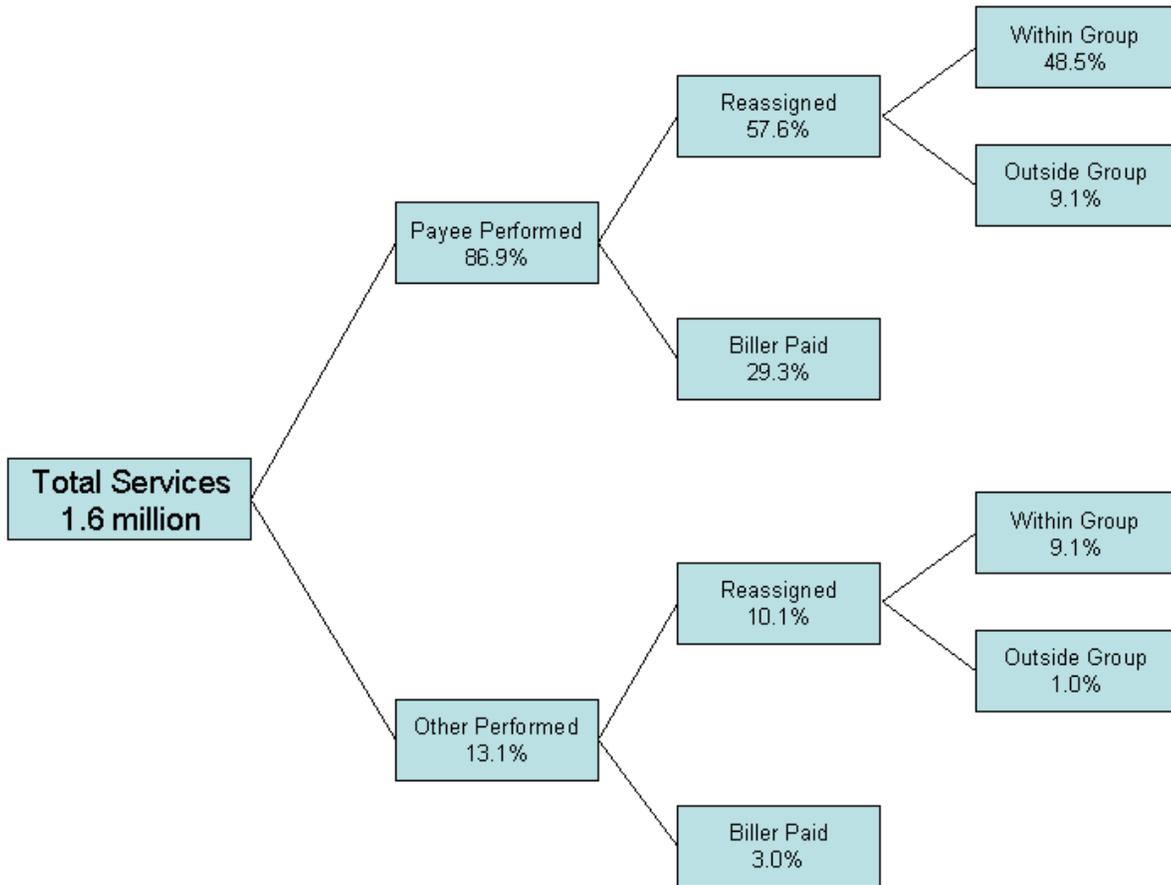
Diagram 1b: Service Delivery, Services Ordered by High Users



Percentages in one column may not add to those in the preceding column because of rounding.

Source: OIG analysis of 2005 Part B data and OIG review of 2005 MR services, 2008.
See Table 1b on p. 43 for confidence intervals.

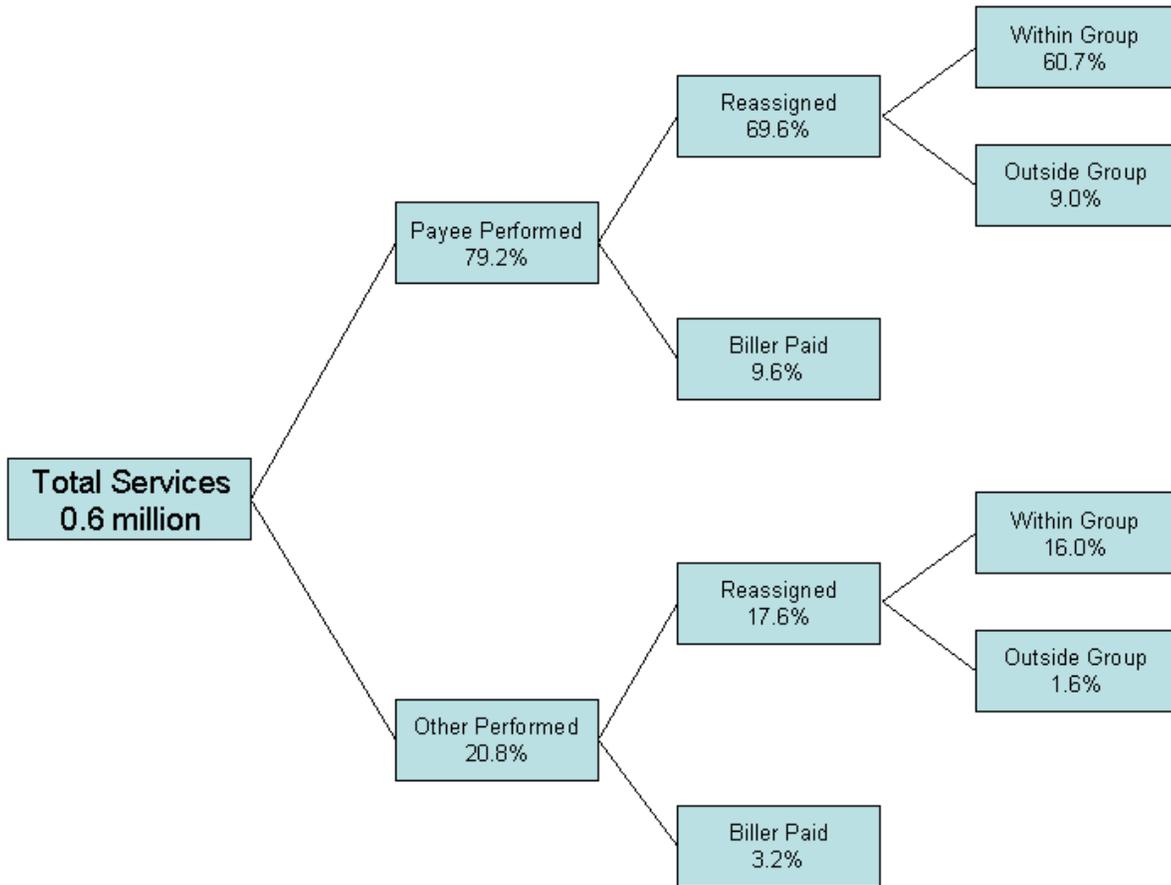
Diagram 1c: Service Delivery, Services Ordered by All Other Users



Percentages in one column may not add to those in the preceding column because of rounding.

Source: OIG analysis of 2005 Part B data and OIG review of 2005 MR services, 2008.
See Table 1c on p. 44 for confidence intervals.

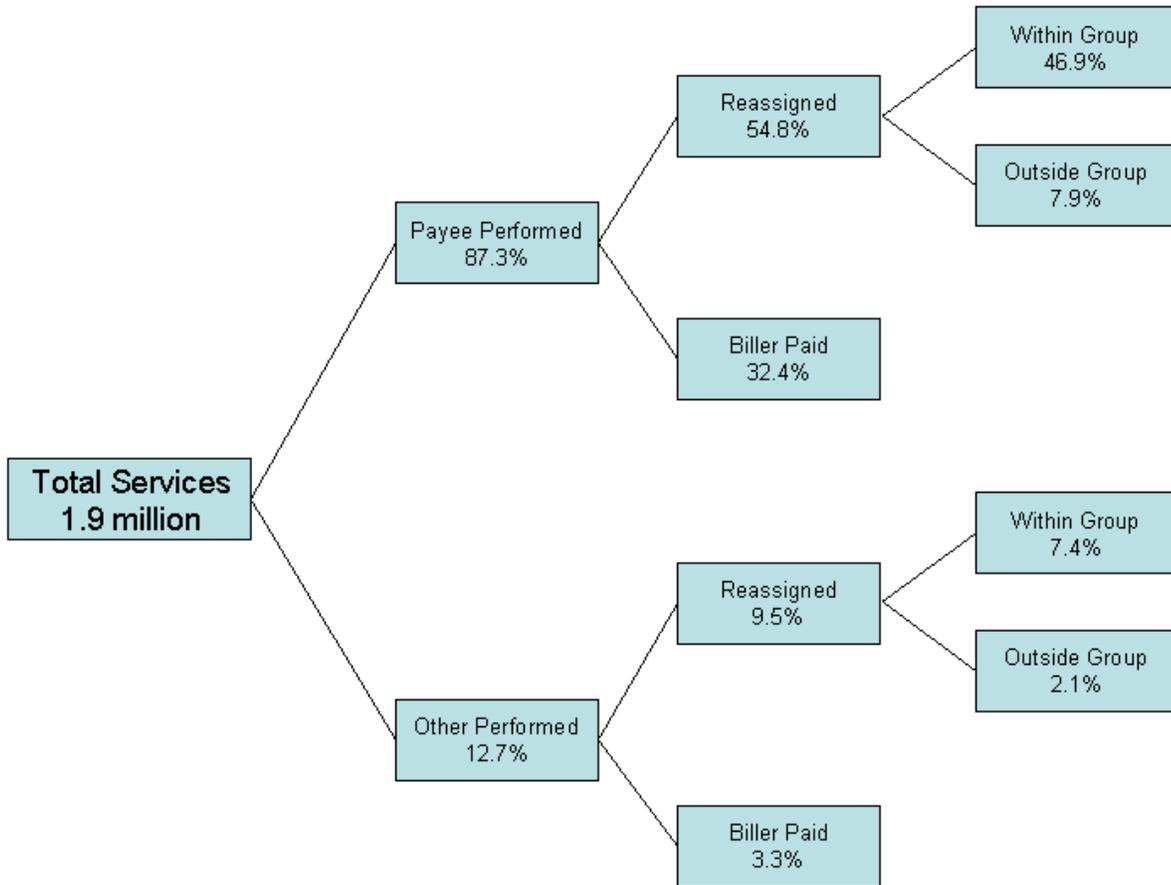
Diagram 1d: Service Delivery, Services Ordered by Connected Doctors



Percentages in one column may not add to those in the preceding column because of rounding.

Source: OIG review of 2005 MR services, 2008.
See Table 1d on p. 45 for confidence intervals.

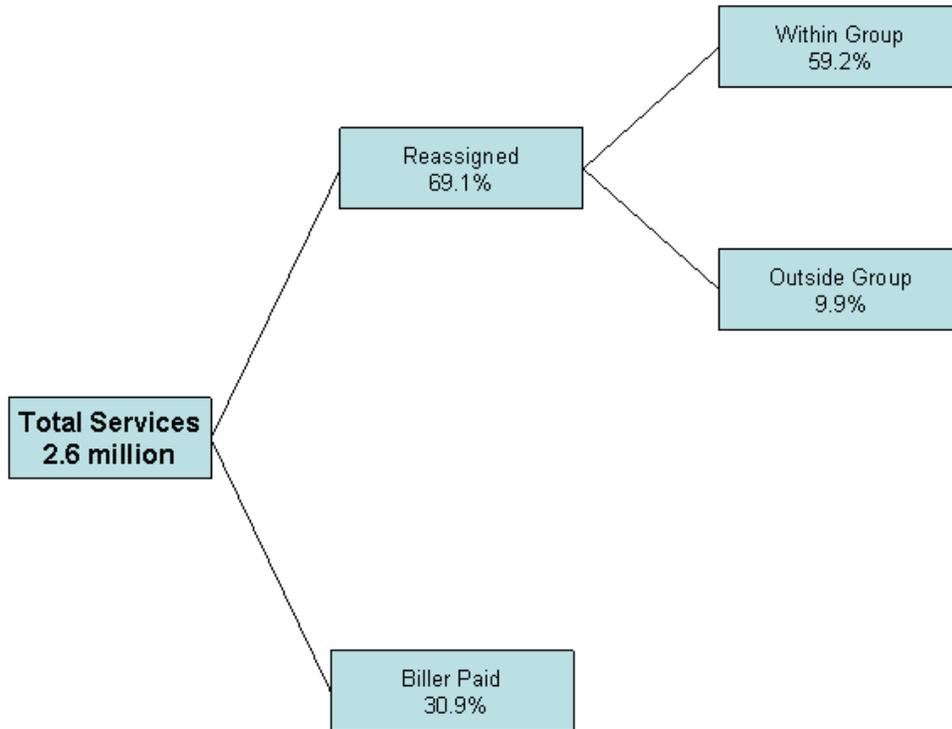
Diagram 1e: Service Delivery, Services Ordered by All Other Doctors



Percentages in one column may not add to those in the preceding column because of rounding.

Source: OIG review of 2005 MR services, 2008.
See Table 1e on p. 46 for confidence intervals.

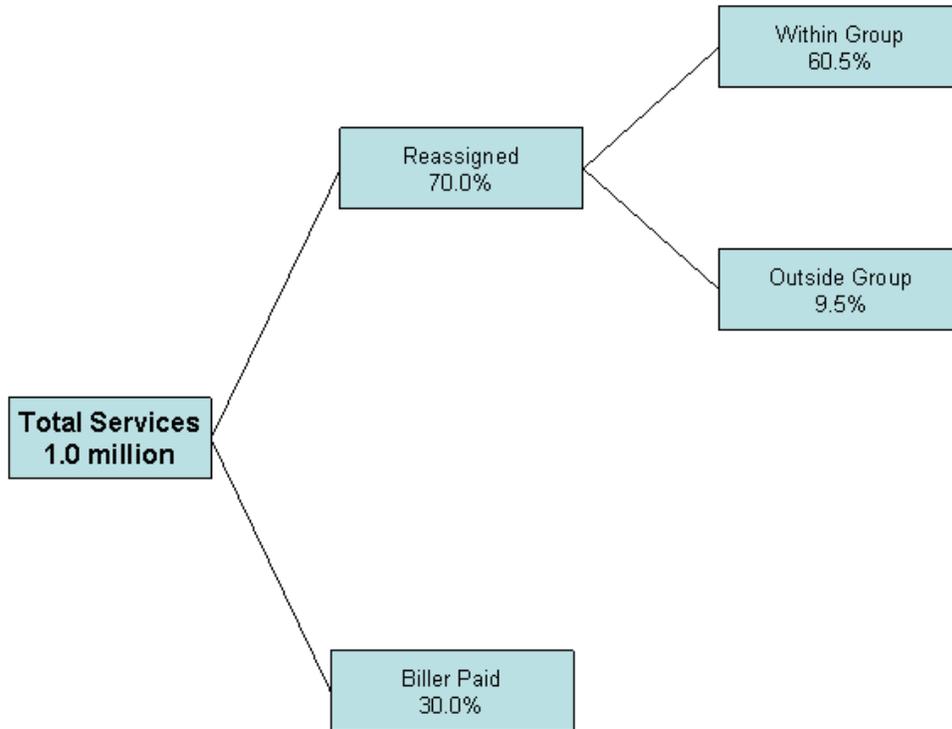
Diagram 2a: Reassignment of Payment, All Services



Percentages in one column may not add to those in the preceding column because of rounding.

Source: OIG analysis of 2005 Part B data and OIG review of 2005 MR services, 2008.
See Table 2a on p. 47 for confidence intervals.

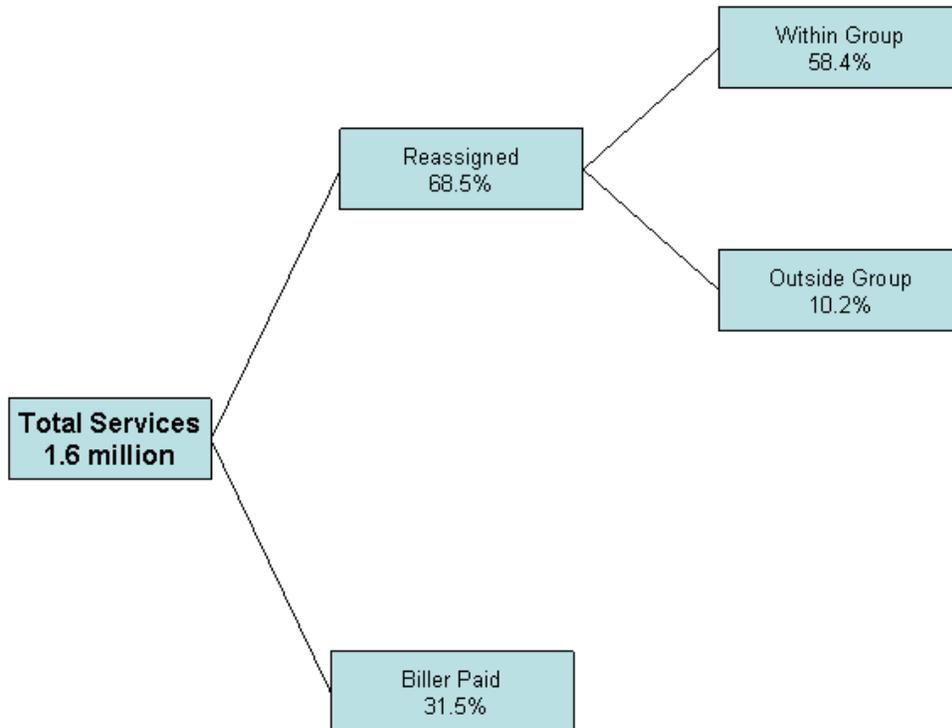
Diagram 2b: Reassignment of Payment, Services Ordered by High Users



Percentages in one column may not add to those in the preceding column because of rounding.

Source: OIG analysis of 2005 Part B data and OIG review of 2005 MR services, 2008.
See Table 2b on p. 47 for confidence intervals.

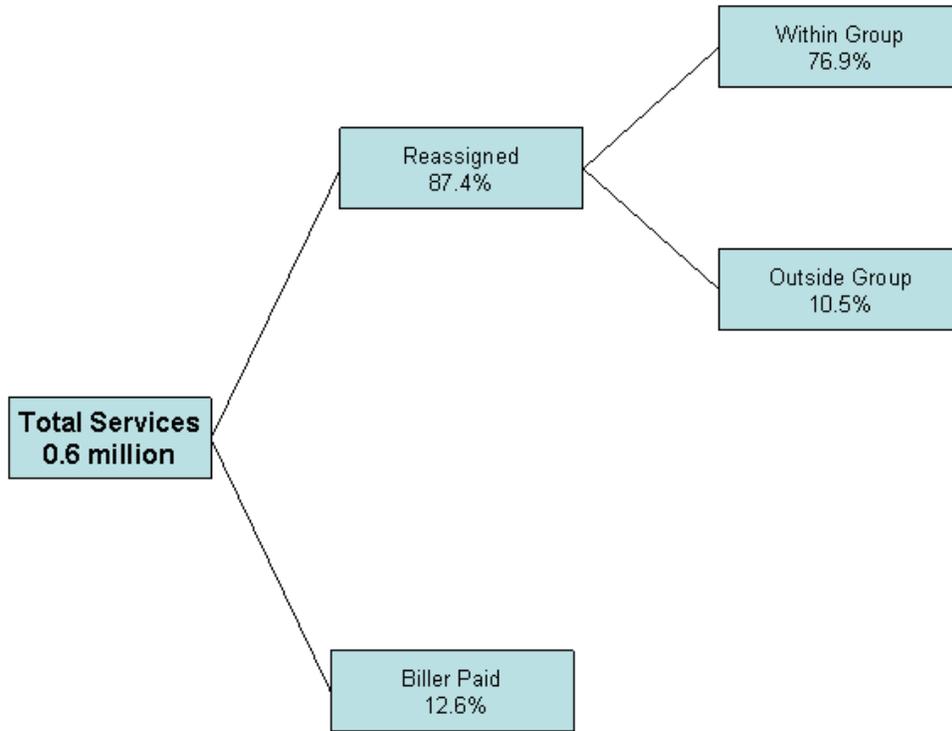
Diagram 2c: Reassignment of Payment, Services Ordered by All Other Users



Percentages in one column may not add to those in the preceding column because of rounding.

Source: OIG analysis of 2005 Part B data and OIG review of 2005 MR services, 2008.
See Table 2c on p. 47 for confidence intervals.

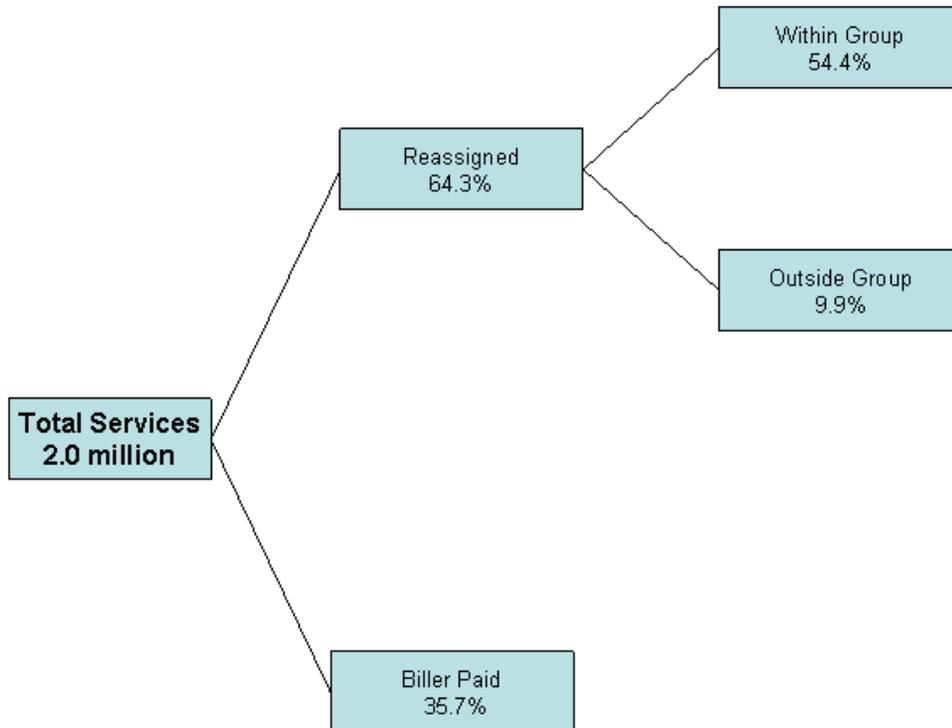
Diagram 2d: Reassignment of Payment, Services Ordered by Connected Doctors



Percentages in one column may not add to those in the preceding column because of rounding.

Source: OIG analysis of 2005 Part B data and OIG review of 2005 MR services, 2008.
See Table 2d on p. 47 for confidence intervals.

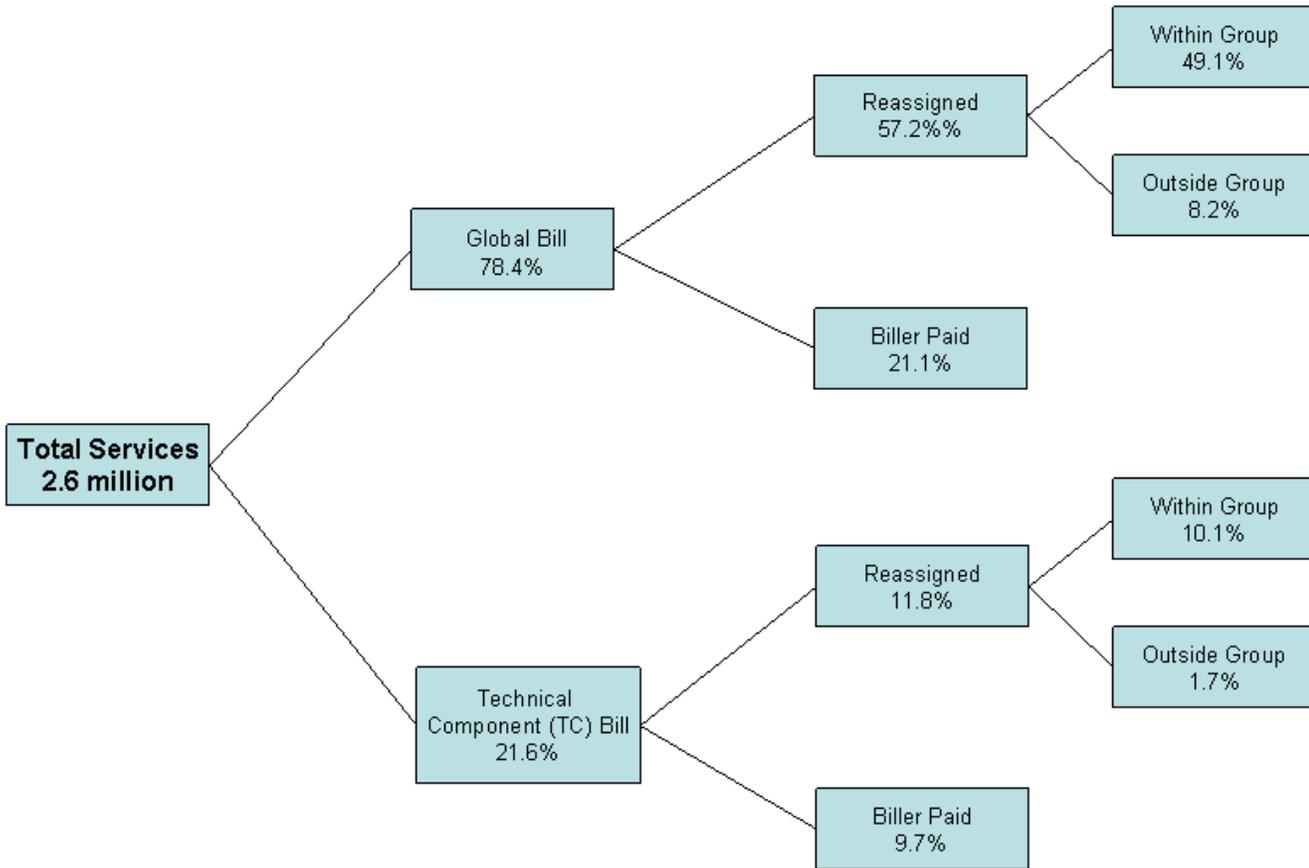
Diagram 2e: Reassignment of Payment, Services Ordered by All Other Doctors



Percentages in one column may not add to those in the preceding column because of rounding.

Source: OIG analysis of 2005 Part B data and OIG review of 2005 MR services, 2008.
See Table 2e on p. 47 for confidence intervals.

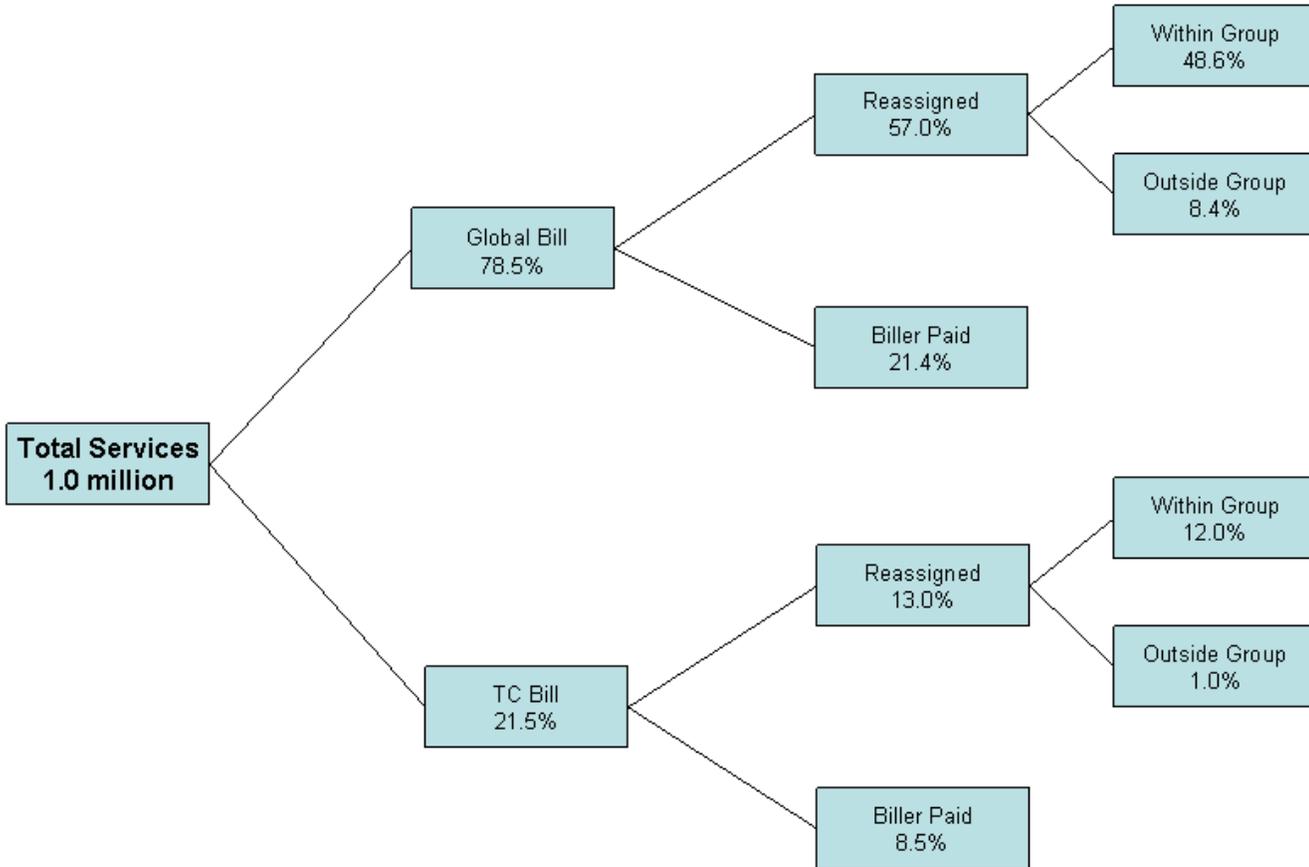
Diagram 3a: Billing Method, All Services



Percentages in one column may not add to those in the preceding column because of rounding.

Source: OIG analysis of 2005 Part B data and OIG review of 2005 MR services, 2008.
See Table 3a on p. 48 for confidence intervals.

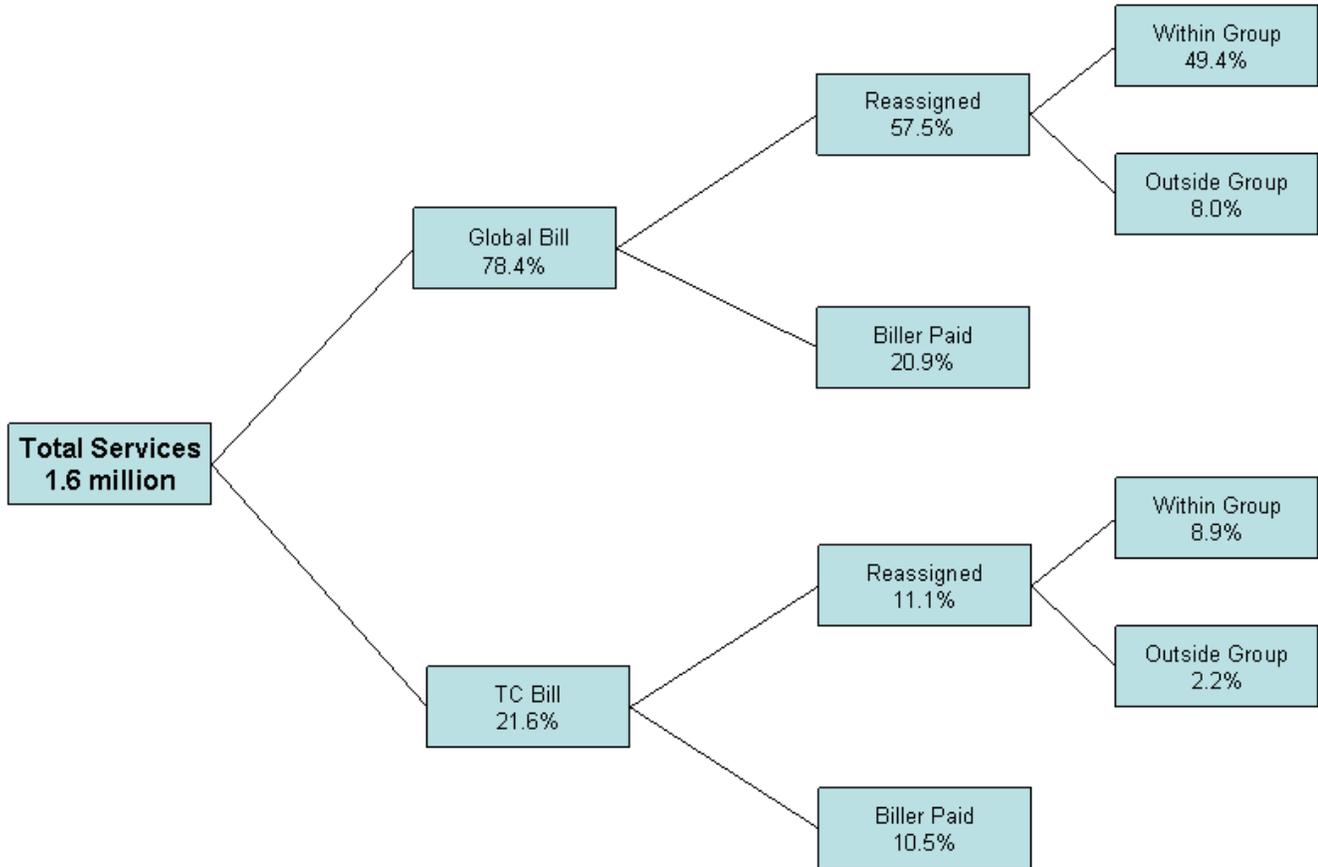
Diagram 3b: Billing Method, Services Ordered by High Users



Percentages in one column may not add to those in the preceding column because of rounding.

Source: OIG analysis of 2005 Part B data and OIG review of 2005 MR services, 2008.
See Table 3b on p. 48 for confidence intervals.

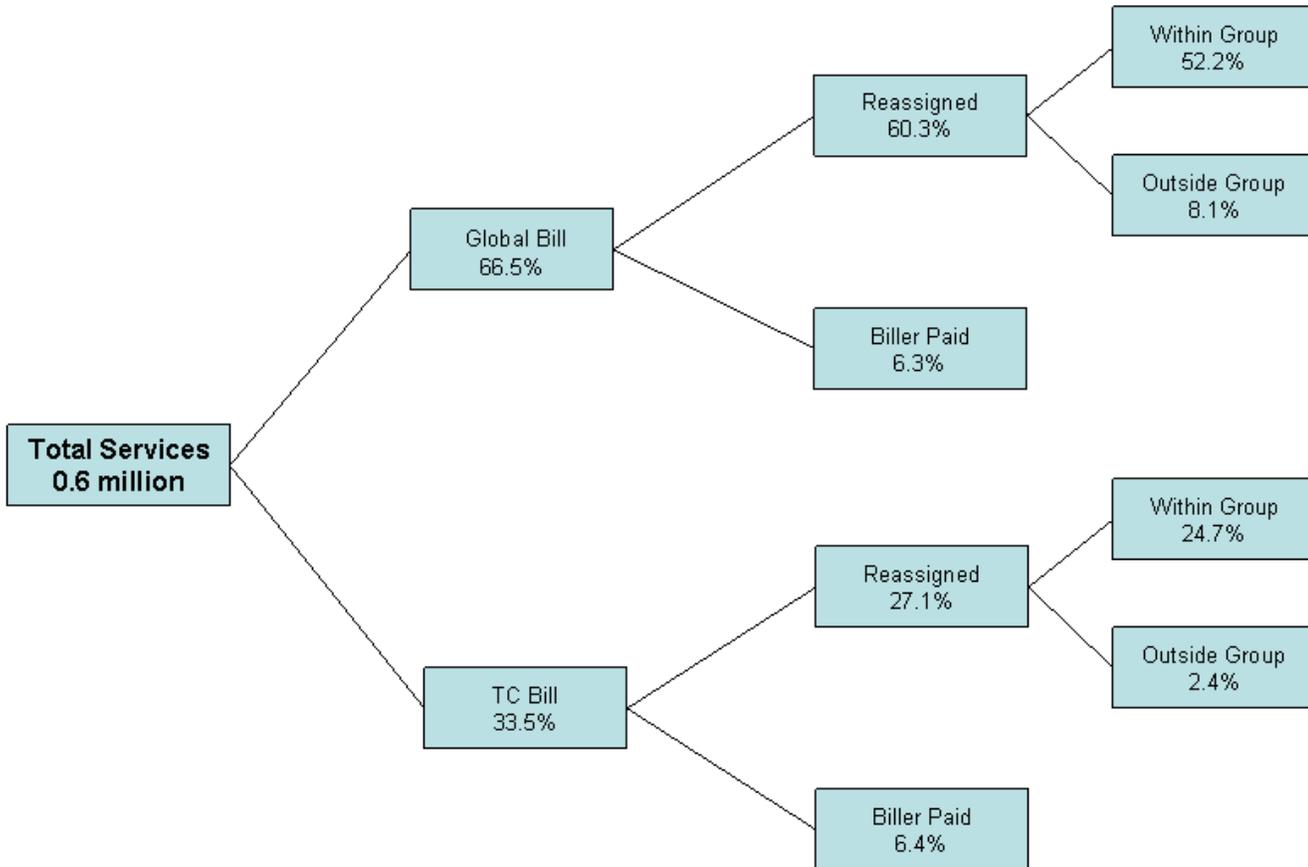
Diagram 3c: Billing Method, Services Ordered by All Other Users



Percentages in one column may not add to those in the preceding column because of rounding.

Source: OIG analysis of 2005 Part B data and OIG review of 2005 MR services, 2008.
See Table 3c on p. 48 for confidence intervals.

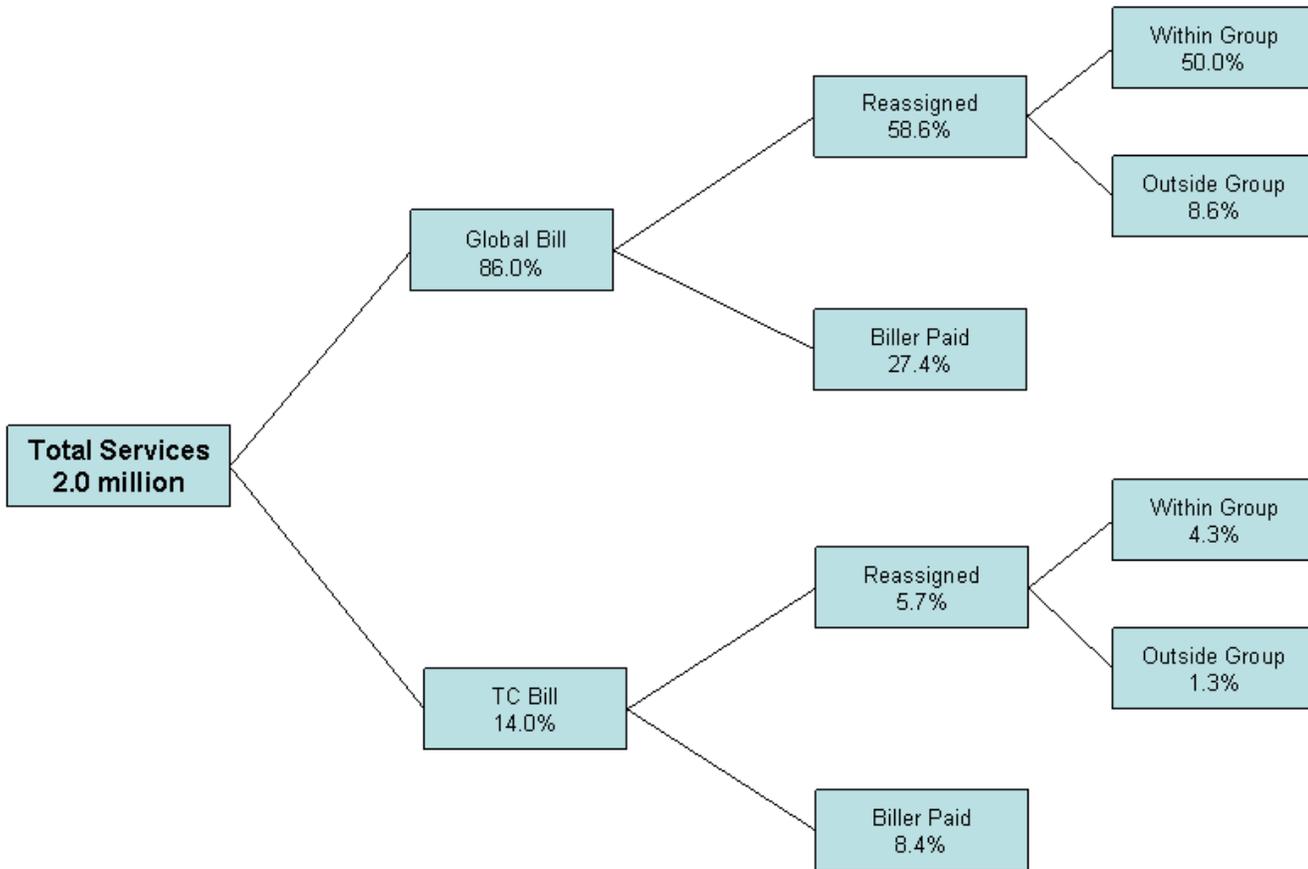
Diagram 3d: Billing Method, Services Ordered by Connected Doctors



Percentages in one column may not add to those in the preceding column because of rounding.

Source: OIG review of 2005 MR services, 2008.
See Table 3d on p. 49 for confidence intervals.

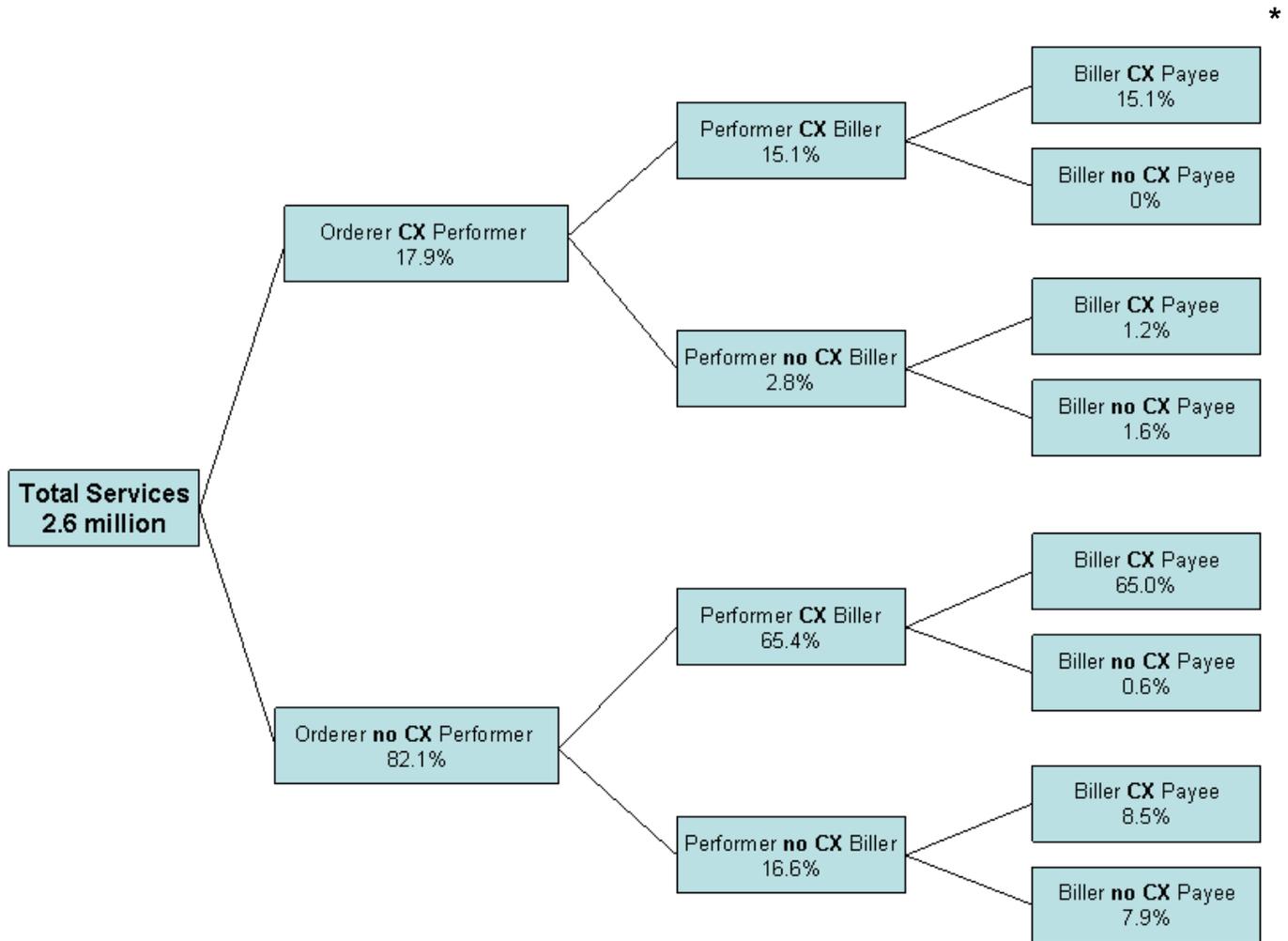
Diagram 3e: Billing Method, Services Ordered by All Other Doctors



Percentages in one column may not add to those in the preceding column because of rounding.

Source: OIG review of 2005 MR services, 2008.
See Table 3e on p. 49 for confidence intervals.

Diagram 4a: Provider Relationships, All Services



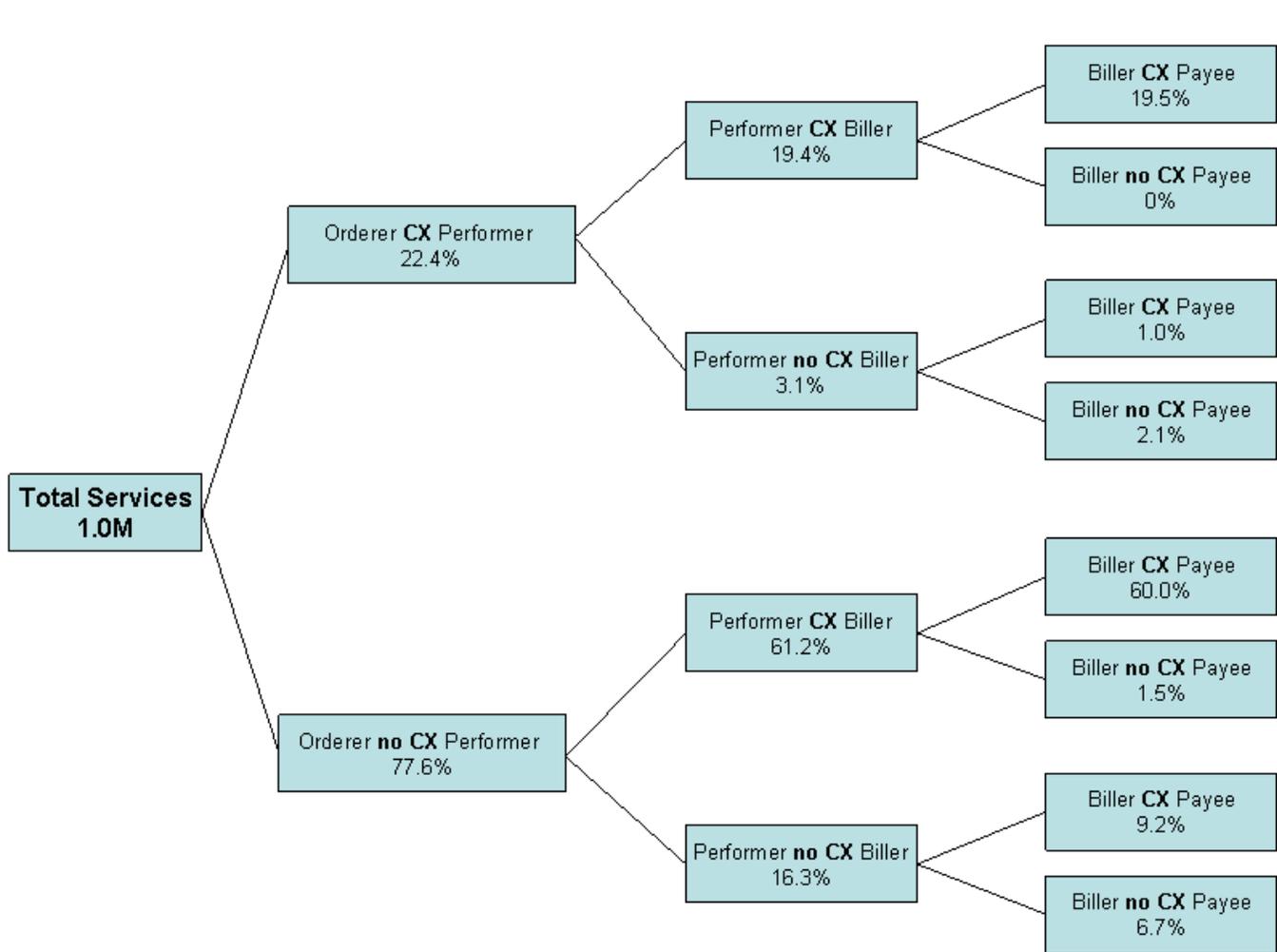
“CX” = Connection: Parties are the same or one is a member of the other.

Percentages in one column may not add to those in the preceding column because of rounding.

* Projections in the right-most column are based on 589 sample units and those in the column that precedes it are based on 590. This causes some percentages in the right-most column to vary from the values in the preceding column.

Source: OIG review of 2005 MR services, 2008.
See Table 4a on p. 50 for confidence intervals.

Diagram 4b: Provider Relationships, Services Ordered by High Users



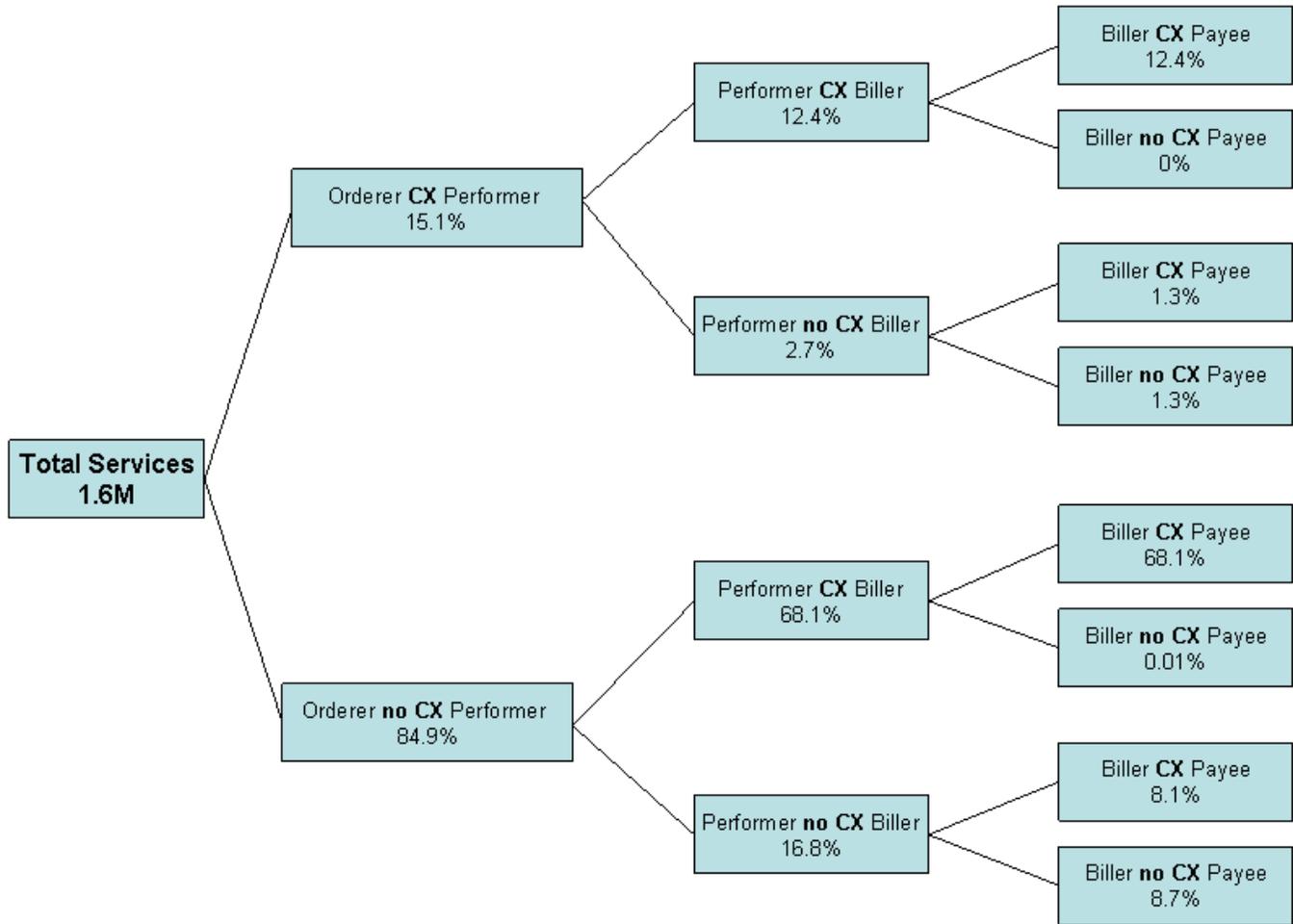
“CX” = Connection: Parties are the same or one is a member of the other.

Percentages in one column may not add to those in the preceding column because of rounding.

* Projections in the right-most column are based on 195 sample units and those in the column that precedes it are based on 196. This causes some percentages in the right-most column to vary from the values in the preceding column.

Source: OIG review of 2005 MR services, 2008.
See Table 4b on p. 51 for confidence intervals.

Diagram 4c: Provider Relationships, Services Ordered by All Other Users

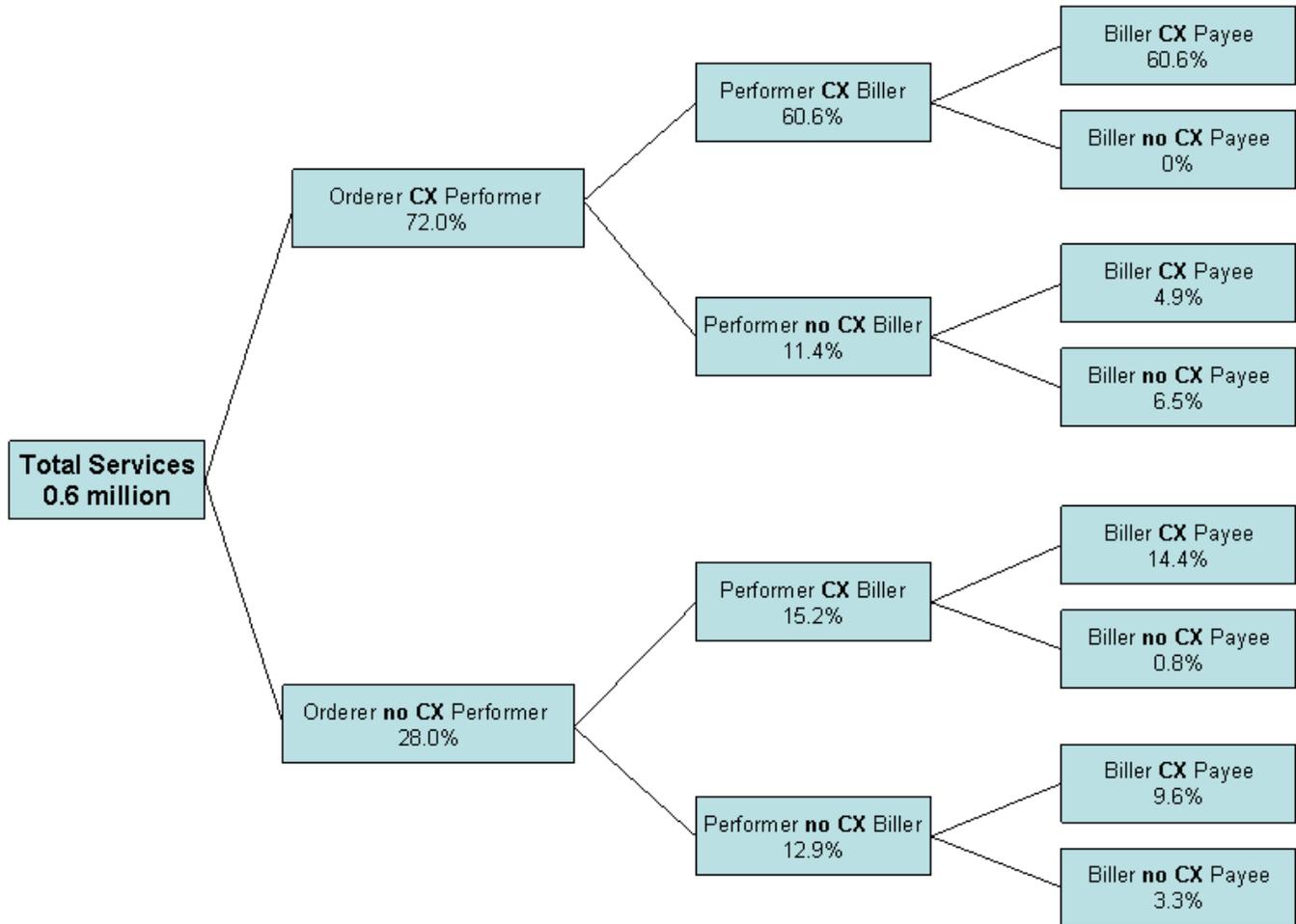


“CX” = Connection: Parties are the same or one is a member of the other.

Percentages in one column may not add to those in the preceding column because of rounding.

Source: OIG review of 2005 MR services, 2008.
See Table 4c on p. 52 for confidence intervals.

Diagram 4d: Provider Relationships, Services Ordered by Connected Doctors



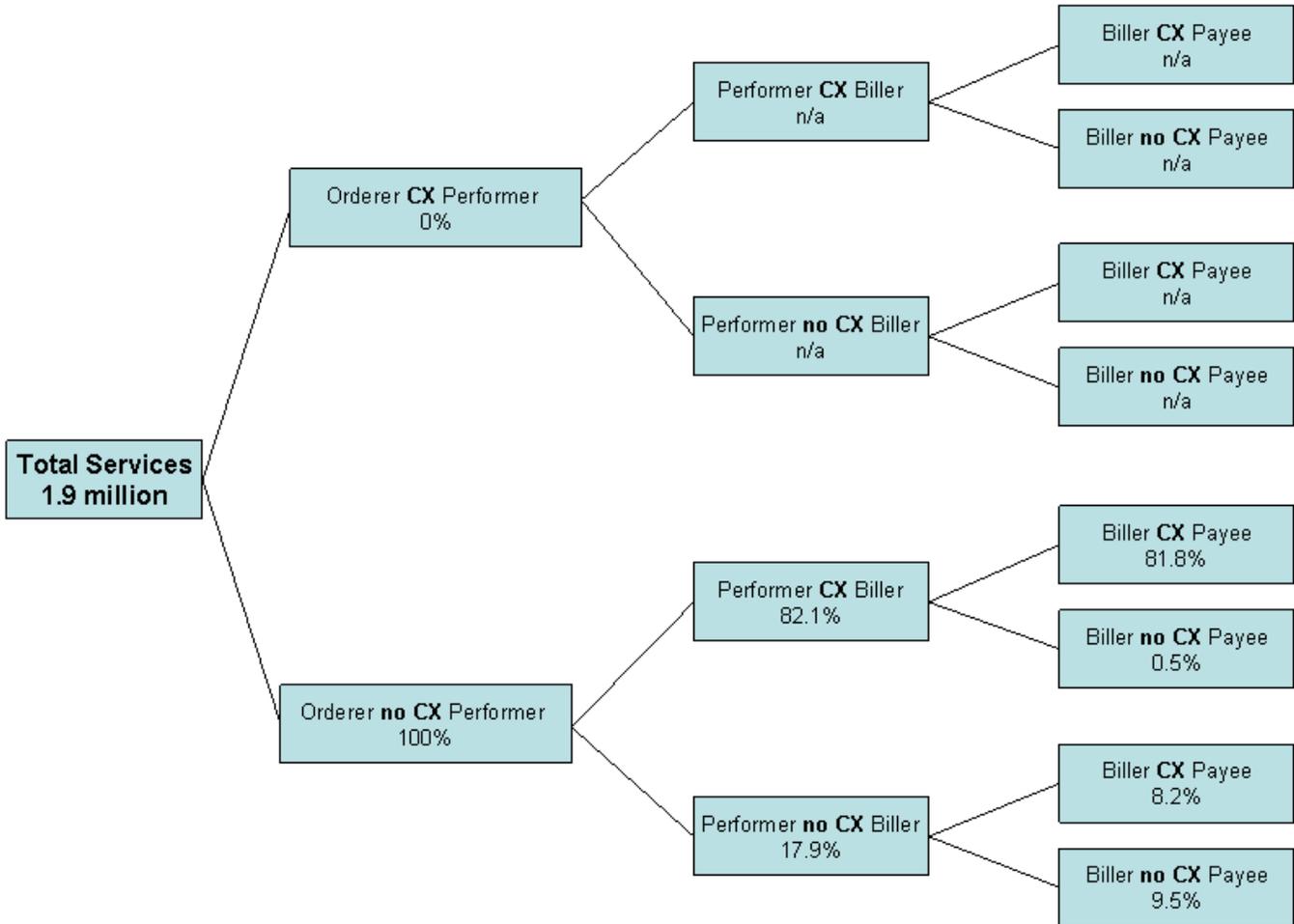
“CX” = Connection: Parties are the same or one is a member of the other.

Percentages in one column may not add to those in the preceding column because of rounding.

Source: OIG review of 2005 MR services, 2008.
See Table 4d on p. 53 for confidence intervals.

Diagram 4e: Provider Relationships, Services Ordered by All Other Doctors

*



“CX” = Connection: Parties are the same or one is a member of the other.

Percentages in one column may not add to those in the preceding column because of rounding.

* Projections in the right-most column are based on 449 sample units and those in the column that precedes it are based on 450. This causes some percentages in the right-most column to vary from the values in the preceding column.

Source: OIG review of 2005 MR services, 2008.
See Table 4e on p. 54 for confidence intervals.

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Table 1a: Confidence Intervals for Diagram 1a: Service Delivery, All Services

Service Characteristic	Point Estimate	Sample Size	95-Percent Confidence Interval
Payee connected to Performer	85.3%	590	82.1%–88.4%
Reassigned	58.5%	589	54.2%–62.9%
Within group	50.4%	589	46.0%–54.8%
Outside group	8.2%	589	5.7%–10.6%
Biller UPIN same as Payee UPIN	26.7%	589	22.8%–30.6%
Payee not connected to Performer	14.7%	590	11.6%–17.9%
Reassigned	11.5%	589	8.7%–14.3%
Within group	9.5%	589	6.9%–12.1%
Outside group	2.0%	589	1.1%–3.7%*
Biller UPIN same as Payee UPIN	3.2%	589	1.7%–4.8%

* Confidence interval calculated using the logit transformation because of poor coverage properties of the standard approximation method when a small number of sample elements possess the characteristic of interest.

Table 1b: Confidence Intervals for Diagram 1b: Service Delivery, Services Ordered by High Users

Service Characteristic	Point Estimate	Sample Size	95-Percent Confidence Interval
Payee connected to Performer	82.7%	196	77.3%–88.0%
Reassigned	60.0%	195	53.1%–66.9%
Within group	53.3%	195	46.3%–60.4%
Outside group	6.7%	195	3.1%–10.2%
Biller UPIN same as Payee UPIN	22.6%	195	16.7%–28.5%
Payee not connected to Performer	17.3%	196	12.0%–22.7%
Reassigned	13.8%	195	9.0%–18.7%
Within group	10.3%	195	6.0%–14.5%
Outside group	3.6%	195	1.0%–6.2%
Biller UPIN same as Payee UPIN	3.6%	195	1.0%–6.2%

Table 1c: Confidence Intervals for Diagram 1c: Service Delivery, Services Ordered by All Other Users

Service Characteristic	Point Estimate	Sample Size	95-Percent Confidence Interval
Payee connected to Performer	86.9%	394	83.1%–90.7%
Reassigned	57.6%	394	52.0%–63.2%
Within group	48.5%	394	42.9%–54.2%
Outside group	9.1%	394	5.8%–12.3%
Biller UPIN same as Payee UPIN	29.3%	394	24.2%–34.4%
Payee not connected to Performer	13.1%	394	9.3%–16.9%
Reassigned	10.1%	394	6.7%–13.5%
Within group	9.1%	394	5.8%–12.3%
Outside group	1.0%	394	0.3%–3.1%*
Biller UPIN same as Payee UPIN	3.0%	394	1.1%–5.0%

* Confidence interval calculated using the logit transformation because of poor coverage properties of the standard approximation method when a small number of sample elements possess the characteristic of interest.

Table 1d: Confidence Intervals for Diagram 1d: Service Delivery, Services Ordered by Connected Doctors

Service Characteristic	Point Estimate	Sample Size	95-Percent Confidence Interval
Payee connected to Performer	79.2%	140	72.1%–86.3%
Reassigned	69.6%	140	61.6%–77.7%
Within group	60.7%	140	52.1%–69.2%
Outside group	9.0%	140	3.9%–14.0%
Biller UPIN same as Payee UPIN	9.6%	140	4.4%–14.7%
Payee not connected to Performer	20.8%	140	13.7%–27.9%
Reassigned	17.6%	140	10.9%–24.3%
Within group	16.0%	140	9.6%–22.5%
Outside group	1.6%	140	0.4%–6.1%*
Biller UPIN same as Payee UPIN	3.2%	140	1.2%–8.2%*

* Confidence interval calculated using the logit transformation because of poor coverage properties of the standard approximation method when a small number of sample elements possess the characteristic of interest.

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Table 1e: Confidence Intervals for Diagram 1e: Service Delivery, Services Ordered by All Other Doctors

Service Characteristic	Point Estimate	Sample Size	95-Percent Confidence Interval
Payee connected to Performer	87.3%	450	83.9%–90.7%
Reassigned	54.8%	449	49.8%–59.9%
Within group	46.9%	449	41.9%–52.0%
Outside group	7.9%	449	5.1%–10.6%
Biller UPIN same as Payee UPIN	32.4%	449	27.7%–37.2%
Payee not connected to Performer	12.7%	450	9.3%–16.1%
Reassigned	9.5%	449	6.5%–12.5%
Within group	7.4%	449	4.7%–10.0%
Outside group	2.1%	449	1.1%–4.2%*
Biller UPIN same as Payee UPIN	3.3%	449	1.4%–5.1%

* Confidence interval calculated using the logit transformation because of poor coverage properties of the standard approximation method when a small number of sample elements possess the characteristic of interest.

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Table 2a: Confidence Intervals for Diagram 2a: Reassignment of Payment, All Services

Service Characteristic	Point Estimate	Sample Size	95-Percent Confidence Interval
Reassigned within group	59.2%	417	56.7%–61.7%
Reassigned outside group	9.9%	417	7.4%–12.4%

Table 2b: Confidence Intervals for Diagram 2b: Reassignment of Payment, Services Ordered by High Users

Service Characteristic	Point Estimate	Sample Size	95-Percent Confidence Interval
Reassigned within group	60.5%	147	56.6%–64.4%
Reassigned outside group	9.5%	147	5.6%–13.4%

Table 2c: Confidence Intervals for Diagram 2c: Reassignment of Payment, Services Ordered by All Other Users

Service Characteristic	Point Estimate	Sample Size	95-Percent Confidence Interval
Reassigned within group	58.4%	270	55.0%–61.7%
Reassigned outside group	10.2%	270	6.8%–13.5%

Table 2d: Confidence Intervals for Diagram 2d: Reassignment of Payment, Services Ordered by Connected Doctors

Service Characteristic	Point Estimate	Sample Size	95-Percent Confidence Interval
Reassigned	87.4%	141	81.6%–93.2%
Reassigned within group	76.9%	141	69.5%–84.3%
Reassigned outside group	10.5%	141	5.1%–15.8%
Biller UPIN paid	12.6%	141	6.8%–18.4%

Table 2e: Confidence Intervals for Diagram 2e: Reassignment of Payment, Services Ordered by All Other Doctors

Service Characteristic	Point Estimate	Sample Size	95-Percent Confidence Interval
Reassigned	64.3%	456	59.4%–69.1%
Reassigned within group	54.4%	456	49.3%–59.4%
Reassigned outside group	9.9%	456	6.9%–12.9%
Biller UPIN paid	35.7%	456	30.9%–40.6%

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Table 3a: Confidence Intervals for Diagram 3a: Billing Method, All Services

Service Characteristic	Point Estimate	Sample Size	95-Percent Confidence Interval
Global bill, reassigned within group	49.1%	355	46.8%–51.4%
Global bill, reassigned outside group	8.2%	355	5.9%–10.5%
TC bill, reassigned within group	10.1%	62	9.0%–11.2%
TC bill, reassigned outside group	1.7%	62	0.9%–3.1%*

* Confidence interval calculated using the logit transformation because of poor coverage properties of the standard approximation method when a small number of sample elements possess the characteristic of interest.

Table 3b: Confidence Intervals for Diagram 3b: Billing Method, Services Ordered by High Users

Service Characteristic	Point Estimate	Sample Size	95-Percent Confidence Interval
Global bill, reassigned within group	48.6%	122	45.0%–52.2%
Global bill, reassigned outside group	8.4%	122	4.8%–12.0%
TC bill, reassigned within group	12.0%	25	10.6%–13.0%
TC bill, reassigned outside group	1.0%	25	0.3%–3.5%*

* Confidence interval calculated using the logit transformation because of poor coverage properties of the standard approximation method when a small number of sample elements possess the characteristic of interest.

Table 3c: Confidence Intervals for Diagram 3c: Billing Method, Services Ordered by All Other Users

Service Characteristic	Point Estimate	Sample Size	95-Percent Confidence Interval
Global bill, reassigned within group	49.4%	233	46.5%–52.4%
Global bill, reassigned outside group	8.0%	233	5.1%–11.0%
TC bill, reassigned within group	8.9%	37	7.3%–10.5%
TC bill, reassigned outside group	2.2%	37	1.0%–4.2%*

* Confidence interval calculated using the logit transformation because of poor coverage properties of the standard approximation method when a small number of sample elements possess the characteristic of interest.

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Table 3d: Confidence Intervals for Diagram 3d: Billing Method, Services Ordered by Connected Doctors

Service Characteristic	Point Estimate	Sample Size	95-Percent Confidence Interval
Global bill	66.5%	141	58.3%–74.8%
Reassigned	60.3%	141	51.7%–68.8%
Within group	52.2%	141	43.4%–60.9%
Outside group	8.1%	141	3.3%–12.8%
Biller UPIN same as Payee UPIN	6.3%	141	2.1%–10.5%
TC bill	33.5%	141	25.2%–41.7%
Reassigned	27.1%	141	19.3%–34.9%
Within group	24.7%	141	17.1%–32.3%
Outside group	2.4%	141	0.8%–7.2%*
Biller UPIN same as Payee UPIN	6.4%	141	2.1%–10.6%

* Confidence interval calculated using the logit transformation because of poor coverage properties of the standard approximation method when a small number of sample elements possess the characteristic of interest.

Table 3e: Confidence Intervals for Diagram 3e: Billing Method, Services Ordered by All Other Doctors

Service Characteristic	Point Estimate	Sample Size	95-Percent Confidence Interval
Global bill	86.0%	456	82.5%–89.5%
Reassigned	58.6%	456	53.6%–63.6%
Within group	50.0%	456	45.0%–55.1%
Outside group	8.6%	456	5.7%–11.4%
Biller UPIN same as Payee UPIN	27.4%	456	22.9%–31.9%
TC bill	14.0%	456	10.5%–17.5%
Reassigned	5.7%	456	3.3%–8.0%
Within group	4.3%	456	2.3%–6.4%
Outside group	1.3%	456	0.6%–3.2%*
Biller UPIN same as Payee UPIN	8.4%	456	5.6%–11.2%

* Confidence interval calculated using the logit transformation because of poor coverage properties of the standard approximation method when a small number of sample elements possess the characteristic of interest.

Table 4a: Confidence Intervals for Diagram 4a: Provider Relationships, All Services

Service Characteristic	Point Estimate	Sample Size	95-Percent Confidence Interval
Referring physician connected to Performer	17.9%	590	14.6%–21.3%
Performer connected to Biller	15.1%	590	12.0%–18.2%
Biller connected to Payee	15.1%	589	12.0%–18.3%
Biller not connected to Payee	0.0%	589	n/a
Performer not connected to Biller	2.8%	590	1.4%–4.3%
Biller connected to Payee	1.2%	589	0.6%–2.7%*
Biller not connected to Payee	1.6%	589	0.8%–3.2%*
Referring physician not connected to Performer	82.1%	590	78.7%–85.4%
Performer connected to Biller	65.4%	590	61.3%–69.6%
Biller connected to Payee	65.0%	589	60.8%–69.2%
Biller not connected to Payee	0.6%	589	0.2%–1.8%*
Performer not connected to Biller	16.6%	590	13.3%–19.9%
Biller connected to Payee	8.5%	589	6.1%–11.0%
Biller not connected to Payee	7.9%	589	5.6%–10.3%

* Confidence interval calculated using the logit transformation because of poor coverage properties of the standard approximation method when a small number of sample elements possess the characteristic of interest.

Table 4b: Confidence Intervals for Diagram 4b: Provider Relationships, Services Ordered by High Users

Service Characteristic	Point Estimate	Sample Size	95-Percent Confidence Interval
Referring physician connected to Performer	22.4%	196	16.6%–28.3%
Performer connected to Biller	19.4%	196	13.8%–24.9%
Biller connected to Payee	19.5%	195	13.9%–25.1%
Biller not connected to Payee	0.0%	195	0.0%–1.9%
Performer not connected to Biller	3.1%	196	1.1%–6.5%*
Biller connected to Payee	1.0%	195	0.1%–3.7%*
Biller not connected to Payee	2.1%	195	0.6%–5.2%*
Referring physician not connected to Performer	77.6%	196	71.7%–83.4%
Performer connected to Biller	61.2%	196	54.4%–68.1%
Biller connected to Payee	60.0%	195	53.1%–66.9%
Biller not connected to Payee	1.5%	195	0.3%–4.4%*
Performer not connected to Biller	16.3%	196	11.1%–21.5%
Biller connected to Payee	9.2%	195	5.1%–13.3%
Biller not connected to Payee	6.7%	195	3.1%–10.2%

* Confidence interval calculated with an exact method based on the binomial distribution because of poor coverage properties of the standard approximation method when a small number of sample elements possess the characteristic of interest.

Table 4c: Confidence Intervals for Diagram 4c: Provider Relationships, Services Ordered by All Other Users

Service Characteristic	Point Estimate	Sample Size	95-Percent Confidence Interval
Referring physician connected to Performer	15.1%	394	11.1%–19.2%
Performer connected to Biller	12.4%	394	8.7%–16.2%
Biller connected to Payee	12.4%	394	8.7%–16.2%
Biller not connected to Payee	0.0%	394	n/a
Performer not connected to Biller	2.7%	394	1.4%–5.3%*
Biller connected to Payee	1.3%	394	0.5%–3.5%*
Biller not connected to Payee	1.3%	394	0.5%–3.5%*
Referring physician not connected to Performer	84.9%	394	80.8%–88.9%
Performer connected to Biller	68.1%	394	62.8%–73.3%
Biller connected to Payee	68.1%	394	62.8%–73.3%
Biller not connected to Payee	0.01%	394	0.002%–0.1%*
Performer not connected to Biller	16.8%	394	12.6%–21.0%
Biller connected to Payee	8.1%	394	5.0%–11.1%
Biller not connected to Payee	8.7%	394	5.6%–11.9%

* Confidence interval calculated using the logit transformation because of poor coverage properties of the standard approximation method when a small number of sample elements possess the characteristic of interest.

Table 4d: Confidence Intervals for Diagram 4d: Provider Relationships, Services Ordered by Connected Doctors

Service Characteristic	Point Estimate	Sample Size	95-Percent Confidence Interval
Referring physician connected to Performer	72.0%	140	64.1%–79.8%
Performer connected to Biller	60.6%	140	52.0%–69.2%
Biller connected to Payee	60.6%	140	52.0%–69.2%
Biller not connected to Payee	0.0%	140	n/a
Performer not connected to Biller	11.4%	140	5.8%–16.9%
Biller connected to Payee	4.9%	140	1.1%–8.7%
Biller not connected to Payee	6.5%	140	2.1%–10.8%
Referring physician not connected to Performer	28.0%	140	20.2%–35.9%
Performer connected to Biller	15.2%	140	8.9%–21.4%
Biller connected to Payee	14.4%	140	8.3%–20.5%
Biller not connected to Payee	0.8%	140	0.1%–5.4%*
Performer not connected to Biller	12.9%	140	7.0%–18.7%
Biller connected to Payee	9.6%	140	4.4%–14.7%
Biller not connected to Payee	3.3%	140	1.3%–8.4%*

* Confidence interval calculated using the logit transformation because of poor coverage properties of the standard approximation method when a small number of sample elements possess the characteristic of interest.

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Table 4e: Confidence Intervals for Diagram 4e: Provider Relationships, Services Ordered by All Other Doctors

Service Characteristic	Point Estimate	Sample Size	95-Percent Confidence Interval
Referring physician not connected to Performer			
Performer connected to Biller	82.1%	450	78.3%–86.0%
Biller connected to Payee	81.8%	449	77.9%–85.7%
Biller not connected to Payee	0.5%	449	0.1%–2.1%*
Performer not connected to Biller	17.9%	450	14.0%–21.8%
Biller connected to Payee	8.2%	449	5.4%–10.9%
Biller not connected to Payee	9.5%	449	6.5%–12.5%

* Confidence interval calculated using the logit transformation because of poor coverage properties of the standard approximation method when a small number of sample elements possess the characteristic of interest.

Statistical Tables

Table 1: Confidence Intervals

Findings	Point Estimate	Sample Size	95-Percent Confidence Interval
Findings on Services Overall			
Percentage of services performed by payee	85.3%	590	82.1% - 88.4%
Percentage of services performed by independent diagnostic testing facility (IDTF), multispecialty group, or diagnostic radiology	88.0%	542	85.0% - 91.0%
Percentage of services not performed by payee	14.7%	590	11.6% - 17.9%
Percentage of reassigned services with payment reassigned within group	85.7%	417	82.0% - 89.3%
Percentage of reassigned services with payment reassigned outside group	14.3%	417	10.7% - 18.0%
Findings on Connected Services			
Percentage of services that were connected services	24.8%	598	21.1% - 28.5%
Percentage of connected services ordered by high users of magnetic resonance (MR)	54.7%	141	47.2% - 62.3%
Percentage of services that were not connected ordered by high users of MR	33.3%	457	30.7% - 35.9%
Percentage of connected services ordered by orthopedic surgery	27.8%	141	20.0% - 35.6%
Percentage of services that were not connected ordered by orthopedic surgery	14.6%	456	11.0% - 18.2%
Table 4			
Percentage of connected services performed by multispecialty group	49.6%	125	40.3% - 58.9%
Percentage of services that were not connected performed by multispecialty group	25.7%	417	21.0% - 30.3%
Percentage of connected services performed by IDTF	13.4%	125	7.1% - 19.7%
Percentage of services that were not connected performed by IDTF	39.3%	417	34.1% - 44.5%
Percentage of connected services performed by diagnostic radiology	7.2%	125	2.4% - 12.0%
Percentage of services that were not connected performed by diagnostic radiology	28.8%	417	24.0% - 33.6%
Percentage of connected services performed by all other specialties	29.8%	125	21.3% - 38.3%
Percentage of services that were not connected performed by all other specialties	6.2%	417	3.7% - 8.8%
Table 5			
Percentage of connected services paid to multispecialty group	50.8%	140	42.0% - 59.6%
Percentage of services that were not connected paid to multispecialty group	26.4%	454	21.9% - 30.8%
Percentage of connected services paid to IDTF	11.2%	140	5.7% - 16.7%
Percentage of services that were not connected paid to IDTF	37.8%	454	32.9% - 42.7%
Percentage of connected services paid to diagnostic radiology	7.3%	140	2.8% - 11.9%
Percentage of services that were not connected paid to diagnostic radiology	31.0%	454	26.3% - 35.6%
Percentage of connected services paid to all other specialties	30.7%	140	22.5% - 38.8%
Percentage of services that were not connected paid to all other specialties	4.9%	454	2.7% - 7.1%
Chart 1			
Percentage of connected services billed as technical component only	33.4%	141	25.2% - 41.7%
Percentage of services that were not connected billed as technical component only	14.0%	457	10.5% - 17.5%
Percentage of connected services with payment reassigned	87.4%	141	81.6% - 93.2%
Percentage of services that were not connected with payment reassigned	64.3%	456	59.4% - 69.1%
Percentage of connected services billed through a provider other than a radiologist	63.2%	141	54.8% - 71.6%
Percentage of services that were not connected billed through a provider other than a radiologist	37.8%	457	32.9% - 42.7%

Table 2: Chi-Square Tests for Connected Magnetic Resonance Services		
Findings	Point Estimate	P value chi-square
Findings on Connected Services		
Percentage of connected services ordered by high users of MR	54.7%	
Percentage of all other services ordered by high users of MR	33.3%	< .0001
Percentage of connected services ordered by orthopedic surgery	27.8%	
Percentage of all other services ordered by orthopedic surgery	14.6%	.0008
Table 4		
Percentage of connected services performed by multispecialty group	49.6%	
Percentage of all other services performed by multispecialty group	25.7%	<.0001
Percentage of connected services performed by IDTF	13.4%	
Percentage of all other services performed by IDTF	39.3%	<.0001
Percentage of connected services performed by diagnostic radiology	7.2%	
Percentage of all other services performed by diagnostic radiology	28.8%	<.0001
Percentage of connected services performed by all other specialties	29.8%	
Percentage of all other services performed by all other specialties	6.2%	<.0001
Table 5		
Percentage of connected services paid to multispecialty group	50.8%	
Percentage of all other services paid to multispecialty group	26.4%	<.0001
Percentage of connected services paid to IDTF	11.2%	
Percentage of all other services paid to IDTF	37.8%	<.0001
Percentage of connected services paid to diagnostic radiology	7.3%	
Percentage of all other services paid to diagnostic radiology	31.0%	<.0001
Percentage of connected services paid to all other specialties	30.7%	
Percentage of all other services paid to all other specialties	4.9%	<.0001
Chart 1		
Percentage of connected services billed as technical component only	33.4%	
Percentage of all other services billed as technical component only	14.0%	<.0001
Percentage of connected services with payment reassigned	87.4%	
Percentage of all other services with payment reassigned	64.3%	<.0001
Percentage of connected services billed through provider other than radiologist	63.2%	
Percentage of all other services billed through provider other than radiologist	37.8%	<.0001

Agency Comments



DEPARTMENT OF HEALTH & HUMAN SERVICES

Centers for Medicare & Medicaid Services

200 Independence Avenue SW
Washington, DC 20201

DATE: AUG 29 2008

TO: Daniel R. Levinson
Inspector General

FROM: Kerry Weems
Acting Administrator 

SUBJECT: Office of Inspector General's Draft Report: "Provider Relationships and the Use of Magnetic Resonance under the Medicare Physician Fee Schedule" (OEI-01-06-00261)

The Centers for Medicare & Medicaid Services (CMS) appreciates the opportunity to review and comment on the Office of Inspector General's (OIG) draft report entitled, "Provider Relationships and the Use of Magnetic Resonance under the Medicare Physician Fee Schedule." Overutilization of diagnostic services has concerned CMS for some time. We continue to strive for the proper balance between allowing proper arrangements that benefit beneficiary access and care quality, and prohibiting abusive arrangements that exist for reasons other than improving beneficiary access or care.

The OIG report bolsters evidence of over utilization CMS has received from studies by academicians and data furnished by private industry. This report found that when doctors order magnetic resonance (MR) services and the parties involved in providing services are connected through a medical practice or business relationship those services were more likely to have been ordered by high users of MR, and were also more likely to have been billed as technical component only, to have had payment reassigned, and to have been billed through a provider other than a radiologist.

CMS has taken some steps to curb over utilization of these diagnostic testing services. We finalized provisions in the calendar year (CY) 2008 physician fee schedule (PFS) final rule with comment period that applies the anti-markup provisions in 42 C.F.R Section 414.50 to the technical component (TC) or professional component (PC) of diagnostic tests that are either purchased from an outside supplier or are performed outside of the "office of the billing physician or other supplier." The effect of the anti-markup provisions is to limit the amount that the billing supplier can bill Medicare to the lesser of what it paid the performing supplier or the fee schedule amount. The primary impetus for the provisions was our concern about the potential for overutilization that occurs when a single-specialty physician group practice refers patients to a pathologist or other specialist who (with a technician) performs the TC and PC and the single-specialty group practice bills for the TC and the PC.

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In the CY 2009 PFS proposed rule, we proposed two alternative approaches for revising the anti-markup provisions. We also requested comments regarding other possible approaches that would address our concerns regarding overutilization motivated by the ability of a physician or physician organization to profit from diagnostic testing services not actually performed by or supervised by a physician who should be considered to “share a practice” with the billing physician or other supplier. The comment period for the CY 2009 PFS proposed rule ends on August 29, 2008. At that time, CMS will be able to analyze the comments received in response to the most recent anti-markup proposals.

The physician self-referral law and regulations (Stark law) also address financial relationships that may motivate physician overutilization of certain services. An area of the physician self-referral law that may facilitate problematic arrangements is the in-office ancillary services exception (42 C.F.R. section 411.355(b)). The exception allows referrals for certain services that are furnished as ancillary to medical services provided by a physician or a group practice, provided they are performed in certain locations and meet other conditions. In the CY 2008 PFS proposed rule, we solicited comments regarding what changes should be made to this exception, if any, and we continue to examine and discuss the issue. Any revisions to the in-office ancillary services exception would be accomplished through a future notice of proposed rulemaking with provisions for public comment.

The CMS appreciates OIG’s analysis of MR services paid under the Medicare PFS and its analysis of the relationship between how the services are provided and the utilization levels of the services. We agree with OIG that the complexity with which MR services are provided warrant continued attention to ensure that services are reasonable, necessary, and compliant with the Medicare statutes and regulations. CMS is committed to examining the utilization of advanced imaging services, including MR, in relation to the ownership of the entities ordering and billing for these services. We look forward to working with OIG to continue to study the utilization of certain services paid under the PFS.



A C K N O W L E D G M E N T S

This report was prepared under the direction of Joyce M. Greenleaf, Regional Inspector General for Evaluation and Inspections in the Boston regional office, and Russell W. Hereford, Deputy Regional Inspector General.

Kenneth R. Price served as the team leader for this study. Other principal Office of Evaluation and Inspections staff from the Boston regional office who contributed include Amanda L. Pyles, Rosemary C. Borck, and Rose C. Lichtenstein; central office staff include Kevin Farber and Doris Jackson.