Physician and Other Medical Provider Grouping and Patient Attribution Methodologies

Generating Medicare Physician Quality Performance Measurement Results (GEM) Project

I. Physician and Other Medical Provider Grouping Methodology

The following are the steps used to identify medical groups for the GEM project.

Step 1) All of the unique Tax Identification Numbers (TINs) in Part B carrier claim line items were identified for 2006. The source of these data was the HAJI database. A description of data sources used for the GEM project can be found in Appendix A.

- The unit of analysis for GEM quality measures for medical groups is the TIN that is included on all Part B carrier claim line items and represents individual organizations or units providing medical services. This enables the GEM project analysis of medical group practices to be completely claims data driven.

- TINs are included on Part B carrier claim line items and can also be associated with other key variables available on Part B claim line items that are needed for physician grouping, beneficiary attribution and quality measure calculation. They include Unique Physician Identification Numbers (UPINs) [National Provider Identifiers (NPIs) were not yet implemented in 2006], provider specialty codes, beneficiary HIC numbers, ICD-9 diagnosis codes, and CPT codes.

Step 2) The GEM project focuses on TINs for medical groups so other TINs that represent laboratories, medical equipment suppliers and other types of providers billing through Part B carrier claims are screened out of the GEM project database. In addition, physicians who bill as solo practitioners are not included. For the GEM project, a medical group practice is defined as an organization that bills CMS for medical services to Medicare beneficiaries and consists of at least two practitioners, at least one of whom is credentialed as a physician (i.e., MD or DO). As a result, solo practitioners are screened out of Part B carrier claims as well. These screening processes are conducted by identifying all of the unique GEM-eligible medical group TINs in the HAJI database by applying both of the following inclusion criteria:

1) Medical group TINs for GEM are defined as those that had physician, physician assistant or nurse practitioner provider specialty codes on at least 50% of Part B carrier claim line items billed by that TIN during 2006. The list of 56 eligible physician, physician assistant and nurse practitioner provider specialty codes is included in Appendix B.

2) Medical group TINs are also defined as those that had two or more UPINs with physician, physician assistant or nurse practitioner provider specialty codes on Part B carrier claim line items billed by that TIN during 2006. The 56 eligible specialty codes are listed in Appendix B.

- Using 50% as the criterion means that a majority of the specialty codes are for medical providers, which is a natural way to define a group that primarily provides medical services. Note that alternatives for defining medical group TINs using 30% and 70% of Part B carrier claims with physician, nurse practitioner or physician assistant provider specialty codes were tested, but little difference was found in the results.

- The requirement for two or more UPINs billing through medical group TINs means that solo practitioners are not treated as a medical group practice for this project. This follows the GEM project focus on analyzing quality performance only for medical group practices with two or more providers.

Step 3) To conduct physician and other medical provider grouping into each TIN, all of the UPINs on Part B carrier claim line items in the HAJI database were identified for 2006. TIN grouping is conducted only for UPINs that represent physicians, physician assistants and nurse practitioners who provided service to Medicare beneficiaries in 2006. As a result, those UPINs that represent other types of providers, and providers who may have only done referrals for Medicare beneficiaries, are screened out of the GEM project database. This is done by applying the following inclusion criteria:

1) Only include UPINs that are in the "Performing UPIN" field on Part B carrier claim line items. Do **not** use UPINs in the "Referring UPIN" field.

2) The provider specialty codes on Part B carrier claim line items with each UPIN are checked to ensure the UPIN represents a physician, physician assistant or nurse practitioner. The list of 56 eligible specialty codes is in Appendix B.

    - The focus on including only performing UPINs and not referring UPINs is to ensure that the UPINs identified as part of the medical group are practicing at that group. Referring UPINs could be practicing at other groups, may be in distant geographic locations and may have little contact with beneficiaries being treated by GEM providers.

    - The focus on physician, physician assistant and nurse practitioner UPINs is intended to include only those providing medical care to beneficiaries. Other types of providers that have specialty codes such as physical therapists, psychologists, pharmacists and others are screened out since they provide more narrow sets of services.

Step 4) For each unique medical group TIN identified in Step 2, all of the unique physician and other medical provider UPINs identified in Step 3 that billed through that TIN in Part B carrier claim line items in 2006 are identified. For primary care providers, the last six months of 2005 are also checked. Primary care physicians include specialty codes 01, 08, 11, 16, 38, 70 and 84. Primary care providers also include nurse practitioners and physician assistants with specialty codes 50 and 97 if they were practicing as part of a TIN that had a plurality of UPINs with specialty codes for physician primary care providers.

- The last six months of 2005 are also included for primary care providers since they may only see well patients once per year for an annual check-up, and if that office visit is delayed there may be more than 12 months between check-ups. Including the last six months of 2005 enables the GEM database to include those physicians who may be seeing some patients only occasionally, but still perceive themselves as responsible for that beneficiary's care.

- Nurse practitioners (NPs) and physician assistants (PAs) typically provide the same type of care as the physicians with whom they practice. Thus in a primary care group, the NPs and PAs typically provide primary care, while in a cardiology group they typically provide cardiology care. The GEM project is data-driven and there are limitations in using claims data to identify the type of care provided by NPs and PAs. Therefore, the plurality of physician providers in a medical group is used to define the specialty of care provided by NPs and PAs.

Step 5) Save the list of UPINs found for each TIN as the physician and other medical provider grouping for that TIN. Calculate the total number of medical provider UPINs associated with each TIN and save that number as the size of the TIN.

- UPINs associated with each TIN are used to define the specialties included in each TIN and the size of the TIN in terms of numbers of providers. Those data are used for analysis of the quality performance results.

II. Patient Attribution Methodology

The following are the steps used to attribute patients to the medical groups.

Step 1) Identify all of the unique beneficiaries in the HAJI database for 2006 through cross-referenced beneficiary identification numbers from the denominator table.

- The denominator table is used as it is derived from the Medicare denominator file that identifies all of the beneficiaries enrolled in Medicare in a given year, which is 2006 for the GEM project.

Step 2) Identify all GEM quality measure eligible beneficiaries by applying the inclusion and exclusion criteria listed below to identify GEM beneficiaries who had full-year Medicare FFS coverage and complete Medicare claims data for 2006:

1) Beneficiary became Medicare eligible on or before 01/01/2006.
2) Beneficiary must have a record in the Medicare enrollment files.
3) Beneficiary must have both Part A and Part B enrollment for all months of the measurement year, from 01/01/2006 to 12/31/2006. Beneficiary cannot have any months of Part A only or Part B only enrollment. Beneficiaries are excluded from assignment if the Medicare Entitlement/Buy-in Indicator is not 3 or C (Part A and Part B; or Parts A and B, State Buy-In) for all months of 2006.

4) Beneficiary did not have any months of Medicare Advantage or other Medicare coordinated care plan enrollment in 2006. This is found using the variable "HMO Coverage" from the denominator file. The value of HMO coverage is the number of months a beneficiary was enrolled in Medicare managed care.
5) Beneficiary did not have any months of Medicare as a secondary payer (due to working aged or disabled status) in 2006. This means the Beneficiary Primary Payer Code (from the EDB) is not equal to A (Working Aged Beneficiary/Spouse with Employer Group Health Plan [EGHP]), B (ESRD beneficiary in the 18 month coordination period with an employer group health plan) or G (working disabled) for any month of the year. All other values are valid. This criterion excludes beneficiaries for whom a private health insurance plan was the primary payer instead of Medicare, and thus Medicare claims will not provide a complete record of the health services provided to the beneficiary.
6) Beneficiary did not reside outside of the United States. Beneficiaries with a State Code that is greater than 53 in the denominator file are excluded from attribution. State codes 01–53 include the 50 states, the District of Columbia, the U.S. Virgin Islands and Puerto Rico.
7) Beneficiary did not enter the Medicare Hospice benefit at any point in 2006.
8) Beneficiary did not die on or between 01/01/2006 and 12/31/2006 (alive on 12/31/06).

- These inclusion and exclusion criteria are applied to ensure that the GEM project has a complete 12-month claims data record for 2006 for each beneficiary in the database. This is important to ensure that no denominator events are missed and that no numerator events are missed for eligible beneficiaries. If less than full-year claims data were available, then some denominator and numerator events that occurred during the missing periods are not included in the analysis.

Step 3) Identify all of Part B carrier claim line items billed during 2006 and during the last six months of 2005 (July – December) for each GEM quality measure eligible beneficiary identified in Step 2. If less than six months of claims are available for the beneficiary in 2005, then use all the claims data available for that year from those last six months. From each beneficiary's line items, identify all of the visits billed as Part B carrier claim line items with Office or Other Outpatient E&M CPT codes or Consultation E&M CPT codes during 2006 or during the last six months of 2005. These visits are identified by CPT codes 99201–99205, 99211–99215 and 99241–99245.

- The last six months of 2005 are included for primary care providers since they may only see well patients once per year for an annual check-up, and if that office visit is delayed there may be somewhat more than 12 months between check-ups. Including the last six months of 2005 enables the GEM database to include those physicians who may be seeing some patients only occasionally, but still perceive themselves as responsible for that beneficiary's care. However, the last six months of 2005 are not used for enrollment inclusions and exclusions in Step 2 since the HEDIS® quality measures used for the GEM project are mainly focused on single-year measurement periods, which is 2006 for the GEM project. Thus beneficiary enrollment and claims records need to be complete for 2006.

- The Office or Other Outpatient E&M CPT codes are used for attribution since they are the CPT codes most commonly used for E&M services. They represent ambulatory care services that are also associated with the quality measures used in the GEM project.

- The Consultation E&M CPT codes have been added for attribution analysis for the GEM project since this project includes separate attribution analysis for subspecialist physicians who may more often use the Consultation E&M CPT codes.

Step 4) Attribute each beneficiary to at most one TIN for the primary care quality measures, if at least one TIN is available that provided two or more eligible E&M visits for that beneficiary and were billed by primary care providers.

A) Identify all of the TINs that billed two or more eligible E&M codes by primary care providers for that beneficiary. Primary care physicians include specialty codes 01, 08, 11, 16, 38, 70 and 84. Primary care providers also include nurse practitioners and physician assistants with specialty codes 50 and 97 if they were practicing as part of a TIN that also had a plurality of UPINs with specialty codes for the physician primary care providers.

B) Attribute the beneficiary to the TIN that provided the plurality of eligible E&M codes by primary care providers. Flag that TIN as responsible for that beneficiary for all 12 GEM quality measures listed in Appendix C.

- A minimum of two eligible E&M visits is required for a TIN to be attributed to a beneficiary. This is to ensure that the TIN provided enough service to the beneficiary to be held accountable for the quality of care provided to that beneficiary.

- The plurality rule is applied for attribution since it increases the level of physician acceptance by attributing the beneficiary to the medical group that provided the most services to the beneficiary.

- The plurality rule is applied only for the providers of a particular specialty practicing in each TIN. This ensures that the attribution for each specialty follows the visits provided by that type of provider at each TIN.

Step 5) Attribute each beneficiary to at most one TIN for the cardiology quality measures, if at least one TIN is available that provided two or more eligible E&M visits for that beneficiary and were billed by cardiology providers.

A) All of the TINs that billed two or more eligible E&M codes by cardiology providers are identified. Cardiologists use specialty code 46. Cardiology providers also include nurse practitioners and physician assistants with specialty codes 50 and 97 if they were practicing as part of a TIN that had a plurality of UPINs with the specialty code for cardiologists.

B) Attribute the beneficiary to the TIN that provided the plurality of eligible E&M codes by cardiology providers. Flag that TIN as responsible for that beneficiary for the five GEM cardiology quality measures listed in Appendix C.

- Separate attribution to subspecialists enables specialists to be held accountable for a subset of the 12 GEM quality measures that are appropriate for each specialty. The list in Appendix B of the specialties associated with each of the 12 GEM quality measures is based on an NCQA analysis.

- Multiple attribution for each beneficiary, to primary care groups and to subspecialist groups, is permitted to promote more accountability for the subspecialist groups that may provide fewer visits for beneficiaries than the primary care groups.

- In some cases a quality measure for one beneficiary may be applied to both a primary care group and a subspecialty group. This was done to promote coordination of care and a teamwork approach to care among provider groups. All the providers can share in the credit when the quality measure data show that high-quality care was provided.

Step 6) Attribute each beneficiary to at most one TIN for the endocrinology quality measures, if at least one TIN is available that provided two or more eligible E&M visits for that beneficiary and were billed by endocrinology providers.

A) All of the TINs that billed two or more eligible E&M codes by endocrinology providers are identified. Endocrinologists use specialty code 46. Endocrinology providers also include nurse practitioners and physician assistants with specialty codes 50 and 97 if they were practicing as part of a TIN that had a plurality of UPINs with the specialty code for endocrinologists.

B) Attribute the beneficiary to the TIN that provided the plurality of eligible E&M codes by endocrinology providers. Flag that TIN as responsible for that beneficiary for the four GEM endocrinology quality measures listed in Appendix C.

Step 7) Attribute each beneficiary to at most one TIN for the nephrology quality measure, if at least one TIN is available that provided two or more eligible E&M visits for that beneficiary and were billed by nephrology providers.

A) All of the TINs that billed two or more eligible E&M codes by nephrology providers are identified. Nephrologists use specialty code 39. Nephrology providers also include nurse practitioners and physician assistants with specialty codes 50 and 97 if they were practicing as part of a TIN that had a plurality of UPINs with the specialty code for nephrologists.

B) Attribute the beneficiary to the TIN that provided the plurality of eligible E&M codes by nephrology providers. Flag that TIN as responsible for that beneficiary for the one GEM nephrology quality measure listed in Appendix C.

Step 8) Attribute each beneficiary to at most one TIN for the neurology quality measure, if at least one TIN is available that provided two or more eligible E&M visits for that beneficiary and were billed by neurology providers.

A) All of the TINs that billed two or more eligible E&M codes by neurology providers are identified. Neurologists use specialty code 13. Neurology providers also include nurse practitioners and physician assistants with specialty codes 50 and 97 if they were practicing as part of a TIN that had a plurality of UPINs with the specialty code for neurologists.

B) Attribute the beneficiary to the TIN that provided the plurality of eligible E&M codes by neurology providers. Flag that TIN as responsible for that beneficiary for the one GEM neurology quality measure listed in Appendix C.

Step 9) Attribute each beneficiary to at most one TIN for the psychiatry quality measure, if at least one TIN is available that provided two or more eligible E&M visits for that beneficiary and were billed by psychiatry providers.

A) All of the TINs that billed two or more eligible E&M codes by psychiatry providers are identified. Psychiatrists use specialty codes 26 and 86. Psychiatry providers also include nurse practitioners and physician assistants with specialty codes 50 and 97 if they were practicing as part of a TIN that had a plurality of UPINs with the specialty codes for psychiatrists.

B) Attribute the beneficiary to the TIN that provided the plurality of eligible E&M codes by psychiatry providers. Flag that TIN as responsible for that beneficiary for the one GEM psychiatry quality measure listed in Appendix C.

Step 10) Attribute each beneficiary to at most one TIN for the rheumatology quality measure, if at least one TIN is available that provided two or more eligible E&M visits for that beneficiary and were billed by rheumatology providers.

A) All of the TINs that billed two or more eligible E&M codes by rheumatology providers are identified. Rheumatologists use specialty code 66. Rheumatology providers also include nurse practitioners and physician assistants with specialty codes 50 and 97 if they were practicing as part of a TIN that had a plurality of UPINs with the specialty code for rheumatologists.

B) Attribute the beneficiary to the TIN that provided the plurality of eligible E&M codes by rheumatology providers. Flag that TIN as responsible for that beneficiary for the one GEM rheumatology quality measure listed in Appendix C.

Step 11) In applying the plurality rule for attribution to the primary care and different subspecialty medical groups in Steps 3–10, the following three tiebreakers were used when necessary to ensure that each beneficiary is only attributed to one TIN for each subspecialty. First, if there is a tie among two or more TINs in the number of eligible E&M codes billed by each type of specialty provider, then attribute the beneficiary to the TIN that provided the most

recent E&M visit. Second, if there is still a tie, attribute the beneficiary to the TIN that provided the earliest E&M visit. Third, if there is still a tie, attribute the beneficiary to one of the remaining TINs at random. (However, check the number of beneficiaries attributed using random allocation. If >0.5% of beneficiaries end up with random attribution for any of the subspecialties, then additional rules for tiebreaking would have been developed.)

- Ties are possible in the attribution analysis when visits are used to identify the TIN that provided the plurality of a particular type of service. As a result, tiebreakers are needed. The third tiebreaker involving random allocation was needed infrequently.

- Other tiebreakers are available if needed. For example, applying the data on allowed charges is one possible approach.

Step 12) Consolidate redundant attribution so that each TIN has one set of quality measures for which it is responsible for each attributed beneficiary. For example, if a beneficiary was attributed to the same TIN for both primary care and for cardiology, then the TIN was accountable for all 12 GEM quality measures for that beneficiary since the cardiology quality measures are a subset of the primary care quality measures, as shown in Appendix C. However, if a beneficiary was attributed to the same TIN for both cardiology and endocrinology, then the TIN was accountable for eight GEM quality measures since there are five cardiology measures and four endocrinology measures; but with one quality measure common to both subspecialties, the overall total for the TIN for that beneficiary was eight quality measures, as shown in Appendix C.

- The goal of the GEM project is to provide quality of care measure results at the medical group level, which involves TINs using this methodology. As a result, the final goal of the beneficiary attribution process is to identify a set of beneficiaries attributed to a TIN and the quality measures associated with those beneficiaries for which the TIN is accountable, depending on which specialist within the TIN provided the plurality of services for that specialty to the beneficiary. A TIN may be attributed a beneficiary for a particular quality measure twice, as for primary care and for cardiology, but the TIN's quality performance analysis will be based on the beneficiary and the quality measure for that TIN, not the number of times it was attributed to the TIN.

Appendix A

GEM Data Sources

CMS provided the following Medicare data sources for the GEM project:

- Health Account Joint Information (HAJI) database containing national Part A and Part B Fee-for-Service (FFS) claims
- Medicare Part D (drug) claims database
- Standard Data Processing System (SDPS) database containing national enrollment, physician and other tables derived from the Medicare Enrollment Database (EDB) and Part D Enrollment Database
- National UPIN Files

The measure calculations for the GEM project require a variety of data from a number of different databases. These databases, although containing information on beneficiaries that can be cross-linked, generally are tailor made for specific purposes. The HAJI database, the source for SDPS data, contains all FFS claim histories on both Part A (inpatient/outpatient) and Part B (private medical group and solo practice) components of Medicare coverage as well as Part D claims. Other information such as Medicare enrollment is available from the Medicare Enrollment Database (EDB); information relating to private medical group and solo practices is found in both the SDPS physician tables as well as the National UPIN Files, and information relating to Part D enrollment and claims can be found in two of the databases referenced above.

Appendix B

CMS Provider Specialty Table Edited to Include Only Physicians, Physician Assistants and Nurse Practitioners for GEM Project Physician Grouping TIN Selection and Patient Attribution

(1) Provider Specialty Codes Flagged for Patient Attribution for GEM	(2) Provider Specialty Codes including Physicians, Physician Assistants and Nurse Practitioners for Physician Grouping TIN Selection
Primary Care	
✓	01 = General practice
✓	08 = Family practice
✓	11 = Internal medicine
✓	16 = Obstetrics/gynecology
✓	38 = Geriatric medicine
✓	70 = Multi-specialty clinic or group practice
✓	84 = Preventive medicine
Specialty Attribution for Specific Measures	
	02 = General surgery
	03 = Allergy/immunology
	04 = Otolaryngology
	05 = Anesthesiology
*	06 = Cardiology
	07 = Dermatology
	09 = Interventional Pain Management
	10 = Gastroenterology
	12 = Osteopathic manipulative therapy
*	13 = Neurology
	14 = Neurosurgery
	18 = Ophthalmology
	20 = Orthopedic surgery
	22 = Pathology
	24 = Plastic and reconstructive surgery
	25 = Physical medicine and rehabilitation
*	26 = Psychiatry
	28 = Colorectal surgery
	29 = Pulmonary disease

	30 = Diagnostic radiology
	33 = Thoracic surgery
	34 = Urology
	36 = Nuclear medicine
	37 = Pediatric medicine
*	39 = Nephrology
	40 = Hand surgery
	44 = Infectious disease
*	46 = Endocrinology
Follows specialty designation of the physicians ✓	50 = Nurse practitioner
*	66 = Rheumatology
	72 = Pain Management
	76 = Peripheral vascular disease
	77 = Vascular surgery
	78 = Cardiac surgery
	79 = Addiction medicine
	81 = Critical care (intensivists)
	82 = Hematology
	83 = Hematology/oncology
	85 = Maxillofacial surgery
*	86 = Neuropsychiatry
	90 = Medical oncology
	91 = Surgical oncology
	92 = Radiation oncology
	93 = Emergency medicine
	94 = Interventional radiology
Follows specialty designation of the physicians ✓	97 = Physician assistant
	98 = Gynecologist/oncologist
	99 = Unknown Physician Specialty

Source: Medicare Part B Reference Manual: Appendix D – CMS Provider Specialty Codes

Appendix C

GEM Project Quality Measures and Physician Specialties Eligible for Patient Attribution and Quality Performance Assessment

GEM Project Quality Measures	Physician Specialties for Patient Attribution and Quality Performance Assessment
1. Breast Cancer Screening	Primary care
2. LDL Testing for Diabetes	Primary care, Cardiology, Endocrinology
3. Retinal Eye Exam for Diabetics	Primary care, Endocrinology
4. HbA1c Testing for Diabetics	Primary care, Endocrinology
5. Nephropathy Testing for Diabetics	Primary care, Endocrinology, Nephrology
6. Cardiovascular LDL Testing	Primary care, Cardiology
7. Beta Blocker Treatment after Heart Attack	Primary care, Cardiology
8. Persistence of Beta-Blocker Treatment after Heart Attack	Primary care, Cardiology
9. Annual Monitoring for Patients on Persistent Medications (ACE Inhibitors, digoxin, diuretics, anti-convulsants)	Primary care (all medications) Cardiology (all but anti-convulsants) Neurology (anti-convulsants only)
10. Antidepressant Medication Management (6 months)	Primary care, Psychiatry
11. Disease-Modifying Anti-Rheumatic Drug Therapy	Primary care, Rheumatology
12. Colorectal Cancer Screening	Primary care