DETAILED METHODOLOGY FOR THE TOTAL PER CAPITA COST MEASURE FOR MEDICARE FEE-FOR-SERVICE BENEFICIARIES

I. Description of Measure

This document provides a detailed description of the *Total Per Capita Cost Measure for Medicare Fee-for-Service (FFS) Beneficiaries* used in the confidential Quality and Resource Use Reports (QRURs) that the Centers for Medicare & Medicaid Services (CMS) distributes to select medical group practices. The measure covers the payment-standardized and risk-adjusted costs of all beneficiaries attributed to a medical group practice. Included in this detailed description is information on how Medicare beneficiaries are attributed to medical group practices, how the Total Per Capita Cost Measure for Medicare Fee-For-Service beneficiaries is computed for medical group practices, and how these costs, at the practice level, are compared among peers. Additional details are provided in a series of appendices at the end of this document.

II. Data Source

The per capita cost measure is constructed from Medicare enrollment and final action FFS claims data available on the CMS Integrated Data Repository (IDR) and include all Part A and Part B claims. Prescription drug event (Part D) data are not included. CMS' Hierarchical Condition Category (HCC) risk scores are used in the risk adjustment models for per capita costs. A detailed discussion of the data is in Appendix A.

III. For Which Medical Group Practices Is the Measure Constructed?

The Total Per Capita Cost Measure is constructed for all medical group practices, identified by Taxpayer Identification Number (TIN), satisfying the following criteria:

1. The medical group practice billed FFS Medicare during the performance period (one calendar year).
2. At least 25 or more eligible professionals billed under the medical group practice's TIN during the performance period.
3. The medical group practice was attributed at least 20 beneficiaries for the performance period after applying any exclusions (discussed below).

Eligible professionals include physicians, practitioners, therapists, and qualified audiologists, as identified by their two-digit CMS specialty codes. Additional information is in Appendix E.

IV. How are Medicare Beneficiaries Attributed to Group Practices?

A. Description of Attribution Approach

The attribution method is a two-step process, where in the first step beneficiaries are assigned to medical group practices based on primary care services (PCS) provided by primary care physicians (PCPs)—defined as physicians practicing internal medicine, family practice, general practice, or geriatric medicine. A beneficiary is attributed to a medical group practice if

the PCPs in the medical group practice accounted for a larger amount of total Medicare allowable charges for PCS than PCPs in any other group or solo practice. In the second step, beneficiaries who are unassigned to a group and had at least one PCS from a physician, regardless of specialty, are assigned to a medical group practice if the professionals in the group accounted for a larger amount of total Medicare allowable charges for PCS than professionals in any other group or solo practice. This step recognizes that some beneficiaries may receive PCS from non-PCPs (that is, specialist physicians, nurse practitioners, physician assistants, and clinical nurse specialists).

Two-digit CMS specialty codes that appear in Medicare carrier/physician services claims files are used to define specialties. For some medical professionals, different CMS specialty codes are included on different claims—for example, general practitioner versus endocrinologist. A medical professional's specialty is determined from carrier/physician services claims from the performance year and based on the specialty code listed most frequently on line items for services rendered by the professional. If a medical professional is associated in Medicare claims with multiple specialties and the most commonly listed code is 99 (the Unknown Physician specialty), the professional is assigned the second-most-frequently listed specialty.

A table of CMS specialty codes is available in Exhibit E.1. CMS requires each eligible professional to designate one or more clinical specialties when enrolling in Medicare. Clinicians are expected to update these and other data, when necessary through Medicare's online Provider Enrollment, Chain and Ownership System (PECOS) at https://pecos.cms.hhs.gov/pecos/login.do.

Exhibit 1. Evaluation & Management Service Codes Included in Beneficiary Attribution Criteria

Current Procedural Terminology Code	Label
99201–99205	Office or other outpatient visits for the evaluation and management of a new patient
99211–99215	Office or other outpatient visit for the evaluation and management of an established patient
99304–99306	Initial nursing facility care, per day, for the evaluation and management of a patient
99307–99310	Subsequent nursing facility care, per day, for the evaluation and management of a patient
99315–99316, 99318	Nursing facility discharge day management
99318	Evaluation and management of a patient involving an annual nursing facility assessment
99324–99328	Domiciliary or rest home visit for the evaluation and management of a new patient
99334–99337	Domiciliary or rest home visit for the evaluation and management of an established patient
99339–99340	Individual physician supervision of a patient (patient not present) in home, domiciliary, or rest home
99341–99345	Home visit for the evaluation and management of a new patient

Source: RTI International and American Medical Association, 2010 Current Procedural Terminology: Professional Edition.

Note: Labels are approximate. See American Medical Association, Current Procedural Terminology for detailed definitions.

People eligible for Medicare due to age (65 or older), end-stage renal disease (ESRD), or a qualifying disability are included in the measure if none of the exclusions listed below applied to them.

B. Exclusion Criteria

A beneficiary meeting any of the following criteria during the performance period is excluded from being attributed to a medical group practice (that is, not attributed):

- The beneficiary was enrolled in Medicare Advantage (Part C) for any part of the performance period.
- The beneficiary was enrolled in a Part A only (no Part B) or Part B only (no Part A) for at least one month in the performance period.
- The beneficiary died during the performance period.
- The beneficiary resided outside the U.S., its territories, and its possessions.
- Prior to risk adjustment, the beneficiary's total payment-standardized costs were in the bottom one percent of the payment-standardized (but non-risk-adjusted) distribution of costs among all beneficiaries in the sample.

Details on these exclusions are in Appendix B.

Claims with payments that are negative, missing, or very low[1] are excluded from the computation of the measure, but the *beneficiaries* with such claims nonetheless are retained (i.e., attributed).

V. Measure Construction Logic

A. Brief Description of the Measure

The measure is formed by first attributing beneficiaries to medical group practices. Unadjusted per capita costs then are calculated as the sum of all Medicare Part A and Part B costs for all beneficiaries attributed to a medical group practice, divided by the number of attributed beneficiaries. All unadjusted costs are then price standardized and risk adjusted to accommodate differences in beneficiary costs that result from circumstances beyond physicians' control. Risk-adjusted costs are computed as the ratio of a medical group practice's observed unadjusted, payment-standardized (but not risk-adjusted) per capita costs to its expected, payment-standardized per capita costs, as determined by the risk adjustment algorithm. Finally, to express the risk-adjusted cost in dollars and for ease of interpretation, the ratio is multiplied by the mean cost of all beneficiaries attributed to all practices.

[1] Claims with standardized allowed amounts under 50 cents were excluded. In many cases these represent claims that provide clinical information—such as a quality-data code for a PQRS measure—where nominal amounts must be included because the provider's billing software cannot accommodate a charge of $0.00.

The cost measure uses administrative claims data that include inpatient hospital; outpatient hospital; skilled nursing facility; home health; durable medical equipment, prosthetics, orthotics, and supplies (DMEPOS); and Medicare carrier/physician services (non-institutional provider) claims. Costs associated with Medicare Part D (outpatient prescription drugs) were not included.[2] To the extent that Medicare claims include such information, costs comprise Medicare payments to providers, beneficiaries (copayments and deductibles), and third-party private payers.

Additional details regarding payment standardization and risk adjustment are in Appendices C and D, respectively.

B. Payment Standardization Algorithm

Geographic variation in Medicare payments to providers can reflect factors unrelated to the care provided to patients. For most types of medical services, Medicare adjusts payments to providers to reflect differences in local input prices (for example, wage rates and real estate costs). Therefore, payments are standardized to enable valid comparisons of costs for each medical group practice to the average costs across all medical group practices, which may be located in geographic areas or settings where reimbursement rates are higher or lower. Before any cost measure is calculated, Medicare unit costs are standardized to equalize payments for each specific service provided in a given health care setting. For example, the standardized price for a given service is the same regardless of the state or city in which the service was provided, or differences in Medicare payment rates among the same class of providers (for example, prospective payment hospitals versus critical access hospitals). Unit costs refer to the total reimbursement paid to providers for services delivered to Medicare beneficiaries. These can include discrete services (such as physician office visits or consultations) or bundled services (such as hospital stays). The standardized payment methodology, which is described in further detail in Appendix C, does the following:

- Eliminates adjustments made to national payment amounts to reflect differences in regional labor costs and practice expenses
- Eliminates payments not directly related to services rendered, such as the graduate medical education, indirect medical education, and disproportionate share payments to hospitals
- Substitutes a national amount for services paid on the basis of state fee schedules
- Maintains differences in actual payments resulting from the setting in which a service is provided, who provides the service, and whether multiple services in the same setting were provided during a single encounter
- Adjusts outlier payments for differences in area wages

[2] Part D (outpatient prescription drug) costs were excluded from the cost measure calculations because not all beneficiaries have Medicare Part D and some who do not have it instead might have creditable prescription drug coverage through other insurance sources or the retiree subsidy, for which Medicare does not have claims data.

- Sets the standardized payment to 0 if the actual payment on the claim was 0 and to missing for interim claims

Additional details relating to the payment standardization algorithm are available at http://www.qualitynet.org/dcs/ContentServer?c=Page&pagename=QnetPublic%2FPage%2FQnetTier4&cid=1228772057350.

C. Risk Adjustment Algorithm

Risk adjustment takes into account patient differences that can affect their medical costs, regardless of the care provided. The Total Per Capita Cost Measure is risk adjusted so practices can be compared more fairly among peers. The risk-adjusted costs of medical group practices attributed a disproportionate number of high-risk beneficiaries will be lower than the groups' unadjusted costs because the high-risk beneficiaries' expected costs will exceed the average beneficiary cost across all medical group practices; similarly, risk-adjusted costs will be higher than unadjusted costs for groups that are attributed comparatively low-risk beneficiaries.

Costs are risk adjusted prospectively using prior year CMS-HCC risk scores derived from the CMS-HCC risk adjustment model that CMS uses across the agency. The CMS-HCC risk adjustment model assigns *International Classification of Diseases–9th Revision* (ICD-9) diagnosis codes obtained from Medicare claims to 70 hierarchical condition categories (HCC) that have related disease characteristics and costs.[3] The model incorporates sex, age, original reason for Medicare entitlement (either age or disability), and Medicaid entitlement. Risk adjustment for the Total Per Capita Cost Measure also accounts for the presence of ESRD in the year prior to the performance period. Each risk score summarizes, in a single number, each Medicare beneficiary's expected cost of care relative to other beneficiaries, given the beneficiary's demographic profile and medical history. Like the CMS-HCC model, the Total Per Capita Cost Measure's risk adjustment model is prospective—in the sense that it uses risk scores from the year prior to the performance period to predict performance year costs—to ensure that the model measures the influence of health on treatment provided (costs incurred) rather than the reverse.

To limit the influence of outliers on the calculation of risk-adjusted costs, attributed beneficiaries across all medical group practices with costs in the bottom 1 percent of the payment-standardized (but non-risk-adjusted) distribution of costs are excluded before estimating the risk-adjustment model, whereas the costs of beneficiaries with costs exceeding the 99th percentile have their costs reset to the 99th percentile value (a process known as Winsorizing).

The risk-adjustment model is estimated by regressing beneficiary costs on a constant: the beneficiary's risk score, the squared value of the risk score, and an indicator for the presence of

[3] The CMS-HCC model uses diagnoses identified for a patient within a given year to predict health risks for the following year along with potential resource utilization. The model consists of cost groups, or diagnoses, that are grouped into the 70 HCCs that are each assigned a weight. These are groups of similar diagnoses that CMS has deemed risk factors for patients. . CMS-HCC scores are calculated each year for each Medicare beneficiary.

ESRD.[4] This model is then used to compute the expected payment-standardized cost for each attributed beneficiary across all medical group practices, given the beneficiary's risk profile (that is, risk score and ESRD status). A medical group practice's expected per capita costs are equal to the sum of expected costs of all its attributed beneficiaries, divided by the number of attributed beneficiaries. As noted earlier, the total of all risk-adjusted per capita costs is then computed as the ratio of unadjusted per capita costs to expected per capita costs for all beneficiaries attributed to a medical practice, multiplied by the mean per capita beneficiary cost across all medical group practices.

Appendix D displays the 70 CMS-HCCs that CMS incorporates into its risk scores and provides additional detail on the steps for risk adjusting the per capita cost measure.

D. Definition of Peer Groups and Performance Benchmarks

A medical group practice's own performance on the Total Per Capita Cost Measure is compared to the average (mean) performance of all medical group practices with at least 25 eligible professionals and 20 or more attributed beneficiaries. That is, each medical group practice's peer group is all medical group practices that qualify for the measure.

[4] The CMS-HCC model generates several different risk scores. For beneficiaries with a full year of medical claims history in the year prior to the performance period, the HCC community risk score is used. For those lacking a full year of medical claims history, the HCC new enrollee score is used. The ESRD indicator is taken from the enrollment data. Details are in Appendix D.

APPENDIX A
DESCRIPTION OF DATA SOURCES

The primary data sources used to calculate the Total Per Capita Cost Measure are Medicare enrollment and Parts A and B FFS paid claims extracted from CMS' systems. CMS-HCC risk scores are used in the risk-adjustment models for per capita costs. Each of these data sources is discussed in detail below.

Enrollment Data

The Medicare enrollment data contain demographic and enrollment information about each beneficiary enrolled in Medicare during a calendar year. The data include the beneficiary's unique Medicare identifier, state and county residence codes, ZIP code, date of birth, date of death, sex, race, age, monthly Medicare entitlement indicators, reasons for entitlement, whether or not the beneficiary's state of residence paid for the beneficiary's Medicare Part A or Part B monthly premiums ("state buy-in"), and monthly Medicare Advantage (Part C) enrollment indicators.

Medicare Claims

Resource use measure computations are based on all final action Medicare claims available on CMS' Integrated Data Repository (IDR) for the measurement year. Specifically, inpatient hospital, outpatient hospital, skilled nursing facility, home health, hospice, carrier/physician services, and DMEPOS claims are analyzed. Under Medicare procedures, when an error is discovered on a claim, a duplicate claim is submitted indicating that the prior claim was in error; a subsequent claim containing the corrected information can then be submitted. The IDR contains only the *final action* claims developed from the Medicare National Claims History database—that is, non-rejected claims for which a payment has been made after all disputes and adjustments have been resolved and details clarified. The scope of claims on the IDR is national. ZIP code is the most discrete level of geographic detail available. Data are submitted continually from the payment contractors (MACs) to CMS and updated at least weekly on the IDR. For the purposes of computing the Total Per Capita Cost Measure included in the 2012 QRURs, the end date of the claim determines the calendar year with which the claim is associated. Providers submit claims to their MAC for processing and payment. The MAC forwards all claims to CMS, where they are stored in the Common Working File and the National Claims History database. The National Claims History database is the source of FFS claims in the IDR.

CMS-HCC Risk Scores

Clinical differences among patients can affect their medical costs, regardless of the care provided. For peer comparisons, a medical group practice's per capita costs are risk adjusted based on the unique mix of patients the practice treated during a given period. The CMS-HCC model that was used assigns ICD-9 diagnosis codes to 70 clinical conditions, grouping codes with similar disease characteristics and costs together. The model predicts future costs based on disease, demographic, and insurance factors from the previous year. There are separate sets of coefficients for beneficiaries in the community; beneficiaries in long-term care institutions; new Medicare enrollees; and beneficiaries with ESRD in dialysis, transplant, and functioning-graft status (both community and institutional).

The community and new enrollee HCC risk scores are used as inputs into a second risk-adjustment model described in Appendix D; the ESRD and institutional scores are not used. Because the ESRD model is concurrent, an ESRD indicator (yes/no) from the previous year's enrollment data was used instead of the ESRD HCC risk score. Inclusion of the indicator instead of the concurrent score in the risk-adjustment model permits estimation of the prospective impact of ESRD on costs. Because institutionalization during the year is endogenous, no adjustment is made for institutional status; the effect of institutionalization on costs is small, on average, once the HCC risk scores are included in the risk-adjustment model.

APPENDIX B
EXCLUSIONS APPLIED TO ATTRIBUTED BENEFICIARIES

Beneficiary exclusions were determined according to the following steps:

1. Identify beneficiaries who were enrolled in managed care during the year: A beneficiary is considered to have gained or lost Part A or Part B entitlement if for any month of the year the buy-in indicator field in the enrollment data has a value other than 3 ("Part A and Part B") or C ("Parts A and B, State Buy-In").
2. Identify beneficiaries with one or more months of Part A but not Part B enrollment in the measurement year; similarly, identify beneficiaries with one or more months of Part B but not Part A enrollment in measurement year.
3. Identify beneficiaries who resided outside the U.S., its territories, or its possessions. These include the 50 United States, the District of Columbia, Puerto Rico, the U.S. Virgin Islands, Guam, American Samoa, and the Northern Marianas.
4. Identify beneficiaries whose total payment-standardized (but non-risk-adjusted) per capita costs were in the bottom 1 percent of the distribution of per capita costs among all beneficiaries in the sample.
5. Truncate outlier values of payment-standardized (non risk-adjusted) per capita costs. Exclude from the per capita cost measure all attributed beneficiaries identified in the previous steps and determine which medical group practices, after exclusions, have at least 20 beneficiaries each attributed to them.

APPENDIX C
PAYMENT STANDARDIZATION

Standardized payments for all annual Medicare claims are merged with original Medicare claims by beneficiary identifier, provider identifier, and claim start and end dates, and supplemented with additional fields like processing date to resolve duplicate matches. This appendix summarizes the standardization method for each of the seven Medicare claim types: inpatient hospital, outpatient hospital, skilled nursing facility (SNF), home health agency, hospice, physician services, and DMEPOS. Full details of the payment standardization methodology are available at http://www.qualitynet.org/dcs/ContentServer?c=Page&pagename=QnetPublic%2FPage%2FQnetTier4&cid=1228772057350.

Inpatient Hospital Claims

The standardized payment for a stay at an acute hospital, inpatient psychiatric facility, inpatient rehabilitation facility, or long-term care hospitals (with normal length of stay) is built as the sum of national base payment rates for labor, non-labor, and capital expenditures, multiplied by the stay's diagnosis-related group rate. Any outlier payments then are added in and adjusted for geographic differences using the hospital wage index. The standardization excludes graduate medical education, indirect medical education, and disproportionate share payments. Transfer stays and discharges to post-acute care facilities are standardized by applying a standardized per diem rate. Claims from Maryland hospitals are standardized by applying a hospital-specific factor to the actual payment, adding in the deductible and coinsurance, and then adjusting by the wage index. Critical access hospital (CAH) payments, long-term care hospital short-stay claim payments, and payments for other inpatient stays are standardized by adjusting the total payment for differences in area wages.

The link (above) to the CMS methodology for standardizing payments provides additional details about the identification of short-stay transfers and post-acute care facility discharges, the identification of Maryland hospitals, and the identification of interim claims.

Skilled Nursing Facility (SNF) Claims

The standardized procedure for SNF claims depends on the type of SNF claim, of which there are four types: prospective payment system SNF claims, CAH swing bed claims, SNF claims for beneficiaries without Part A coverage or who have exhausted Part A coverage, and claims for outpatient services provided by SNFs. For prospective payment system claims, the standardized payment is equal to the applicable per diem rate multiplied by the number of Medicare covered days. The applicable per diem rate for rehabilitation resource utilization groups (RUGs) is equal to the average nursing base rate multiplied by the RUG weight for that RUG plus the average rehabilitation base rate multiplied by the RUG therapy weight. For non-rehabilitation RUGs, the therapy portion of the rate is based on the average non-rehabilitation therapy rate. The base rates are the average of the urban and rural rates. If the RUG on the revenue center line cannot be matched to a RUG weight, then the standardized payment is equal to the actual payment with coinsurance added back in, adjusted for differences in area wages.

For CAH swing bed claims, the standardized payment is the actual payment with coinsurance added back in, adjusted for differences in area wages.

SNF claims for beneficiaries without Part A coverage or who have exhausted Part A coverage and claims for outpatient services provided by SNFs are standardized using the Healthcare Common Procedure Coding System (HCPCS) code on each revenue center line and standardizing, like other Part B fee schedule claims, by using the physician fee schedule, the clinical laboratory fee schedule, the ambulance fee schedule, and the DMEPOS fee schedule, as applicable.

Home Health Agency Claims

The standardization method for home health claims depends on whether the claim type is designated as home health or outpatient, and, if the former, whether the claim is for a short episode. Home health claims for short episodes are standardized by adjusting the actual payment by the wage index associated with the labor share. For other home health claims, the standardized payment is built up from the base rate for each home health resource group and is multiplied by the applicable home health resource group weight and added to a supply amount, outlier payments adjusted by the labor-related wage rate, and any add-ons for prosthetics, durable medical equipment, or oxygen that are present on the claim. For claims identified by their claim type as outpatient claims that are present in the home health file, the standardized payment is assigned to be equal to the actual payment amount.

Hospice Claims

The standardization of hospice claims depends on the value of the revenue center code for each line item. If the revenue center code is for services furnished to patients by a physician or nurse practitioner, then the standardized payment is equal to the actual payment amount for that line item. If the revenue center code for a line item indicates continuous home care, then the standardized payment is equal to the base rate for continuous home care for that year times the number of units divided by four (because units are reported in 15-minute increments). If the revenue center code indicates that the service is for routine home care, inpatient respite care, or general inpatient care, then the standardized payment is equal to the base rate for that type of care for that year multiplied by the number of units.

Outpatient Hospital Claims

The standardization method for an outpatient hospital claim depends on whether the service was provided in a Maryland hospital and whether the claim is for a service paid on a reasonable cost or pass-through basis, under the Outpatient Prospective Payment System (OPPS), or under another fee schedule. These types of claims can be divided into five groups, each of which is standardized using a different method:

1. Revenue center code lines for reasonable cost or pass-through services[5]
2. Revenue center code lines with an ambulatory payment classification

[5] Reasonable cost or pass-through revenue center code lines are identified by status indicators: F (corneal tissue acquisition, certain certified registered nurse anesthetist services, and hepatitis B vaccines), G (drug/biological pass-through), H (device or therapeutic radiopharmaceuticals pass-through), and L (influenza or pneumococcal pneumonia vaccines).

3. Revenue center code lines with status indicating services not paid under OPPS
4. Hospital outpatient services for CAHs
5. Claims for services furnished by Maryland hospitals

Revenue center code lines for reasonable costs or pass-through services are standardized by using the actual payment and adding in the coinsurance and deductible amounts from the revenue center line. For revenue center code lines with an ambulatory payment classification, the standardized payment is set equal to the OPPS schedule amount for the HCPCS code on the revenue line multiplied by the number of units on the revenue line, and adjusted for multiple procedures as indicated by the modifier on the revenue line item. If the service was paid under the OPPS fee schedule and has a status indicating a significant procedure subject to multiple-procedure discounting, the standardized payment is constructed by adjusting the actual payment by a coinsurance adjustment factor, adding in the deductible, and adjusting by the labor-related wage rate. If the service was paid under the OPPS fee schedule and has a status indicating ancillary services, the standardized payment is set to the actual payment amount plus any applicable cost sharing for that line. Revenue center code lines not paid under OPPS are standardized by using the rates indicated on the various Part B fee schedules (physician, clinical laboratory, ambulance, DMEPOS). Hospital outpatient services from CAHs are standardized by using the actual payment on the claim plus any deductible and coinsurance, and then adjusting for differences in area wages. Standardized payments for services furnished by Maryland hospitals are derived by applying a hospital-year-specific factor to the actual paid claims amount, adding in the deductible amount, and adjusting for differences in area wages.

Although the CMS methodology standardizes all outpatient hospital claim outlier payments at the claim level, development of certain components of the per capita cost measure requires outpatient hospital claims at the line-item level. Consequently, neither actual nor standardized outlier payments are added on to the line-level standardized payments for outpatient hospital claims.

Claims from the following sources appear in the hospital outpatient file, but payment amounts are standardized separately.

1. Rural health clinics and federally qualified health centers, for which standardized payments are equal to actual payment amounts plus deductibles, adjusted for wage differences
2. Comprehensive outpatient rehabilitation facilities and outpatient rehabilitation facilities, for which standardized payments are calculated in the same way as for services paid under the physician fee schedule
3. Community mental health centers, for which standardized payments are calculated in the same way as for services paid under the OPPS fee schedule
4. Renal dialysis facilities, for which the standardized payment is equal to the actual claim payment amount minus outlier payments and a wage-adjusted training payment (if applicable), plus deductible and coinsurance, all divided by the wage index; the result is added to the unadjusted training payment plus the outlier payment

Carrier/Physician Services Claims

Payments for services included in the carrier/physician services claims file are standardized using various methods, depending on the type of service. These claims can be categorized into six broad areas:

1. **Physician services**

   Standardized payments for the physician services, including all evaluation and management; all procedures; all imaging; laboratory diagnostic tests paid under the physician fee schedule and non-laboratory diagnostic tests; chiropractic services; vision, hearing, and speech services; and other services, are calculated by multiplying the annual conversion factor by the sum of the relevant work, transitioned practice expense, and malpractice relative value units. Adjustments are made for technical versus professional components, multiple procedures, co-surgeon and assistant surgeon deductions, non-physician-supplied services, facility versus non-facility settings, and number of units. These aspects of the claims are specified in modifier fields and place of service fields at the individual line item level of each claim.

2. **Anesthesia services**

   Standardized payments for anesthesia services are calculated by multiplying the anesthesia conversion factor for the relevant year by the sum of the base units for the specified anesthesia HCPCS code and the units for that service on the line item (divided by 1,000). An additional multiple procedure discount or certified registered nurse anesthetist adjustment also may apply, as specified in the modifier field of the line item.

3. **Ambulatory surgical center (ASC) services**

   Standardized payments for ASC services are generally equal to the ASC fee schedule amount for the service provided multiplied by the number of units and adjusted for multiple procedures.

4. **Clinical laboratory services**

   Standardized payments for clinical laboratory services are equal to the national limit amounts for specified services (as captured by HCPCS codes) multiplied by the number of units. If a HCPCS code has a national limit amount equal to 0, or if the code indicates an automated general profile, then the standardized amount is equal to the actual claim line payment amount plus the coinsurance and deductible for that claim line.

5. **Part B–covered drugs**

   The standardized payment for Part B–covered drugs is equal to the actual claim line payment amount plus the coinsurance and deductible for that claim line.

6. **Ambulance services**

   Payments for ambulance services are standardized using two methods. For claim lines for mileage, the standardized amount is equal to the actual claim line payment amount plus the coinsurance and deductible for that claim line. For all other ambulance services, the standardized amount is equal to the mean of the actual line

amounts over all line items in the claims data set associated with the specific ambulance HCPCS code present on the claim line.

Durable Medical Equipment, Prosthetics, Orthotics, and Surgical Supplies (DMEPOS) Claims

In general, the standardized payment for durable medical equipment line items is equal to the ceiling of the DMEPOS fee schedule relevant for that service times an adjustment factor based on the modifier code for the service times the number of units. If the HCPCS code refers to a device that is for prosthetics, orthotics, or surgical supplies, then the standardized payment is equal to five-sixths times the DME fee schedule amount for that HCPCS code and modifier times the number of units. The basic approach to standardization is the same for both competitive and non-competitive bidding.

APPENDIX D
RISK ADJUSTMENT

In computing the Total Per Capita Cost Measure, payment-standardized cost data for each beneficiary are risk adjusted. The risk-adjustment process involves several steps, beginning with preparing the data for risk adjustment at the beneficiary level and culminating with the computation of a group practice–specific risk-adjusted per capita cost for attributed beneficiaries that serves as the basis for comparison among medical group practices.

1. **Calculate each beneficiary's observed total costs during the measurement year.** For each beneficiary attributed to a medical group practice, sum the beneficiary's total payment-standardized Medicare claims costs (after exclusions) during the measurement year.
2. **Exclude beneficiaries with extremely low costs and modify the values of extremely high total payment-standardized costs**. Remove beneficiaries with total payment standardized costs in the bottom 1 percent of the cost distribution of all beneficiaries who were attributed to all medical group practices (that is, the beneficiaries with the lowest costs) from further analysis.[6] To limit the influence of the highest-cost patients on the risk-adjustment model, total costs for beneficiaries in the top 1 percent (highest costs) are replaced with the value of the 99th percentile of the distribution of total patient costs, a process known as Winsorization.
3. **For beneficiaries with multiple CMS-HCC risk scores, determine which score to use.** For beneficiaries with both a community and a new enrollee risk score, only the new enrollee risk score is used in the risk adjustment model.[7] Exhibit D.1 below displays the 70 CMS-HCCs that CMS uses in its model to produce CMS-HCC risk scores.
4. **Compute expected payment-standardized beneficiary costs.** To compute expected beneficiary costs, the payment-standardized total costs (after Winsorization) of retained beneficiaries (TOT_COST) are regressed on the following independent variables:
    - HCC community risk score (COMMUNITY_HCC_SCORE), from the year prior to the measurement year
    - HCC community risk score squared (COMMUNITY_HCC_SCORE_SQ), from the year prior to the measurement year
    - HCC new enrollee risk score (NEW_ENROLLEE_HCC_SCORE)), from the year prior to the measurement year

[6] A close examination of the data when this model was under development revealed that the majority of extremely low or zero value claims are likely erroneous. All claims following payment standardization with a $0 payment amount are dropped from the analysis, so no beneficiary has a total payment-standardized cost equal to $0 during the measurement year.

[7] There are separate CMS-HCC models for new enrollees (the New Enrollee Model) and established enrollees (the Community Model). The New Enrollee Model adjusts payments based on age, gender, and disability status, whereas the Community Model incorporates medical history.

- HCC new enrollee risk score squared (NEW_ENROLLEE_HCC_SCORE_SQ), from the year prior to the measurement year
- indicator of end-stage renal disease (ESRD_FLAG)), from the year prior to the measurement year

Only one risk score—either the community score or the new enrollee score—is used for each beneficiary in the regression. If a beneficiary has only one score, that score is used and the other is given a value of zero in the regression. If a beneficiary has both scores, the new enrollee score is used.

More specifically, the following linear regression is estimated:

$$\begin{aligned} TOT\_COST = {} & Beta\_0 + Beta\_1 * (1\text{-}NEW\_AVAIL) * COMMUNITY\_HCC\_SCORE \\ & + Beta\_2 * (1\text{-}NEW\_AVAIL) * COMMUNITY\_HCC\_SCORE\_SQ \\ & + Beta\_3 * NEW\_AVAIL * NEW\_ENROLLEE\_HCC\_SCORE \\ & + Beta\_4 * NEW\_AVAIL * NEW\_ENROLLEE\_HCC\_SCORE\_SQ \\ & + Beta\_5 * ESRD\_FLAG + error \end{aligned}$$

where *Beta_0* is a constant term, *Beta_1* through *Beta_5* are regression coefficients, and *error* is an error term. The regression yields a set of coefficients, one per independent variable. Each coefficient measures the association between its corresponding independent variable and total beneficiary cost when the other independent variables are held constant.

For each beneficiary attributed to a given practice, the coefficients from the estimated regression model are used to compute the beneficiary's expected costs, given the beneficiary's HCC risk score, type of score (community or new enrollee), and ESRD status.

5. **Compute the ratio of observed costs (Step 1) to expected costs (Step 4) at the group practice level.** For each medical group practice, sum the total observed Winsorized payment-standardized (but unadjusted) costs for all beneficiaries attributed to the practice, and divide that sum by the sum of expected costs computed for the same set of beneficiaries.
6. **Compute risk-adjusted payment-standardized per capita costs.** For each practice, multiply the ratio of observed to expected costs computed in the previous step by the mean Winsorized payment-standardized (but unadjusted) total cost among all beneficiaries included in the sample.

Exhibit D.1. Hierarchical Condition Categories (HCCs) Included in the CMS-HCC Risk Adjustment Model

HCC Number and Brief Description of Disease/Condition	
HCC1 = HIV/AIDS	HCC75 = Coma, Brain Compression/Anoxic Damage
HCC2 = Septicemia/Shock	HCC77 = Respirator Dependence/Tracheostomy Status
HCC5 = Opportunistic Infections	HCC78 = Respiratory Arrest
HCC7 = Metastatic Cancer and Acute Leukemia	HCC79 = Cardio-Respiratory Failure and Shock
HCC8 = Lung, Upper Digestive Tract, and Other Severe Cancers	HCC80 = Congestive Heart Failure
HCC9 = Lymphatic, Head and Neck, Brain, and Other Major Cancers	HCC81 = Acute Myocardial Infarction
HCC10 = Breast, Prostate, Colorectal, and Other Cancers and Tumors	HCC82 = Unstable Angina and Other Acute Ischemic Heart Disease
HCC15 = Diabetes with Renal or Peripheral Circulatory Manifestation	HCC83 = Angina Pectoris/Old Myocardial Infarction
HCC16 = Diabetes with Neurologic or Other Specified Manifestation	HCC92 = Specified Heart Arrhythmias
HCC17 = Diabetes with Acute Complications	HCC95 = Cerebral Hemorrhage
HCC18 = Diabetes with Ophthalmologic or Unspecified Manifestation	HCC96 = Ischemic or Unspecified Stroke
HCC19 = Diabetes without Complication	HCC100 = Hemiplegia/Hemiparesis
HCC21 = Protein-Calorie Malnutrition	HCC101 = Cerebral Palsy and Other Paralytic Syndromes
HCC25 = End-Stage Liver Disease	HCC104 = Vascular Disease with Complications
HCC26 = Cirrhosis of Liver	HCC105 = Vascular Disease
HCC27 = Chronic Hepatitis	HCC107 = Cystic Fibrosis
HCC31 = Intestinal Obstruction/Perforation	HCC108 = Chronic Obstructive Pulmonary Disease
HCC32 = Pancreatic Disease	HCC111 = Aspiration and Specified Bacterial Pneumonias
HCC33 = Inflammatory Bowel Disease	HCC112 = Pneumococcal Pneumonia, Emphysema, Lung Abscess
HCC37 = Bone/Joint/Muscle Infections/Necrosis	HCC119 = Proliferative Diabetic Retinopathy and Vitreous Hemorrhage
HCC38 = Rheumatoid Arthritis and Inflammatory Connective Tissue Disease	HCC130 = Dialysis Status
HCC44 = Severe Hematological Disorders	HCC131 = Renal Failure
HCC45 = Disorders of Immunity	HCC132 = Nephritis
HCC51 = Drug/Alcohol Psychosis	HCC148 = Decubitus Ulcer of Skin
HCC52 = Drug/Alcohol Dependence	HCC149 = Chronic Ulcer of Skin, Except Decubitus
HCC54 = Schizophrenia	HCC150 = Extensive Third-Degree Burns
HCC55 = Major Depressive, Bipolar, and Paranoid Disorders	HCC154 = Severe Head Injury
HCC67 = Quadriplegia, Other Extensive Paralysis	HCC155 = Major Head Injury
HCC68 = Paraplegia	HCC157 = Vertebral Fractures Without Spinal Cord Injury
HCC69 = Spinal Cord Disorders/Injuries	HCC158 = Hip Fracture/Dislocation
HCC70 = Muscular Dystrophy	HCC161 = Traumatic Amputation
HCC71 = Polyneuropathy	HCC164 = Major Complications of Medical Care and Trauma
HCC72 = Multiple Sclerosis	HCC174 = Major Organ Transplant Status
HCC73 = Parkinson's and Huntington's Diseases	HCC176 = Artificial Openings for Feeding or Elimination
HCC74 = Seizure Disorders and Convulsions	HCC177 = Amputation Status, Lower Limb/Amputation Complications

APPENDIX E
PHYSICIAN SPECIALTY AND ELIGIBLE PROFESSIONAL DETERMINATION

Only eligible professionals are counted in determining whether a medical group practice has a sufficiently large number of providers to qualify for the Total Per Capita Cost Measure, and only physicians and certain other select specialties are considered in the attribution algorithm. The Total Per Capita Cost Measure uses the two-digit CMS specialty codes that appear on Medicare carrier claims to define specialties.

CMS requires that each eligible professional self-designate one medical specialty, when initially enrolling to become a Medicare provider. The official repository of information about medical professionals who submit claims to Medicare is the Provider Enrollment, Chain, and Ownership System (PECOS) at https://pecos.cms.hhs.gov/pecos/login.do. CMS uses this source for information on the state and site of practice. For some medical professionals, different CMS specialty codes are included on different claims—for example, general practitioner versus endocrinologist—depending on the treatment provided to a given patient or at a given practice site. For the purposes of the Total Per Capita Cost Measure, a medical professional's specialty is determined, using 2011 carrier claims, based on the specialty code most frequently listed on line items for services rendered by the professional. If a medical professional is associated in Medicare claims with multiple specialties and the most commonly listed code is 99 (the Unknown Physician specialty), the professional is assigned to the second-most-frequently listed specialty.

Exhibit E.1 identifies which specialties are associated with eligible professionals and the attribution algorithm. Specialty codes that are not associated with eligible professionals frequently represent non-medical professionals, such as facilities or medical supply companies.

Exhibit E.1. Specialties Associated with Eligible Professionals and Attribution

CMS Specialty Designation	CMS Specialty Code	Designated as an Eligible Professional Specialty	Designated as a Specialty to Be Considered in the Attribution Algorithm
Addiction Medicine	79	Yes	Yes
All Other Suppliers (e.g., Drug Stores)	87	No	No
Allergy/Immunology	03	Yes	Yes
Ambulance Service Supplier (e.g., Private Ambulance Companies, Funeral Homes)	59	No	No
Ambulatory Surgical Center	49	No	No
Anesthesiologist Assistant	32	Yes	Yes
Anesthesiology	05	Yes	Yes
Audiologist (Billing Independently)	64	Yes	Yes
Cardiac Electrophysiology	21	Yes	Yes
Cardiac Surgery	78	Yes	Yes
Cardiology	06	Yes	Yes
Centralized Flu	C1	No	No
Certified Clinical Nurse Specialist	89	Yes	Yes
Certified Nurse Midwife	42	Yes	Yes
Certified Registered Nurse Anesthesiologist	43	Yes	Yes
Chiropractor, Licensed	35	Yes	Yes
Clinical Laboratory (Billing Independently)	69	No	No
Clinical Psychologist	68	Yes	Yes
Clinical Psychologist (Billing Independently)	62	Yes	Yes
Colorectal Surgery (Formerly Proctology)	28	Yes	Yes
Critical Care (Intensivists)	81	Yes	Yes
Department Store (For DMERC Use)	A7	No	No
Dermatology	07	Yes	Yes
Diagnostic Radiology	30	Yes	Yes
Emergency Medicine	93	Yes	Yes
Endocrinology	46	Yes	Yes
Family Practice	08	Yes	Yes
Gastroenterology	10	Yes	Yes
General Practice	01	Yes	Yes
General Surgery	02	Yes	Yes
Geriatric Medicine	38	Yes	Yes

Exhibit E.1 *(continued)*

CMS Specialty Designation	CMS Specialty Code	Designated as an Eligible Professional Specialty	Designated as a Specialty to Be Considered in the Attribution Algorithm
Geriatric Psychiatry	27	Yes	Yes
Grocery Store (For DMERC Use)	A8	No	No
Gynecologist/Oncologist	98	Yes	Yes
Hand Surgery	40	Yes	Yes
Hematology	82	Yes	Yes
Hematology/Oncology	83	Yes	Yes
Home Health Agency (DMERCs Only)	A4	No	No
Hospice and Palliative Care	17	Yes	Yes
Hospital	A0	No	No
Independent Diagnostic Testing Facility	47	No	No
Individual Certified Orthotist	55	No	No
Individual Certified Prosthetist	56	No	No
Individual Certified Prosthetist-Orthotist	57	No	No
Infectious Disease	44	Yes	Yes
Intensive Cardiac Rehabilitation	31	No	No
Intermediate Care Nursing Facility (DMERCs Only)	A2	No	No
Internal Medicine	11	Yes	Yes
Interventional Pain Management	09	Yes	Yes
Interventional Radiology	94	Yes	Yes
Licensed Clinical Social Worker	80	Yes	Yes
Mammography Screening Center	45	No	No
Mass Immunization Roster Biller	73	No	No
Maxillofacial Surgery	85	Yes	Yes
Medical Oncology	90	Yes	Yes
Medical Supply Company For DMERC	54	No	No
Medical Supply Company with Certified Orthotist	51	No	No
Medical Supply Company with Certified Prosthetist	52	No	No
Medical Supply Company with Certified Prosthetist-Orthotist	53	No	No
Medical Supply Company with Pedorthic Personnel	B3	No	No
Medical Supply Company with Registered Pharmacist	58	No	No

Exhibit E.1 *(continued)*

CMS Specialty Designation	CMS Specialty Code	Designated as an Eligible Professional Specialty	Designated as a Specialty to Be Considered in the Attribution Algorithm
Medical Supply Company with Respiratory Therapist (DMERCs Only)	A6	No	No
Nephrology	39	Yes	Yes
Neurology	13	Yes	Yes
Neuropsychiatry	86	Yes	Yes
Neurosurgery	14	Yes	Yes
Nuclear Medicine	36	Yes	Yes
Nurse Practitioner	50	Yes	Yes
Nursing Facility, Other (DMERCs Only)	A3	No	No
Obstetrics/Gynecology	16	Yes	Yes
Occupational Therapist (Independently Practicing)	67	Yes	Yes
Ocularist	B5	No	No
Ophthalmology	18	Yes	Yes
Optician	96	No	No
Optometrist	41	Yes	Yes
Oral Surgery (Dentists Only)	19	Yes	Yes
Orthopedic Surgery	20	Yes	Yes
Osteopathic Manipulative Medicine	12	Yes	Yes
Otolaryngology	04	Yes	Yes
Pain Management	72	Yes	Yes
Pathology	22	Yes	Yes
Pediatric Medicine	37	Yes	Yes
Pedorthic Personnel	B2	No	No
Peripheral Vascular Disease	76	Yes	Yes
Pharmacy (DMERCs Only)	A5	No	No
Physical Medicine and Rehabilitation	25	Yes	Yes
Physical Therapist (Independently Practicing)	65	Yes	Yes
Physician Assistant	97	Yes	Yes
Plastic and Reconstructive Surgery	24	Yes	Yes
Podiatry	48	Yes	Yes
Portable X-Ray Supplier (Billing Independently)	63	No	No
Preventive Medicine	84	Yes	Yes
Psychiatry	26	Yes	Yes

Exhibit E.1 *(continued)*

CMS Specialty Designation	CMS Specialty Code	Designated as an Eligible Professional Specialty	Designated as a Specialty to Be Considered in the Attribution Algorithm
Public Health or Welfare Agencies (Federal, State, and Local)	60	No	No
Pulmonary Disease	29	Yes	Yes
Radiation Oncology	92	Yes	Yes
Radiation Therapy Centers	74	No	No
Registered Dietician/Nutrition Professional	71	Yes	Yes
Rehabilitation Agency	B4	No	No
Rheumatology	66	Yes	Yes
Single or Multispecialty Clinic or Group Practice	70	Yes	Yes
Skilled Nursing Facility	A1	No	No
Sleep Medicine	C0	Yes	Yes
Slide Preparation Facilities	75	No	No
Speech Language Pathologists	15	Yes	Yes
Sports Medicine	23	Yes	Yes
Surgical Oncology	91	Yes	Yes
Thoracic Surgery	33	Yes	Yes
Unassigned	95	No	No
Unknown Physician	99	Yes	Yes
Unknown Supplier/Provider	88	No	No
Urology	34	Yes	Yes
Vascular Surgery	77	Yes	Yes
Voluntary Health or Charitable Agencies (e.g., National Cancer Society, National Heart Association, Catholic Charities)	61	No	No

Source: 2011 Source for CMS Specialty Code: Medicare Claims Processing Manual, Chapter 26 - Completing and Processing Form CMS-1500 Data Set (Rev. 2226, 5-20-11; Rev. 2261, 07-29-11; Rev. 2375, 12-22-11), 10.8.2 - Physician Specialty Codes, (Rev. 2098, Issued: 11-19-10, Effective Date: 04-01-11, Implementation Date: 04-04-11), 10.8.3 - Nonphysician Practitioner, Supplier, and Provider Specialty Codes, (Rev. 2248, Issued: 06-24-11, Effective: 04-01-11, Implementation: 04-04-11).