

2018 Specialist Scoring Methodology

1-Overview of Specialty Tiering

This document on Specialty-based Tiering Methodology describes the method used by BCBSNC for the Cost & Quality product for 2018 and is provided for informational purposes only. Physician designation ratings are a guide to choosing a physician, practice or medical group. Because ratings have a risk of error, they should not be the sole basis for selecting a doctor. Patients should confer with their physician before making a decision.

The specialties being evaluated are *Cardiology, Orthopedics, Obstetrics and Gynecology (OBGYN), Neurology, Gastroenterology, Endocrinology, and General Surgery*.

The practice peer group identification varied by specialty. All peer groups only represent providers practicing in the state of North Carolina. The mix of services and conditions treated by a practice determined who their peer group was. Sub-groups were identified for Cardiology and Orthopedics. Cardiology practices were grouped into 'non-interventional', 'catheterization only', 'catheterization and implants', or 'all services' peer groups. Orthopedic practices were grouped into 'non-interventional', 'knee/arm/shoulder', 'spine', 'hand', or 'all services'. For these specialties, practices are only compared to their specific sub-group (For more information see in Appendix E).

General Surgery, OBGYN, Gastroenterology, Endocrinology and Neurology practices did not need to be grouped due to the types of services provided and the fact that the indirect standardization process helps control for case-mix differences.

- Designation is made at the practice level. Designation only includes In-network providers contracted with BCBSNC.
 - All providers who participated in a practice during the prior three years could have data included for the practice. Practices are defined by BCBSNC Network Management contracting. Practices with multiple billing provider ID's or Tax ID's may be grouped together under a single practice by Network Management.
 - If a provider treated patients at a practice that is no longer active then the data for those patients is not used in scoring the provider at the current practice s/he is a part of. However, a provider who left a currently active practice will have his/her data included for that practice's score.
 - Multi-specialty groups are included in the designation process. But only episodes attributed to a provider of the correct specialty are included.
 - BCBSNC will base its Tiered Network on Quality, Cost, and RowdMap overall efficiency.
 - Any practice that meets the Quality criteria will also be assessed on Cost criteria and RowdMap overall efficiency to determine designation (only on Cost for OBGYN due to the fact that RowdMap does not evaluate OBGYN practices).
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- From time to time, BCBSNC may choose, in its discretion, to assign Tier 1 status to a practice in order to increase marketability of the product based on placement of Tier 1 providers.

2-Cost Efficiency

Episodes Treatment Groups (ETGs) are used to evaluate the cost efficiency of practices. These ETGs help determine the average cost of treating an episode of care for a variety of medical conditions. The resulting costs are then compared to corresponding costs from other practices of the same specialty and in the same geographical area.

Three years of claims data is used to compute cost efficiency, though not every claim received during that time period is necessarily used. Only claims that are assigned to an 'episode of care' relevant to the specialty are included. The current claims period is for Oct 2013 – Sept 2016.

Cost Efficiency is accomplished at the practice level. For Cost Efficiency, a minimum of 10 medical cases (episodes of care) during the study period is required. Any practice with fewer than the 10 episodes required is designated as a Tier 2 Practice.

2.1 – Episodes of Care

Episodes of care are created using OptumInsight's Episode Treatment Grouper (ETG) logic. For general surgeons only, Procedure Episode Grouper (PEG) logic is used.

The ETG software version 8.0 looks across all types of claims to identify services that are related to the treatment of more than 500 specific conditions. All claims that are related to a specific condition and within a clinically defined time window are grouped together into an episode of care (ETG). These claims can be from many different providers. More detailed explanation of how episodes of care are created can be found at the following website: <http://etg.optum.com/etg-links/learn-about-etgs/>.

The ETG software version 8.0 looks across all claims to identify services related to a surgical procedure. The claims related to that procedure within a clinically defined time window are grouped into the procedure episode of care (PEG). Like the ETG grouper, these claims can be from many different providers. More detailed explanation on the PEG grouper can be found at the following website: <https://etg.optum.com/peg-links/learn-about-pegs/>.

2.2 – Attribution of Episodes to Practices

Episodes are attributed to only one practice. For ETG episodes, this attribution decision is based upon the practice that incurs the most charges for an episode, given that they represent at least 30% of total professional management and surgery charges. For the PEG episodes, it is the practice who performed the surgical procedure. If no practice is identified using this method then the episode is dropped.

Only episodes relevant to the specialty and assigned to a practice of that specialty type were included in the analysis. See Appendix C for the Base ETG's used by Specialty and the PEG's used for General Surgery and Appendix D for the specialist types included for each Specialty.

Only completed episodes are included in the scoring. Acute ETG conditions and PEG episodes are complete when sufficient time has passed since services were rendered for the condition to indicate that the episode has ended. Chronic ETG episodes are all 12 months in duration.

Allowed amounts are used for all efficiency measures. Allowed amounts reflect both patient cost burden and that paid by BCBSNC. Pharmacy costs are included in the total allowed amount because the vast majority of BCBSNC members (> 85%) have pharmacy coverage and an analysis showed that excluding members without pharmacy coverage had no impact on practice level results.

Base ETGs and PEGs with less than 10 total episodes during the 3 year study period are dropped from use in the scoring method.

Data are weighted such that more current (2016) data have greater influence on scoring than the older (2013) episodes. This approach allows recent changes in practice styles, referral patterns and/or contracting to be reflected in the efficiency results.

2.3 – Scoring Methodology

The evaluation of physicians for cost efficiency compares observed cost for episodes of care to expected cost for episodes of care, with adjustments for the patient's severity of illness and the physician's case mix.

For PEGs, the expected score is a weighted average score based on peer average cost for each combination of PEG and place of service (inpatient vs outpatient). Similar to ETGS, an overall 3 year benchmark is used at each PEG/place of service if there are not at least 10 cases to compute a benchmark.

2.4 – Reduction of the Influence of Outliers

Ranking is used as the principal procedure in this analysis. This has the advantage of eliminating the effects of outliers. Episodes are ordered from lowest to highest and converted to percentiles. All episodes with costs below the 5th percentile are removed due to the fact that they are considered unusual episodes or may have resulted from data entry errors.

After percentiles are obtained, episode costs are evaluated in a uniform scale and the outliers are automatically capped since percentiles range from 0 to 100. So the influence of outliers is significantly reduced.

Given that physicians will treat many conditions among patients with a variety of illness severity, this generates cost percentiles within the benchmark sets and allows for episodes to be compared to other physicians in their specialty and market.

The sets of episodes from a physician are identified and ranked according to costs. The resulting percentiles are combined into supersets of episodes. The superset is then reordered by the percentiles

of each episode, lowest to highest. The sorted episodes are then assigned a rank from lowest (1) to highest.

The physician's own episodes will be spread out among the others in the superset according to their percentiles compared to similar cases and severities. Subsequently, a statistical test is used to determine whether the rankings are statistically different from the expected ranking of a random episode in the superset, which would be the median rank.

The minimum number of episodes for statistical validity is 10 and this is due to the fact that a non-parametric procedure is being used.

The previous steps generate a case-mix and severity-adjusted superset of episodes containing the physician's observed episode ranks, and the expected ranks for their peers. The test compares a physician's episode ranks by summing them to generate episodes within their specialty and geographical area.

The *Wilcoxon Rank-Sum* test is then applied to determine if the physician's episode ranks are statistically different from the median. This is a standard Non-Parametric test used to determine whether a set of rankings is significantly different from the median.

The *Expected Rank Sum* is simply the median rank times the number of episodes attributed to the practice. The difference between the *expected* and *observed* rank sum is expressed as a number of standard deviations (Z-score). Higher Z-scores indicate higher cost rankings (or lower cost efficiency), and lower Z-scores indicate lower rankings (or higher cost efficiency).

A 95% confidence level ($p < 0.05$) is used for testing. If the *Wilcoxon Rank-Sum* test shows no statistically significant difference from the median, the practice receives an individual cost efficiency outcome of *Meets Expectations*. If the *Wilcoxon Rank-Sum* test shows lower cost ranks that are statistically significantly different from the median, the practice receives a classification of *Exceeds Expectations*. If the *Wilcoxon Rank-Sum* test shows higher cost ranks that are statistically significantly different from the median, the practice is classified as *Below Expectations*.

Both outcomes of *Meets Expectations* and *Exceeds Expectations* would result in a cost efficiency designation of Tier 1 if no additional criteria were used.

2.5-Selection of Peer Group Practices

A Propensity Scoring Matching methodology that takes more factors into account will be used. The included factors are Specialty, Region, Urban/Rural, and Relative Risk Score.

The Propensity Scoring Matching methodology is commonly used to select a control group when several factors must be taken into account. It uses a Logistic Regression algorithm to find the best

control matches for each practice. Each practice being evaluated is matched to peer group practices based on Specialty, Region, Urban/Rural, Panel Size and Relative Risk Score.

2.6-Methodology Illustration

The example below is used to illustrate the methodology above. It is based on data obtained from BCBSNC providers. For simplicity, we are assuming the universe consists of only 3 providers (Dr. A, Dr. B, and Dr. C), with the same specialty and located in the same geographical area. All their services were grouped into two ETGs: *Migraine Headache, w/o Complication, w/o Comorbidity* (Table 1) and *Epilepsy w/o Complication w/o Comorbidity, w/o Surgery* (Table 2).

Table 1-Distribution of Allowed Amount By Provider for
Migraine Headache, w/o Complication, w/o Comorbidity

Provider	ETG	Allowed Amount	Percentile
Dr. B	Migraine headache, w/o complication, w/o comorbidity	1,046	0.00
Dr. B	Migraine headache, w/o complication, w/o comorbidity	1,505	0.10
Dr. C	Migraine headache, w/o complication, w/o comorbidity	1,540	0.20
Dr. A	Migraine headache, w/o complication, w/o comorbidity	2,081	0.30
Dr. A	Migraine headache, w/o complication, w/o comorbidity	2,276	0.40
Dr. A	Migraine headache, w/o complication, w/o comorbidity	2,338	0.50
Dr. A	Migraine headache, w/o complication, w/o comorbidity	2,341	0.60
Dr. B	Migraine headache, w/o complication, w/o comorbidity	2,402	0.70
Dr. C	Migraine headache, w/o complication, w/o comorbidity	2,965	0.80
Dr. C	Migraine headache, w/o complication, w/o comorbidity	3,221	0.90
Dr. C	Migraine headache, w/o complication, w/o comorbidity	4,065	1.00

In Table 1, Migraine ETG related costs were ordered from lowest to highest and then ranked by percentiles. The same logic was used for Epilepsy ETG in Table 2. Once all episodes were ranked from lowest to highest by percentiles for both Migraine and Epilepsy, the percentile distributions were combined in a single set called Superset.

Table 2-Distribution of Allowed Amount By Provider for
Epilepsy w/o Complication w/o Comorbidity, w/o Surgery

Provider	ETG	allowed	Percentile
Dr B	Epilepsy, w/o complication, w/o comorbidity, w/o surgery	165	0
Dr B	Epilepsy, w/o complication, w/o comorbidity, w/o surgery	268	0.111
Dr A	Epilepsy, w/o complication, w/o comorbidity, w/o surgery	498	0.222
Dr B	Epilepsy, w/o complication, w/o comorbidity, w/o surgery	501	0.333
Dr A	Epilepsy, w/o complication, w/o comorbidity, w/o surgery	807	0.444
Dr A	Epilepsy, w/o complication, w/o comorbidity, w/o surgery	954	0.555
Dr C	Epilepsy, w/o complication, w/o comorbidity, w/o surgery	982	0.666
Dr A	Epilepsy, w/o complication, w/o comorbidity, w/o surgery	1,002	0.777
Dr C	Epilepsy, w/o complication, w/o comorbidity, w/o surgery	2,032	0.888
Dr C	Epilepsy, w/o complication, w/o comorbidity, w/o surgery	2,568	1

Table 3 display the results after combining both types of episodes in a single table and ordering by percentiles. We are evaluating Dr. C and we are assuming that Dr. A and Dr. B are the only other providers who have at least 10 episodes in each of the 2 types. In other words, Dr. A and Dr. B episodes will be used as benchmarks for evaluating Cost Efficiency for Dr. C.

Table 3-Superset of Episodes for *Dr. C*

Provider	ETG Desc	Allowed Amt	Percentile	Rank
Dr B	Migraine headache, w/o complication, w/o comorbidity	1,046	0.00	1
Dr B	Epilepsy, w/o complication, w/o comorbidity, w/o surgery	165	0.00	1
Dr B	Migraine headache, w/o complication, w/o comorbidity	1,505	0.10	2
Dr B	Epilepsy, w/o complication, w/o comorbidity, w/o surgery	268	0.11	3
Dr C	Migraine headache, w/o complication, w/o comorbidity	1,540	0.20	4
Dr A	Epilepsy, w/o complication, w/o comorbidity, w/o surgery	498	0.222	5
Dr A	Migraine headache, w/o complication, w/o comorbidity	2,081	0.30	6
Dr B	Epilepsy, w/o complication, w/o comorbidity, w/o surgery	501	0.33	7
Dr A	Migraine headache, w/o complication, w/o comorbidity	2,276	0.40	8
Dr A	Epilepsy, w/o complication, w/o comorbidity, w/o surgery	807	0.444	9
Dr A	Migraine headache, w/o complication, w/o comorbidity	2,338	0.50	10
Dr A	Epilepsy, w/o complication, w/o comorbidity, w/o surgery	954	0.555	11
Dr A	Migraine headache, w/o complication, w/o comorbidity	2,341	0.60	12
Dr C	Epilepsy, w/o complication, w/o comorbidity, w/o surgery	982	0.67	13
Dr B	Migraine headache, w/o complication, w/o comorbidity	2,402	0.70	14
Dr A	Epilepsy, w/o complication, w/o comorbidity, w/o surgery	1,002	0.777	15
Dr C	Migraine headache, w/o complication, w/o comorbidity	2,965	0.80	16
Dr C	Epilepsy, w/o complication, w/o comorbidity, w/o surgery	2,032	0.888	17
Dr C	Migraine headache, w/o complication, w/o comorbidity	3,221	0.90	18
Dr C	Migraine headache, w/o complication, w/o comorbidity	4,057	1.00	19
Dr C	Epilepsy, w/o complication, w/o comorbidity, w/o surgery	2,568	1.000	19

Dr. C episodes were highlighted in Table 3. The data was ranked as shown in that table. The ranks corresponding to Dr. C were summed and this is called *Observed Rank Sum*.

$$\text{Observed Rank Sum} = 4 + 13 + 16 + 17 + 18 + 19 + 19 = 106$$

To find the *Expected Rank Sum* we must first find the Median for the given ranks. This is accomplished using the formula below:

$$\text{Median} = \frac{\text{Number of Dr C ranks} + \text{Number of ranks of the other doctors} + 1}{2}$$

$$\text{Expected Median for Dr C} = \frac{7 + 14 + 1}{2} = 11$$

To find the *Expected Rank Sum* for Dr. C, note that we expect his 7 episodes to be at the median level, so

$$\text{Expected Rank Sum} = 7 \times 11 = 77$$

The *standard deviation* is found to be 13.4. The *Observed Rank Sum* appear to be well above the *Expected Rank Sum*. The *Wilcoxon Rank-Sum* test determined that *Dr. C is Below Expectations in Cost Efficiency (the p-value was less than 0.05)*.

We can standardize Dr. C's performance using the Standard Normal Distribution:

$$Z = \frac{(\text{Observed Rank Sum} - \text{Expected Rank Sum})}{\text{Standard Deviation}}$$

$$Z = \frac{(106 - 77)}{13.4} = 2.16$$

The derived Z variable is the *Cost Index*.

3–Quality Efficiency

Designation based upon the EBM quality measures and procedural complication rates will use the following method:

The EBM quality measures are run for two 12 month time periods. A quality score requires at least 10 observations for a practice across any combination of measures and members. Gastroenterology, General Surgery, Orthopedic Surgery, Neurology and Endocrinology practices with insufficient data for quality will still be scored on *Cost Efficiency* and given designation based only on the efficiency score.

For EBM measures it is possible for a member to count more than once for a single provider on a single measure if the member qualified for the measure in both time periods. In addition, the member will count more than once for a provider if they qualify across several measures.

There are five potential sources used for quality measurement: NCQA Recognition Programs, participation in a specialty-specific quality improvement program, Blue Quality Physicians Program (BQPP), adherence with evidence based medicine (EBM) process measures, and rates of potentially avoidable complications for specialty-specific procedures.

Potentially avoidable complication measures use PROMETHEUS® ECR® Analytics software (more details on the complication measures can be found at <http://www.hci3.org/programs-efforts/prometheus-payment/ecr-analytics>). EBM measures are computed using MedVantage HealthSmart Designer Suite software. The measures are all NCQA and NQF endorsed.

Attributing Patients to a Practice

Provider attribution varies by measure. For EBM measures the member is attributed to the provider with the most evaluation and management (E&M) office based encounters during a given time period among providers of the same specialty. For measures of procedure-centric complication rates, the member is attributed to provider of service for the procedure.

3.2 - Quality Criteria by Specialty Type

3.2.1 – Cardiology

a) Participation in one of the following NCQA certifications (At least 75% of active providers in a practice must be recognized):

- i) At least 75% of providers in a practice must be recognized by the Heart Stroke Recognition Program (HSRP)
- ii) NCQA Patient Centered Specialty Practice (PCSP)

OR

b) Meeting specific thresholds on both:

- i) Set of evidence based medicine (EBM) quality measures
- ii) Potentially avoidable complications of cardiac catheterization.

3.2.2 – Orthopedics

a) Participation in one of the following NCQA certifications (At least 75% of active providers in a practice must be recognized):

- i) NCQA Back Pain Recognition Program (BPRP) (At least 75% of providers in a practice must be recognized)
- ii) NCQA Patient Centered Specialty Practice (PCSP) (At least 75% of providers in a practice must be recognized)

OR

- b) Meeting specific thresholds on both:
 - i) EBM quality measures for low back pain management
 - ii) Potentially avoidable complications rates for hip replacement, knee replacement and knee arthroscopy

3.2.3 – Gastroenterology

- a) Participation in one of the following quality improvement data programs is weighted at 100% of the overall quality score:
 - i) American Gastroenterological Association (AGA) Digestive Health Outcomes Registry®
 - ii) GI Quality Improvement Consortium, Ltd. registry (GIQuIC)
 - iii) Accreditation Association for Ambulatory Health Care (AAAHC)
 - iv) NCQA Patient Centered Specialty Practice Recognition (PCSP) Program (At least 75% of providers in a practice must be recognized)

OR

- b) Meeting specific thresholds in the following:
Potentially avoidable complication rates for colonoscopy and gastroesophageal reflux disease (GERD), and upper Endoscopy

3.2.4 – General Surgery

- a) Participation in one of the following quality improvement data programs is weighted at 100% of the overall quality score:
 - i) American College of Surgeons National Surgical Quality Improvement Program (ACS NSQIP®)
 - ii) GI Quality Improvement Consortium, Ltd. registry (GIQuIC).
 - iii) NCQA Patient Centered Specialty Practice Recognition (PCSP) Program. (At least 75% of providers in a practice must be recognized)

OR

- b) Potentially avoidable complication rates for colonoscopy, colon re-section, and cholecystectomy

3.2.5 – OBGYN

- a) Participation in one of the following NCQA certifications (at least 75% of active providers in a practice must be recognized):
 - i) NCQA Physician Practice Connections (PPC)
 - ii) NCQA Patient-Centered Specialty Practice (PCSP)
 - iii) Blue Quality Physician Program (BQPP)

OR

- b) Meeting specific thresholds on both:
 - i) Potentially avoidable complication rates for deliveries and hysterectomies.
 - ii) EBM measures for breast cancer screening, cervical cancer screening and Chlamydia screening

3.2.6-Neurology

- a) Participation in the following NCQA certification (at least 75% of active providers in a practice must be recognized):
NCQA Patient-Centered Specialty Practice (PCSP)

OR

- b) Meeting specific thresholds on EBM quality measures for migraine treatment and medication management for patients using anticonvulsants

3.2.7- Endocrinology

- a) Participation in one of the following NCQA certifications:
 - i) NCQA recognition in Diabetes Recognition Program (DRP) (At least 75% of providers in a practice must be recognized)
 - ii) NCQA Patient-Centered Specialty Practice (PCSP)

OR

- b) Meeting specific thresholds on a set of evidence based medicine (EBM) quality measures for Diabetes measures

3.3 – Quality Methodology

Indirect standardization is used to create an expected score. The expected score is a weighted average score based on peer performance for each measure and weighted to reflect the mix of measures the practice has. This creates an expected practice level score that assumed the peers of the practice had the same mix of patients. The peer group for each practice consists of all practices in the state of North Carolina for which there were providers of the given specialty treating BCBSNC members during the relevant study time frame.

Quality scores are further weighted to provide more balanced scores across the different measures. This reflects the relative importance, but lower frequency, of procedural complications. The procedural complications were given greater weighting in the final scoring for Cardiology, Orthopedics and OBGYN (see Appendix A). For Gastroenterology and General Surgery, participation in a quality improvement program was weighted as 100% of the total quality score.

Illness burden is not adjusted for in the evaluation of quality.

A ratio is computed for actual quality compared to expected quality. With this ratio a score of 1 indicates that the practice performed exactly as expected compared to peers. A score below 1 indicates lower quality relative to what was expected. An example of the use of indirect standardization is illustrated in Appendix B.

A 90% confidence interval is computed for the provider quality ratio. The methodology to compute this score follows the methodology laid out by MedVantage for their Composite Quality Measure. It is a proprietary algorithm but involves using indirect standardization with a confidence interval based on a binomial distribution. The basic methodology was adopted from Harvard Pilgrim Health Care which is affiliated with Harvard Medical School.

4–Combining Cost and RowdMap

Standardization is used to create standard scores (same scale) for all 3 categories. With the categories converted to the same scale, the following criteria will be used for generating a composite score:

First determine whether the practice pass or fails Quality. If it passes, apply the following formula to compute the Composite Score:

$$\text{Composite Score} = \frac{1}{10} (4 \text{ RowdMap} + 6 \text{ Cost Index})$$

Hence, the weights in the above formula are 60% and 40% for *Cost* and *RowdMap* respectively. There are no *RowdMap* scores for OBGyn. For this specialty, the *Composite Score* is equal to the Cost Index for practices that met the Quality criteria.

A Two-sample parametric test is used to determine significant differences between the practices and respective peer groups based on the *Composite Score*. The Empirical Rule (based on the Normal Distribution) is used to derive thresholds used to generate a 1 to 3 scale variable. Those thresholds vary by specialty.

If the *p-value* is greater than or equal to 0.05, the practice is not significantly different from peers and the conclusion is that it *Meets Expectations* (scale 2).

If the *p-value* is less than 0.05, the practice is significantly different from peers. In this case, a threshold (the median for example) is derived based on the distribution of data which vary by specialty. If the *Composite Score* is less than the threshold then the practice is classified as *Exceeds Expectations* (scale 1). If the *Composite Score* for the practice is greater than the threshold, then the practice is classified as *Below Expectations* (scale 3).

A practice may be classified as Tier 1 or Tier 2 according to the criteria in Table 4 below.

Table 4-Mapping of Test Outcomes to Tier Category

Outcome of Test	1 to 3 Scale	Tier
Exceeds Expectations	1	Tier 1
Meets Expectations	2	Tier 1
Below Expectations	3	Tier 2

Appendix A

Cardiology Quality Measures and Weights

Measure	Weight assigned
Members 18 years of age and older during the measurement year who were hospitalized and discharged alive with a diagnosis of acute myocardial infarction (AMI) and who received persistent beta-blocker treatment for six months after discharge.	count of all eligible members
Patients 18 years or older with a diagnosis of Heart Failure who also have left ventricular systolic dysfunction (LVSD) were prescribed ACEI or ARB therapy during the last 3 months of the measurement interval in the timeframe of analysis.	count of all eligible members
Patients 18 years or older with a diagnosis of HF who also have LVSD were prescribed beta blocker therapy during the last 3 months of the measurement interval in the timeframe of analysis.	count of all eligible members
Patients 18 years or older with diagnoses of coronary artery disease or cardiac procedure were prescribed lipid-lowering therapy within the timeframe of analysis.	count of all eligible members
Patients 18 years or older with coronary artery or cardiac procedure received at least one lipid profile during the timeframe of analysis.	
Patients at least 18 years or older with a diagnosis of HF and atrial fibrillation were prescribed warfarin during the timeframe of analysis.	count of all eligible members
Patients 18 years or older with diagnoses of heart failure who have a quantitative or qualitative measurement of LV function performed any time prior to the end of the measurement year.	count of all eligible members
Percentage of percutaneous coronary interventions with a potentially avoidable complication	count of all eligible procedures x 10

Orthopedic Quality Measures and Weights

Measure	Weight assigned
The percentage of members with a primary diagnosis of low back pain who did not have an imaging study (plain X-ray, MRI, CT scan) within 28 days of the diagnosis.	count of all eligible members
Percentage of knee arthroscopies with a potentially avoidable complication	Count of all eligible procedures x 2
Percentage of knee replacements with a potentially avoidable complication	Count of all eligible procedures x 2
Percentage of hip replacements with a potentially avoidable complication	Count of all eligible procedures x 2

Gastroenterology Quality Measures and Weights

Measure	Weight assigned
Percentage of members treated for gastroesophageal reflux disease with a potentially avoidable complication	Count of all eligible members
Percentage of all colonoscopies with a potentially avoidable complication	Count of all eligible procedures

General Surgery Quality Measures and Weights

Measure	Weight assigned
Percentage of colonoscopies with a potentially avoidable complication	Count of all eligible procedures
Percentage of cholecystectomies with a potentially avoidable complication	Count of all eligible procedures
Percentage of colon re-sections with a potentially avoidable complication	Count of all eligible procedures

Neurology Quality Measures and Weights

Measure	Weight assigned
Members 18 years of age and older during the measurement year with a diagnosis of migraine and coronary artery disease (CAD) who did not have an active prescription for triptans or ergot derivatives during the previous 3 years.	count of all eligible members
Patients 18 years or older during the measurement year with frequent or severe migraine who have an active prescription for migraine preventive medications within the 3 months prior to measurement year.	count of all eligible members
Patients 18 years or older who received at least 180 days of ambulatory medication therapy for Barbiturate anticonvulsants during the measurement year and had at least one therapeutic monitoring event for the therapeutic agent in the measurement year.	count of all eligible members
Patients 18 years or older who received at least 180 days of ambulatory medication therapy for Hydantoin anticonvulsants during the measurement year and had at least one therapeutic monitoring event for the therapeutic agent in the measurement year.	count of all eligible members
Patients 18 years or older who received at least 180 days of ambulatory medication therapy for miscellaneous (Valproic acid) anticonvulsants during the measurement year and had at least one therapeutic monitoring event for the therapeutic agent in the measurement year.	count of all eligible members
Patients 18 years or older who received at least 180 days of ambulatory medication therapy for Dibenzazepine anticonvulsants during the measurement year and had at least one therapeutic monitoring event for the therapeutic agent in the measurement year.	count of all eligible members

Patients 18 years or older with a diagnosis of migraine who had a new prescription for narcotic analgesics (for migraine) within three months of the end of the measurement year, who also had an active prescription for migraine abortive medications within the ninety days prior to the initial prescription for narcotic analgesics.	count of all eligible members
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OBGYN Quality Measures and Weights

Measure	Weight Assigned
The percentage of women 40–69 years of age who had a mammogram to screen for breast cancer.	Count of all eligible members
The percentage of women 21–64 years of age who received one or more Pap tests to screen for cervical cancer.	Count of all eligible members
The percentage of women 16–20 years of age who were identified as sexually active and who had at least one test for Chlamydia during the measurement year.	Count of all eligible members
The percentage of women 21–24 years of age who were identified as sexually active and who had at least one test for Chlamydia during the measurement year.	Count of all eligible members
Percentage of deliveries with a potentially avoidable complication	Count of all eligible procedures x 20
Percentage of hysterectomies with a potentially avoidable complication	Count of all eligible procedures x 20

Endocrinology Quality Measures and Weights

Measure	Weight Assigned
Proportion of patients 18 years or older with diagnoses of hyperlipidemia and CAD Dx and no diabetes Dx any time prior to the end of the measurement year, who were prescribed lipid-lowering therapy within the last 3 months of the measurement year.	Count of all eligible members
Proportion of patients 18 years or older with diagnoses of hyperlipidemia and diagnoses of diabetes Dx and no CAD Dx anytime prior to the end of the measurement year, who were prescribed lipid-lowering therapy within the last 3 months of the measurement year.	Count of all eligible members
The percentage of members 18–75 years of age with diabetes (type 1 and type 2) who had the following: • Hemoglobin A1c (HbA1c) testing.	Count of all eligible members

The percentage of members 18–75 years of age with diabetes (type 1 and type 2) who had the following: • Eye exam (retinal) performed.	Count of all eligible members
The percentage of members 18–75 years of age with diabetes (type 1 and type 2) who had the following: • LDL-C screening.	Count of all eligible members
The percentage of members 18–75 years of age with diabetes (type 1 and type 2) who had the following: • Medical attention for nephropathy.	Count of all eligible members

Appendix B

Cardiology Base ETGs
162200: Hypo-functioning thyroid gland
163000: Diabetes
164700: Hyperlipidemia, other
164800: Obesity
316000: Cerebral vascular disease
386500: Ischemic heart disease
386600: Pulmonary heart disease
386800: Congestive heart failure
386900: Cardiomyopathy
387000: Aortic aneurysm
387100: Heart failure, diastolic
387200: Cardiac infection
387400: Valvular disorder
387500: Severe ventricular rhythms
387600: Severe heart block
387700: Other conduction disorders
387800: Atrial fibrillation & flutter
388100: Hypertension
388300: Cardiac congenital disorder
388700: Other cardiac diseases
389000: Arterial inflammation
389500: Non-cerebral, non-coronary atherosclerosis
389800: Other non-inflammatory arterial diseases
390300: Embolism & thrombosis of veins

390500: Phlebitis & thrombophlebitis of veins
390600: Varicose veins of lower extremity
391000: Other diseases of veins
399900: Cardiovascular diseases signs & symptoms

Orthopedic Base ETGs
164600: Gout
316500: Spinal trauma
316700: Hereditary & degenerative diseases of central nervous system, other
317100: Congenital disorders of central nervous system
317500: Carpal tunnel syndrome
317700: Inflammation of non-cranial nerves, except carpal tunnel
318300: Traumatic disorders of non-cranial nerves
318400: Congenital disorders of peripheral nerves
668901: Open wound - foot & ankle
668902: Open wound - lower leg
668904: Open wound - hand & forearm
668905: Open wound - elbow & upper arm
669001: Skin trauma, except burn & open wound - foot & ankle
669002: Skin trauma, except burn & open wound - lower leg
669003: Skin trauma, except burn & open wound - hip & thigh
669004: Skin trauma, except burn & open wound - hand & forearm
669005: Skin trauma, except burn & open wound - elbow & upper arm
669006: Skin trauma, except burn & open wound – shoulder
669009: Skin trauma, except burn & open wound – trunk
669010: Skin trauma, except burn & open wound – other
711101: Infection of bone & joint - foot & ankle
711102: Infection of bone & joint - knee & lower leg
711103: Infection of bone & joint - thigh, hip & pelvis
711104: Infection of bone & joint - hand, wrist & forearm
711105: Infection of bone & joint - elbow & upper arm
711106: Infection of bone & joint – shoulder
711112: Infection of bone & joint – unspecified
711901: Major joint inflammation - foot & ankle
711902: Major joint inflammation - knee & lower leg
711903: Major joint inflammation - thigh, hip & pelvis
711904: Major joint inflammation - hand, wrist & forearm
711905: Major joint inflammation - elbow & upper arm
711906: Major joint inflammation – shoulder
711908: Major joint inflammation – back

711910: Major joint inflammation – other
711912: Major joint inflammation – unspecified
712000: Osteoporosis
712201: Joint degeneration, localized - foot & ankle
712202: Joint degeneration, localized - knee & lower leg
712203: Joint degeneration, localized - thigh, hip & pelvis
712204: Joint degeneration, localized - hand, wrist & forearm
712205: Joint degeneration, localized - elbow & upper arm
712206: Joint degeneration, localized – shoulder
712208: Joint degeneration, localized – back
712211: Joint degeneration, localized – neck
712212: Joint degeneration, localized – unspecified
712901: Open fracture or dislocation of lower extremity - foot & ankle
712902: Open fracture or dislocation of lower extremity - knee & lower leg
712903: Open fracture or dislocation - thigh, hip & pelvis
712904: Open fracture or dislocation of upper extremity - hand, wrist & forearm
712905: Open fracture or dislocation of upper extremity - elbow & upper arm
712906: Open fracture or dislocation of upper extremity – shoulder
712909: Open fracture or dislocation – trunk
713101: Closed fracture or dislocation of lower extremity - foot & ankle
713102: Closed fracture or dislocation of lower extremity - knee & lower leg
713103: Closed fracture or dislocation - thigh, hip & pelvis
713104: Closed fracture or dislocation of upper extremity - hand, wrist & forearm
713105: Closed fracture or dislocation of upper extremity - elbow & upper arm
713106: Closed fracture or dislocation of upper extremity – shoulder
713109: Closed fracture or dislocation of trunk
713900: Malignant neoplasm of bone & connective tissue, other than head & neck
714100: Non-malignant neoplasm of bone & connective tissue, other than head & neck
714301: Joint derangement - foot & ankle
714302: Joint derangement - knee & lower leg
714303: Joint derangement - thigh, hip & pelvis
714304: Joint derangement - hand, wrist & forearm
714305: Joint derangement - elbow & upper arm
714306: Joint derangement – shoulder
714312: Joint derangement – unspecified
714501: Major trauma, other than fracture or dislocation - foot & ankle
714502: Major trauma, other than fracture or dislocation - knee & lower leg
714503: Major trauma, other than fracture or dislocation - thigh, hip & pelvis
714504: Major trauma, other than fracture or dislocation - hand, wrist & forearm
714505: Major trauma, other than fracture or dislocation - elbow & upper arm
714506: Major trauma, other than fracture or dislocation – shoulder

714512: Major trauma, other than fracture or dislocation – unspecified
714601: Minor orthopedic trauma - foot & ankle
714602: Minor orthopedic trauma - knee & lower leg
714603: Minor orthopedic trauma - thigh, hip & pelvis
714604: Minor orthopedic trauma - hand, wrist & forearm
714605: Minor orthopedic trauma - elbow & upper arm
714606: Minor orthopedic trauma – shoulder
714608: Minor orthopedic trauma – back
714609: Minor orthopedic trauma – trunk
714611: Minor orthopedic trauma – neck
714612: Minor orthopedic trauma – unspecified
714801: Bursitis & tendinitis - foot & ankle
714802: Bursitis & tendinitis - knee & lower leg
714803: Bursitis & tendinitis - thigh, hip & pelvis
714804: Bursitis & tendinitis - hand, wrist & forearm
714805: Bursitis & tendinitis - elbow & upper arm
714806: Bursitis & tendinitis – shoulder
714812: Bursitis & tendinitis – unspecified
714901: Other minor orthopedic disorders - foot & ankle
714902: Other minor orthopedic disorders - knee & lower leg
714903: Other minor orthopedic disorders - thigh, hip & pelvis
714904: Other minor orthopedic disorders - hand, wrist & forearm
714905: Other minor orthopedic disorders - elbow & upper arm
714906: Other minor orthopedic disorders – shoulder
714908: Other minor orthopedic disorders – back
714911: Other minor orthopedic disorders – neck
714912: Other minor orthopedic disorders – unspecified
715101: Orthopedic deformity - foot & ankle
715102: Orthopedic deformity - knee & lower leg
715103: Orthopedic deformity - thigh, hip & pelvis
715104: Orthopedic deformity - hand, wrist & forearm
715105: Orthopedic deformity - elbow & upper arm
715106: Orthopedic deformity – shoulder
715108: Orthopedic deformity - back
715109: Orthopedic deformity - trunk
715111: Orthopedic deformity - neck
715112: Orthopedic deformity - unspecified
779700: Conditional exam
779800: Major specific procedures not classified elsewhere
780100: Other preventative & administrative services
821000: Late effects & late complications

Gastroenterology Base ETGs
208200: Iron deficiency anemia
473100: Infection of stomach & esophagus
473300: Inflammation of esophagus
473500: Gastritis &/or duodenitis
473800: Ulcer
474000: Malignant neoplasm of stomach & esophagus
474200: Non-malignant neoplasm of stomach & esophagus
474400: Trauma of stomach or esophagus
474500: Anomaly of stomach or esophagus
474900: Diverticulitis & diverticulosis
475000: Other infectious diseases of intestines & abdomen
475200: Other inflammation of intestines & abdomen
475300: Inflammatory bowel disease
475400: Malignant neoplasm of large intestine
475500: Malignant neoplasm of small intestine & abdomen
475600: Non-malignant neoplasm of intestines & abdomen
476000: Congenital anomalies of intestines & abdomen
476100: Vascular diseases of intestines & abdomen
476300: Bowel obstruction
476400: Irritable bowel syndrome
476600: Hernias, except hiatal
476800: Hiatal hernia
476900: Other diseases of intestines & abdomen
477100: Infection of rectum or anus
477400: Hemorrhoids
477600: Inflammation of rectum or anus
477800: Malignant neoplasm of rectum or anus
478000: Non-malignant neoplasm of rectum or anus
478500: Other diseases & disorders of rectum & anus
479900: Gastroenterology diseases signs & symptoms
521400: Infectious hepatitis
521600: Non-infectious hepatitis
521800: Cirrhosis
521900: Acute pancreatitis
522000: Chronic pancreatitis
522300: Cholelithiasis
522500: Malignant neoplasm of hepatobiliary system

522700: Non-malignant neoplasm of hepatobiliary system
523200: Other diseases of hepatobiliary system

General Surgery Base ETGs
162100: Hyper-functioning thyroid gland
162200: Hypo-functioning thyroid gland
162400: Malignant neoplasm of thyroid gland
163900: Hyper-functioning parathyroid gland
316000: Cerebral vascular disease
389000: Arterial inflammation
389500: Non-cerebral, non-coronary atherosclerosis
390300: Embolism & thrombosis of veins
390500: Phlebitis & thrombophlebitis of veins
390600: Varicose veins of lower extremity
391000: Other diseases of veins
473300: Inflammation of esophagus
474900: Diverticulitis & diverticulosis
475200: Other inflammation of intestines & abdomen
475300: Inflammatory bowel disease
475400: Malignant neoplasm of large intestine
475500: Malignant neoplasm of small intestine & abdomen
475600: Non-malignant neoplasm of intestines & abdomen
476100: Vascular diseases of intestines & abdomen
476300: Bowel obstruction
476800: Hiatal hernia
476900: Other diseases of intestines & abdomen
477100: Infection of rectum or anus
477400: Hemorrhoids
477600: Inflammation of rectum or anus
477800: Malignant neoplasm of rectum or anus
478000: Non-malignant neoplasm of rectum or anus
478500: Other diseases & disorders of rectum & anus
521900: Acute pancreatitis
522000: Chronic pancreatitis
522500: Malignant neoplasm of hepatobiliary system
522700: Non-malignant neoplasm of hepatobiliary system
523200: Other diseases of hepatobiliary system
635600: Malignant neoplasm of breast
635800: Non-malignant neoplasm of breast

636000: Other disorders of breast
666900: Psoriasis
667000: Chronic skin ulcers
667200: Bacterial infection of skin
667800: Other inflammation of skin
668000: Malignant neoplasm of skin, major
668200: Non-malignant neoplasm of skin
668901: Open wound - foot & ankle
668902: Open wound - lower leg
668903: Open wound - hip & thigh
668904: Open wound - hand & forearm
668905: Open wound - elbow & upper arm
668907: Open wound - head & face
668909: Open wound - trunk
668912: Open wound - unspecified
669001: Skin trauma, except burn & open wound - foot & ankle
669002: Skin trauma, except burn & open wound - lower leg
669003: Skin trauma, except burn & open wound - hip & thigh
669004: Skin trauma, except burn & open wound - hand & forearm
669006: Skin trauma, except burn & open wound - shoulder
669007: Skin trauma, except burn & open wound - head & face
669009: Skin trauma, except burn & open wound - trunk
669010: Skin trauma, except burn & open wound - other
669012: Skin trauma, except burn & open wound - unspecified
714100: Non-malignant neoplasm of bone & connective tissue, other than head & neck
714901: Other minor orthopedic disorders - foot & ankle
714904: Other minor orthopedic disorders - hand, wrist & forearm
714908: Other minor orthopedic disorders - back
714911: Other minor orthopedic disorders - neck
714912: Other minor orthopedic disorders - unspecified
821000: Late effects & late complications

General Surgery PEGs
70111: APPENDECTOMY
70212: CHOLECYSTECTOMY
70411: ESOPHAGOPLASTY/FUNDOPLASTY
70911: LOWER GI REMOVAL
71511: REPAIR, INGUINAL HERNIA
71711: REPAIR, UMBILICAL HERNIA

71811: UPPER GI REMOVAL
707111: GI RESTRICTIVE PROCEDURE_BAND
707112: GI RESTRICTIVE PROCEDURE_SLEEVE
707113: GI RESTRICTIVE PROCEDURE_BYPASS

OBGYN Base ETGs
164300: Female sex gland disorders
587100: Infection of upper genitourinary system
587200: Sexually transmitted diseases, primary
587300: Sexually transmitted diseases, disseminated
587400: Infection of lower genitourinary system, not sexually transmitted
588000: Inflammation of genitourinary system, except kidney stones
588800: Non-malignant neoplasm of genitourinary system, except prostate
589000: Trauma to genitourinary system
589200: Urinary incontinence
589500: Other diseases of genitourinary system
601100: Pregnancy, with delivery
602100: Ectopic pregnancy
602200: Spontaneous abortion
602300: Induced abortion
633200: Infection of ovary &/or fallopian tubes
633500: Infection of uterus
633700: Infection of cervix
633900: Monilial infection of vagina (yeast)
634000: Infection of vagina except monilial
634200: Endometriosis
634300: Inflammatory condition of female genital tract, except endometriosis
634400: Malignant neoplasm of cervix
634500: Malignant neoplasm of ovaries
634600: Malignant neoplasm of uterus
634700: Non-malignant neoplasm of female genital tract
634900: Conditions associated with menstruation
635100: Conditions associated with infertility
635300: Other diseases of female genital tract
635600: Malignant neoplasm of breast
635800: Non-malignant neoplasm of breast
636000: Other disorders of breast
667300: Viral skin infection
712000: Osteoporosis
748000: Uncomplicated neonatal management
748500: Other disorders, antenatal origin

748700: Other neonatal disorders, perinatal origin
779000: Exposure to infectious diseases
779400: Routine exam
779600: Contraceptive management

Neurology Base ETGs
316900: Migraine headache
405300: Other disorders of ear/nose/throat
319900: Neurological diseases signs & symptoms
869900: Isolated signs, symptoms & non-specific diagnoses or conditions
315200: Epilepsy
317700: Inflammation of non-cranial nerves, except carpal tunnel
315100: Multiple sclerosis
318600: Other neurological diseases
712208: Joint degeneration, localized - back
316000: Cerebral vascular disease
712211: Joint degeneration, localized - neck
317100: Congenital disorders of central nervous system
318400: Congenital disorders of peripheral nerves
316700: Hereditary & degenerative diseases of central nervous system, other
317300: Inflammation of cranial nerves
317500: Carpal tunnel syndrome
240600: Other neuropsychological or behavioral disorders
714911: Other minor orthopedic disorders - neck
316800: Parkinson's disease
315000: Inflammation of central nervous system, other
316300: Brain trauma
353600: Visual disturbances
714908: Other minor orthopedic disorders - back
240100: Attention deficit disorder
714912: Other minor orthopedic disorders - unspecified
350600: Inflammatory eye disease
239100: Organic drug or metabolic disorders
353700: Other & unspecified diseases & disorders of eye & adnexa
315600: Non-malignant neoplasm of central nervous system
316400: Alzheimer's disease
318300: Traumatic disorders of non-cranial nerves
714611: Minor orthopedic trauma - neck
714608: Minor orthopedic trauma - back

715108: Orthopedic deformity - back
239000: Dementia
314300: Nonviral encephalitis
316600: Amyotrophic lateral sclerosis
715101: Orthopedic deformity - foot & ankle
712202: Joint degeneration, localized - knee & lower leg
239200: Autism & child psychoses
317900: Peripheral nerve neoplasm
714901: Other minor orthopedic disorders - foot & ankle
715107: Orthopedic deformity - head & face
712212: Joint degeneration, localized - unspecified
714601: Minor orthopedic trauma - foot & ankle
712204: Joint degeneration, localized - hand, wrist & forearm

Endocrinology Base ETGs
162200: Hypo-functioning thyroid gland
163000: Diabetes
162300: Non-toxic goiter
162100: Hyper-functioning thyroid gland
388100: Hypertension
162400: Malignant neoplasm of thyroid gland
164400: Male sex gland disorders
165300: Other diseases of endocrine glands
164500: Nutritional deficiency
712000: Osteoporosis
164800: Obesity
163400: Non-malignant neoplasm of pituitary gland
169900: Endocrine disease signs & symptoms
164300: Female sex gland disorders
165100: Other metabolic disorders
162600: Other diseases of thyroid gland
164700: Hyperlipidemia, other
163900: Hyper-functioning parathyroid gland
163600: Hypo-functioning adrenal gland
163500: Hyper-functioning adrenal gland
163800: Non-malignant neoplasm of adrenal gland
164000: Hypo-functioning parathyroid gland
162500: Non-malignant neoplasm of thyroid gland
352400: Diabetic retinopathy
163300: Malignant neoplasm of pituitary gland

163700: Malignant neoplasm of adrenal gland
164100: Malignant neoplasm of parathyroid gland
162000: Lipidoses (Gaucher's Disease, Fabry's Disease, Mucopolipidosis I-III)

Appendix C

Specialty types included as part of the peer groups

Provider Specialty	Specialty Codes
Cardiology	Cardiovascular Disease
Endocrinology	Endocrinology
Orthopedics	Orthopedic Surgery
	Physician Assistants
	Sports Medicine
Gastroenterology	Gastroenterology
	Ambulatory Surgery Center
General Surgery	General Surgery
	Colorectal Surgery
	Physician Assistants
	Proctology
Neurology	Neurology
OBGYN	Obstetrics
	OBGYN
	Gynecology
	OBGYN Group
	OB&GYN
	Midwife, Certified Nurse
	NP-OBGYN
	NP-Women's Health

Appendix D

Cardiology Subspecialty Peer Groups

Full Label	Description
Non-Interventionist	A practice with low treatment rates on their episodes- under 10%
Catheterizations Only	Practice does catheterizations (stents and angioplasties), but no more involved treatments
Implants and Catheterizations	Practice does catheterizations, and implants, but no more involved treatments
All Services	Practices does all kinds of treatments- catheterizations, implants, and electrophysiology studies

Ortho Subspecialty Peer Groups

Full Label	Description
Low Treatment	Practice has treatment procedures on 10% or fewer of their episodes
Spine/Neck/Back	Specialist- Spine, Neck and Back
Knee, Arm,, and Shoulder	Specialist – Knee, Arm and Shoulders
Hand/Wrist	Specialist- Hand, Carpal Tunnel
All Services	All other general Orthopedic practices