

# Cigna Centers of Excellence Hospital Value Tool 2015 Methodology

For Hospitals

Updated: February 2015

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## Introduction

We annually evaluate hospital patient outcomes and cost-efficiency information through the Cigna Centers of Excellence (COE) program. The 2015 hospital profiles will be available in the online health care professional directory on the secure Cigna website for covered individuals, beginning January 1, 2015.

The profiles contain information for up to 27 inpatient surgical procedures and medical conditions, 9 of which contribute to four categories that combine related procedures, and are available for most Cigna-participating hospitals. A score of up to three stars (\*) each for both patient outcomes and cost-efficiency measures can be received for each procedure and condition evaluated. Hospitals that attain either six or five stars (three stars for patient outcomes + two stars for cost-efficiency OR three stars for cost-efficiency + two stars for patient outcomes) receive the Cigna Center of Excellence designation for that procedure or condition.

Approximately 83% (4,004 of 4,809) of hospitals participating in our network, including those in third party vendor networks, met the defined volume criteria for evaluation of at least one surgical procedure or medical condition for 2015.

Because the COE program reflects only a partial assessment of quality and cost-efficiency for select hospitals, it should not be the sole basis for decision-making, and we encourage covered individuals to consider all relevant factors and to speak with their treating physician when selecting a hospital. Assessments under this program are not utilized as the sole basis for performance based payments to Cigna-contracted hospitals. However, assessments may be a component of an overall pay for performance based payment methodology with some contracted hospitals.

## Surgical Procedures and Medical Conditions

The 27 surgical procedures and medical conditions used for the 2015 hospital profiles, listed in Table 1, are determined by volume, variability of outcome, and consumer interest.

**Table 1: 2015 Individual Level Assessments – Surgical Procedures and Medical Conditions**

<b>General Surgery</b>	<b>Cardiac Care</b>	<b>Orthopedics</b>
Colon Surgery Laparoscopic Gallbladder Removal Total Abdominal Hysterectomy Radical Prostatectomy Removal of Kidney/Ureter	Coronary Artery Bypass Surgery Cardiac Defibrillator Implant Cardiac Pacemaker Implant Heart Valve Replacement	Total Hip Replacement Total Knee Replacement
<b>Obstetrics and Gynecology</b>	<b>Gastroenterology</b>	<b>Neurologic</b>
Cesarean Section** Vaginal Delivery** Surgery for Female Reproductive Cancer Mastectomy/Lumpectomy for Breast Cancer	Bariatric Surgery	Stroke Head & Neck Endarterectomy

\*\* Conditions and Procedures not included in reporting for states where MedPAR data is the only source, cost transparency displays will show for these conditions in MedPAR states and low volume facilities

## 2015 Category Level Assessments

<b>Orthopedic Back</b>	<b>General Cardiac Medical</b>	<b>Elective Cardiac Medical</b>	<b>Pulmonology Medical</b>
Disc Surgery Spinal Fusion	Heart Attack Heart Failure Irregular Heartbeat	Cardiac Catheterization Angioplasty, with/without Stent	Chronic Obstructive Pulmonary Disorder (COPD)  Pneumonia – Adult



## Patient Outcomes Data Sources

We assess the quality of care provided to patients treated for one of the 27 surgical procedures and medical conditions, 9 of which contribute to four medical and surgical categories using measures of patient outcome derived from publicly available, hospital self-reported All-Payer and MedPAR data. All-Payer data are available in 21 states (See Appendix 1) and MedPAR data is available in 30 states (See Appendix 1). MedPAR data is used where All-Payer data is not available.

Note: Tennessee Maine and New Hampshire are All- Payer states; however, only MedPAR data were used for these states due to the age of these states' All-Payer data. Two years of hospital data were used in the analysis, either 2010-2011 or 2011-2012 for All-Payer data states, and 2011-2012 for MedPAR data states. (See Appendix 1 for detail.)

Hospital admission volume for each surgical procedure or medical condition must meet a minimum of 100 incidences during the measurement period to be evaluated. For 2015 Bariatric surgery must meet a minimum of 50 admissions. Hospital admission volume for category level evaluation must meet a minimum of 50 admissions per each condition within the category during the measurement period.

## Construction of the Cigna Hospital Quality Index

The Cigna Hospital Quality Index is a composite index that we use to rank hospital performance for each of the COE eligible medical conditions and surgical procedures. It is comprised of seven component indices that each measures a dimension of hospital quality performance. Overall Hospital Quality Index scores are determined using two to four of the individual quality index components, depending on the specific condition/procedure being assessed (See Appendix 4). The component indices are as follows:

- Complications Index
- Mortality Index
- CMS Specific Condition Index
- CMS Predicted Readmission Rate Index
- Surgical Care Improvement (SCIP) Index
- Primary C-Section Delivery Rate Index
- Leapfrog Index

Each of the seven component hospital quality indices are described in the following section of this document.

## Complications Index

A Complications Index is designed to assess whether a hospital has a pattern of complications for patients who have one of the COE program's assessed surgical procedures or medical conditions. The index is constructed using Agency for Healthcare Research and Quality (AHRQ) Patient Safety Indicator specifications. The complication index then contributes to the Cigna Hospital Quality Index for a given hospital and surgical procedure or medical condition along with other quality indices, each index receiving a designated weight.

The following steps are involved in the construction of the Complications Index:

1. Identify each patient during the data period that underwent an assessed COE program surgical procedure or received treatment for an assessed COE program medical condition at Hospital A. This population of patients is identified using specific MS-DRG and ICD-9 Procedure Code logic developed by WebMD (See Appendix 2).

Note: Where condition categories are defined (Orthopedic Back Surgery, General Cardiac Medical, Elective Cardiac Medical, Pulmonology Medical), COE status is awarded for the condition category and not for the individual medical conditions or surgical procedures that comprise the category. (See Table 1 for definitions.)



- For each procedure or condition-specific population of patients, determine whether each patient in that population was at risk for one or more of 13 medical or surgical complications as defined by Agency for Healthcare Quality and Research (AHRQ) Patient Safety Indicators (PSIs). If they are at risk, determine if the patient experienced that complication. At risk status for the complication is determined using the relevant PSI denominator specifications, while an occurrence of the complication is determined using the relevant PSI numerator specifications. The specific complications that are evaluated are displayed below:

**Table 2: AHRQ Patient Safety Indicators (PSIs) Used to Calculate Complications Index**

PSI	Complication Name	Category of Quality Indicator	Type of Indicator
PSI 1	Complications of anesthesia	Patient Safety Indicators	Complications
PSI 3	Decubitus ulcer	Patient Safety Indicators	Complications
PSI 5	Foreign body left in	Patient Safety Indicators	Complications
PSI 6	Iatrogenic pneumothorax	Patient Safety Indicators	Complications
PSI 7	Central venous catheter-related bloodstream infections	Patient Safety Indicators	Complications
PSI 8	Post-op hip fracture	Patient Safety Indicators	Complications
PSI 9	Post-op hemorrh/hematoma	Patient Safety Indicators	Complications
PSI 10	Post-op physiology or metabolism derangement	Patient Safety Indicators	Complications
PSI 11	Post-op respiratory failure	Patient Safety Indicators	Complications
PSI 12	Post-op PE or DVT	Patient Safety Indicators	Complications
PSI 13	Post-op sepsis	Patient Safety Indicators	Complications
PSI 14	Post-op wound dehiscence	Patient Safety Indicators	Complications
PSI 15	Accidental puncture/laceration	Patient Safety Indicators	Complications
PSI 16	Transfusion reaction	Patient Safety Indicators	Complications

Detailed specifications for all AHRQ Patient Safety Indicators (PSIs) can be found at:  
[http://www.qualityindicators.ahrq.gov/modules/psi\\_overview.aspx](http://www.qualityindicators.ahrq.gov/modules/psi_overview.aspx).

- If the patient was at risk for one or more specific complications as defined by the above PSIs, a value of one (1) is assigned. If the patient was not at risk for one or more specific complications as defined by the above PSIs, a value of zero (0) is assigned. The resulting number (1 or 0) accumulates in the denominator. This process is repeated for all patients in the identified population.
- If the patient was at risk and actually experienced one or more complications as defined by the above PSIs, a value of one (1) is assigned. If the patient did not experience one or more complications as defined by the above PSIs, a value of zero (0) is assigned. The resulting number (1 or 0) accumulates in the numerator. This process is repeated for all patients in the identified population.
- The result of this process will be a fraction between 0.0 and 1.0 that reflects an overall complication rate (i.e., the percentage of patients at risk for medical and surgical complications who experienced one or more complications as a result of the surgical procedure or treatment for the specified medical condition). Note: This means that the individual AHRQ PSIs are not used to calculate complication-specific rates for a hospital, but rather the PSI technical specifications for the numerator (complication occurrence) and denominator (at-risk for complication) are used to arrive at an overall aggregate complication rate for the surgical procedure or medical condition being assessed.



6. All complication rates are APR-DRG case mix and severity adjusted, respective to teaching/non-teaching facility status.
7. A modified (volume-weighted) z-score is calculated to determine whether there is a significant statistical difference between each hospital's actual complication rate and the expected (average) complication rate for the surgical procedure/medical condition, with teaching hospitals and non-teaching hospitals being analyzed separately.
8. The difference in actual to expected complication rate for each hospital is evaluated for statistical significance at both a 90% and an 80% confidence level.
  - a. If a hospital's complication rate is significantly lower than the expected complication rate with a 90% confidence level, the hospital is assigned a Complications Index value of 0.5.
  - b. If a hospital's complication rate is significantly lower than the expected complication rate with an 80% confidence level, the hospital is assigned a Complications Index value of 0.75.
  - c. If a hospital's complication rate is not significantly different than the expected complication rate with an 80% confidence level, the hospital is assigned a Complications Index value of 1.0.
  - d. If a hospital's complication rate is significantly higher than the expected complication rate with an 80% confidence level, the hospital is assigned a Complications Index value of 1.25.
  - e. If a hospital's complication rate is significantly higher than the expected complication rate with a 90% confidence level, the hospital is assigned a Complications Index value of 1.50.

This value for each hospital (i.e., the Complications Index) is used as one component of the Cigna overall Hospital Quality Index to which a weight is applied using the quality index weighting grid (See Appendix 2).

### **Mortality Index**

Cigna utilizes ARHQ software to construct a Mortality Index based on AHRQ Inpatient Quality Indicators (IQIs) for each hospital being evaluated for COE status for the following conditions/procedures and medical categories:

- AMI (heart attack)
- Stroke
- CHF
- Pneumonia
- Heart Valve Replacement
- Pulmonology Medical Category (COPD, adult pneumonia)
- General Cardiology Medical Category (AMI, CHF, irregular heartbeat)

The following steps are involved in the construction of the Mortality Index:

1. Identify each patient during the data period that underwent an assessed COE program surgical procedure or received treatment for an assessed COE program medical condition at each hospital being evaluated. This population of patients is identified using specific MS-DRG and ICD-9 Procedure Code logic developed by WebMD (See Appendix 2).



2. For each patient, determine whether he/she was at risk of death and died for the procedure/condition being assessed. The AHRQ software analyzes the ICD-9 and CPT data for each patient as well as the discharge disposition in the hospital's patient population for each relevant IQI.
3. For each patient, create a composite indicator. If the patient was at-risk of death for one or more of the AHRQ inpatient quality indicators, they are assigned a one (1) in the denominator of the composite indicator otherwise they are assigned a 0 (zero). If the patient was determined to be at-risk of death for one or more of the AHRQ inpatient quality indicators and actually died then the patient is assigned a one (1) in the numerator for the composite indicator, otherwise a 0 (zero) is assigned.
4. The numerators of the composite indicator (representing the number of patients who died) of all patients in the patient population that were hospitalized for the procedure or condition being assessed are then added. Similarly, the denominators of the composite indicator (representing the number of patients who were at-risk for death) of all patients in the patient population that were hospitalized for the procedure or condition being assessed are then added.
5. The numerator divided by the denominator produces the raw mortality rate, which is then APR-DRG case mix and severity adjusted, respective to teaching or non-teaching facility status, to produce the Adjusted Mortality Rate.
6. A modified (volume-weighted) z-score is calculated to determine whether there is a significant statistical difference between each hospital's actual mortality rate (risk adjusted) and the expected (average) mortality rate (risk adjusted) for the surgical procedure or medical condition, with teaching hospitals and non-teaching hospitals being analyzed separately.
7. The difference in actual to expected mortality rate for each hospital is evaluated for statistical significance at both a 90% and an 80% confidence level.
  - a. If a hospital's mortality rate is significantly lower than the expected mortality rate with a 90% confidence level, the hospital is assigned a Mortality Index value of 0.5.
  - b. If a hospital's mortality rate is significantly lower than the expected mortality rate with an 80% confidence level, the hospital is assigned a Mortality Index value of 0.75.
  - c. If a hospital's mortality rate is not significantly different than the expected mortality rate with an 80% confidence level, the hospital is assigned a Mortality Index value of 1.0.
  - d. If a hospital's mortality rate is significantly higher than the expected mortality rate with an 80% confidence level, the hospital is assigned a Mortality Index value of 1.25.
  - e. If a hospital's mortality rate is significantly higher than the expected mortality rate with a 90% confidence level, the hospital is assigned a Mortality Index value of 1.50.

This value for each hospital (i.e., the Mortality Index) is used as one component of the Cigna overall Hospital Quality Index to which a weight is applied using the quality index weighting grid (See Appendix 4).



### **CMS Specific Condition Indices**

Condition-specific indices are constructed for the following conditions using hospital-level process of care quality measures from the CMS Hospital Compare database: acute myocardial infarction (heart attack), heart failure, and pneumonia. These condition-specific indices assess hospital processes that have been associated with improved patient outcomes. The indices are used as a component of the Cigna Hospital Quality Index for evaluating hospital performance in providing care for these conditions. For more information, please go to: [http://www.jointcommission.org/core\\_measure\\_sets.aspx](http://www.jointcommission.org/core_measure_sets.aspx).

The following steps are involved in the construction of condition-specific quality indices:

1. The CMS Hospital Compare database is accessed to obtain hospital-specific quality data for the three condition categories – acute myocardial infarction (heart attack), heart failure, and pneumonia. Each of these condition categories includes specific process measures. The results are then used to construct three quality indices, one for each medical condition.
2. A weighted average of the measures belonging to each condition category is calculated in order to produce a raw rollup or composite measure. (See Appendix 3.)
3. A Specific Condition Raw Index is created for each of the three conditions by dividing the hospital's score by the average of all hospitals' scores. Teaching hospitals and non-teaching hospitals are analyzed separately.
4. This Specific Condition Raw Index is then subtracted from 2.0 in order to generate a Specific Condition Index that reflects the hospital's adherence to the condition-specific sub measures and that is directionally consistent in terms of value with other index components of the overall Hospital Quality Index.
5. The Specific Condition Index for each of the three medical conditions is trimmed so that any index value greater than 1.5 is assigned a value of 1.5 and any index value less than 0.5 is assigned a value of 0.5. This helps prevent skewing the overall Cigna Hospital Quality Index.
6. Each Specific Condition Index then receives a weight of 0.20 (See Appendix 4) and contributes to the Cigna Hospital Quality Index for the appropriate condition.

### **CMS Predicted Readmission Rate Index**

Predicted hospital readmission rate indices using Centers for Medicare & Medicaid (CMS) Hospital Compare readmission rate data are constructed for the same medical conditions as for the CMS specific condition indices (acute myocardial infarction, heart failure, and pneumonia) and are used as a component in the construction of the overall Cigna Hospital Quality Index for evaluating hospital performance for these three medical conditions.

The condition-specific CMS predicted readmission rate for each hospital is divided by the average condition-specific predicted readmission rate for all hospitals nationally (teaching hospitals and non-teaching hospitals are analyzed separately) in order to generate a CMS Readmission Rate Index for the hospital condition. If the CMS Predicted Readmission Rate Index is less than 1.0, the hospital is performing at a higher quality level than its peer group (teaching or non-teaching hospitals). A score of 1.0 represents average performance, and a score greater than 1.0 represents a lower level of quality performance.

The CMS Predicted Readmission Rate Index for pneumonia is used for the Pulmonology Medical condition category as a reasonable approximation since a CMS Predicted Readmission Rate for COPD is not available. The CMS Predicted Readmission Rate Indices for acute myocardial infarction and heart failure are blended to generate a Predicted Readmission Rate Index for the General Cardiac Medical condition category.



The CMS Predicted Readmission Rate Index for the hospital then receives a weight of 0.15 and contributes to the overall Cigna Hospital Quality Index for the hospital for the relevant condition categories: Pulmonology Medical and General Cardiac Medical.

### **CMS Surgical Care Improvement Project (SCIP) Index**

A Surgical Care Improvement Project index is constructed using CMS Hospital Compare data. This index is a measure of hospital performance for having quality processes in place that have been demonstrated to prevent post-operative surgical complications, including infections.

A process similar to that used to construct the CMS Specific Condition Index and the CMS Readmission Rate Index is used to construct the CMS Surgical Care Improvement Index. A weighted average of CMS defined Surgical Care Improvement process quality measures (See Appendix 3) is calculated and then compared to national averages for teaching and non-teaching hospitals to create the index. The index receives a weight of 0.35 (See Appendix 4) and contributes to the Cigna Hospital Quality Index for all surgical procedures being evaluated for hospital performance.

### **Primary C-Section Delivery Rate Index**

A primary C-section Delivery Rate Index is constructed using the AHRQ Inpatient Quality Indicator (IQI #33). This quality measure is the percentage of all deliveries that are C-section deliveries and is used to evaluate each assessed hospital's quality performance related to vaginal deliveries. Deliveries with a diagnosis of abnormal presentation, preterm, fetal death, multiple gestation, or previous cesarean delivery are excluded from the denominator of the measure as are cases in which any breech procedure code is present.

A process similar to that used to construct the Complication Index that is based on other AHRQ Patient Safety Indicator measures is used to construct the Primary C-section Delivery Rate Index. The index receives a weight of 0.15 and contributes to the overall Cigna Hospital Quality Index for the assessment of vaginal delivery hospital performance.

### **Leapfrog Index**

The Leapfrog Group, a partnership of employers, purchasers, and public agencies, uses its members' collective leverage to initiate breakthrough improvements in the safety, quality, and affordability of health care for Americans. By means of its annual Leapfrog Hospital Survey, the Leapfrog Group collects data on a range of quality and safety practices and outcomes that are used to rate hospitals on their performance.

We use the following specific Leapfrog measures to calculate a composite Leapfrog Index for those hospitals targeted by Leapfrog to report data. If the hospital is not targeted a leapfrog score is not calculated. If a hospital is targeted and opts not to report, the hospital will receive the lowest score. This index is then used as one of the components of the overall Cigna Hospital Quality Index.

The following Leapfrog measures are used to calculate the Leapfrog index:

- Computer Physician Order Entry (CPOE)
- ICU Physician Staffing
- Hospital Acquired Conditions (HAC): Central line associated blood stream infections
- Never Events
- Safe Practices

Each Leapfrog measure is rated by Leapfrog on a 1-4 scale:

- 1 = Willing to report
- 2 = Some progress
- 3 = Substantial progress
- 4 = Fully meets standards



The following steps are involved in calculating a Leapfrog Index:

1. Each Leapfrog measure score is transformed to a converted Leapfrog score so that the resulting index is consistent with the quantitative direction of other indexes we use to calculate the Cigna Hospital Quality Index: a Leapfrog value of 4 (fully implemented) is assigned a converted score of 1; 3 (good progress) is assigned a converted score of 2; 2 (some progress) is assigned a converted score of 3; 1 (willing to report) is assigned a converted score of 4. Targeted hospitals that do not report data for a measure are assigned a converted score of 5. Hospitals that are not targeted by Leapfrog or do not provide the service are not included in the evaluation.
2. A hospital specific Leapfrog composite score is calculated by taking an average of the converted individual Leapfrog measure scores, (i.e., dividing the sum of the individual converted scores by the number of Leapfrog measures).
3. An average composite Leapfrog score for all Leapfrog data reporting hospitals nationally is then calculated for all hospitals reporting Leapfrog data by taking the average of all hospitals' Leapfrog composite scores. Separate average scores are calculated for teaching hospitals and non-teaching hospitals.
4. A hospital-specific Leapfrog Index is then calculated by dividing the hospital-specific Leapfrog score by the national average Leapfrog score for all hospitals (teaching or non-teaching average score as appropriate).
5. The resulting hospital-specific Leapfrog Index is then winsorized. Index values above 1.3 are assigned a value of 1.3; index values below 0.5 are assigned a value of 0.5.
6. The winsorized Leapfrog Index is then given a weight of 0.05 and used as a component in the calculation of the overall Cigna Hospital Quality Index for all medical conditions or surgical procedures. The 0.05 weight is reallocated equally between the remaining quality components for hospitals that do not report Leapfrog data. For example, in the case of a hospital evaluated for Coronary Artery Bypass (CABG) procedures that does not report Leapfrog data, the 0.05 Leapfrog weight would be reallocated equally between the Complications Index (weight of 0.60) and the CMS SCIP Index (weight of .35) giving a new Complications Index weight of 0.625 and a new CMS SCIP Index weight of .375 for that hospital for CABG procedures.

### Patient Outcomes: Hospital Quality Index Calculation and Scoring

The overall Cigna Hospital Quality Index composite score is calculated as follows:

Hospital Quality Index = (Complications Index) (Complications weighting) + (Mortality Index) (Mortality Weighting) + (Surgical Infection Prevention Index) (SCIP weighting) + (CMS Readmission Rate Index) (CMS Readmission Rate Index weighting) + (CMS Condition Specific Index) (CMS Condition Specific Index weighting) + (Primary C-section Delivery Rate Index) (Primary C- Section Delivery Rate Index weighting) + (Leapfrog Index) (Leapfrog weighting)

The Hospital Quality Indices for all evaluated hospitals are then ranked in numerical order within medical condition or category and then separated into three performance categories according to the following distribution:

- Bottom 25% - One Quality Star (\*)
- Middle 65% - Two Quality Stars (\*\*)
- Top 10% - Three Quality Stars (\*\*\*)

Patient Outcomes quality stars are displayed in the online healthcare professional directory on our secure website for individuals, myCigna.com. A given hospital may be awarded one star (below average), two stars (average), or three stars (above average) for certain conditions and procedures as hospital performance for each condition and procedure is evaluated separately.



As previously referenced on page three of this document, to be sure that hospital data is annually stable; a “stable volume threshold” is established. This threshold helps mitigate the variation in the hospital rankings from year to year and provides a volume baseline that can be used when comparing data in future years.

Volume is also used as an indirect indicator of quality. There is evidence that suggests that “hospitals performing more of certain intensive, high-technology, or highly complex procedures may have better outcomes for those procedures” (AHRQ IQI Guide, V 2.1, Rev 4, Dec 22, 2004). Having credible volume thresholds helps ensure that hospitals that have “suspect” or “questionable” quality due to low volumes are eliminated from consideration since lower volumes of admissions lead to more variation in the outcomes of those admissions.

### **Bariatric Centers of Excellence Evaluation**

Cigna has two bariatric center designation programs - a 3 Star Quality designation and the Center of Excellence (COE) designation.

To receive the Center of Excellence designation, hospitals and bariatric treatment facilities that attain three stars for patient outcomes and at least two stars for cost-efficiency will receive the COE designation. Hospitals need to perform at least 50 inpatient bariatric procedures to be evaluated for cost-efficiency.

To meet the 3 Star Quality designation, the bariatric treatment facility must be accredited by the Metabolic and Bariatric Surgery Accreditation and Quality Improvement Program (MBSAQIP). A hospital would still need to achieve at least 2 cost stars to receive COE designation for a total of five stars.

In June 2014, the Metabolic and Bariatric Surgery Accreditation and Quality Improvement Program (MBSAQIP) began to distinguish between different types of accreditation, including Comprehensive, Lap band, low acuity, etc. Beginning in October 2014, for 3 Star Quality and COE designations, Cigna will accept only the Comprehensive and Comprehensive with Adolescent accreditation types for facilities that are newly accredited by MBSAQIP.

For facilities that have been accredited by MBSAQIP and given the 3 Star Quality designation and/or the COE designation, we will grandfather these facilities and allow them to continue their COE status with Cigna until January 1, 2016. At that time if the facility has not pursued and achieved the Comprehensive or the Comprehensive with Adolescent accreditation types they will lose their designation status with Cigna.

### **Cost-Efficiency: Hospital Cost-Efficiency Score Calculation**

Cost efficiency is a measure of a hospital's average cost for a particular procedure or condition, severity adjusted for national comparison. This facility-based average cost per condition or procedure will be referred to from this point as the Cost-Efficiency Score. Physicians' fees and outpatient services are not included in the Cost-Efficiency Score.

The Cost-Efficiency Score for each condition or procedure within each hospital is modeled so that average condition or procedure costs for different hospitals with different payment mechanisms (per diem rate, case rate, and discount from charges) can be compared to one another, thus allowing us to compare the cost-efficiency performance of hospitals with different payment types in the same market.

The average cost reflects both the rates that a hospital charges and the average time spent in the hospital for a specific surgical procedure or medical condition. The Cost-Efficiency Score for a medical condition or surgical procedure may be affected by a variety of factors, including geographic cost differences (e.g., major metropolitan areas typically have higher costs compared to rural areas) and the cost information used to calculate the national average cost.



We use the hospital-specific Open Access Plus contracted rates in effect as of January 1, 2014 to model the average inpatient cost for each COE procedure or condition for each hospital being evaluated. To assist us with this modeling, we use Scenario<sup>®</sup>, a software package that we developed. The rate calculations used in the Scenario modeling tool include diagnosis related group (DRG) exceptions, stop loss language and applicable carve-outs.

Based on the specific hospital contract for each facility, the modeled average cost calculated by the Scenario software for each condition or procedure within the facility can be a case rate, a discount from billed charges or a per diem, depending on the type of rate applicable for a given hospital.

For case rates, the Cost-Efficiency Score is equal to the case rate modeled through the Scenario software. There are no additional adjustments or calculations for case rates. No severity adjustment is applied to case rates.

Example: The Scenario software returns a case rate of \$15,000 for a knee replacement at Hospital X. The Cost-Efficiency Score would be \$15,000.

For a per diem, we use the average length of stay data, available on the publicly available All-Payer and Medicare data for the hospital being evaluated for each condition, to calculate the Cost-Efficiency Score. A severity adjustment based on APR-DRGs is applied to this average length of stay for each facility, for each condition. The Cost-Efficiency Score is calculated by multiplying the per diem rate (derived from the Scenario software) by the severity adjusted average length of stay from the All-payer/Medicare databases.

Example: The Scenario software returns a per diem rate of \$4,000 per day for a knee replacement at Hospital Y. The average length of stay for a knee replacement at Hospital Y is 3 Days. After applying the APR-DRG severity adjustment, the adjusted average length of stay is 4 days. The Cost-Efficiency score is \$16,000: \$4,000 (per diem rate) \* 4 (severity-adjusted average length of stay).

For a discount arrangement, we use the average charge data, available on the publicly available All-Payer and Medicare databases for the hospital being evaluated for each condition, to calculate the Cost-Efficiency Score. A severity adjustment, based on APR-DRGs, is applied to this average charge for each facility for each condition. The Cost- Efficiency Score is calculated by multiplying the discount rate (derived from the Scenario software) by the severity- adjusted average charge from the All-payer/Medicare databases.

Example: The Scenario software returns a discount rate of 30% for a knee replacement at Hospital Z. The average charge from the All-Payer database, for a knee replacement at Hospital Z is \$26,000. After applying the APR-DRG severity adjustment, the adjusted average charge is \$27,000. The Cost-Efficiency score is \$18,900: \$27,000 (severity adjusted average charge) \* .7 (1 - the discount rate of 30%).

The modeled average cost for a given hospital for a specific medical condition or procedure is used to assess hospital results in each geographic market as detailed in the following section. For the purpose of cost-efficiency comparisons, teaching and non-teaching hospitals are not analyzed separately. The modeled average hospital cost for a given medical condition or procedure is displayed in the online hospital directory as a range.



## Cost-Efficiency: Hospital Cost-Efficiency Score Ranking

The Cost-Efficiency Scores (modeled average costs for a specific medical condition or procedure) for all evaluated hospitals in a geographic market are ranked in numerical order and then separated into three performance categories according to the following distribution:

- Bottom 33% (highest average cost) One Cost-Efficiency Star (\*)
- Middle 33% (intermediate average cost) Two Cost-Efficiency Stars (\*\*)
- Top 33% (lowest average cost) Three Cost-Efficiency Stars (\*\*\*)

The distribution of condition or procedure average costs determines the number of cost-efficiency displayed online.

Because a hospital's Cost-Efficiency Score is calculated for each individual medical condition and surgical procedure evaluated under the Cigna Centers of Excellence program, it is possible (and quite common) for a given hospital to be awarded different numbers of cost-efficiency stars for different conditions and procedures.

## Additional Information

### No Results Shown

Hospital data may not display in the online health care professional directory for many reasons, including but not limited to:

- there is insufficient patient volume or All-Payer or MedPAR data available for that procedure or condition,
- a surgical procedure is not performed or a condition is not treated at the hospital, or
- contract limitation prohibits display of cost and quality data

### Academic Teaching and Community Hospitals

A hospital's Patient Outcomes results are compared to the hospital's peer group, either community hospitals or teaching/academic hospitals. The results are combined together for display purposes within the online search results. The community versus teaching/academic hospital comparison only applies to the Patient Outcomes measure.

### Updating Centers of Excellence and Hospital Value Tool Data

Centers of Excellence and Hospital Value Tool data are generally analyzed and refreshed annually. While every attempt is made to use the best available data and nationally recognized standards, we acknowledge that Patient Outcomes and Cost-Efficiency standards continue to evolve. Accordingly, individuals are not encouraged to use this information as the sole basis for decision-making and to consult with their treating physician when selecting a hospital.

### Process for Hospitals to Request Results

Hospitals should contact their contractor or contact Cigna Customer Service at 1.800.88Cigna (882.4462) for a copy of their specific results.

### Process for Hospitals to Correct Errors or Request Reconsideration

A hospital can request to review data, Patient Outcomes and Cost-Efficiency ratings, or request reconsideration, correct errors, or submit additional information for review and reconsideration by email to [PhysicianEvaluationInformationRequest@Cigna.com](mailto:PhysicianEvaluationInformationRequest@Cigna.com) or by fax to 1.866.448.5506. The facility name, tax identification number, and contact information must be included in the request. A Network Clinical Manager will contact the facility to discuss the request and to initiate the Selection Review Committee review process. The Selection Review Committee will meet within 30 days of receipt of submitted documentation and provide a written response to the requested review.



### Process to Provide Feedback

Individuals with Cigna-administered coverage, clients, and participating physicians and hospitals are encouraged to provide feedback and improvement suggestions. Clients and individuals with Cigna-administered coverage should call the telephone number listed on the back of their ID card. Participating physicians and hospitals may provide feedback by email to [PhysicianEvaluationInformationRequest@Cigna.com](mailto:PhysicianEvaluationInformationRequest@Cigna.com), or by fax to 1.866.448.5506. Methodology changes are reviewed and implemented annually.



## Appendices

### APPENDIX 1: Data Sources for COE

#### All-Payer Data States (2010/2011 Data)

Utah
Vermont

#### All-Payer Data States (2011/2012 Data)

Colorado	New York
Florida	North Carolina
Illinois	Oregon
Iowa	Pennsylvania
Maryland	Rhode Island
Massachusetts	Virginia
Nevada	Wisconsin
New Jersey	Arizona
California	Washington
Texas	

#### MedPAR Data States (2011/2012 Data)

Alabama	Minnesota
Arkansas	Mississippi
Alaska	Missouri
Delaware	Montana
Connecticut	Nebraska
District of Columbia	New Hampshire
Georgia	New Mexico
Hawaii	North Dakota
Idaho	Ohio
Indiana	Oklahoma
Kansas	South Carolina
Kentucky	South Dakota
Louisiana	Tennessee
Maine	West Virginia
Michigan	Wyoming



## APPENDIX 2: Condition/Procedure Population Specifications

#	WebMD Condition/Category	MDC#	DX #	Med Surg	CMS Index Used	MS-DRGs		ICD9 Procedure Codes		ICD9 Diagnosis Codes
1	Elective Cardiac Medical	5	993	Med/Surg	CMS SCIP index	246, 247, 248, 249, 250, 251, 286, 287	and	PP 3606, 3607, 0066		
2	Angioplasty, with and without Stent	5	8	Surg	CMS SCIP index	246, 247, 248, 249, 250, 251	and	PP 3606, 3607, 0066		
3	Cardiac Catheterization	5	23	Med	NONE	286, 287				
4	General Cardiac Medical	5	992	Med	CMS HF/HA index	280, 281, 282, 283, 284, 285, 291, 292, 293, 308, 309, 310				
5	Heart Attack	5	75	Med	CMS HA index	280, 281, 282, 283, 284, 285				
6	Heart Failure	5	76	Med	CMS HF index	291, 292, 293				
7	Irregular Heartbeat	5	91	Med	NONE	308, 309, 310				
8	Orthopedic Back Surgery	1, 8	991	Surg	CMS SCIP index	028, 029, 030	and OR	PP 8100 thru 8108, 8130 thru 8139,		
						456, 457, 458, 459, 460, 471, 472, 473	OR			
						490, 491, 028, 029, 030	and	PP 8050, 8051, 0302, 0309		
9	Disc Surgery	8	51	Surg	CMS SCIP index	490, 491, 028, 029, 030	and	PP 8050, 8051, 0302, 0309		
10	Spinal Fusion	1	143	Surg	CMS SCIP index	028, 029, 030	and OR	PP 8100 thru 8108, 8130 thru 8139,		



#	WebMD Condition/ Category	MDC#	DX #	Med Surg	CMS Index Used	MS-DRGs		ICD9 Procedure Codes		ICD9 Diagnosis Codes
						456, 457, 458, 459, 460, 471, 472, 473				
11	Pulmonology Medical	4	994	Med	CMS PNE index	190, 191, 192, 193, 194, 195			and	2D 4808, 4828, 486
12	COPD (pulmonary disease)	4	37	Med	NONE	190, 191, 192				
13	Pneumonia	4	118	Med	CMS PNE index	193, 194, 195			and	2D 4808, 4828, 486
	Individual Conditions									
14	Abdominal Hysterectomy	13	153	Surg	CMS SCIP index	742, 743	and	PP 684, 686, 6839, 6849		
15	Bariatric Surgery	10	200	Surg	CMS SCIP index	326, 327, 328, 619, 620, 621	and	2P 4431, 4438, 4439, 4469, 4389, 4550, 4551, 4590, 4591, 437, 435, 436, 4493, 4495, 4499	and	2D V8535, V8536, V8537, V8538, V8539,
16	Cardiac Defibrillator Implant	5	24	Surg	CMS SCIP index	222, 223, 224, 225, 226, 227				
17	Cardiac Pacemaker Implant	5	25	Surg	CMS SCIP index	242, 243, 244, 258, 259, 260, 261, 262	and	PP 377@, 378@,		
18	Cesarean Section	14	29	Surg	CMS SCIP index	765, 766				
19	Colon Surgery	6	34	Surg	CMS SCIP index	329, 330, 331	and	PP 4571, 4572, 4573, 4574, 4575, 4576, 4577, 1731, 1732, 1733, 1734, 1735, 1736, 1737, 1738, 1739, 4581, 4582, 4583,		
								4840, 4842, 4843		



#	WebMD Condition/ Category	MDC#	DX #	Med Surg	CMS Index Used	MS-DRGs		ICD9 Procedure Codes		ICD9 Diagnosis Codes
20	Coronary Artery Bypass Surgery	5	40	Surg	CMS SCIP index	231, 232, 233, 234, 235, 236				
21	Gall Bladder Removal, Laparoscopic	7	66	Surg	CMS SCIP index	417, 418, 419	and	PP 5123, 5124		
22	Heart Valve Replacement	5	79	Surg	CMS SCIP index	216, 217, 218, 219, 220, 221	and	PP 3510, 3511, 3512, 3513, 3514, 3520, 3521, 3522, 3523, 3524, 3525, 3526, 3527, 3528		
23	Head & Neck Endarterectomy	1	74	Surg	CMS SCIP index	034, 035, 036, 037, 038, 039	and	PP 0063, 0064, 3810, 3812, 3832, 3842		
24	Hip Replacement	8	87	Surg	CMS SCIP index	466, 467, 468, 469, 470	and	PP 8151, 8152, 8153, 0070, 0071, 0072, 0073, 0074, 0075, 0076, 0077, 0085, 00		
25	Knee Replacement	8	95	Surg	CMS SCIP index	461, 462, 466, 467, 468, 469, 470	and	PP 8154, 8155, 0080, 0081, 0082, 0083, 0084		
26	Stroke	1	144	Med	NONE	061, 062, 063, 064, 065, 066				
27	Vaginal Delivery	14	166	Med	NONE	767, 768, 774, 775				
	Cancer Conditions									
28	Surgery for Female Cancer	13	154	Surg	CMS SCIP index	736, 737, 738, 739, 740, 741				
29	Mastectomy Total/Simple	9	155	Surg	CMS SCIP index	579, 580, 581, 582, 583	and	2P = 854@ or 8533 or 8534 or 8535 or	and	2D = 174@ or 175@ or 2330
30	Prostatectomy Radical	12	126	Surg	CMS SCIP index	665, 666, 667, 707, 708	and	PP 603, 604, 605, 6061, 6062, 6069		



#	WebMD Condition/Category	MDC#	DX #	Med Surg	CMS Index Used	MS-DRGs		ICD9 Procedure Codes		ICD9 Diagnosis Codes
31	Kidney/Ureter Removal	11	93	Surg	CMS SCIP index	656, 657, 658	and	PP 554, 5551, 5552, 5554, 5640, 5641, 5642		



### APPENDIX 3: CMS Hospital Condition-Specific Quality Measures

<b>Heart Attack Care</b>	
Percent of patients given ACE Inhibitor or ARB for Left Ventricular Systolic Dysfunction (LVSD)	Heart Attack
Percent of patients given aspirin at discharge	Heart Attack
Percent of patients given Percutaneous Coronary Intervention (PCI) within 90 minutes of arrival	Heart Attack
Percent of patients given Fibrinolytic medication within 30 minutes of arrival	Heart Attack
Percent of heart attack patients who are given a prescription for a statin at discharge	Heart Attack
<b>Heart Failure Care</b>	
Percent of patients given ACE Inhibitor or ARB for Left Ventricular Systolic Dysfunction (LVSD)	Heart Failure
Percent of patients given assessment of Left Ventricular Function	Heart Failure
Percent of patients given discharge instructions	Heart Failure
<b>Pneumonia Care</b>	
Percent of patients given the most appropriate initial antibiotic(s)	Pneumonia
Percent of patients whose emergency room blood culture was performed prior to first antibiotic received in hospital	Pneumonia
<b>Surgical Care Improvement Measures</b>	
Percent of surgery patients who received preventative antibiotic(s) one hour before incision	All Surgical Procedures
Percent of surgery patients whose preventative antibiotic(s) are stopped within 24 hours after surgery	All Surgical Procedures
Percent of surgery patients that received the appropriate preventive antibiotic(s) for their surgery	All Surgical Procedures
Percent of surgery patients who were taking beta blockers prior to hospitalization who are kept on beta blockers during the period just before and after surgery	Surgical Procedures
Percent of surgery patients who got treatment at the right time (within 24 hours before or after surgery) to help prevent blood clots after certain types of surgery	All Surgical Procedures
Percent of surgery patients whose urinary catheters were removed on day 1 or 2 after surgery	All Surgical Procedures
Percent of surgical patients who were actively warmed in the OR	All Surgical Procedures
<b>Heart Surgical Procedures</b>	
Percent of all heart surgery patients whose blood sugar (blood glucose) is kept in good control in the days right after surgery	Surgical Procedures



**APPENDIX 4: Conditions and Procedures with Hospital Quality Index Component Index Weights**

<b>CONDITION / PROCEDURE DESCRIPTION</b>	<b>MORTALITY WEIGHT</b>	<b>CMS SCIP WEIGHT</b>	<b>COMPLICATION WEIGHT</b>	<b>LEAPFROG WEIGHT *</b>	<b>CMS READMIT WEIGHT</b>	<b>CMS SPECIFIC CONDITION WEIGHT</b>	<b>AHRQ IQI33 Weight</b>
Abdominal Hysterectomy	0	0.35	0.6	0.05	0	0	0
Angioplasty, with and without Stent	0	0.35	0.6	0.05	0	0	0
Cardiac Catheterization	0	0	0.95	0.05	0	0	0
Cardiac Defibrillator Implant	0	0.35	0.6	0.05	0	0	0
Cardiac Pacemaker Implant	0	0.35	0.6	0.05	0	0	0
Cesarean Section	0	0.35	0.6	0.05	0	0	0
Colon Surgery	0	0.35	0.6	0.05	0	0	0
COPD (pulmonary disease)	0	0	0.95	0.05	0	0	0
Coronary Artery Bypass Surgery	0	0.35	0.6	0.05	0	0	0
Disc Surgery	0	0.35	0.6	0.05	0	0	0
Elective Cardiac Medical	0	0.35	0.6	0.05	0	0	0
Gall Bladder Removal, Laparoscopic	0	0.35	0.6	0.05	0	0	0
General Cardiac Medical	0.6	0	0	0.05	0.15	0.2	0
Head & Neck Endarterectomy	0	0.35	0.6	0.05	0	0	0
Heart Attack	0.6	0	0	0.05	0.15	0.2	0
Heart Failure	0.6	0	0	0.05	0.15	0.2	0
Heart Valve Replacement	0.3	0.35	0.3	0.05	0	0	0
Hip Replacement	0	0.35	0.6	0.05	0	0	0
Irregular Heartbeat	0	0	0.95	0.05	0	0	0
Kidney/Ureter Removal Cancer	0	0.35	0.6	0.05	0	0	0
Knee Replacement	0	0.35	0.6	0.05	0	0	0
Mastectomy, Total/Simple	0	0.35	0.6	0.05	0	0	0
Orthopedic Back Surgery	0	0.35	0.6	0.05	0	0	0
Pneumonia	0.6	0	0	0.05	0.15	0.2	0



CONDITION / PROCEDURE DESCRIPTION	MORTALITY WEIGHT	CMS SCIP WEIGHT	COMPLICATION WEIGHT	LEAPFROG WEIGHT *	CMS READMIT WEIGHT	CMS SPECIFIC CONDITION WEIGHT	AHRQ IQI33 Weight
Prostatectomy, Radical	0	0.35	0.6	0.05	0	0	0
Pulmonology Medical	0.6	0	0	0.05	0.15	0.2	0
Spinal Fusion	0	0.35	0.6	0.05	0	0	0
Stroke	0.95	0	0	0.05	0	0	0
Surgery for Female Cancer	0	0.35	0.6	0.05	0	0	0
Vaginal Delivery	0	0	0	0.05	0	0	0

#### APPENDIX 5: Calculation of CMS Condition-Specific Quality Index (Heart Attack)

Measure	Total Count	Measure Count	Percent Compliant
ACE Inhibitor or ARB for LVSD	129	123	95%
Percent of heart attack patients who are given a prescription for a statin at discharge	239	239	100%
Aspirin at discharge	638	599	94%
PTCA received within 90 minutes of arrival	126	113	90%
Fibrinolytic Medication within 30 minutes of arrival	0	0.0	0%
Heart Attack (AMI) Composite Score includes all 5 measures in composite = Avg (AMI2+3+7a+8a+10)	1132	1074	94.9%

Total Count = Sample size for Hospital A (denominator)  
Measure Count = Number of occurrences (numerator)

Percent Compliance with Heart Attack specific quality measures =  $1074/1132 = 94.9\%$

To generate Heart Attack Index:  $2.00 - 0.949 = 1.05$

The closer the Heart Attack Index is to 1.00, the higher the compliance rate with the heart attack related quality measures and thus the higher the quality. As the Heart Attack Index increases, overall quality related to heart attack decreases.

