TennCare's Episodes of Care: description of risk adjustment for Wave 2 episodes

Tennessee | Medicaid

COPD acute exacerbation (COPD); screening and surveillance colonoscopy (COLO); outpatient and nonacute inpatient cholecystectomy (CHOLE); acute PCI (PCI-A); and nonacute PCI (PCI-N)

The State of Tennessee has implemented a bundle-based approach to reimburse providers for the care delivered to patients enrolled in the state's Medicaid program. Bundled payments cover all the services provided to a patient for treatment of a specific condition during a defined episode of care, including services related to diagnosing, managing, and treating that condition. The actual provision of services to a specific patient for a specific condition is herein called an *episode*, while the grouping for payment of episode-related services normally used to treat the condition is called a *bundle*. This distinction is useful because the state may choose as a matter of policy to exclude from the bundle some of the services in an episode. For each of these patients and episodes, a provider will be determined to have overall responsibility (the episode *quarterback*). The total cost of care for each quarterback in delivering all bundled services will be measured and compared with targets and thresholds to determine overall performance.

The comparison of bundle costs for a provider is based on the average risk-adjusted cost of the provider's episodes with the targets and thresholds established by the state for payment purposes. The healthcare services required to deliver a bundle of care can vary greatly across patient episodes. Risk adjustment quantifies the part of this variation in cost that can be explained by clinical factors such as disease progression, comorbidities, and other patient attributes that correlate with clinical need, including age and gender. A higher risk score for an episode means a higher expected cost relative to other episodes of the same type due to the clinical or demographic factors. Risk-adjusting bundle costs enables more equitable comparisons across providers and with targets and thresholds.

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The first phase of this new payment initiative included three bundle types: asthma, acute exacerbation; perinatal; and total joint replacement. An earlier document, which included several detailed examples of episode risk adjustment, described the risk adjustment approach used for these three bundles. This earlier document may provide useful background to those new to bundled payment.

The present document provides details on the approach used by Wellpoint to compute episode risk and to risk-adjust episode costs for the following bundles: COPD acute exacerbation (COPD); screening and surveillance colonoscopy (COL); outpatient and nonacute inpatient cholecystectomy (CHOLE); acute PCI (APCI); and nonacute PCI (NPCI). It describes the general approach used to measure risk across all bundle types, followed by a description of the specific risk markers used for each type of bundle.

I. Overview: measuring episode risk

Episode risk models are designed to predict the total *expected cost* for an episode of care — those costs that are expected given the clinical characteristics of the patient and the episode. These costs include the payments for all services received by a patient during the course of an episode. Given a measure of the expected cost, or relative risk, for an episode, actual episode costs can be risk adjusted. Risk-adjusted costs can then be compared across all quarterbacks and combined with targets to determine performance under the program. *Example 1* illustrates this concept.

Example 1 — CHOLE episode risk adjustment:

- A surgeon serves as the quarterback for 10 CHOLE episodes during calendar year 2019.
- The total cost for each of those episodes is calculated using costs for all services included in the episode (medications, imaging and testing, evaluation and management, and so on).
- The characteristics of the 10 patients and their episodes are used to assign a risk score to each individual episode. This risk score represents the relative expected costs of each episode based on clinical and patient factors such as age, gender, diagnoses, and disease comorbidities.
- Episode risk is expressed as a relative score. A risk score of 1.000 represents the average risk of episodes for a given set of covered lives. An individual cholecystectomy episode that, based on its clinical and patient factors, is expected to be 10% higher cost than average would be assigned a risk score of 1.100
- The actual total cost for each of the surgeon's episodes is risk adjusted to compute risk-adjusted total cost. Actual cost is divided by episode risk score, so that higher risk episodes will have costs adjusted down while lower risk episodes will have costs adjusted up, allowing episodes with different risk to be fairly compared. For example, an episode with a total cost of $33,000 and a risk score of 1.100 would have a risk-adjusted total cost of $30,000.

- The quarterback's overall performance is based on average risk-adjusted cost for the 10 episodes. This amount can be compared with that of other providers and with targets to determine performance under the program.

As shown in *Example 1,* all episodes for the quarterback are assessed to determine their relative risk and the quarterback's average risk-adjusted cost is computed.

A unique risk model was developed for each bundle type based on clinical and demographic variables that would influence the potential cost of those specific episodes.

Episode risk models use two key features: *episode risk markers* and *episode risk weights*. Risk markers describe those unique clinical characteristics of an episode that were found statistically to affect episode costs. Risk weights describe a risk marker's incremental relative contribution to expected episode costs, or risk.

As noted above, a separate risk model was developed for each bundle type. As a result, the risk markers and risk weights included in the models differ by bundle type. This is to be expected, given that different clinical factors will have a different impact on bundle costs, depending upon the type of episode.

Five major steps are used to assign a risk score to a bundle:
1. Identify clinical risk markers using clinical input.
2. Assign demographic risk markers.
3. Apply risk weights to each risk marker.
4. Compute an episode risk score.
5. Adjust preliminary risk scores for risk score neutrality.

Each of these steps is described below.

II. Assigning clinical risk markers to an episode

The following steps are used to assign clinical risk markers to an episode:
1. Identify qualified services that can contribute diagnoses to risk marker identification.
2. Identify the set of initial risk markers using clinical criteria.
3. Assign clinically appropriate service timing to risk markers.
4. Reduce to a minimum necessary set of risk markers per bundle using statistical criteria.

II.1 Identify qualified services

Only diagnoses from *qualified* service records are considered when identifying risk markers. Qualified services include such services as office visits, consultations, ER visits, surgeries, and inpatient stays. Nonqualified services include such services as lab or radiology or services delivered by a DME or ambulance provider. In this way, the methodology does not consider

diagnoses from ancillary services or *rule-out* tests. Only services with diagnoses confirmed and assigned by a clinician or facility are used. Qualified services are determined by examining the procedure and revenue codes on an individual service record.

II.2 Identify initial risk markers

Two sets of clinical risk markers are considered for use in risk-adjusting episodes based on the diagnoses observed on qualified services. First, the diagnoses associated with qualified services are grouped into Episode Treatment Groups® (ETGs®). ETGs are then selected for evaluation as a risk marker based on their clinical relevance to the episode and their prevalence in the episodes.[1] In addition, the State of Tennessee defines risk makers using both Clinical Classifications Software (CCS) groups and the state's own specific definitions. The second set of risk makers consists of those markers that are specified by the state that meet minimum requirements regarding frequency of occurrence. (The CCS groups are not used since they tend to duplicate information captured by ETGs.)

II.3 Assign service timing

Service timing is also important when setting initial clinical risk markers. Three windows of service timing, based on clinical appropriateness, were specified for all ETG-based risk markers: (1) risk marker occurred in the 365 days prior to the episode start through 30 days prior to the episode start (*Comorbidity risk marker,* prior window); (2) risk marker occurred in the 30 days prior to the episode start through end of the episode (*Episode risk marker* window); (3) risk marker occurred in the 365 days prior to the episode start through the episode end (*Comorbidity risk marker,full* window):

- *Episode risk marker* window — used to identify risk markers that occurred in the context of the episode itself. The episode risk marker window begins 30 days prior to episode start and extends through the end of the episode.
- *Comorbidity risk marker, full* window — used to identify risk markers for other conditions not directly related to the episode that increase the complexity and risk associated with its delivery. This window includes a longer period of time — 365 days prior to the episode start through the episode end.
- *Comorbidity risk marker, prior* window — used to identify risk markers for other conditions not directly related to the episode that increase the complexity and risk associated with its delivery. This window covers the 365 days prior to the episode start through 30 days prior to the episode start. This approach allows for recognition of patient comorbidities that might be considered complications of the episode itself, if first observed during the episode risk marker window.

In general, risk markers defined by the State include their own criteria with regard to service timing.

Following this step, all initial clinical risk markers have been assigned to the episode.

II.4 Reduce to the minimum necessary set of risk markers per bundle

After the initial clinical review, the selected set of clinical risk markers are analyzed statistically to determine their impact on costs for the episode being evaluated. Risk factors for inclusion in the final model are determined based on their clinical relevance to the episode and their impact on costs.

III. Assign demographic risk markers to a bundle

Demographic characteristics of patients can also affect risk, either because age and gender can affect coverage decisions or because they serve as proxies for unmeasured clinical attributes. For this reason, the statistical evaluation of potential risk markers also evaluates the extent to which the models should distinguish among patients based on age and gender. One of the five bundle types (COPD) include two or more demographic risk markers in the final risk model — based on an individual's age and gender at the time of the trigger event. Age and gender did not have a statistically meaningful effect on the costs of the other four bundles, which means that all individuals are assigned the same base risk weight that corresponds to an uncomplicated episode.

IV. Apply risk weights to each marker

Each risk marker is assigned a *risk weight*. This risk weight describes a marker's incremental contribution to bundle risk for that bundle type. Model risk weights were estimated using historical data describing a large number of bundles. The risk weights for each risk model, by episode type, are described later in tables 1 to 5. For each episode, all the demographic and clinical risk markers are captured along with the corresponding risk weights. All identified risk weight values are then added together to achieve the preliminary risk score for that individual episode.

V. Preliminary risk score

The preliminary risk score for each individual episode is calculated as the sum of individual risk weight values that apply to that episode. Preliminary risk scores for each episode are then adjusted to achieve risk score neutrality across all episodes.

VI. Adjust preliminary risk for risk score neutrality

The preliminary risk score for an episode is multiplied by an episode specific risk neutrality factor. This factor was based on the adjustment needed to ensure that the average risk score for each episode was equal to 1.00 for Wellpoint. Risk neutrality factors are calculated at the beginning of each performance period. These values are held constant through the performance period to ensure that providers are measured against constant risk-adjusted thresholds. The final risk score after this adjustment is then used to risk adjust the cost of the individual episode.

Example 2 — applying risk neutrality factors:

- All risk factors associated with an episode are identified and the corresponding risk weight values (clinical and demographic) are added together to achieve the preliminary risk score for an individual episode.
- Preliminary risk scores are then multiplied by a risk neutrality factor to ensure that the average risk score for Wellpoint is 1.00.
- The application of the risk neutrality factor will make the final risk score different that the sum of risk weights listed in tables 1 to 5 below.
- For example, if the risk neutrality factor an acute PCI episode was 0.987, then a 58-year-old man without other clinical risk factors would have a final risk score of 0.9886 (0.987 multiplied by 1.0016 equals 0.9886).

Please go to Availity Essentials to find the most recent *TennCare's Episodes of Care: Risk Neutrality Factors* document.

1 The methodology described here uses the clinical constructs of Episode Treatment Groups (ETGs) to categorize diagnosis codes into clinically meaningful groups. The clinical constructs within the ETG methodology are defined in terms of both ICD-9-CM and ICD-10-CM/PCS, which means that the risk models described here do not depend upon the underlying coding system used to populate claims.

Tables

Tables 1 to 5 below show the risk weights for COPD acute exacerbation (COPD); screening and surveillance colonoscopy (COL); outpatient and nonacute inpatient cholecystectomy (CHOLE); acute PCI (APCI); and nonacute PCI (NPCI). The risk weights shown in these tables were used to risk-adjust the cost of the individual episodes. The preliminary risk score for each episode is the sum of the risk weights for all risk markers observed. The final risk score will be the preliminary risk score for an episode multiplied by an episode-specific risk neutrality factor.

Table 1. COPD acute exacerbation (COPD)*

Risk marker description	Risk weight
Age 18 to 44	0.0712
Age 45 to 54	0.1288
Age 55 to 64	0.2336
Nutritional deficiency (*Comorbidity risk marker, full* window)	0.1578
Bacterial lung infections (*Comorbidity risk marker, full* window)	0.3624
Other metabolic disorders (*Comorbidity risk marker, full* window)	0.1961
Obesity (*Comorbidity risk marker, full* window)	0.0571
Severe presentation of COPD (*Episode risk marker* window)	0.4015
Substance abuse: alcohol dependence (*Comorbidity risk marker, full* window) or opioid or barbiturate dependence (*Comorbidity risk marker, full* window)	0.0658
Ischemic heart disease (*Episode risk marker* window)	0.1712
Heart failure, diastolic (*Comorbidity risk marker, full* window)	0.1482
Hypertension (*Comorbidity risk marker, full* window)	0.0750
Other inflammatory lung diseases (*Comorbidity risk marker, full* window)	0.3566
Acute respiratory distress syndrome (*Comorbidity risk marker, full* window)	0.5943

*In 2022, the COPD risk model was updated to test new risk markers and incorporate 2022 episode design and configuration file maintenance changes.

Table 2. Screening and surveillance colonoscopy (COLO)

Risk marker description	Risk weight
All ages	0.7864
Nonmalignant neoplasm of intestines and abdomen (*Comorbidity risk marker, full* window)	0.2132
Acute pancreatitis (*Episode risk marker* window)	0.1677
Malignant neoplasm of large intestine (*Comorbidity risk marker, full* window)	0.1375
Bowel obstruction (*Comorbidity risk marker, full* window)	0.0919
Non-malignant neoplasm of rectum or anus (*Comorbidity risk marker, full* window)	0.0872
Hemorrhoids (*Comorbidity risk marker, full* window)	0.0852
Substance abuse (*Comorbidity risk marker, full* window): cocaine or amphetamine dependence, acute alcohol intoxication, alcohol dependence, opioid or barbiturate dependence, or other drug dependence	0.0626
Other inflammation of intestines and abdomen (*Comorbidity risk marker, full* window) or other infectious diseases of intestines and abdomen (*Comorbidity risk marker, full* window)	0.0555
Hiatal hernia (*Comorbidity risk marker, full* window)	0.0519
Diverticulitis and diverticulosis (*Comorbidity risk marker, full* window)	0.0407
Ulcer (*Comorbidity risk marker, full* window)	0.0277
Nutritional deficiency (*Comorbidity risk marker, full* window)	0.0217
Asthma (*Comorbidity risk marker, full* window) or chronic obstructive pulmonary disease (*Comorbidity risk marker, full* window)	0.0101

Table 3. Outpatient and nonacute inpatient cholecystectomy (CHOLE)

Risk marker description	Risk weight
All ages	1.0694
Appendicitis (*Comorbidity risk marker, full* window)	0.1084
Bowel obstruction (*Comorbidity risk marker, full* window)	0.0957
Bacterial lung infections (*Episode risk marker* window)	0.0735
Hernias, except hiatal (*Comorbidity risk marker, full* window)	0.0614
Dehydration (*Comorbidity risk marker, full* window)	0.0492
Heart failure (*Comorbidity risk marker, full* window)	0.0485
Chronic renal failure (*Comorbidity risk marker, full* window)	0.0427
Infection of stomach and esophagus (*Comorbidity risk marker, full* window)	0.0422
Other inflammation of intestines and abdomen (*Comorbidity risk marker, full* window)	0.0368
Obesity (*Comorbidity risk marker, full* window)	0.0358
Hiatal hernia (*Comorbidity risk marker, full* window)	0.0233
Cardiovascular conditions (*Comorbidity risk marker, full* window): ischemic heart disease, pulmonary heart disease, cardiomyopathy, aortic aneurysm, valvular disorder, other conduction disorders, atrial fibrillation and flutter, hypertension or cardiac congenital disorder	0.0144

Table 4. Acute PCI (PCI-A)

Risk marker description	Risk weight
All ages	1.0016
Immunodeficiencies (*Comorbidity risk marker, full* window)	0.0663
Obesity (*Comorbidity risk marker, full* window)	0.0683

Risk marker description	Risk weight
Cocaine or amphetamine dependence (*Comorbidity risk marker, full* window)	0.0049
Acute renal (*Comorbidity risk marker, full* window)	0.0681
Subendocardial infarction (*Episode risk marker* window)	0.0180
Multiple vessel or staged PCI (*Episode risk marker* window)	0.1846
Heart failure (*Comorbidity risk marker, full* window)	0.0694
Behavioral health disorders (*Comorbidity risk marker, full* window): mood disorder, depressed; mood disorder, bipolar; psychotic and schizophrenic disorders; dementia; mental disorders, organic and drug- induced; personality disorder, eating disorder; anxiety disorder or phobias; psychosexual disorder; intellectual disability; other neuropsychological or behavioral disorders	0.0456
Gastrointestinal disorders (disorders (*Comorbidity risk marker, full* window): inflammation of esophagus; gastritis and/or duodenitis; ulcer	0.0639

Table 5. Nonacute PCI (PCI-N)

Risk marker description	Risk weight
All ages	1.0206
Obesity (*Comorbidity risk marker, full* window)	0.0513
Cocaine or amphetamine dependence (*Comorbidity risk marker, full* window)	0.0170
Aortic aneurysm (*Comorbidity risk marker, full* window)	0.0078
Acute renal (*Comorbidity risk marker, full* window)	0.0495
Multiple vessel or staged PCI (*Episode risk marker* window)	0.1844
Heart failure (*Comorbidity risk marker, full* window)	0.0651
Behavioral health disorders (*Comorbidity risk marker, full* window): mood disorder, depressed; mood disorder, bipolar; psychotic and schizophrenic disorders; dementia; mental disorders, organic and drug-induced; personality disorder, eating disorder;	0.0382

Risk marker description	Risk weight
anxiety disorder or phobias; psychosexual disorder; intellectual disability; other neuropsychological or behavioral disorders	
Gastrointestinal disorders (disorders (*Comorbidity risk marker, full* window): inflammation of esophagus; gastritis and/or duodenitis; ulcer	0.0502