

Risk adjustment in CMS episode-based payment models

A resource guide

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Providers participating in episode-based payment initiatives and organizations developing and administering these models have a tough task in understanding the financial risks being undertaken.

In recent years, the Centers for Medicare and Medicaid Services (CMS) has implemented a variety of episode-based payment models, each of which has a unique and complex set of risk arrangements for providers. The specifics of the risk arrangements vary from one model to the next. The impact, especially as regards provider compensation for an episode of care, is a function of how the different pieces of a payment model work together.

Risk adjustment¹ is present in each of these alternative payment models, with varying levels of sophistication. Risk adjustment is a methodology intended to modify payment levels to reflect cost considerations outside of the provider's control. Additionally, other factors, such as a model being mandatory or voluntary, can also impact risk. Savvy participants who understand the risks they face will utilize the different model features to improve patient care while optimizing return and minimizing downside risk.

This paper provides a high-level guide on risk adjustment within the broader scope of four CMS episode-based payment models. While we only briefly touch on the basics of the programs in question, links are provided to more detailed resources. Additionally, the appendix at the end contains a glossary of important terms and abbreviations.

Risk adjustment in current CMS models

COMPREHENSIVE CARE FOR JOINT REPLACEMENT (CJR)

In this model, acute care hospitals enter an episode-based payment arrangement covering all related Medicare Parts A and B care for lower extremity joint replacement or reattachment (LEJR). The episode is initiated by an inpatient admission that will eventually be paid under Medicare Severity-Diagnosis Related Group (MS-DRG) 469² or 470,³ and the episode runs for 90 days post-discharge.

CJR does not use a complex risk adjustment methodology but instead uses a form of *risk stratification*, with four sets of target prices calculated based on the following two dimensions:

1. **MS-DRG 469 vs. 470:** Different prices are assigned for episodes with (469) and without (470) major complications or comorbidities.
2. **Hip fracture:** Episodes precipitated by a hip fracture are assigned higher prices than those that are not.

As noted in the sidebar, on page 2, this level of stratification does not fully account for the risks that hospitals are exposed to, especially in the later years of the model. Essentially, hospitals who historically treat a “riskier”⁴ population (compared to other hospitals in the same region) will be penalized, to an increasing degree over time, and for reasons other than poor episode cost or quality performance.

1 “Risk adjustment” as used in this paper is defined as the process of varying payment based on the particular risk profile of a given patient and/or medical episode. A primer on provider payment and risk adjustment can be found here: <http://www.milliman.com/insight/2016/Provider-payment-What-does-risk-adjustment-have-to-do-with-it/>.

2 Major joint replacement or reattachment of lower extremity *with* major complications or comorbidities.

3 Major joint replacement or reattachment of lower extremity *without* major complications or comorbidities.

4 In this context, “riskier” means patients with higher risk scores.

Why risk adjustment is needed in the CJR model

The target prices for the CJR model are the stick against which hospital episode spending is measured. A subtle but important note is that these prices are based on “...a blend of historical hospital-specific spending and regional spending for LEJR episodes, with the regional component of the blend increasing over time.”⁵ By performance year 4 (slated to begin on January 1, 2019), the target prices are set with 100% regional pricing.

An issue associated with using regional benchmarks is the diversity in patient morbidity among hospitals in the same region. A risk adjustment methodology can help mitigate mix issues—to prevent a hospital being unduly penalized just for having a sicker population, or conversely, to prevent a hospital from being unjustifiably rewarded simply for having a healthier population, compared to the regional average.

A study by the Institute for Healthcare Policy and Innovation (University of Michigan, Ann Arbor)^{6,7} analyzed the impact of CMS-Hierarchical Condition Category (HCC) risk adjustment on estimated CJR reconciliation payments under two scenarios: 1) when historical *hospital-specific* episode spending is used to calculate the target price, and 2) when historical *regional* episode spending is used to calculate the target price. They “...identified no significant association between reconciliation payments and CMS-HCC risk scores when target episode prices were set using hospital historical spending. This finding reflects the relative year-over-year consistency of patient complexity within hospitals.”⁸ However, when regional episode spending was used to calculate benchmarks, the authors “...found that risk adjustment consistently reduced reconciliation payments to hospitals with the lowest CMS-HCC risk scores, and consistently increased reconciliation payments to hospitals with the highest risk scores.”⁹ Consequently, the implementation of risk adjustment can help mitigate case mix issues.

Actuarial perspective

The study referenced in the sidebar highlights a real risk to hospitals in the CJR model. Further, these risks are difficult to control, particularly in later performance years utilizing regionally based target prices.

However, note that the model includes stop-loss limits on the upside and downside risk that providers face, going from 0% (no downside risk) in performance year 1 up to 20% in year 5. This means that provider gain/loss is capped at +/-20% of the target price.¹⁰

The model includes a quality component to reward higher-quality providers through lower discount rates on the target price. A quality floor provision is also used so that hospitals with poor quality performance cannot be eligible for reconciliation payments at all.

Another important consideration is a recently finalized rule¹¹ that gives providers in 33 of the 67 metropolitan statistical areas (MSAs) affected a one-time option to leave the CJR model. This effectively changes the model from being mandatory to voluntary in those areas. While the risk-averse provider will strongly consider this option, it is worth noting that CJR model participation can count as an Advanced alternative payment model (APM)¹² under the Medicare Access and CHIP Reauthorization Act of 2015 (MACRA) for qualifying APM participants (QPs). Many providers see participation in an Advanced APM as a desirable goal: those who meet certain thresholds of Advanced APM participation will be exempt from the Merit-based Incentive Payment System (MIPS) program, and thus exempt from potential downward adjustments to their Medicare payment rates.

- 5 CMS. Comprehensive Care for Joint Replacement (CJR) Model: Provider and Technical Fact Sheet, p. 4. Retrieved December 1, 2017, from <https://innovation.cms.gov/Files/fact-sheet/cjr-providerfs-finalrule.pdf>.
- 6 Ellimoottil, Chad et al. (2016). The new bundled payment program for joint replacement may unfairly penalize hospitals that treat patients with medical comorbidities. *Health affairs* (Project Hope) 35.9: 1651–1657.
- 7 Note that the Ellimoottil paper is limited in the following ways: 1) The CJR model includes an array of geographic areas, but the study only used Michigan hospitals. 2) The CMS-HCC risk adjustment model is not specific to the CJR population, so some important risk variables for LEJR are excluded and potentially limit the accuracy of the risk adjustment. 3) The authors did not include the stop-loss mechanism or the quality floor provision that are in the CJR model.
- 8 Ellimoottil, *ibid*.
- 9 Ellimoottil, *ibid*.
- 10 82 FR 180, p. 294.
- 11 CMS-5524-F.
- 12 CMS. APMs Overview. Retrieved December 1, 2017, from <https://qpp.cms.gov/apms/overview>.

A potential implication of making the CJR model voluntary is that only historically efficient providers will choose to continue participation as these providers will benefit from prices derived from regional data. This form of adverse selection will vary from area to area based on the number of hospitals and the dispersion of historical costs by hospital. As such, providers making the decision to continue or exit the model should consider the competitive landscape as much as their own financial incentives.

Note that current CJR participants in MSAs affected by this transition will be able to continue in the program by submitting a “voluntary participation election letter to CMS no later than January 31, 2018.”¹³

CJR resources

CMS web page: <https://innovation.cms.gov/initiatives/cjr>

Model overview: <https://innovation.cms.gov/Files/fact-sheet/cjr-providerfs-finalrule.pdf>

Institute for Healthcare Policy and Innovation Paper: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5329901/pdf/nihms851493.pdf>

Federal Register (Final Rule): <https://www.gpo.gov/fdsys/pkg/FR-2017-01-03/pdf/2016-30746.pdf>

Federal Register (Finalized Changes): <https://s3.amazonaws.com/public-inspection.federalregister.gov/2017-25979.pdf>

EPISODE PAYMENT MODELS (EPM)

CMS proposed, subsequently delayed, and then recently finalized cancellation¹⁴ of three new episode-based payment models that were originally intended to start at the beginning of 2018:^{15,16}

1. Acute Myocardial Infarction (AMI) Model
2. Coronary Artery Bypass Graft (CABG) Model
3. Surgical Hip and Femur Fracture Treatment (SHFFT) Model

Even though the EPMs have been canceled, a discussion of their risk features is still instructive given how recently they were proposed by CMS (December 20, 2016). Details on these models

13 CMS (November 30, 2017). Comprehensive Care for Joint Replacement Model Policy Changes and Cancellation of Episode Payment Models and Cardiac Rehabilitation Incentive Payment Model (CMS-5524-F and IFC). Retrieved December 1, 2017, from <https://www.cms.gov/Newsroom/MediaReleaseDatabase/Fact-sheets/2017-Fact-Sheet-items/2017-11-30.html>.

14 CMS-5524-F.

15 The model was originally supposed to start on July 1, 2017, but was postponed. A recently finalized rule now cancels the models altogether.

16 CMS (November 30, 2017). Episode Payment Models: General Information. Retrieved December 1, 2017, from <https://innovation.cms.gov/initiatives/epm/>.

can be found below in the EPM resources section. The EPMs contain many of the same risk arrangements as the CJR model discussed above:^{17,18,19,20}

- No advanced risk adjustment methodology is used for these models. Instead, MS-DRGs stratify the target prices (includes different DRGs for cases with and without complications and comorbidities). Prices are further stratified for episode characteristics such as a CABG readmission in an AMI episode.
- Provider financial risk is capped by stop-loss limits, with an initial period of no downside risk.
- Target prices are calculated with a blend of historical hospital and regional data that increases toward 100% regional data in the last two years of the model.
- Mandatory in selected MSAs.

In addition, a quality adjustment is made to reward higher-quality providers.

Actuarial perspective

EPM episodes are often more complex than their CJR counterparts, but the overall model designs share many similarities. Risk stratification based on MS-DRG is relatively simple,²¹ although the EPMs include several protective measures for smaller hospitals:

- All three models include a provision for hospitals with a low volume of the particular episode (“at or below the 10th percentile”). These hospitals are afforded lower stop-loss limits at the same level as rural hospitals, sole community hospitals (SCHs), Medicare-dependent hospitals, and rural referral centers (RRCs).
- All three models have no downside risk in performance year 1, and voluntary downside risk in year 2. Note that the decision to accept downside risk in year 2 has downstream effects for providers considering different paths under MACRA (APM vs. MIPS).

17 CMS (December 22, 2016). Acute Myocardial Infarction Model: Provider and Technical Fact Sheet. Retrieved December 1, 2017, from <https://innovation.cms.gov/Files/fact-sheet/ami-providertech-fs.pdf>.

18 CMS (December 22, 2016). Coronary Artery Bypass Graft Model: Provider and Technical Fact Sheet. Retrieved December 1, 2017, from <https://innovation.cms.gov/Files/fact-sheet/cabg-providertech-fs.pdf>.

19 CMS (December 22, 2016). Surgical Hip and Femur Fracture Treatment Model: Provider and Technical Fact Sheet. Retrieved December 1, 2017, from <https://innovation.cms.gov/Files/fact-sheet/shfft-providertech-fs.pdf>.

20 CMS (February 22, 2017). Webinar: Advancing Care Coordination Through Episode Payment Models (EPMs); Cardiac Rehabilitation Incentive Payment Model; and Changes to the Comprehensive Care for Joint Replacement Model (CJR): Final Rule Overview, p. 16. Retrieved December 1, 2017, from <https://innovation.cms.gov/Files/slides/epm-fnruleintro-slides.pdf>.

21 “Simple” in this case refers to the lack of a risk adjustment methodology that is likely to reasonably reflect factors, such as case mix, that will impact episode costs. An example would be to include patient age, gender, and a more complex analysis of comorbidities than what is included in the MS-DRGs.

- Some AMI or CABG episodes are complex and require patient transfer to a new hospital. CMS includes a transfer provision for AMI episodes where the patient is transferred to a new hospital with an AMI or CABG MS-DRG and the initial hospital episode is canceled. A new episode is initiated if the receiving hospital is an EPM participant.²²

Considering these features and the complexity of EPM episodes, it is unclear how this risk stratification would have performed relative to the provisions of the CJR program.

EPM resources

Milliman summary of EPMs: <http://us.milliman.com/insight/2017/Inside-Medicares-episode-payment-models/>

CMS web page: <https://innovation.cms.gov/initiatives/epm>

CMS Final Rule presentation: <https://innovation.cms.gov/Files/slides/epm-fnruleintro-slides.pdf>

CMS AMI Model Fact Sheet: <https://innovation.cms.gov/Files/fact-sheet/ami-providertech-fs.pdf>

CMS CABG Model Fact Sheet: <https://innovation.cms.gov/Files/fact-sheet/cabg-providertech-fs.pdf>

CMS SHFFT Model Fact Sheet: <https://innovation.cms.gov/Files/fact-sheet/shfft-providertech-fs.pdf>

BUNDLED PAYMENTS FOR CARE IMPROVEMENT (BPCI) INITIATIVE

The BPCI initiative includes four different voluntary episode-based payment models,²³ covering an array of services, episode definitions, and payment types (retrospective and prospective) for 48 different clinical episodes spanning 181 MS-DRGs. Providers choose which episodes to participate in and the length of the post-acute care period to include in the episode (30, 60, or 90 days).

While the inclusion of a risk adjustment methodology was considered during the development of the program,²⁴ the final models did not include any form of advanced risk adjustment. Instead, risk is stratified only by the MS-DRGs that define the clinical episodes. As noted above for CJR, MS-DRGs distinguish between cases with and without complications and comorbidities to provide some protection for more severe episodes.

Actuarial perspective

As we noted in the sidebar for the CJR model, the development of target prices using regional versus a hospital's own historical data can have a nontrivial impact on payment outcomes when advanced risk adjustment is not used. Each of the three BPCI models that include provider financial risk (models 2, 3, and 4) use a hospital's own data for developing episode target prices. However, if the hospital's data set is insufficiently large, it is augmented with regional data. "The episode cost to Medicare is calculated for each Episode Initiator (EI)²⁵ using three years of historical data...If a minimum threshold of historical data is not available for a particular Episode Initiator for an episode, regional data are used to supplement the Episode Initiator's historical data to calculate the episode cost."²⁶

As a result, the same discussion noted in the sidebar for CJR applies here as well. When regional benchmarks are used, hospitals that treat patients with higher risk scores (i.e., patients with higher risk) will perform worse against the episode target price compared to hospitals that treat patients with lower risk scores. Smaller providers are more likely to have fewer historical episodes and hence have their benchmarks derived, at least in part, from regional data. This indicates a unique disadvantage (in the form of increased volatility in patient risk characteristics that are not covered by the risk stratification inherent in the MS-DRGs) for smaller providers who do not have credible historical data (by BPCI standards).

A natural question is: how do BPCI and CJR overlap? Acute care hospitals (located in CJR-selected MSAs) participating in BPCI models 1, 2, or 4 for major joint replacement of the lower extremity episodes are not required to participate in the CJR model.²⁷ Those hospitals are essentially given a choice between the different risk arrangements inherent in each model.

It is pertinent to note that models 2 and 3 (retrospective reconciliation) have a feature similar to stop-loss built into the reconciliation calculation. For each episode, the provider chooses a risk track to bear 100% of the risk up to the 75th, 95th, or 99th percentile; and 20% of the risk over the risk track threshold. This additional flexibility at the episode level is a key tool for providers to consider, especially considering that the models do not have detailed risk adjustment.

22 CMS, Final Rule Overview webinar, *ibid.*, p. 8

23 The first of which concluded at the end of 2016 and did not have a provider financial risk component.

24 CMS (April 19, 2012). Webinar: Bundled Payments Application Guidance for Models 2-4. Retrieved December 1, 2017, from <https://innovation.cms.gov/resources/Bundled-Payments-Application-Guidance.html>.

25 The hospital, provider group, or post-acute care provider initiating the episode.

26 CMS (February 2014). Bundled Payments for Care Improvement (BPCI): Background on Model 2 for Prospective Participants, p. 4. Retrieved December 1, 2017, from https://innovation.cms.gov/Files/x/BPCI_Model2Background.pdf.

27 CMS. Comprehensive Care for Joint Replacement Model. Retrieved December 1, 2017, from <https://innovation.cms.gov/initiatives/cjr>.

The BPCI models will end September 30, 2018. However, CMS is currently working on a new version of the initiative, unofficially known as BPCI-Advanced.

BPCI initiative resources

CMS web page: <https://innovation.cms.gov/initiatives/bundled-payments/>

CMS Fact Sheet: <https://www.cms.gov/Newsroom/MediaReleaseDatabase/Fact-sheets/2016-Fact-sheets-items/2016-04-18.html>

CMS Learning Area: <https://innovation.cms.gov/initiatives/Bundled-Payments/learning-area.html>

ONCOLOGY CARE MODEL (OCM)

Oncology practices enter an episode-based payment arrangement (on a voluntary basis) for all Medicare Parts A and B services and certain Part D expenditures for a six-month episode, triggered by a chemotherapy claim. The model augments payment in two ways:²⁸

1. **Performance-based payment (PBP):** Total episode costs are compared to a *risk-adjusted* target price. The target is also adjusted for the practice's own baseline experience. Providers who choose a two-sided risk arrangement either receive an additional payment (assuming quality targets are met), or must pay back the cost difference for amounts over the target.
2. **Monthly enhanced oncology services (MEOS) payment:** CMS makes a flat, \$160 per patient per month (PPPM) payment to cover the cost of managing and coordinating care.

Risk adjustment of the target price means that it will vary for each episode based on a predefined set of factors that CMS has determined to have a statistically significant impact on claim costs. Assuming the risk adjustment methodology is properly indicative of episode costs, the provider risk should be reasonably mitigated for the variation in patient characteristics and treatment protocol in question.

CMS has defined the following factors for risk adjustment:²⁹

- Age/gender
- Dual eligibility for Medicare and Medicaid (Part D enrollment status and receipt of low-income subsidy [LIS] are considered)
- Institutional status
- Selected non-cancer comorbidities

28 CMS (November 2017). Oncology Care Model Overview, p. 14. Retrieved December 1, 2017, from <https://innovation.cms.gov/Files/slides/ocm-overview-slides.pdf>.

29 Oncology Care Model Overview, *ibid.*, pp. 16-17.

- Receipt of selected cancer-directed surgeries, bone marrow transplant, and/or radiation therapy
- Type of chemotherapy drugs used during episode (for breast, prostate, and bladder cancers only)
- Participation in a clinical trial
- History of prior chemotherapy use
- Episode length
- Hospital referral region

Note that the model also includes an implicit risk adjustment, as different types of cancer are initially given different benchmarks (i.e., prior to application of the formal risk adjustment described above). In addition, CMS makes an upward adjustment for the use of novel therapies, which can have a significant impact on episode costs.

Finally, CMS gives providers the option of entering a one-sided or two-sided risk arrangement. In a one-sided arrangement, the provider is not responsible for costs in excess of the target. Thus, providers who opt for the one-sided model are further protected from downside risk. Note, however, that the one-sided option carries its own price: providers choosing one-sided risk must accept a higher discount rate on the target price for the episode (4% compared to 2.75% in the two-sided arrangement), and the model will not qualify as an Advanced APM³⁰ under MACRA.

Actuarial perspective

As you can see, this risk adjustment methodology is complex and understanding the financial implications may be difficult for providers. This is the most advanced form of risk adjustment used in any of the CMS episode-based payment models, thus reflecting the high level of variability in cancer treatments and outcomes. This model feature is crucial, especially for smaller practices with lower patient volume, as the oncologist cannot control which patients come through the door. All patients must be treated, and the provider should not be rewarded nor punished based on who they happen to treat.

OCM resources

CMS web page: <https://innovation.cms.gov/initiatives/oncology-care/>

Model overview: <https://innovation.cms.gov/Files/slides/ocm-overview-slides.pdf>

30 Note that providers accepting risk on the episodes still need to meet the QP threshold to become an Advanced APM.

Concluding thoughts

Providers participating in episode-based payment initiatives and organizations developing and administering these models have a tough task in understanding the financial risks being undertaken. The goal of these models is to improve quality and efficiency by increasing payments to providers who perform well and decreasing payments to those who do not. Risk adjustment and other risk arrangements are used to create a level playing field. However, the reality is that the models may not address all episode characteristics that are indicative of cost, including those outside of the provider's control. In consideration of these limitations, providers must evaluate their respective risks and identify optimal program strategies. This can be accomplished by taking a holistic perspective on risk arrangements within the broader set of design features for any given episode-based payment model.

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Appendix

ABBREVIATIONS

ACH – Acute care hospital
AMI – Acute Myocardial Infarction Model
APM – Alternative Payment Model
BPCI – Bundled Payments for Care Improvement Model
CABG – Coronary Artery Bypass Graft Model
CJR – Comprehensive Care for Joint Replacement Model
CMS – Centers for Medicare and Medicaid Services
EI – Episode initiator
EPM – Episode Payment Model
FFS – Medicare fee-for-service
LEJR – Lower extremity joint replacement
LIS – Low-income subsidy for Medicare prescription drug coverage
MACRA – Medicare Access and CHIP Reauthorization Act of 2015
MIPS – Merit-based Incentive Payment System
MSA – Metropolitan statistical area
MS-DRG – Medicare Severity-Diagnosis Related Group
OCM – Oncology Care Model
PAC – Post-acute care
PGP – Physician group practice
QP – Qualifying APM participant
RRC – Rural referral center
SCH – Sole community hospital
SHFFT – Surgical Hip and Femur Fracture Treatment Model

TERMS

Advanced APM: Under MACRA, some APMs qualify as participant providers to be evaluated under the Advanced APM track, as opposed to MIPS. This should not be confused with APMs in general. All of the episode-based payment models discussed above are APMs, but not all will qualify a provider as an Advanced APM in all circumstances.

Bundled payment/episode-based payment: A flat reimbursement amount for a defined episode of care to cover all costs incurred. This often takes the form of a retrospective reimbursement where providers are paid standard FFS rates and a settlement happens after the fact, based on a target price amount.

Episode initiator: The provider initiating the episode. This provider may or may not be the entity taking on the episode payment risk.

Episode of care: The time period and services covered to treat a specific medical condition.

Post-acute care: The portion of an episode of care after discharge from an acute care setting (often 90 days).

Prospective: This definition depends on context. A prospective episode is one where the payment rate is determined in advance of the episode of care. A prospective risk adjustment methodology is one where historical data is used to predict the future risk features of a population.

Retrospective: This definition depends on context. A retrospective episode is one where the provider bills normal FFS amounts, and a settlement occurs at some point after the episode of care, where the amount actually spent on the care is compared to a target price for the episode. A retrospective risk adjustment methodology is one where current or past data is used to determine the risk features of a population for adjustment in that time period.

Risk adjustment: “...The process of using members’ risk scores to account for morbidity differences in some analysis or payment model.”³¹

Risk score: The output of a risk adjustment model (or risk adjuster). This score gives the relative level of risk of a given patient based on the predefined characteristics built into the model.

Risk stratification: In the context of APMs, risk stratification is the process of developing different rates for different segments of the population based on a given criteria (i.e., the presence of a fracture in the CJR model).

Stop-loss: In the context of APMs, a defined limit on the level of gain/loss exposure that a provider is subject to. This is described relative to a target price (i.e., +/- 5% of the target price).

Target price: The reference price of an episode of care that a provider is measured against in an episode-based payment arrangement. Risk adjustment and risk stratification are performed on the target price. Note that the target price is often adjusted for quality measures defined by the model.

Triggering event: The event in the claim data that indicates the initiation of an episode of care. This is often the presence of a specified MS-DRG on an inpatient claim.

31 Whittal, Ksenia (March 2016). Provider Payment: What Does Risk Adjustment Have to Do With It? Milliman White Paper. Retrieved December 1, 2017, from http://www.milliman.com/uploadedFiles/insight/2016/2205HDP_20160325.pdf.