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Final Recommendation for the Maryland Hospital Acquired Conditions Program for Rate Year 2027

April 9, 2025

This document contains staff final recommendations for the RY 2027 Maryland Hospital Acquired Conditions Program.

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List of Abbreviations

AHRQ	Agency for Health Care Research and Quality
APR-DRG	All Patients Refined Diagnosis Related Groups
CMS	Centers for Medicare & Medicaid Services
CY	Calendar Year
DRG	Diagnosis-Related Group
FFY	Federal Fiscal Year
FY	State Fiscal Year
HAC	Hospital-Acquired Condition
HAI	Hospital Associated Infection
HSCRC	Health Services Cost Review Commission
ICD	International Statistical Classification of Diseases and Related Health Problems
MHAC	Maryland Hospital-Acquired Condition
NHSN	National Healthcare Safety Network
NQF	National Quality Forum
PMWG	Performance Measurement Work Group
POA	Present on Admission
PPC	Potentially Preventable Complication
PSI	Patient Safety Indicator
QBR	Quality-Based Reimbursement
RY	Rate Year
SIR	Standardized Infection Ratio
SOI	Severity of Illness
TCOC	Total Cost of Care
VBP	Value-Based Purchasing
YTD	Year to Date

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Key Methodology Concepts and Definitions

Potentially preventable complications (PPCs): 3M originally developed 65 PPC measures, which are defined as harmful events that develop after the patient is admitted to the hospital and may result from processes of care and treatment rather than from the natural progression of the underlying illness. PPCs, like national claims-based hospital-acquired condition measures, rely on **present-on-admission codes** to identify these post-admission complications.

At-risk discharge: Discharge that is eligible for a PPC based on the measure specifications

Diagnosis-Related Group (DRG): A system to classify hospital cases into categories that are similar clinically and in expected resource use. DRGs are based on a patient's primary diagnosis and the presence of other conditions.

All Patients Refined Diagnosis Related Groups (APR-DRG): Specific type of DRG assigned using 3M software that groups all diagnosis and procedure codes into one of 328 All-Patient Refined-Diagnosis Related Groups.

Severity of Illness (SOI): 4-level classification of minor, moderate, major, and extreme that can be used with APR-DRGs to assess the acuity of a discharge.

APR-DRG SOI: Combination of Diagnosis Related Groups with Severity of Illness levels, such that each admission can be classified into an APR-DRG SOI "cell" along with other admissions that have the same Diagnosis Related Group and Severity of Illness level.

Case-Mix Adjustment: Statewide rate for each PPC (i.e., normative value or "norm") is calculated for each diagnosis and severity level. These **statewide norms** are applied to each hospital's case-mix to determine the expected number of PPCs, a process known as **indirect standardization**.

Observed/Expected Ratio: PPC rates are calculated by dividing the observed number of PPCs by the expected number of PPCs. Expected PPCs are determined through case-mix adjustment.

Diagnostic Group-PPC Pairings: Complications are measured at the diagnosis and Severity of Illness level, of which there are approximately 1,200 combinations before one accounts for clinical logic and PPC variation.

Zero norms: Instances where no PPCs are expected because none were observed in the base period at the Diagnosis Related Group and Severity of Illness level.

Policy Overview

Policy Objective	Policy Solution	Effect on Hospitals	Effect on Payers/Consumers	Effects on Health Equity
The quality programs operated by the Health Services Cost Review Commission, including the Maryland Hospital Acquired Conditions (MHAC) program, are intended to drive improvements in patient outcomes and to ensure that any incentives to constrain hospital expenditures under the Total Cost of Care Model do not result in declining quality of care on an all-payer basis. Thus, HSCRC's quality programs reward quality improvements and achievements that reinforce the incentives of the Total Cost of Care Model, while guarding against unintended consequences and penalizing poor performance.	The MHAC program is one of several pay-for-performance quality initiatives that provide incentives for hospitals to improve and maintain high-quality patient care and value over time.	The MHAC policy currently holds 2 percent of inpatient hospital revenue at-risk for complications that may occur during a hospital stay as a result of treatment rather than the underlying progression of disease. Examples of the types of hospital acquired conditions included in the current payment program are respiratory failure, pulmonary embolisms, and surgical-site infections.	This policy affects a hospital's overall GBR and so affects the rates paid by payers at that particular hospital. The HSCRC quality programs are all-payer in nature and so improve quality for all patients that receive care at the hospital.	Historically the MHAC policy included the better of improvement and attainment, which incentivized hospitals to improve poor clinical outcomes that are often emblematic of disparities. The protection of improvement has since been phased out to ensure that poor clinical outcomes and the associated health disparities are not made permanent, which is especially important for a measure that is limited to in-hospital complications. In the future, the MHAC policy may provide direct hospital incentives for reducing disparities, similar to the approved readmission disparity gap improvement policy. Also for future consideration is inclusion of electronic Clinical Quality Measures to address areas such as maternal complications, which disproportionately impact lower income, minority patients.

Recommendations

The MHAC policy was redesigned in Rate Year (RY) 2021 to modernize the program for the new Total Cost of Care Model.[1] The RY 2021 policy approach to performance assessment, scoring, and conversion of scores to revenue adjustments has been maintained through RY 2026. This RY 2027 final recommendation maintains the Potentially Preventable Complication (PPC) measures used for RY 2026 and also presents methodology updates to address small cell size concerns and scaling to determine revenue adjustments. Specifically, the policy provides validity and reliability analysis results, hospital-level and statewide scores and revenue adjustments for the current methodology that scores hospitals on each PPC individually compared to an option that scores hospitals based on a PPC composite measure. While small hospitals initially raised concerns about small cell sizes, staff proposes the Commission consider adopting this new scoring methodology for all hospitals based on the findings outlined in this policy. Staff also proposes changes for how scores are converted to revenue adjustments. Lastly, staff outlines stakeholders' feedback to the policy as well as our responses.

The final recommendations for the RY 2027 Maryland Hospital Acquired Conditions (MHAC) program are as follows:

1. Use 3M Potentially Preventable Complications (PPCs) to assess hospital acquired complications.
    a. Maintain a focused list of PPCs in the payment program that are clinically recommended and that generally have higher statewide rates and variation across hospitals.
    b. Assess monitoring PPCs based on clinical recommendations, statistical characteristics, and recent trends to prioritize those for future consideration for updating the measures in the payment program.
    c. Engage hospitals on specific PPC increases to understand trends and discuss potential quality concerns.
2. Assess performance using more than one year of data for small hospitals (i.e., less than 21,500 at-risk discharges and/or 22 expected PPCs). The performance period for small hospitals will be CYs 2024 and 2025.
3. Assess hospital performance based on statewide attainment standards.
4. Score hospital performance on a PPC composite that includes all payment PPCs weighted by

[1] See the RY 2021 policy for detailed discussion of the MHAC redesign, rationale for decisions, and approved recommendations.

hospital specific expected volume and Solventum (3M) cost weights as a proxy for patient harm.[2]

5. Maintain a prospective revenue adjustment scale with a maximum penalty at 2 percent and maximum reward at 2 percent:
    a. Use a continuous linear scale that ranges from 0 to 100 percent without a hold harmless zone.
    b. Establish the cut point for penalties and rewards as the average hospital MHAC score as determined through prospective modeling.
    c. Retrospectively assess the average hospital MHAC scores and propose to the Commissioners that the cutpoint be modified if the actual average score is more than +/- 10 percent different from the prospectively modeled average MHAC score.
6. Going forward, consider other candidate measures/measure sets that may be important for assessing hospital avoidable, harmful complications and appropriate for use in the program, e.g., digitally specified measures.

Introduction

Maryland hospitals are funded under a population-based revenue system with a fixed annual revenue cap set by the Maryland Health Services Cost Review Commission (HSCRC or Commission) under the All-Payer Model agreement with the Centers for Medicare & Medicaid Services (CMS) beginning in 2014, and continuing under the current Total Cost of Care (TCOC) Model agreement, which took effect in 2019. Under the global budget system, hospitals are incentivized to shift services to the most appropriate care setting and simultaneously have revenue at risk in Maryland's unique, all-payer, pay-for-performance quality programs; this allows hospitals to keep any savings they earn via better patient experiences, reduced hospital-acquired infections, or other improvements in care. Maryland systematically revises its quality and value-based payment programs to better achieve the state's overarching goals: more efficient, higher quality care, and improved population health. It is important that the Commission ensure that any incentives to constrain hospital expenditures do not result in declining quality of care. Thus, the Commission's quality programs reward quality improvements and achievements that reinforce the

[2] Hospitals without any at-risk or expected for a specific PPC would not be assessed on that PPC. The two maternity related PPCs are dropped for hospitals without this service line, but almost all other Payment PPCs are included for all hospitals at this time weighted by the hospital volume.

incentives of the global budget system, while guarding against unintended consequences and penalizing poor performance.

The Maryland Hospital Acquired Conditions (MHAC) program is one of several quality pay-for-performance initiatives that provide incentives for hospitals to improve and maintain high-quality patient care and value over time. The program currently holds 2 percent of hospital revenue at-risk for hospital acquired complications that may occur during a hospital stay as a result of treatment rather than the underlying progression of disease. Examples of the types of hospital acquired conditions included in the current payment program are sepsis, respiratory failure, pulmonary embolisms, and surgical-site infections.

For MHAC, as well as the other statewide hospital quality programs, annual updates are vetted with stakeholders and approved by the Commission to ensure the programs remain aggressive and progressive with results that meet or surpass those of the national CMS analogous programs (from which Maryland must receive annual exemptions). With the onset of the Total Cost of Care Model Agreement, each Quality program was overhauled to ensure they support the goals of the Model. For the MHAC policy, the overhaul was completed during 2018, which entailed an extensive stakeholder engagement effort. The major accomplishments of the MHAC program redesign were focusing the payment incentives on a narrower list of clinically significant complications, moving to an attainment only system given Maryland's sustained improvement on complications, adjusting the scoring methodology to better differentiate hospital performance, and weighting complications by their associated cost weights as a proxy for patient harm. The redesign also assessed how hospital performance is converted to revenue adjustments, and ultimately recommended maintaining the use of a linear revenue adjustment scale with a hold harmless zone.

For this RY 2027 MHAC policy, staff proposes maintaining the current focused list of payment PPCs and suggests consideration of potential changes to calculate hospital scores and applying revenue adjustments to address small cell size concerns that particularly impact small hospitals; the potential changes entail the use of a composite measure to calculate all hospital scores, and updating the revenue adjustment scaling approach. The Assessment section below includes an evaluation of PPCs in the payment program as well as those in "monitoring" status using the RY 2026 current MHAC methodology. This recommendation does not propose moving any complication categories from monitoring to payment. However, the Assessment section does provide analyses to evaluate the current methodology versus using a composite score, and includes a discussion of options for updating revenue adjustment scaling.

Background

Exemption from Federal Hospital-Acquired Condition Programs

The Federal Government operates two hospital complications payment programs, the Deficit Reduction Act Hospital Acquired Condition program (DRA-HAC), which reduces reimbursement for hospitalizations with inpatient complications, and the HAC Reduction Program (HACRP), which penalizes hospitals with the highest rates of complications. Detailed information, including HACRP complication measures, may be found in Appendix I. Also, it should be noted that the CMS Value-Based Purchasing program and the analogous Quality Based Reimbursement program contain a safety domain that assess hospital acquired complication measures.

Because of the State's unique all-payer hospital model and its global budget system, Maryland does not directly participate in the federal pay-for-performance programs. Instead, the State administers the Maryland Hospital Acquired Conditions (MHAC) program, which relies on quality indicators validated for use with an all-payer inpatient population. However, the State must submit an annual report to CMS demonstrating that Maryland's MHAC program targets and results continue to be aggressive and progressive, i.e., that Maryland's performance meets or surpasses that of the nation. Specifically, the State must ensure that the improvements in complication rates observed under the All-Payer Model through 2018 are maintained throughout the TCOC model. Based on performance to date, CMS has granted Maryland exemptions from the federal pay-for-performance programs (including the HAC Reduction Program) each year through Federal Fiscal Year 2025.

Overview of the MHAC Policy

The MHAC program, first implemented for Rate Year 2011, is based on a classification system developed by 3M Health Information Systems (3M), now Solventum. To identify potentially preventable complications (PPCs), the system uses the present-on-admission (POA) variable for eligible secondary diagnosis codes available in claims data to identify conditions not POA. The PPC system originally comprised specifications for 65 PPCs,[3] defined as harmful events that develop after the patient is admitted to the hospital and may result from processes of care and treatment rather than from the natural progression of the underlying

[3] In RY 2020, 45 out of 65 PPCs or PPC combinations were included in the program as 3M had discontinued some PPCs and others were deemed not suitable for a pay-for-performance program. The re-designed RY 2021 policy reduced the PPCs assessed to a focused list of 14 PPCs that were clinically actionable and had higher rates and greater variation across hospitals, and/or were clinically significant. In RY 2025, the policy was updated to include PPC 47 Encephalopathy, so there are now 15 payment PPCs.

illness. For example, the program holds hospitals accountable for venous thrombosis and sepsis that occur during inpatient stays. These complications can lead to 1) poor patient outcomes, including longer hospital stays, permanent harm, and death; and 2) increased costs. Thus, the MHAC program is designed to provide incentives to improve patient care by adjusting hospital budgets based on PPC performance.

Current MHAC Methodology

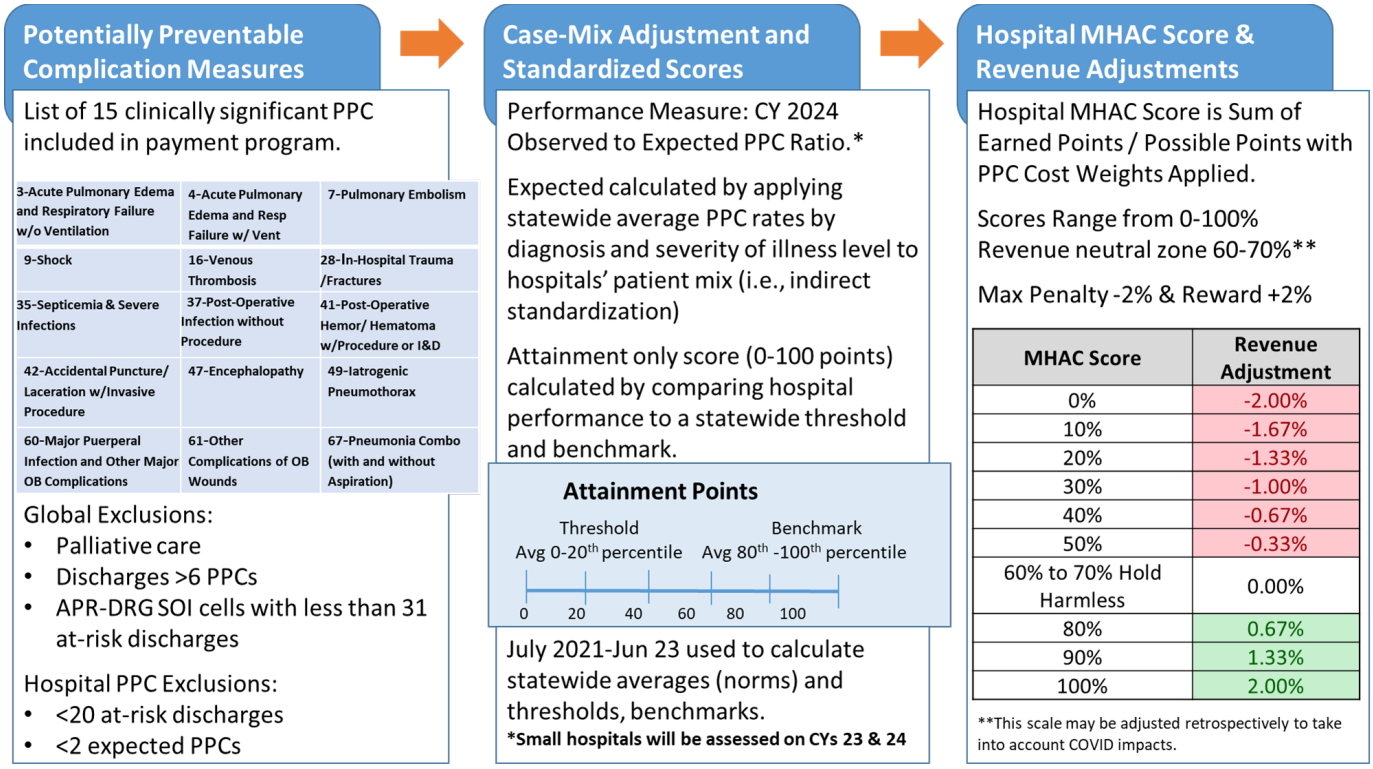
Figure 1 provides an overview of the three steps in the Rate Year 2026 MHAC methodology (also see Appendix II) that converts hospital performance to standardized scores, and then payment adjustments, as outlined below:

Step 1. For the PPCs identified for payment, clinically-determined global and PPC-specific exclusions, as well as volume based hospital-level exclusions are identified to ensure fairness in assignment of complications.

Step 2. Case-mix adjustment is used to calculate observed to expected ratios that are then converted to a standardized point score (from 0-100 points) based on each hospital's attainment levels using a similar scoring methodology that is used for CMS Value-Based Purchasing and Maryland QBR program.

Step 3. Overall hospital scores are then calculated by taking the points for each PPC and multiplying by the 3M PPC cost weights, then summing numerator (points scored) and denominator (possible points) across the PPCs to calculate a percent score. A linear point scale set prospectively is then used to calculate the revenue adjustment percent. This prospective scaling approach differs from national programs that relatively rank hospitals after the performance period. Additionally, the HACRP differs in that it provides no opportunity for rewards and reduces payments by 1 percent for hospitals in the worst-performing quartile.

Figure 1. Overview Rate Year 2026 MHAC Methodology



Assessment

This section provides an overview of the statewide PPC trends—for those used for payment, under monitoring, and overall (comprising a total of 58 PPCs)–using the current RY 2026 methodology. Following the results to date, this section provides analyses that evaluate the validity and reliability of hospital scores using the current methodology compared to options that score hospitals based on a PPC composite measure. The scoring methodologies vary in terms of PPC inclusion criteria, what is used to weight the PPC measures for the overall MHAC score, and how PPC performance is assessed relative to performance standards and rolled up to calculate the overall MHAC score. Lastly, this section provides modeled revenue adjustments for hospitals based on both scoring methods as well as additional options for scaling rewards and penalties.

Statewide PPC Performance Trends

Performance trends to date provided below use the RY 2026 methodology, illustrating Maryland's continued improvement under the program.

Complications Included in Payment Program

Under the All-Payer Model, Maryland hospitals saw a dramatic decline in complications and, as a State, well exceeded the requirement of a 30 percent reduction by the end of CY 2018. These reductions were achieved through clinical quality improvement, as well as improvements in documentation and coding.

As mentioned previously, the MHAC redesign assessed which PPCs should be included in the pay-for-performance program based on criteria developed by the Clinical Adverse Events Measures (CAEM) subgroup that are outlined in the "Monitored Complications" section below.

Under the TCOC Model, Maryland must maintain these improvements by not exceeding the CY 2018 PPC rates for complications included in the payment program. Figure 2 below shows the statewide observed to expected (O/E) ratio from 2018 through September CY 2024.[4] The O/E ratio presents the count of observed PPCs divided by the calculated number of expected PPCs (which is generated using statewide normative values applied to the case-mix of discharges a hospital experiences). An O/E Ratio of greater than 1 indicates that a hospital experienced more PPCs than expected, and conversely, an O/E Ratio less than one indicates that a hospital experienced fewer PPCs than expected. Figure 2 below also indicates how Maryland is performing relative to CY 2018, which is the time period that will be used to assess any backsliding on performance.[5] Specifically, there has been a 40.9 percent decrease in the ratio based on the most recent data available (CY 2018 YTD O/E ratio = 1.15 and CY 2024 YTD O/E ratio = 0.68).

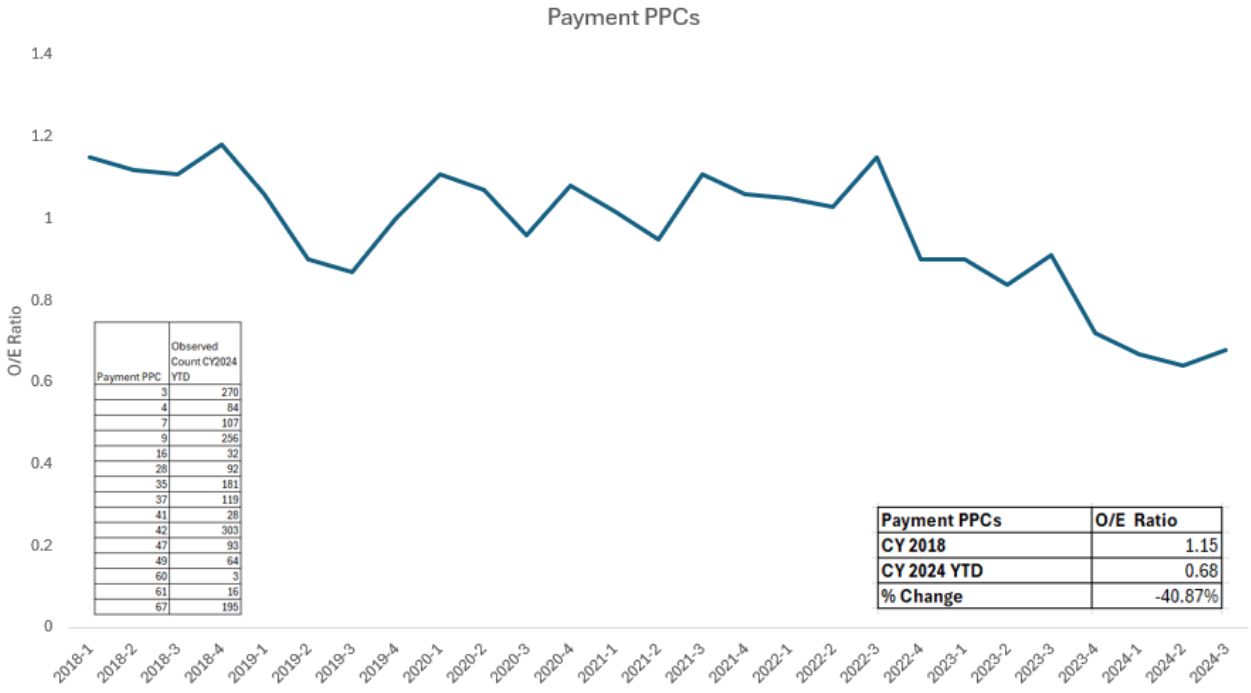
PPCs in the MHAC payment program include:

3 Acute Pulmonary Edema and Resp Failure w/o Ventilation
4 Acute Pulmonary Edema, Resp Failure w/ventilation
7 Pulmonary Embolism
9 Shock
16 Venous Thrombosis
28 In-Hospital Trauma and Fractures
35 Septicemia & Severe Infections
37 Post-Operative Infection & Deep Wound Disruption Without Procedure

[4] Staff notes that, consistent with federal policies during the COVID Public Health Emergency, PPC data from January-June 2020 will not be used for assessing quality of care.
[5] Beginning in v38 of the 3M PPC grouper, COVID exclusions vary by PPC.

41 Peri-Operative Hemorrhage & Hematoma w/ Hemorrhage Control Procedure or I&D
42 Accidental Puncture/ Laceration During Invasive Procedure
47 Encephalopathy
49 Iatrogenic Pneumothorax
60 Major Puerperal Infection and Other Major Obstetric Complications
61 Other Complications of Obstetrical Surgical & Perineal Wounds
67 Pneumonia Combo (with and without aspiration)

Figure 2. Payment Program PPCs Observed to Expected Ratios by Quarter CY 2018 to CY 2024 YTD Through September

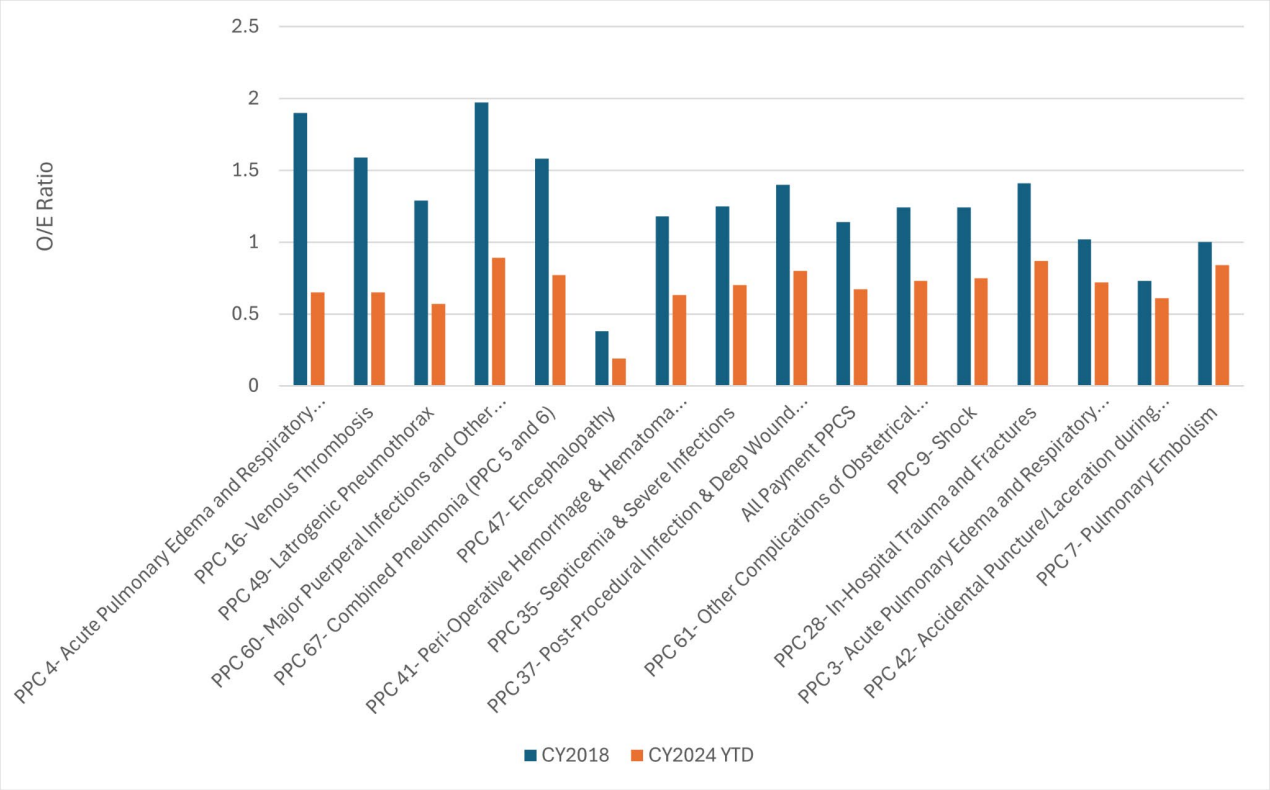


Payment PPC	Observed Count CY2024 YTD
3	270
4	84
7	107
9	256
16	32
28	92
35	181
37	119
41	28
42	303
47	93
49	64
60	3
61	16
67	195

Payment PPCs	O/E Ratio
CY 2018	1.15
CY 2024 YTD	0.68
% Change	-40.87%

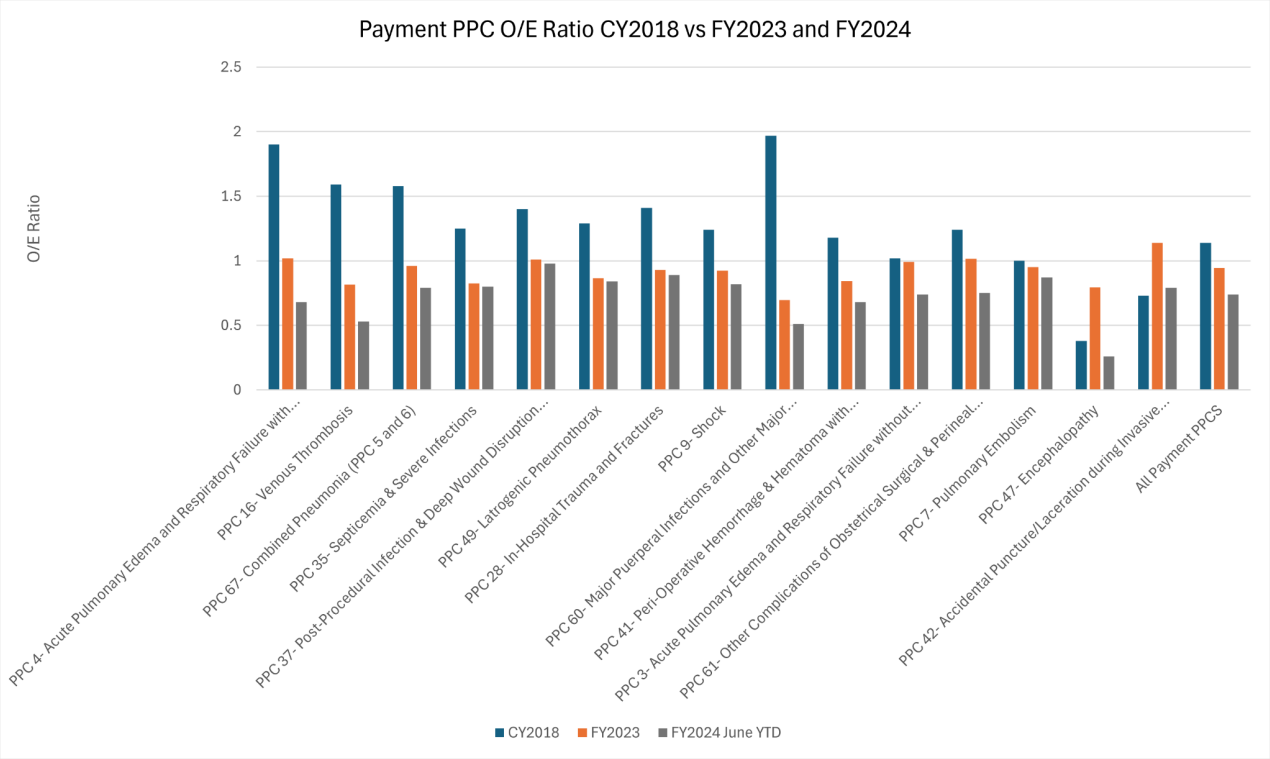
In terms of specific improvements among the 15 payment PPCs, Figure 3 shows the O/E ratios for CY 2018 and CY 2024 YTD, sorted from greatest percent decrease (on the left). The three PPCs with the greatest decreases (improvements) include PPC 4- Acute Pulmonary Edema and Respiratory Failure with Ventilation, PPC16- Venous Thrombosis, and PPC 67- Combined Pneumonia.

Figure 3. Payment Program PPC Observed to Expected Ratios CY 2018 and CY 2024 September YTD



Staff also analyzed payment PPC changes for FYs 2023 and 2024 compared to the base period of CY 2018 as illustrated in Figure 4 below. The overall PPC O/E ratios show a steadily declining trend across the three time periods; from FY2023 to FY2024 all payment PPCs showed a decrease in the O/E ratios (improvement).

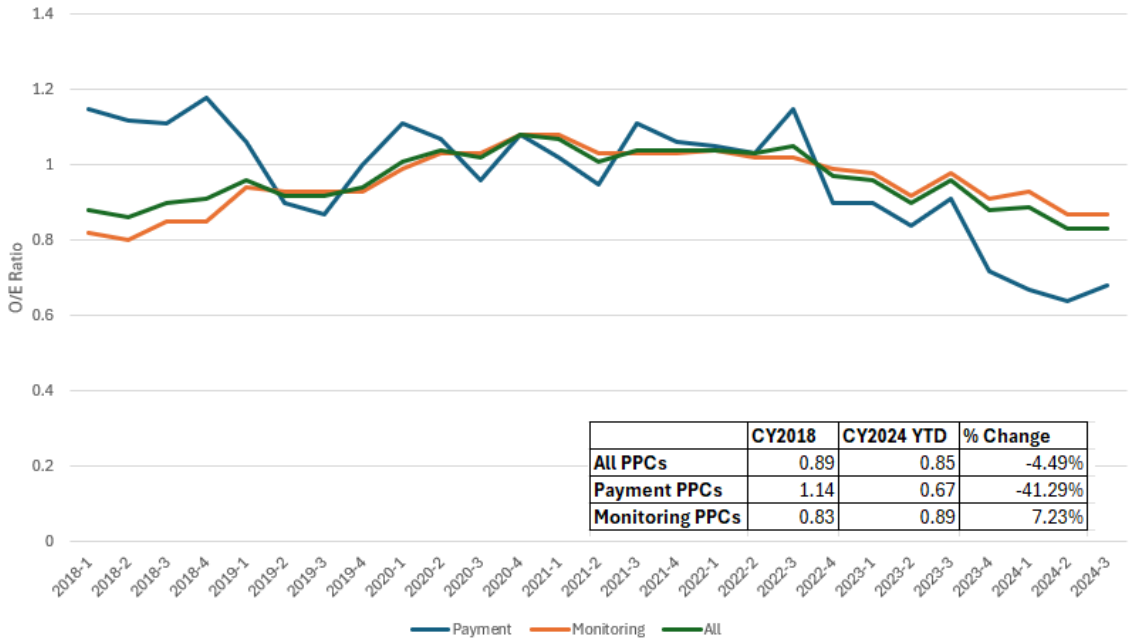
Figure 4. Payment Program PPC Observed to Expected Ratio Trends; CY 2018, FY 2023, and FY 2024



Monitored Complications

In addition to focusing on a narrowed list of PPCs for payment, as stated previously, the RY 2021 MHAC policy following the program redesign included a recommendation to monitor the remaining PPCs. Staff fulfills this recommendation by monitoring all PPCs that are still considered clinically valid by 3M, and distinguishing between “Monitoring” and “Payment” PPCs. The overall PPC trend across all 56 (payment and monitored) PPCs shows that there has been a decrease in the overall statewide O/E ratio from 0.89 in CY 2018 to 0.85 in CY 2024 YTD through September; the minimal improvement in overall performance is the result both of increases in some of the PPCs under monitoring status and reductions in the payment program PPCs, as illustrated in Figure 5 below. As also illustrated, the monitored PPC trends have increased from 0.83 as of 2018 to 0.89 in YTD 2024 with the highest O/E ratios experienced from Q3 2020 to Q1 2021 during the COVID peak period.

Figure 5. PPC O/E RatioTrends CY 2018 Qtr 1 Through CY 2024 Qtr 3



	CY2018	CY2024 YTD	% Change
All PPCs	0.89	0.85	-4.49%
Payment PPCs	1.14	0.67	-41.29%
Monitoring PPCs	0.83	0.89	7.23%

To support determinations on whether to move monitored PPCs into the payment program, staff considers several factors identified by the Clinical Adverse Events Measures (CAEM) subgroup which was convened when the MHAC program was re-designed for RY 2021. These include:

- PPC Data Analysis/Statistics: greater than 50% increase in O/E ratio compared to 2018, rate per 1,000 generally 0.5 or above, volume of observed events 100 or above (over two years), significant variation across hospitals, O/E ratios less than .85 and greater than 1.15, and at least half of the hospitals are eligible for the PPC.
- Additional Considerations: PSI overlap, clinical significance, potential influence of coding practices/changes, opportunity for improvement/actionability, impact on all-payers.

Based on staff evaluation of the monitored PPCs vetted with the PMWG, staff does not recommend moving any monitored PPCs into the payment program for RY 2027. Appendix III provides the statewide percentage changes in the O/E ratios for the monitored PPCs from 2018 to 2024 YTD through September sorted by the observed PPCs with the largest increases.

Stability of Case-Mix Adjusted PPC Rates and Scoring

Small Cell Size Considerations

Statistical issues of measurement validity and reliability related to small cell sizes impact all hospitals but are amplified for small hospitals. The current MHAC program addresses small cell size concerns in two ways: 1) All hospitals are excluded from being assessed on a PPC if they do not meet the minimum criteria of 2 expected PPCs and 20 admissions at-risk for a PPC; and 2) Small hospitals (those with less than 21,500 at-risk or 22 expected PPCs across all payment PPCs) are assessed using two years of data. Currently in RY 2026, only 4 hospitals are assessed on all of the 15 PPCs in the MHAC program and 5 hospitals are considered small hospitals by the criteria outlined above.

Despite the Commission's best efforts to address small cell size concerns, one relatively small hospital has requested changes to the MHAC policy that would better balance the tradeoff between incenting greater year over year performance across all in-hospital complications and concerns of statistical instability for PPC evaluations amongst small hospitals. In advance of the RY 2026 Policy, the hospital expressed their concerns that they had in previous years been eligible for PPC 35-Sepsis but had the previous year seen their expected rate drop below 2, rendering them ineligible for inclusion of this PPC in their MHAC score. They noted further that the PPC was serious and highly amenable to interventions which they had identified and implemented; however, with the minimum expected criteria of 2, their performance on PPC 35 is not counted or recognized in their score. Staff did not remove the inclusion requirement of 2 expected PPCs, as there was concern over the potential instability of the measurement with very low numbers of events. Further, the hospital was concerned that they were measured on two years of performance, vs. one year, as a small hospital.

As Maryland hospitals continue to improve on payment PPCs, small cell size issues are also impacting larger hospitals (i.e., non-small hospitals) and reducing the regulatory oversight of complications. The current approach of having minimum criteria for at-risk and expected is designed to increase validity and reliability of the measures. However, over time, hospitals may be assessed on fewer PPC measures, effectively reducing the comprehensiveness of the program and failing the crucial test of content validity, the degree to which a measure captures the concept it is intended to measure. Thus, staff assessed methods to evaluate the PPCs through updates to the MHAC methodology aimed at better addressing small cell size issues and related statistical reliability and validity. Among the methods considered were Bayesian

smoothing[6], a statistical approach used by CMS for similar concerns, and scoring performance using a weighted composite evaluation, which would assess a hospital on all PPCs as one measure relative to statewide performance standards, as opposed to evaluating each PPC individually compared to performance standards. Results of the modeling to address small cell sizes and excluded PPCs were presented to the PMWG during the RY 2026 policy development process. Initial concerns regarding Bayesian smoothing were that, despite improved statistical reliability, small hospitals' evaluations and financial penalties/rewards would be driven by the statewide average as opposed to the hospital's' performance, which additionally could reduce the incentive for small hospitals to improve. For these reasons, staff focused its attention on the composite measurement approach in RY 2027.

Potential PPC Composite Score Options to Improve Statistical Measurement

During the RY 2027 MHAC updating process, concerns were again raised regarding the current MHAC methodology by PMWG members and other hospital stakeholders and included the following:

- **Low Content Validity** - Hospital performance may be based on a small subset of PPCs, as few as two or three of the 15 PPC measures for small hospitals.
- **Reduced Reliability** - Individual PPC measurement results in lower reliability as measured by signal to noise ratios, i.e., the degree to which the measurement captures hospital complications (signal) versus random variation or interference that can mask or obscure the signal (noise).
- **Face Validity** - Scores for hospitals defined as small tend to be at the high or low ends of performance.
- **Redundant Data Use** - Two years of data in the measurement period for small hospitals (vs. one year for other hospitals) means that one year of performance will be counted in two consecutive Rate Year scores under the program.

Working with Mathematica Policy Research (MPR), staff assessed and presented options for developing a weighted PPC composite to address these issues. Specifically, three potential composite methodologies

[6] Under this Bayesian smoothing approach, a hospital's smoothed O/E ratio for each PPC measure equals the sum of a) the hospital's O/E ratio for the PPC measure times the reliability of the PPC measure at the hospital and b) one minus the reliability of the PPC measure at the hospital times the statewide O/E ratio for the PPC measure. If the reliability of a PPC measure is 1.00 at the hospital, then the hospital's smoothed O/E ratio equals the hospital's O/E ratio and is not affected by the statewide average. If the reliability of a PPC measure is 0.00 at a hospital, then the hospital's smoothed O/E ratio equals the statewide average.

were modeled and compared to the current MHAC methodology. Similarities and differences from the current methodology in the steps for calculating hospital composite scores are outlined in Figure 6 below.

Figure 6. Summary of MHAC Score Calculation Steps for Current Methodology vs Composite Models 1-3

Calculation Steps	Current Methodology	PPC Composite Option 1	PPC Composite Option 2	PPC Composite Option 3
PPC Exclusion Criteria	Exclude PPC measures with <2 expected PPCs or <20 at risk discharges	Exclude PPCs with 0 at-risk discharges		
PPC Measure "Volume" Weights	PPC measures not weighted by volume	PPC measures with greater expected PPCs at hospital receive a larger weight	PPC measures with more at-risk discharges at hospital receive larger weight	PPC measures with more observed PPCs across Maryland hospitals receive a larger weight
PPC Measure 3M Cost Weights	PPC measures are weighted by 3M Cost Weights			
Benchmarks and Thresholds	For each of the 15 payment PPCs, calculate a benchmark and threshold	Calculate a benchmark and threshold for the PPC Composite		

As shown in Figure 6 above, the differences between the current methodology and the composite options are the PPC exclusion criteria, what is used to weight the PPC measures, and how performance is assessed relative to performance standards (i.e., the benchmarks and thresholds). While all of the methods tested maintain the use of the Solventum (3M) cost weights as a proxy for patient harm, the composite options also weight by volume using three different methods. More importantly, the composite methodologies differ from the current methodology in that hospitals are scored on the PPC measure composite as opposed to being scored on each individual PPC (i.e., how the benchmarks and thresholds are calculated).

In order to evaluate the current methodology and potential composite score options, staff assessed the validity and reliability of each method. Specifically, the models were assessed on content validity[7] and signal to noise ratios for reliability. Content validity refers to the degree to which a measure captures the concept it is intended to measure. The intention of the MHAC Program is to evaluate Maryland hospitals based on their performance on the 15 payment PPCs, so methodologies that evaluate Maryland hospitals on all 15 payment PPCs would have the highest content validity. The composite methodologies tested evaluate Maryland hospitals on payment PPC measures with greater than 0 at-risk discharges, resulting in very high content validity, even for the smallest hospitals (Figure 7). Staff believes this is the most important reason to move to this methodology.

Figure 7. Content Validity Current Methodology Versus Composite Options

Hospital Category*	Number of Hospitals	Average Number of PPC Measures Evaluated	
		Current Methodology	Composite Methodology
Small Hospitals	5	3.6	13.2
Medium Hospitals	15	11.0	14.5
Large Hospitals	21	13.8	15

*Hospital category definitions are based on FY 2024 data. Small hospitals had less than 21,500 at-risk discharges or 22 expected PPCs; medium hospitals had between 60,000 and 150,000 at-risk discharges; large hospitals had greater than 150,000 at-risk discharges.

The current methodology evaluates Maryland hospitals on PPC measures for which the hospital has at least two expected PPCs, resulting in fewer PPC measures being evaluated, especially for small and medium hospitals. As illustrated in Figure 7 above, the five small Maryland hospitals are evaluated on an average of 13.2 payment PPC measures under the composite methodologies compared with 3.6 payment PPC measures under the current methodology. The 15 medium Maryland hospitals are evaluated on an

[7] Staff also assessed predictive validity, the extent that past performance is predictive of future performance and is assessed by calculating the correlation of results between different performance periods. While all composite options demonstrated sufficient predictive validity, Composite Option 1 demonstrated slightly higher correlations compared to the other composite options.

average 14.5 payment PPC measures under the composite methodologies compared with 11.0 payment PPC measures under the current methodology. In addition to improving content validity, evaluating small hospitals on almost all of the 15 payment PPCs under the composite methodologies lessens the degree to which one observed PPCs on one payment PPC measure can have a drastic negative impact on a small hospital's MHAC revenue adjustment in consecutive rate years.

The other evaluation that assisted staff in advancing to a composite methodology was reliability. Reliability refers to the consistency of a measure and thus its dependability in assessing the performance of a hospital, minimizing random errors in measurement. Staff assessed the reliability of PPC measures and PPC composite values using the Morris signal-to-noise method under which a score of 1.00 indicates a perfect signal of hospital performance without noise (i.e., perfect reliability) and a score of 0 indicates no signal of hospital performance and all noise (i.e., worst reliability). Staff consider reliability above 0.50 to be acceptable but would hope the MHAC methodology could achieve an average reliability across Maryland hospitals of 0.75 or higher. The current methodology achieves reliability generally somewhat below the desired minimum of 0.50, with the average reliability across FY 2021 to FY 2024 being 0.39. Composite Options 1, 2, and 3 all yield substantially higher reliability than the current methodology, especially Composite Option 1 with an average reliability of 0.76 across FY 2021 to FY 2024 (Figure 8).

Figure 8. Average Reliability Across Maryland Hospitals using a 1-year Performance Period by Methodology

Performance Period	Current Methodology*	Composite Option 1	Composite Option 2	Composite Option 3
FY 24	0.24	0.61	0.48	0.54
FY 23	0.38	0.81	0.63	0.68
FY 22	0.50	0.81	0.70	0.76
FY 21	0.42	0.80	0.62	0.72
Average	**0.39**	**0.76**	**0.61**	**0.68**

Based on the results of reliability and validity analyses of the current methodology versus the composite options presented above and also detailed in Appendix IV, **staff supports adoption of Composite Option 1 to replace the current methodology**.

Hospital Scores and Revenue Adjustments

The hospital MHAC scores are calculated based on 1) hospital performance on each payment PPC measure relative to the PPC measure's benchmark and threshold (current methodology) or 2) hospital performance on the weighted PPC composite relative to the PPC composite benchmark and threshold (proposed staff change). Hospital MHAC scores are then converted to revenue adjustments using a prospectively determined revenue adjustment scale, which allows hospitals to track their progress throughout the performance period. Since the MHAC program redesign in RY 2021, the scale has remained the same–that is, it ranges from 0 to 100 percent with a hold-harmless zone between 60 and 70 percent (originally centered around the average hospital score calculated prospectively); subsequently, as long as the statewide average score was within that zone in a given year, staff did not adjust the range for simplicity. However, with moving to the Composite scoring methodology, staff is proposing to adopt a continuous linear revenue adjustment scale that ranges from 0 to 100 percent without a hold harmless zone. The average hospital MHAC score, as determined through prospective modeling, would still be the cut point for rewards and penalties. Staff believes there is no longer a need for a hold harmless zone because the composite methodology is more reliable and the revenue adjustments closer to the cut point are generally small. Figure 9 provides the estimated revenue adjustments statewide under the current methodology and Composite Option 1, with and without a hold harmless zone. This prospective modeling does not provide actual values for any rate year, and has been updated in the final policy with more recent data. For this modeling, the average MHAC score varied across the two methods with the average score higher under the Composite score compared to the current methodology. Thus, the changes in revenue adjustments are due to the change to the Composite and the higher score needed to get a reward.

The estimated statewide aggregate penalties and rewards were larger under Composite Option 1 than the Current Methodology (Figure 1). Net revenue adjustments increased from $3.7 million under the Current Methodology to $43.8 million under the Composite Option 1 with no hold harmless zone (staff proposal). Hospitals' estimated revenue adjustments under the Current Methodology and Composite Option 1 were highly correlated (0.83 with no hold harmless zone and 0.85 with a hold harmless zone).

Figure 9. Statewide Aggregate Revenue Adjustments Under Current Methodology and Composite Option 1

	Current Methodology		Composite Option 1 Methodology	
	No Hold Harmless Zone	Hold Harmless Zone	No Hold Harmless Zone	Hold Harmless Zone
State Net Total	$3,673,917	$1,268,658	$43,766,281	$41,640,034
Penalty	-$29,096,005	-$21,676,921	-$40,468,836	-$35,363,552
% Inpatient	-0.25%	-0.18%	-0.34%	-0.30%
Reward	$32,769,922	$22,945,579	$84,235,117	$77,003,586
% Inpatient	0.28%	0.19%	0.71%	0.65%

Appendix V contains the by-hospital MHAC scores and estimated hospital revenue adjustments under the current methodology and Composite Option 1. Staff has recommended that the cut point be prospectively set but a retrospective assessment should also be done in the initial years of the methodology to check the average hospital MHAC scores. Staff proposes that if the actual average MHAC score is more than +/- 10 percentage points different from the prospectively modeled average MHAC score, that the staff provide the Commission with a recommendation to change the cut point after the performance period.

Stakeholder Feedback and Staff Responses

Feedback on the Draft RY 2027 MHAC Recommendations was offered by Commissioners, PMWG Members, other hospital stakeholders and in written comments from the Maryland Hospital Association (MHA), Johns Hopkins Health System (JHHS), University of Maryland Medical System (UMMS), Garrett Regional Medical Center (GRMC), and Medstar Health. Feedback, summarized below, addressed the current methodology versus transitioning to Composite Option 1, and did not address use of a continuous scale versus one with a hold harmless zone as is done with the current methodology. Staff believes that this is in part because the statewide revenue adjustments do not vary significantly with or without the hold harmless zone and thus have recommended moving to the full linear scale that assesses revenue adjustments differentially across all scores.

Transition to a Composite Measure Approach

- Several PMWG members, hospital stakeholders, and written commenters (UMMS, GRMC, MedStar, MHA) articulated support for the methodology updates, highlighting the improved validity and reliability of the Composite Option 1 approach compared to the MHAC current methodology, noting in particular the benefit of more accurate measurement for small hospitals. MedStar

specifically notes that Composite Option 1 is more comprehensive and that by weighting the PPCs by the hospital expected PPC rate it holds large and small hospitals accountable for the PPCs that are most germane to their scope of care.

- GRMC favors Composite Option 1 for all hospitals, but suggests adopting it at least for the hospitals defined as small, as the approach more fairly measures their actual performance on all of the PPC measures. In further support of Composite Option 1, GRMC raised concerns with staff that their hospital would not be assessed on the Sepsis PPC under the current methodology (because they have less than two expected PPCs), yet they believe inclusion of the PPC allows them to receive credit for important improvement efforts they have made in this area. Conversely, GRMC acknowledges that under the Composite methodology they would be newly at risk for PPCs between zero and two expected occurrences, but believe the Composite more accurately measures their quality of care. Using similar rationale, GRMC has previously opposed the use of Bayesian smoothing that is often used to address small cell size measurement concerns, as their scores would be significantly influenced by the statewide mean, and again not reflect their actual performance.
- MHA recommends that HSCRC incorporate a hybrid approach that allows smaller hospitals to be on the new PPC composite methodology and also allows larger hospitals to remain on the existing MHAC program PPC methodology. They note that while small hospitals are advantaged by Composite Option 1, they believe an undue burden is placed on Academic Medical Centers (AMCs) because norms are set on unique surgeries that they perform (e.g., complex bowel procedures, complex cardiac surgery, major spinal reconstruction/revision surgery, and neurosurgery) and thus incur greater penalties and have limited opportunities to improve because of the complex nature of these unique procedures.
- Both JHHS and UMMS support further and more comprehensive refinement and evaluation of the Composite Option 1.
    - JHHS recommends continuation of the current MHAC methodology for RY2027, pending this additional work. The JHHS letter also notes that while Maryland transitions from the Total Cost of Care Model and into the future state, they anticipate significant policy changes with implications for quality policies and methodologies. Therefore, to ensure alignment and efficiency, substantial changes to the MHAC program should not be made until foundational policy and model elements are established.

- UMMS alternatively supports moving ahead with the methodology updates but recommends additional analyses to enhance the methodology. Specifically, they have concerns about the specialized procedures performed by the AMCs and suggest further enhancements to the new methodology such as (a) setting targets for cohorts of hospitals that have similar patient types; (b) restricting APR-DRG-SOIs (All Patient Refined Diagnosis-Related Groups - Severity of Illness) in the model to common diagnoses across hospital types, similar to the Quality Based Reimbursement (QBR) mortality program; and (c) acquiring data outside the state of Maryland for comparison of academic medical centers.

Staff Response

Staff concurs that Composite Option 1 offers a superior scoring approach, resulting in hospital specific-scores with significantly increased content validity and reliability:

- Content validity, the degree to which a measure captures the concept it is intended to measure[8] is greatly improved by increasing the number of PPCs on which hospitals are measured. The number of PPCs out of 15 on which hospitals are measured on average increases from 3.6 PPCs for small hospitals, 11.0 for medium hospitals, and 13.8 for large hospitals under the current methodology to 13.2, 14.5 and 15 respectively. Given the payment PPCs have been vetted for clinical significance and actionability, staff believe it is important to assess hospitals on any PPC that is applicable to the patients they serve. Furthermore, weighting the MHAC score by hospital specific expected PPCs focuses the hospitals on complications that are more common for the patients they serve and does not overly weight low volume PPCs for small hospitals.
- Reliability is the consistency of a measure and thus its dependability in assessing the performance of a hospital versus measurement error[9]. Higher reliability indicates that the measure methodology allows us to distinguish one hospital's performance from another, as well as actual clinical performance from random variation. Reliability of PPC measurement statewide over 4 years (FY 21 through FY 24) improves from an average signal to noise ratio of 0.39 under the current

[8] The intention of the MHAC Program is to evaluate Maryland hospitals based on their performance on the 15 payment PPCs, so methodologies that evaluate Maryland hospitals on all 15 payment PPCs would have the highest content validity.

[9] Using the Morris signal-to-noise method, a score of 1.00 indicates a perfect signal of hospital performance without noise (i.e., perfect reliability) and a score of 0 indicates no signal of hospital performance and all noise (i.e., worst reliability). A score of 0.50, for example, means that a given score is subject to random variation and is reliable each at 50% of the time.

methodology to 0.76 under Composite Option 1, indicating that on average the measure results are unreliable 61% of the time under the current methodology but that decreases to 24% of the time under Composite Option 1.

In short, the Composite option is far superior in distinguishing hospital performance such that all hospitals are held increasingly accountable for PPCs that are most germane to the types of patients and services they provide.

With regard to the concerns related to PPC norms for rare and complex procedures done at AMCs, staff looks forward to working with these hospitals to conduct additional analyses and make methodology refinements if needed. However, the staff does think that the proposed changes are superior to the current methodology and thus are not supportive of delaying its implementation or adopting a hybrid approach. Specifically, while AMCs may be performing unique surgeries, staff believes fundamentally that these surgeries should be assessed for potentially preventable complications. Since the start of using the PPCs, the individual PPC measures have been refined based on input from Maryland hospitals, and, as such, changes (e.g., new exclusions) have been made for clinical scenarios where the complication is deemed not preventable by Solventum. Thus, the HSCRC encourages hospitals to continue to submit input to Solventum where there are clinical concerns through the established process. Second, staff believes that the norms at the diagnosis and severity of illness level are granular enough to take into account differences in expected outcomes. Hospitals with an observed-to-expected ratio greater than 1 during the performance period means that either their performance has worsened from the base period for patients where they heavily influence the normative values, or their performance is worse compared to other hospitals seeing patients with the same diagnoses and severity of illness, or a combination of both. But in whatever case, this type of performance, i.e., an observed-to-expected ratio greater than 1, suggests hospitals do have room for improvement. Last, in terms of the benchmarks and thresholds, staff will continue to assess whether AMCs are unfairly being held to performance standards set by smaller hospitals.

Again, staff agrees that ongoing analysis to improve and refine the PPC measures and methodology should be undertaken for the MHAC program specifically, and staff will continue to partner with hospitals and other key stakeholders formally through the work of the PMWG and informally through ongoing open communication.

Finally, staff agrees that transitioning from the TCOC model to the future model may entail establishing updated foundational policy elements for the quality programs. As has been our approach, staff will collaborate with hospitals and other key stakeholders to undertake the needed work.

Updating Measures Based on Data Trends

Commissioner Elliot commented in response to the MHAC Draft RY 27 policy about PPCs in monitoring status, noting that some have increasing trends that may warrant further investigation,e.g., PPC 26 Diabetic Ketoacidosis.

Staff Response

Staff notes that in the program redesign in RY 2021 the PMWG subgroup established criteria to evaluate monitored PPCs to determine whether they should be included in the MHAC payment program. Based on the established criteria, staff does not recommend moving any monitored PPCs into the payment program at this time. Staff agrees that the criteria for evaluating PPCs appropriate for inclusion in the payment program should be updated based on any approved updates to the program methodology (i.e., clinically significant but low volume complications could be reconsidered under a weighted composite).

Recommendations

The final recommendations for the RY 2027 Maryland Hospital Acquired Conditions (MHAC) program are as follows:

1. Use 3M Potentially Preventable Complications (PPCs) to assess hospital acquired complications.
    a. Maintain a focused list of PPCs in the payment program that are clinically recommended and that generally have higher statewide rates and variation across hospitals.
    b. Assess monitoring PPCs based on clinical recommendations, statistical characteristics, and recent trends to prioritize those for future consideration for updating the measures in the payment program.
    c. Engage hospitals on specific PPC increases to understand trends and discuss potential quality concerns.
2. Assess performance using more than one year of data for small hospitals (i.e., less than 21,500 at-risk discharges and/or 22 expected PPCs). The performance period for small hospitals will be CYs 2024 and 2025.
3. Assess hospital performance based on statewide attainment standards.
4. Score hospital performance on a PPC composite that includes all payment PPCs weighted by hospital specific expected volume and Solventum (3M) cost weights as a proxy for patient harm.[10]
5. Maintain a prospective revenue adjustment scale with a maximum penalty at 2 percent and maximum reward at 2 percent:
    a. Use a continuous linear scale that ranges from 0 to 100 percent without a hold harmless zone.
    b. Establish the cut point for penalties and rewards as the average hospital MHAC score as determined through prospective modeling.
    c. Retrospectively assess the average hospital MHAC scores and propose to the Commissioners that the cutpoint be modified if the actual average score is more than +/- 10 percent different from the prospectively modeled average MHAC score.
6. Going forward, consider other candidate measures/measure sets that may be important for assessing hospital avoidable, harmful complications and appropriate for use in the program, e.g., digitally specified measures.

[10] Hospitals without any at-risk or expected for a specific PPC would not be assessed on that PPC. The two maternity related PPCs are dropped for hospitals without this service line, but almost all other Payment PPCs are included for all hospitals at this time weighted by the hospital volume.

Appendix I. Background on Federal Complication Programs

The Federal Government operates two hospital complications payment programs, the Deficit Reduction Act Hospital Acquired Condition program (DRA-HAC) and the HAC Reduction Program (HACRP), both of which are designed to penalize hospitals for post-admission complications.

Federal Deficit Reduction Act, the Hospital-Acquired Condition Present on Admission Program

Beginning in Federal Fiscal Year 2009 (FFY 2009), per the provisions of the Federal Deficit Reduction Act, the Hospital-Acquired Condition Present on Admission Program was implemented. Under the program, patients were no longer assigned to higher-paying Diagnosis Related Groups if certain conditions were acquired in the hospital and could have reasonably been prevented through the application of evidence-based guidelines.

Hospital-Acquired Condition Reduction Program

CMS expanded the use of hospital-acquired conditions in payment adjustments in FFY 2015 with a new program, entitled the Hospital-Acquired Condition Reduction Program, under the authority of the Affordable Care Act. That program focuses on a narrower list of complications and penalizes hospitals in the bottom quartile of performance. Of note, as detailed in Figure 1 below, all the measures in the Hospital-Acquired Condition Reduction Program are used in the CMS Value Based Purchasing program, and the National Healthcare Safety Network (NHSN) Healthcare-Associated Infection (HAI) measures are also used in the Maryland Quality Based Reimbursement (QBR) program.

Figure 1. CMS Hospital-Acquired Condition Reduction Program (HACRP) FFY 2024 Measures

Recalibrated Patient Safety Indicator (PSI) measure:^ ● PSI 03 – Pressure Ulcer Rate ● PSI 06 – Iatrogenic Pneumothorax Rate ● PSI 08 – In-Hospital Fall with Hip Fracture Rate ● PSI 09 – Perioperative Hemorrhage or Hematoma Rate ● PSI 10 – Postoperative Acute Kidney Injury Requiring Dialysis Rate ● PSI 11 – Postoperative Respiratory Failure Rate ● PSI 12 – Perioperative Pulmonary Embolism or Deep Vein Thrombosis Rate ● PSI 13 – Postoperative Sepsis Rate ● PSI 14 – Postoperative Wound Dehiscence Rate ● PSI 15 – Unrecognized Abdominopelvic Accidental Puncture/Laceration Rate
Central Line-Associated Bloodstream Infection (CLABSI)^*
Catheter-Associated Urinary Tract Infection (CAUTI)^*
Surgical Site Infection (SSI) – colon and hysterectomy^*
Methicillin-resistant Staphylococcus aureus (MRSA) Bacteremia^*
Clostridium Difficile Infection (CDI)^*

^Recalibrated PSI Composite Measures included in the CMS VBP Program beginning FFY 2023. * National Healthcare Safety Network (NHSN) Healthcare-Associated Infection (HAI) measures included in both the CMS VBP and Maryland QBR Programs

For more information on the DRA HAC program POA Indicator, please refer to: https://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/HospitalAcqCond/index

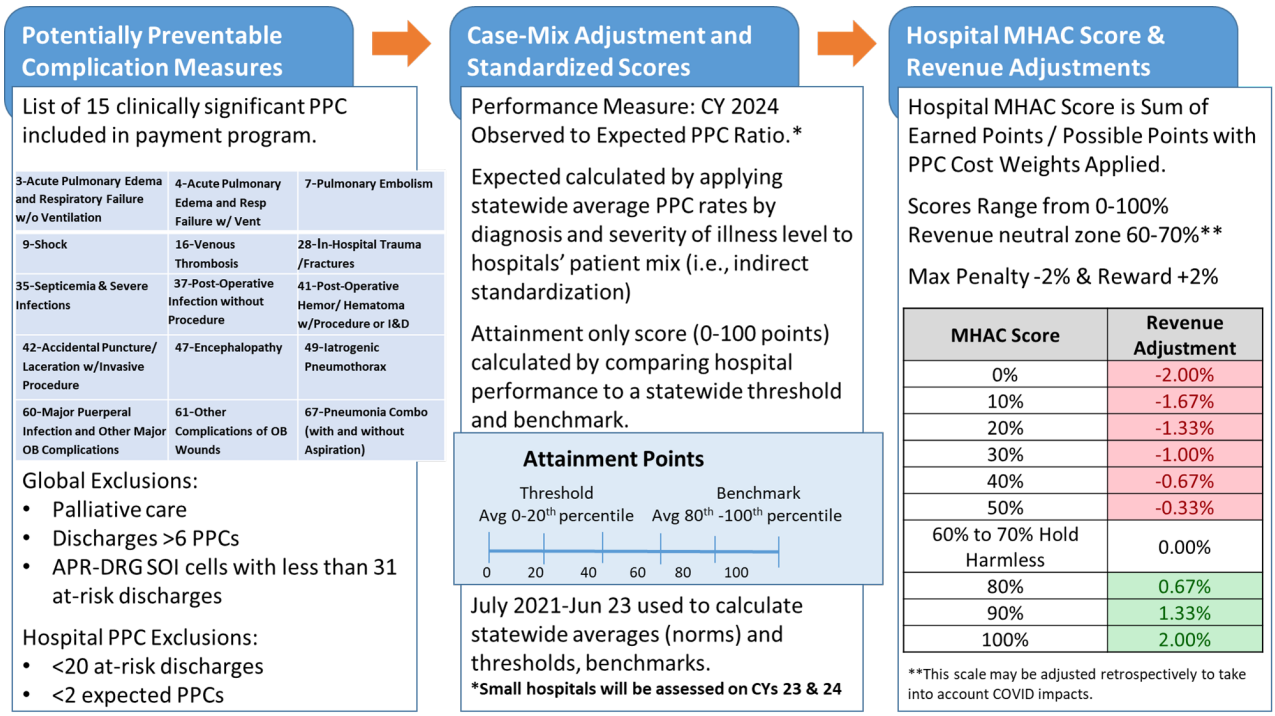
For more information on the DRA HAC program, please refer to: https://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/HospitalAcqCond/Downloads/FAQ-DRA-HAC-PSI.pdf

For more information on the HAC Reduction program, please refer to: https://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/AcuteInpatientPPS/HAC-Reduction-Program

Appendix II: RY 2026 MHAC Program Methodology

Figure 1 below provides a summary overview of the approved RY 2026 MHAC methodology.

Figure 1. Overview of RY 2026 Approved MHAC Methodology



Performance Metric

The methodology for the MHAC program measures hospital performance using the Observed (O) /Expected (E) ratio for each PPC. Expected number of PPCs are calculated using historical data on statewide PPC rates by All Patient Refined Diagnosis Related Group and Severity of Illness Level (APR-DRG SOI). See below for details on how the expected number of PPCs are calculated for each hospital.

Observed and Expected PPC Values

The MHAC scores are calculated using the ratio of $Observed : Expected$ PPC values.

Given a hospital's unique mix of patients, as defined by APR-DRG category and Severity of Illness (SOI) level, the HSCRC calculates the hospital's expected PPC value, which is the number of PPCs the hospital would have experienced if its PPC rate were identical to that experienced by a normative set of hospitals.

The expected number of PPCs is calculated using a technique called indirect standardization. For illustrative purposes, assume that every hospital discharge is considered “at-risk” for a PPC, meaning that all discharges would meet the criteria for inclusion in the MHAC program. All discharges will either have no PPCs, or will have one or more PPCs. In this example, each discharge either has at least one PPC, or does not have a PPC. The unadjusted PPC rate is the percent of discharges that have at least one PPC.

The rates of PPCs in the normative database are calculated for each diagnosis (APR-DRG) category and severity level by dividing the observed number of PPCs by the total number of admissions. The PPC norm for a single diagnosis and severity level is calculated as follows:

Let:

N = norm

P = Number of discharges with one or more PPCs

D = Number of “at-risk” discharges

i = A diagnosis category and severity level

$$N_i = \frac{P_i}{D_i}$$

In the example, each normative value is presented as PPCs per discharge to facilitate the calculations in the example. Most reports will display this number as a rate per one thousand discharges.

Once the normative expected values have been calculated, they can be applied to each hospital. In this example, the normative expected values are computed for one diagnosis category and its four severity levels.

Consider the following example in Figure 2 for an individual diagnosis category.

Figure 2. Expected Value Computation Example for one Diagnosis Category

A Severity of illness Level	B At-risk Discharges	C Observed Discharges with PPCs	D PPCs per discharge (unadjusted PPC Rate)	E Normative PPCs per discharge	F Expected # of PPCs	G Observed: Expected Ratio
			= (C / B)	(Calculated from Normative Population)	= (B x E)	= (C / E) rounded to 4 decimal places
1	200	10	.05	.07	14.0	0.7143
2	150	15	.10	.10	15.0	1.0000
3	100	10	.10	.15	15.0	0.6667
4	50	10	.20	.25	12.5	0.8000
Total	**500**	**45**	**.09**		**56.5**	**0.7965**

For the diagnosis category, the number of discharges with PPCs is 45, which is the sum of discharges with PPCs (column C). The overall rate of PPCs per discharge in column D, 0.09, is calculated by dividing the total number of discharges with PPCs (sum of column C) by the total number of discharges at risk for PPCs (sum of column B), i.e., 0.09 = 45/500. From the normative population, the proportion of discharges with PPCs for each SOI level for that diagnosis category is displayed in column E. The expected number of PPCs for each severity level shown in column F is calculated by multiplying the number of at-risk discharges (column B) by the normative PPCs per discharge rate (column E). The total number of PPCs expected for this diagnosis category is the expected number of PPCs for the severity levels.

In this example, the expected number of PPCs for the APR DRG category is 56.5, which is then compared to the observed number of discharges with PPCs (45). Thus, the hospital had 11.5 fewer observed discharges with PPCs than were expected for 500 at-risk discharges in this APR DRG category. This difference can be expressed as a percentage difference as well.

All APR-DRG categories and their SOI levels are included in the computation of the observed and expected rates, except when the APR-DRG SOI level has less than 30 at-risk discharges statewide.

PPC Exclusions

Consistent with prior MHAC policies, the number of at-risk discharges is determined prior to the calculation of the normative values (hospitals with <10 at-risk discharges are excluded for a particular PPC) and the normative values are then re-calculated after removing PPCs with <2 complication expected. The following exclusions will also be applied:

For each hospital, discharges will be removed if:

- Discharge is in an APR-DRG SOI cell has less than 31 statewide discharges.
- Discharge has a diagnosis of palliative care (this exclusion may be removed in the future once POA status is available for palliative care for the data used to determine performance standards); and
- Discharge has more than 6 PPCs (i.e., a catastrophic case, for which complications are probably not preventable).

For each hospital, PPCs will be removed if during the base period:

- The number of cases at-risk is less than 20; and
- The expected number of PPCs is less than 2.

The PPCs for which a hospital will be assessed are determined using the base period data and not reassessed during the performance period. This is done so that scores can be reliably calculated during the performance period from a pre-determined set of PPCs. The MHAC summary workbooks provide the excluded PPCs for each hospital.

Combination PPCs

Based on clinical input and 3M recommendation, starting in RY 2021 two pneumonia (PPC 5 Pneumonia & Other Lung Infections & PPC 6 Aspiration Pneumonia) PPCs were combined into single pneumonia PPC and the 3M cost weight is a simple average of the two PPC cost weights.

Hospital Exclusions

Acute care hospitals that do not have sufficient volume to have at least 15 at-risk and 1.5 expected for any payment program PPC are excluded from the MHAC policy.

Benchmarks and Thresholds

For each PPC, a threshold and benchmark value are calculated using the determined base period data. In previous rate years when improvement was also assessed, the threshold was set at the statewide median

of 1 and the benchmark was the O/E ratio for the top performing hospitals that accounted for 25% of discharges. For RY 2021 under an attainment only methodology, staff adapted the MHAC points system to allow for greater performance differentiation by moving the threshold to the value of the observed to expected ratio at the 10th percentile of hospital performance, moving the benchmark to the value of the observed to expected ratio at the 90th percentile of hospital performance, and assigning 0 to 100 points for each PPC between these two percentile values.

Attainment Points (possible points 0-100)

If the PPC ratio for the performance period is greater than the threshold, the hospital scores zero points for that PPC for attainment.

If the PPC ratio for the performance period is less than or equal to the benchmark, the hospital scores a full 100 points for that PPC for attainment.

If the PPC ratio is between the threshold and benchmark, the hospital scores partial points for attainment. The formula for calculating the Attainment points is as follows:

- Attainment Points = [99 * ((Hospital's performance period score - Threshold)/ (Benchmark – Threshold))] + 0.5

Calculation of Hospital Overall MHAC Score

To calculate the final score for each hospital, the attainment points earned by the hospital and the potential points (i.e., 100) for each PPC are multiplied by the 3M cost weights. Hospital scores across PPCs are calculated by summing the total weighted points earned by a hospital, divided by the total possible weighted points (100 per PPC * 3M cost weight).

RY 2025 Update: Small Hospital Methodology

Hospital-specific PPC inclusion requirements were updated for the RY 2025 policy, i.e., all hospitals are required to have at least 20 at-risk discharges and 2 expected PPCs in order for a particular PPC to be included in the payment program. Because of the volatility in performance scores for smaller hospitals, the Commission also approved the following policy updates in RY 2025:

> "Establish small hospital criteria for assessing performance under the MHAC policy based on the number of at-risk discharges and expected PPCs (i.e., small hospitals are those with less 21,500 at-risk discharges and/or 22 expected PPCs across all payment program PPCs) as opposed to the number of PPC measure types, and for hospitals that meet small hospital criteria, increase

reliability of score by using two years of performance data to assess hospital performance (i.e., for RY 2025 use CY 2022 and 2023). “

RY 2026 Update: Calculating Performance Standards

Staff modified the methodology slightly to make the performance standards less sensitive to potential outliers by averaging the worst and best performing hospitals (as opposed to taking a single value at the 90th and 10th percentile). This updated methodology is more in line with the CMS VBP program approach to setting the benchmark. Staff explored a couple of options and determined that averaging the 20 percent of O/E ratios of the worst and best performing hospitals results yields similar benchmark and threshold values compared to the previous method but avoids the cliff effects of using a single percentile.

Appendix III: Monitoring PPCs

The table below shows the monitored PPCs' O/E ratios for CY 24 YTD (through September) and the percent changes in the observed-to-expected ratio from CY 2018.

Monitoring PPC	2018 O/E	2024 YTD O/E	2018-2024 % Change	Observed Count CY24 YTD	Eligible Hospitals CY24 YTD
2:Extreme CNS Complications	1.82	0.82	-55.19%	19	23
21: Clostridium Difficile Colitis	1.31	0.73	-44.50%	54	41
25: Renal Failure with Dialysis	1.19	0.68	-43.37%	4	13
45: Post-Procedure Foreign Bodies	0.79	0.52	-34.51%	1	
29:Poisonings due to Anesthesia	0.88	0.61	-30.88%	13	31
10: Congestive Heart Failure	0.82	0.58	-28.67%	6	21
65:Urinary Tract Infection without Catheter	1.11	0.80	-27.62%	407	
66: Catheter-Related Urinary Tract Infection	1.02	0.74	-26.95%	6	
39:Reopening Surgical Site	1.08	0.85	-20.91%	128	
14: Ventricular Fibrillation/Cardiac Arrest	0.84	0.74	-11.31%	168	42
33: Cellutis	0.92	0.90	-2.49%	49	
11: Acute Myocardial Infarction	0.96	0.95	-0.95%	67	39
54: Infections due to Central Venous Catheters	0.85	0.88	3.58%	28	
18: Major Gastrointestinal Complication with Transfusion or Significant Bleeding	0.52	0.60	14.66%	35	38
24: Renal Failure without Dialysis	0.81	0.96	17.77%	706	43
40: Peri-Operative Hemorrhage & Hematoma without Hemorrhage Control Procedure or I&D Proc	0.82	0.97	18.76%	133	
20: Other Gastrointestinal Complications without Transfusion or Significant Bleeding	0.69	0.88	28.36%	82	41
44: Other Surgical Complication- Mod	0.63	0.81	29.38%	14	
8: Other Pulmonary Complications	0.72	0.95	31.05%	39	39
23: GU Complications Except UTI	0.61	0.84	38.07%	35	37
1:Stroke & Intracranial Hemorrhage	0.68	0.95	40.57%	104	40

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Monitoring PPC	2018 O/E	2024 YTD O/E	2018-2024 % Change	Observed Count CY24 YTD	Eligible Hospitals CY24 YTD
48: Other Complications of Medical Care	0.57	0.80	40.77%	84	
19:Major Liver Complications	0.69	0.98	41.55%	29	35
26: Diabetic Ketoacidosis & Coma	0.59	0.88	47.97%	29	37
50: Mechanical Complication of Device, Implant & Graft	0.56	0.84	50.35%	75	
15: Peripheral Vascular Complications Except Venous Thrombosis	0.53	0.80	50.68%	21	32
34: Moderate Infections	0.60	0.92	52.77	33	
13: Other Cardiac Complications	0.57	0.87	52.96%	27	35
64: Other In-Hospital Adverse Events	0.49	0.77	58.40%	56	
27:Post-Hemorrhagic & Other Acute Anemia with Transfusion	0.72	1.16	61.66%	106	40
52:Inflammation & Other Complications of Devices, Implants or Grafts Except Vascular Infection	0.67	1.09	63.24%	174	
17: Major Gastrointestinal Complications without Transfusion or Significant Bleeding 0	0.67	1.09	63.24%	53	38
38: Post-Operative Wound Infection & Deep Wound Disruption with Procedure	1.24	2.07	67.39%	11	
53:Infection, Inflammation & Clotting Complications of Peripheral Vascular Catheters & Infusions	0.54	0.92	69.77%	26	
51: Gastrointestinal Ostomy Complications	0.47	0.88	87.51%	57	
59: Medical & Anesthesia Obstetric Complications	0.48	0.99	106.96%	54	
31: Decubitus Ulcer	0.35	0.87	147.91%	80	
30: Poisonings due to Anesthesia	**0 observed**	**0 Observed**			
32: Transfusion Incompatibility Reaction	**0 observed**	**0 Observed**			

Appendix IV. Composite Options Testing Results

Working with Mathematica, staff tested three composite options as outlined below.

As shown in the equation below, PPC Composite Option 1 is calculated as the sum of the hospital's observed PPCs times the 3M Cost Weight for each payment PPC measure divided by the sum of the hospital's expected PPCs times the 3M Cost Weight for each payment PPC measure.

$$PPC\ Composite_j = \frac{\left(\sum_{i=1}^{15} ObservedPPC_{ij} * 3MCostWeight_i\right)}{\left(\sum_{i=1}^{15} ExpectedPPC_{ij} * 3MCostWeight_i\right)}$$

PPC Composite Option 1 does not explicitly weight PPC measures by volume, but PPC measures with higher expected PPCs receive more weight. The expected PPCs for a PPC measure increases as the volume of at-risk discharges increases.

As show in the equation below, PPC Composite Option 2 is calculated as the sum of the hospital's observed-to-expected (O/E) ratio for each payment PPC measure, weighted by the PPC measure's 3M Cost Weight and hospital's volume of at-risk discharges for the given PPC measure.

$$PPC\ Composite_j = \sum_{i=1}^{15} \left(\frac{Observed\ PPCs_{ij}}{Expected\ PPCs_{ij}}\right) * \left(\frac{Volume_{ij} * 3MCostWeight_i}{\sum_{i=1}^{15} Volume_{ij} * 3MCostWeight_i}\right)$$

As shown in the equation below, PPC Composite Option 3 is calculated as the sum of hospital's O/E ratio for each payment PPC measure, weighted by the PPC measure's 3M Cost Weight and the proportion of observed payment PPCs statewide for the given PPC measure.

$$PPC\ Composite_j = \sum_{i=1}^{15} \left(\frac{Observed\ PPCs_{ij}}{Expected\ PPCs_{ij}}\right) * \left(\frac{StateProportion_i * 3MCostWeight_i}{\sum_{i=1}^{15} StateProportion_i * 3MCostWeight_i}\right)$$

For example, if there were 10,000 observed PPCs across the 15 payment PPC measures across Maryland hospitals and there were 1,000 observed PPCs for a given payment PPC measure, then the statewide proportion would be 0.10 for the PPC measure.

Similarities and differences from the current methodology in the steps for calculating hospital composite scores are outlined in Figure 1 below.

Figure 1. Summary of MHAC Score Calculation Steps for Current Methodology vs Models 1-3

Calculation Steps	Current Methodology	PPC Composite Option 1	PPC Composite Option 2	PPC Composite Option 3
PPC Exclusion Criteria	Exclude PPC measures with <2 expected PPCs or <20 at risk discharges	Exclude PPCs with 0 at-risk discharges		
PPC Measure "Volume" Weights	PPC measures not weighted by volume	PPC measures with greater expected PPCs at hospital receive a larger weight	PPC measures with more at-risk discharges at hospital receive larger weight	PPC measures with more observed PPCs across Maryland hospitals receive a larger weight
PPC Measure 3M Cost Weights	PPC measures are weighted by 3M Cost Weights			
Benchmarks and Thresholds	For each of the 15 payment PPCs, calculate a benchmark and threshold	Calculate a benchmark and threshold for the PPC Composite		

Staff used data from FY 2018 through FY 2024 to model six iterations of Maryland hospital results under each composite option and the current methodology (Figure 2). To inform decision making, staff assessed the content validity, predictive validity, and reliability of each composite option and the current methodology across the six iterations of results.

Figure 2. Performance Periods for Each Iteration of MHAC Results

Iteration	Small Hospital Performance Period	Non-Small Hospital Performance Period
1	FY 2023- FY 2024	FY 2024

Iteration	Small Hospital Performance Period	Non-Small Hospital Performance Period
2	FY 2022- FY 2023	FY 2023
3	FY 2021- FY 2022	FY 2022
4	FY 2020- FY 2021	FY 2021
5	FY 2019- FY 2020	FY 2020
6	FY 2018- FY 2019	FY 2019

Notes: 1) A base period of FYs 2021 and FY 2022 was used for each iteration to keep PPC measure O/E ratios and PPC composite values on the same scale to facilitate comparisons across iterations. 2) Small hospitals were identified as having <21,500 at-risk discharges or <22 expected PPCs during the base period.

Content validity refers to the degree to which a measure captures the concept it is intended to measure. The intention of the MHAC Program is to evaluate Maryland hospitals based on their performance on the 15 payment PPCs, so methodologies that evaluate Maryland hospitals on all 15 payment PPCs would have the highest content validity. The composite methodologies evaluate Maryland hospitals on payment PPC measures with greater than 0 at-risk discharges, resulting in very high content validity even for the smallest hospitals (Figure 3). The current methodology only evaluates Maryland hospitals on PPC measures for which the hospital has at least two expected PPCs, resulting in fewer PPC measures being evaluated especially for small and medium hospitals. The five small Maryland hospitals are evaluated on an average of 13.2 payment PPC measures under the composite methodologies compared with 3.6 payment PPC measures under the current methodology. The 15 medium Maryland hospitals are evaluated on an average of 14.5 payment PPC measures under the composite methodologies compared with 11 payment PPC measures under the current methodology. In addition to improving content validity, evaluating small hospitals on almost all of the 15 payment PPCs under the composite methodologies lessens the degree to which one observed PPCs on one payment PPC measure can drastically negatively impact a small hospital's MHAC revenue adjustment in consecutive rate years.

Figure 3. Content Validity Current Methodology Versus Composite Options

Hospital Category*	Number of Hospitals	Average Number of PPC Measures Evaluated	
		Current Methodology	Composite Methodology
Small Hospitals	5	3.6	13.2
Medium Hospitals	15	11.0	14.5
Large Hospitals	21	13.8	15

Predictive validity refers to the extent that past performance is predictive of future performance. Staff calculated correlations in hospitals' PPC composite values across iterations to assess predictive validity. A measure can be considered to have sufficient predictive validity if adjacent performance periods have moderately to highly correlated and correlations get smaller as the distance between performance periods increases. All composite options demonstrated sufficient predictive validity, but Composite Option 1 demonstrated slightly higher correlations across iterations of results (Figure 4).

Figure 4. Average Correlations of Composite Values Composite Options

Distance Between Performance Periods	Composite Option 1	Composite Option 2	Composite Option 3
1 Year Apart	0.61	0.57	0.53
2 Years Apart	0.40	0.34	0.28
3 Years Apart	0.31	0.23	0.27
4 Years Apart	0.13	0.10	0.10

Reliability refers to the degree to which a measure captures the underlying quantity the measure is intended to capture. Staff assessed the reliability of PPC measures and PPC composite values using the Morris signal-to-noise method under which a score of 1.00 indicates a perfect signal of hospital performance without noise (i.e., perfect reliability) and a score of 0 indicates no signal of hospital performance and all noise (i.e., worst reliability). Staff consider reliability above .50 to be acceptable but would hope the MHAC methodology could achieve an average reliability across Maryland hospitals of 0.75 or higher. The current methodology achieves reliabilities generally somewhat below the desired minimum reliability of 0.50, with the average reliability across FY 2021 to FY 2024 being 0.39 (Figure 5). Options 1, 2, and 3 all yield substantially higher reliabilities than the current methodology, especially Composite Option 1 with an average reliability of 0.76 across FY 2021 to FY 2024.

Figure 5. Average Reliability Across Maryland Hospitals using a 1-year Performance Period by Methodology

Performance Period	Current Methodology*	Composite Option 1	Composite Option 2	Composite Option 3
FY 24	0.24	0.61	0.48	0.54
FY 23	0.38	0.81	0.63	0.68

Performance Period	Current Methodology*	Composite Option 1	Composite Option 2	Composite Option 3
FY 22	0.50	0.81	0.70	0.76
FY 21	0.42	0.80	0.62	0.72
Average	**0.39**	**0.76**	**0.61**	**0.68**

Note: Reliability was calculated using a one-year performance period for all hospitals. Two years of performance data are used to assess reliability for small hospitals, so the actual average reliability across Maryland hospitals is slightly higher than represented in Figure 10.
**For the Current Methodology, staff calculated average reliability across payment PPC measures with two or more expected PPCs during the performance period.*

Average reliability dipped lower across methodologies when using FY 2024 as the performance period. As rates of observed PPCs continue to decrease across Maryland hospitals over time, PPC measure and PPC composite reliability could decrease. Staff will continue to monitor PPC measure and PPC composite reliability and consider using two years of performance period data for all hospitals if reliability when using one year of performance period data continues to decrease. Figure 6 below shows that PPC measure and PPC composite reliability is notably higher when using a two-year performance period for all hospitals and above 0.75 for Composite Option 1 for the FY 2024-2023 performance period.

Figure 6. Average Reliability Across Maryland Hospitals using a 2-year Performance Period by Methodology

Performance Period	Current Methodology*	Composite Option 1	Composite Option 2	Composite Option 3
23-24	0.33	0.78	0.68	0.71
22-23	0.50	0.86	0.76	0.80
21-22	0.54	0.87	0.76	0.81
20-21	0.47	0.85	0.71	0.77
Average	**0.46**	**0.84**	**0.73**	**0.77**

**For Current Methodology, calculated average reliability across payment PPCs with two or more expected PPCs during performance period.*

When examining small hospitals only, the composite options have drastically higher reliability than the current methodology (Figure 7). When using two years of data, the average reliability across small hospitals using Composite

Option 1 is greater than the minimum reliability of 0.50 but somewhat lower for Composite Option 2 and Composite Option 3 and much lower under the current methodology.

Figure 7. Average Reliability Across Small Maryland Hospitals using a 1-year, 2-year, and 3-year Performance Period by Methodology

Performance Period	Current Methodology*	Composite Option 1	Composite Option 2	Composite Option 3
One Year (FY24)	0.13	0.28	0.14	0.18
Two Years (FY23-24)	0.19	0.51	0.32	0.34
Three Years (FY22-24)	0.32	0.66	0.43	0.41
One Year (FY23)	0.20	0.46	0.26	0.29
Two Years (FY22-23)	0.45	0.67	0.41	0.42
Three Years (FY21-23)	0.41	0.73	0.46	0.45

**For Current Methodology, calculated average reliability across payment PPCs with two or more expected PPCs during performance period.*

Aside from assessing validity and reliability of the composite methodologies, staff also examined hospital level results to understand the implications of the different weights each composite methodology puts on each payment PPC measure. As shown in Figure 8 below, the weight put on each PPC measure can vary notably across composite methodologies. In this hypothetical example, the given hospital has a very similar number of at-risk discharges for PPC measures 28 and 42 and therefore both have volume weights of 12.7% under Composite Option 2. However, PPC 42 has almost twice as many expected PPCs as PPC 28 (10.2 versus 5.4) so PPC 42 receives roughly twice the weight as PPC 28 under Composite Option 1. Reliability tends to increase as the number of expected PPCs at a hospital increases and the weight Composite Option 1 puts on each PPC measure is based on the number of expected PPCs at the hospital, offering a plausible explanation for why Composite Option 1 demonstrated consistently higher reliabilities than the other composite options. Composite Option 3 also yields high reliability levels across iterations, but staff anticipate hospitals may perceive this methodology to be less fair than Composite Option 1 because the weight put on payment PPC measures is based on statewide proportion of expected PPCs instead of hospital-specific percentage of expected PPCs. Across Maryland hospitals and payment PPC measures, the average difference between the proportion of observed PPCs statewide and hospital-specific percentage of expected PPCs was about 3 percentage points (e.g., 3% compared with 6%), thus confirming that the Composite Option 3 methodology could be considered less representative of hospital-specific performance or less fair. This average difference also could explain why reliabilities across iterations were somewhat lower for Composite Option 3 than Composite Option 1.

Figure 8. MHAC Composite Weighting Hypothetical Example

PPC Measure	At-risk discharges	Expected PPCs	Pct. of hospital's expected PPCs (Composite Option 1)	Pct. of hospital's at-risk discharges (Composite Option 2)	Proportion of statewide observed PPCs (Composite Option 3)	3M Cost Weight
28	20,270	5.4	2.4%	12.7%	4.8%	0.45
42	20,294	10.2	4.5%	12.7%	7.3%	0.50

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Appendix V: Hospital MHAC Scores and Revenue Adjustments

Revenue Adjustments using Current Methodology Versus Composite Option 1 (FY 2024, No Hold Harmless Zone)

Hospital ID	Current Methodology MHAC Score	Current Methodology Revenue Adjustment (%)	Current Methodology Revenue Adjustment ($)	Composite Option 1 MHAC Score	Composite Option 1 Revenue Adjustment (%)	Composite Option 1 Revenue Adjustment ($)
210001	81%	0.56%	$1,423,142	100%	2.00%	$5,039,916
210002	62%	-0.31%	-$4,617,661	69%	-0.36%	-$5,302,059
210003	44%	-0.80%	-$2,485,564	46%	-0.91%	-$2,805,928
210004	68%	-0.15%	-$621,983	59%	-0.60%	-$2,473,805
210005	65%	-0.23%	-$590,242	68%	-0.38%	-$976,759
210008	58%	-0.42%	-$931,822	62%	-0.53%	-$1,161,392
210009	44%	-0.80%	-$14,607,773	35%	-1.17%	-$21,246,274
210011	80%	0.49%	$1,246,330	91%	0.86%	$2,203,369

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Hospital ID	Current Methodology MHAC Score	Current Methodology Revenue Adjustment (%)	Current Methodology Revenue Adjustment ($)	Composite Option 1 MHAC Score	Composite Option 1 Revenue Adjustment (%)	Composite Option 1 Revenue Adjustment ($)
210012	82%	0.64%	$3,323,176	100%	2.00%	$10,380,258
210015	81%	0.56%	$2,100,086	100%	2.00%	$7,437,246
210016	81%	0.56%	$1,371,722	100%	2.00%	$4,857,817
210017	62%	-0.31%	-$90,870	96%	1.50%	$433,517
210018	60%	-0.37%	-$353,352	61%	-0.55%	-$528,368
210019	72%	-0.04%	-$145,233	88%	0.49%	$1,704,529
210022	65%	-0.23%	-$578,467	69%	-0.36%	-$897,973
210023	76%	0.19%	$688,215	83%	-0.03%	-$99,947
210024	68%	-0.15%	-$402,570	99%	1.87%	$5,020,432
210027	97%	1.77%	$3,252,024	100%	2.00%	$3,667,597
210028	72%	-0.04%	-$41,650	95%	1.37%	$1,375,935

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Hospital ID	Current Methodology MHAC Score	Current Methodology Revenue Adjustment (%)	Current Methodology Revenue Adjustment ($)	Composite Option 1 MHAC Score	Composite Option 1 Revenue Adjustment (%)	Composite Option 1 Revenue Adjustment ($)
210029	63%	-0.29%	-$1,350,580	68%	-0.38%	-$1,810,249
210032	86%	0.94%	$799,222	100%	2.00%	$1,696,058
210033	74%	0.04%	$58,577	95%	1.37%	$2,229,949
210034	95%	1.62%	$2,080,350	100%	2.00%	$2,564,689
210035	84%	0.79%	$772,265	89%	0.61%	$597,826
210037	66%	-0.20%	-$252,999	88%	0.49%	$601,382
210038	67%	-0.18%	-$249,189	93%	1.12%	$1,568,641
210039	67%	-0.18%	-$143,611	64%	-0.48%	-$387,451
210040	82%	0.64%	$1,029,976	100%	2.00%	$3,217,228
210043	74%	0.04%	$117,117	86%	0.23%	$762,629
210044	74%	0.04%	$94,883	76%	-0.19%	-$510,532

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Hospital ID	Current Methodology MHAC Score	Current Methodology Revenue Adjustment (%)	Current Methodology Revenue Adjustment ($)	Composite Option 1 MHAC Score	Composite Option 1 Revenue Adjustment (%)	Composite Option 1 Revenue Adjustment ($)
210048	55%	-0.50%	-$1,109,998	48%	-0.86%	-$1,892,453
210049	88%	1.09%	$2,590,152	100%	2.00%	$4,737,251
210051	72%	-0.04%	-$77,609	87%	0.36%	$674,710
210056	91%	1.32%	$2,463,763	100%	2.00%	$3,732,568
210057	91%	1.32%	$4,408,925	100%	2.00%	$6,679,462
210058	96%	1.70%	$1,374,710	100%	2.00%	$1,619,362
210060	64%	-0.26%	-$97,883	78%	-0.15%	-$55,167
210061	56%	-0.48%	-$226,110	58%	-0.62%	-$294,751
210062	73%	-0.01%	-$30,054	100%	2.00%	$4,218,428
210063	84%	0.79%	$2,315,287	100%	2.00%	$5,851,361
210064	98%	1.85%	$1,260,000	100%	2.00%	$1,362,957

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Hospital ID	Current Methodology MHAC Score	Current Methodology Revenue Adjustment (%)	Current Methodology Revenue Adjustment ($)	Composite Option 1 MHAC Score	Composite Option 1 Revenue Adjustment (%)	Composite Option 1 Revenue Adjustment ($)
210065	70%	-0.10%	-$90,785	83%	-0.03%	-$25,728