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Final Recommendation for the Maryland Hospital Acquired Conditions Program for Rate Year 2025

December 14, 2022

This document contains final recommendations for the RY 2025 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.

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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 ensure that any incentives to constrain hospital expenditures under the Total Cost of Care Model do not result in declining quality of care. 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.

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Recommendations

The MHAC policy was redesigned in Rate Year (RY) 2021 to modernize the program for the new Total Cost of Care Model. This RY 2025 final recommendation, in general, maintains the measures and methodology that were developed and approved for RYs 2022 through 2024.[1]

These are the final recommendations for the RY 2025 Maryland Hospital Acquired Conditions (MHAC) program:

1. Continue to 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 as indicated/appropriate to understand trends and discuss potential quality concerns.
2. Use more than one year of performance 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 2022 and 2023.
3. Continue to assess hospital performance on attainment only.
4. Continue to weigh the PPCs in the payment program by 3M cost weights as a proxy for patient harm.
5. Maintain a prospective revenue adjustment scale with a maximum penalty at 2 percent and maximum reward at 2 percent and continuous linear scaling with a hold harmless zone between 60 and 70 percent.

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

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Introduction

Maryland hospitals have been funded under a population-based revenue system with a fixed annual revenue cap 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 Maryland Health Services Cost Review Commission's (HSCRC's or Commission's) quality programs reward quality improvements and achievements that reinforce the 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 respiratory failure, pulmonary embolisms, and surgical-site infections.

For MHAC, as well as the other State 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). For purposes of the RY 2025 MHAC Final Policy, staff vetted the updated final policy in October with the Performance Measurement Workgroup (PMWG), the standing advisory group that meets monthly to discuss Quality policies.

Additionally, with the onset of the Total Cost of Care Model Agreement with CMS on January 1, 2019, each 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 weighing 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.

In light of the recent MHAC program redesign, and the COVID-19 Public Health Emergency (PHE), this RY 2025 MHAC policy proposes minimal changes to the program. The assessment section does, however, include an evaluation of PPCs in "Monitoring" status because the approved recommendations for RY 2021 and future rate years included identifying PPCs that due to worsening performance should be included back into the MHAC program. Furthermore, the assessment section outlines necessary timeline changes and the current plan to assess the impact of COVID-19 for both the RYs 2023 and 2024 policy.

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 high rates of complications. Detailed information, including HACRP complication measures, may be found in Appendix I.

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 the 2020 PPC results, CMS granted Maryland exemption from the federal pay-for-performance programs (including the HAC Reduction Program) for Federal Fiscal Year 2022 on October 29, 2021; HSCRC is awaiting CMS' response to our exemption request for FFY 2023.

Overview of the MHAC Policy

The MHAC program, which was first implemented for RY 2011, is based on a system developed by 3M Health Information Systems (3M) to identify potentially preventable complications (PPCs) using

present-on-admission for eligible secondary diagnosis codes available in claims data. 3M originally developed specifications for 65 PPCs[2], 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. 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.

MHAC Methodology

Figure 1 provides an overview of the three steps in the RY 2025 MHAC methodology that converts hospital performance to standardized scores, and then payment adjustments, as outlined below:

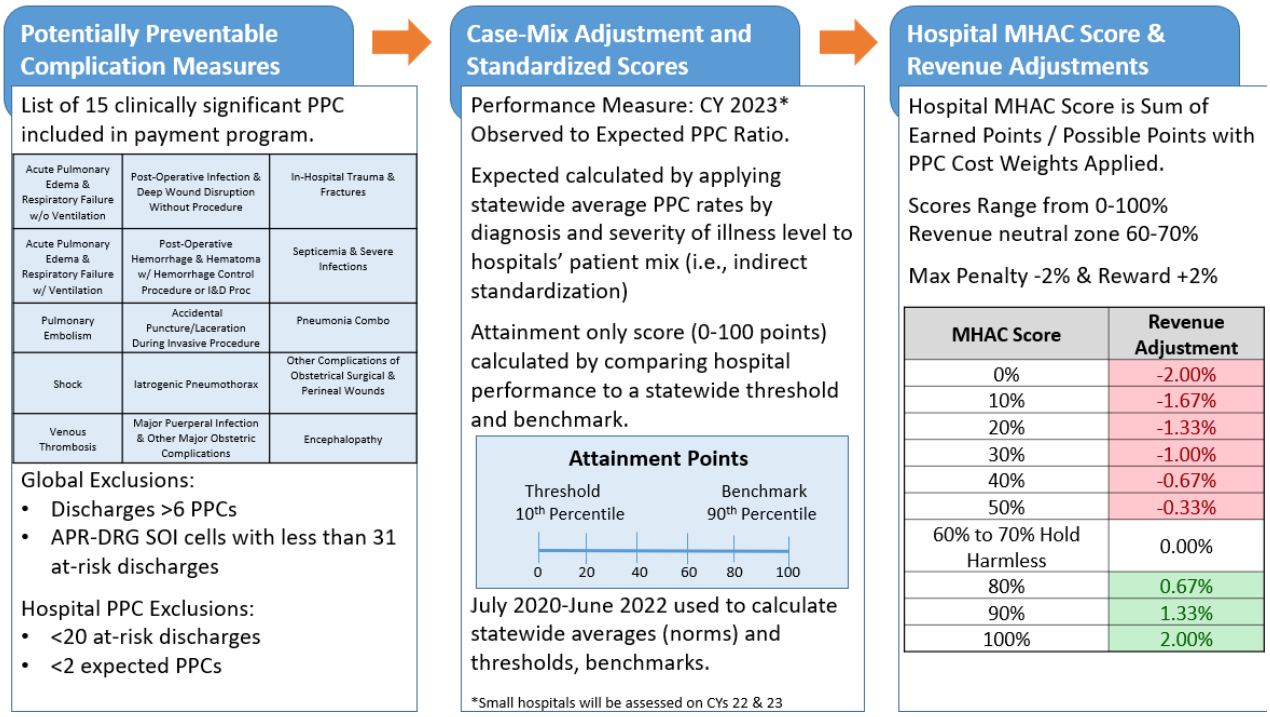
Step 1. For the PPCs identified for payment, clinically-determined global and PPC-specific exclusions, as well as volume based hospital-level exclusions are identified to ensure fairness in assignment of complications.

Step 2. Case-mix adjustment is used to calculate observed to expected ratios that are then converted to a standardized point based score (0-100 points) based on each hospital's attainment levels using the same 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.

[2] In RY 2020, there were 45 PPCs or PPC combinations included in the program, from an initial 65 PPCs in the software, as 3M had discontinued some PPCs and others were deemed not suitable for a pay-for-performance program.

Figure 1. Overview Rate Year 2025 MHAC Methodology



Assessment

In order to develop the RY 2025 MHAC policy, staff solicited input from the PMWG and other stakeholders. In general, stakeholders support the staff's recommendation to not make major changes to the RY 2025 MHAC program. This section of the report provides an overview of the statewide PPC trends—for those used for payment, under monitoring, and overall—and updates related to 3M clinical logic and MHAC methodology.

Statewide PPC Performance Trends

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.

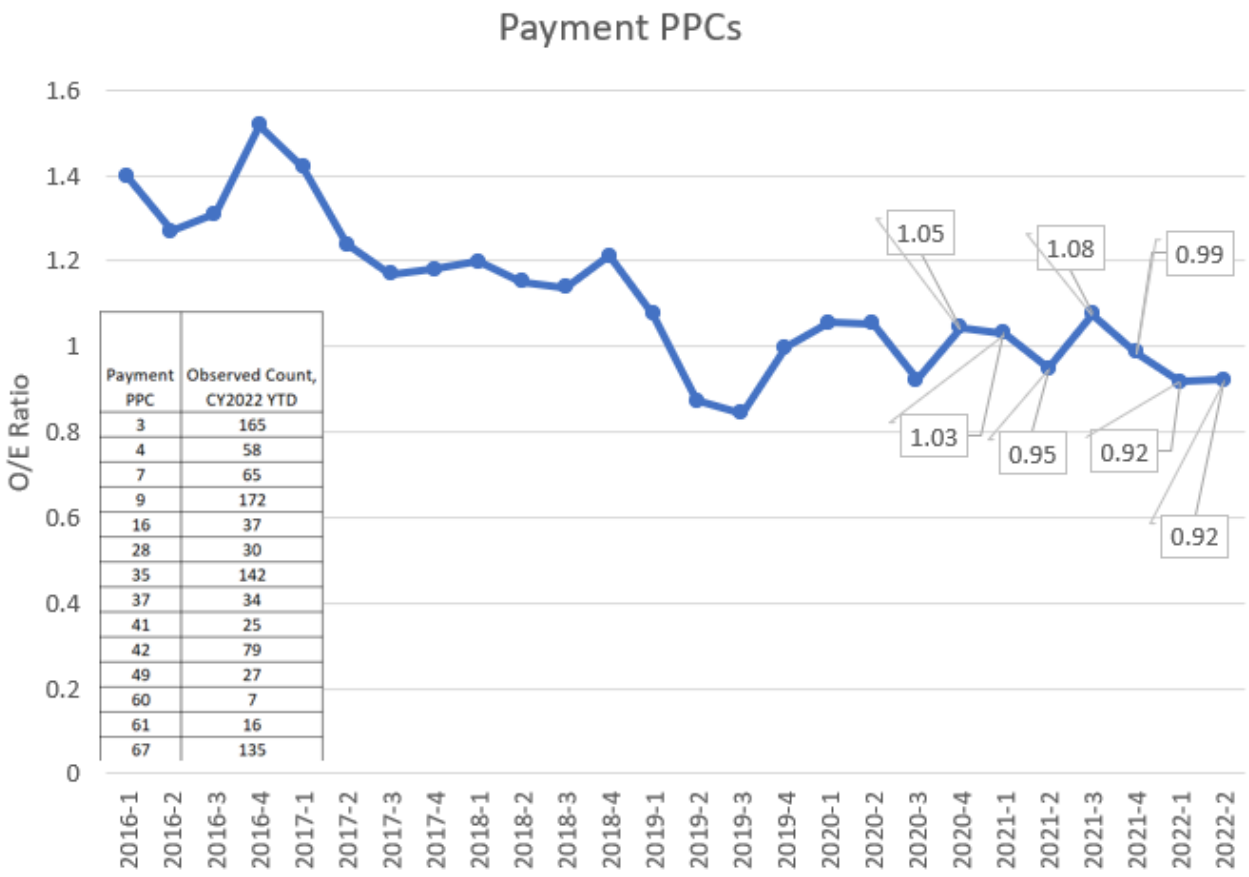
Under the TCOC Model, Maryland must maintain these improvements by not exceeding the CY 2018 PPC rates. Figure 2 below shows the statewide observed to expected (O/E) ratio from 2016 through June CY 2022.[3] The O/E ratio presents the count of observed PPCs divided by the calculated number of expected PPCs (which is generated using 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.[4] Specifically, there has been a 22% decrease in the ratio based on the most recent data available (CY 2018 O/E ratio = 1.18 and CY 2022 YTD O/E ratio = 0.92).

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
41 Post-Operative Hemorrhage & Hematoma w/ Hemorrhage Control Procedure or I&D
42 Accidental Puncture/ Laceration During Invasive Procedure
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)

[3] 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.
[4] Beginning in v38 of the 3M PPC grouper, COVID exclusions vary by PPC.

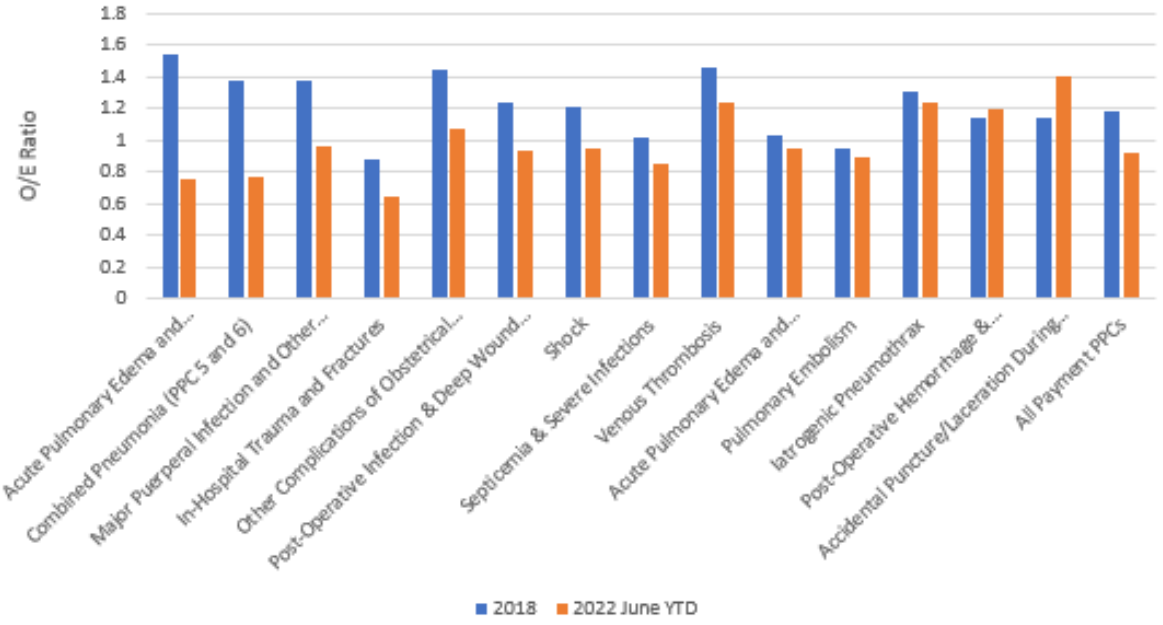
Figure 2. Payment Program PPCs Quarterly Observed to Expected Ratios CY 2016 to CY 2022 June



Payment PPC	Observed Count, CY2022 YTD
3	165
4	58
7	65
9	172
16	37
28	30
35	142
37	34
41	25
42	79
49	27
60	7
61	16
67	135

In terms of specific improvements among the 14 payment PPCs, Figure 3 shows the O/E ratios for CY 2018 and CY 2022 YTD, sorted from greatest percent decrease (on the left) to greatest percent increase (on the right). The two PPCs that worsened during this time period include PPC 41- Postoperative Hemorrhage & Hematoma w/ Hemorrhage Control Procedure or I&D and PPC 42-Accidental Puncture/ Laceration During Invasive Procedure. The three PPCs with the greatest decreases include PPC 4- Acute Pulmonary Edema, Resp Failure w/ventilation, PPC 60- Major Puerperal Infection and Other Major Obstetric Complications and PPC 67 - Pneumonia Combo (with and without aspiration).

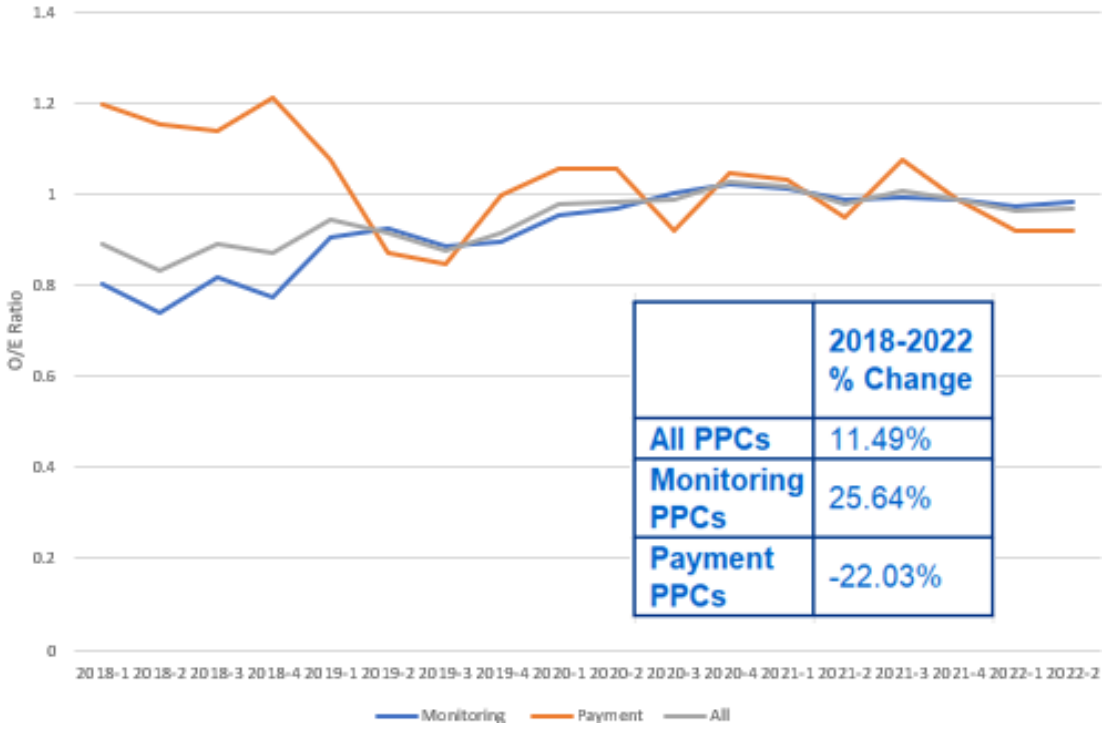
Figure 3. Payment Program PPC Observed to Expected Ratios CY 2019 and CY 2022 June YTD



Monitored Complications

In addition to focusing on a narrowed list of PPCs for payment, as stated previously, the RY 2021 MHAC policy 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 54 PPCs shows that there has been an increase in the overall statewide O/E ratio from 0.87 in CY 2018 to 0.97 in CY 2022 YTD; the worsening performance is driven primarily by increases in PPCs under monitoring status, and not increases in the payment program PPCs, as illustrated in Figure 4. In the RY 2023 policy, staff reached out to hospitals with increases in monitoring PPCs and were given several reasons for the increase unrelated to declining quality. Appendix III provides the statewide changes in observed, expected, and the O/E ratios for the monitoring PPCs sorted by the observed PPCs that accounted for the largest proportion of the increase from 2018 to 2022 YTD through June.

Figure 4. PPC O/E Ratio Trends CY 2016 Through CY 2022 Qtr 2



As mentioned previously, the MHAC redesign process assessed which PPCs should be included in the pay-for-performance program based on criteria developed by the Clinical Adverse Events Measures (CAEM) subgroup. To support determining the monitored PPCs that are the best candidates for re-adopting into the payment program, staff and stakeholders are using the previously established criteria that include:

- PPC Data Analysis/Statistics
  - Greater than 50% increase in O/E ratio comparing 2022 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
  - At least half of the hospitals are eligible for the PPC
- Additional Considerations
  - PSI overlap
  - Clinical significance
  - Opportunity for improvement

- All-payer

Based on staff assessment to date of monitored PPC trends and the criteria above, staff vetted the PPCs listed below with PMWG stakeholders[5]. Staff established two tiers of PPCs currently monitored to consider for use in the payment program, which were listed in the RY 2024 policy. For RY 2025, staff assessed the increases in monitoring PPCs and found that PPC 31 (Decubitus Ulcer) and PPC 47 (Encephalopathy), which were in the "Strongly Consider" tier in last year's analysis, are still of concern according to the criteria for re-inclusion into the payment program that is listed above.

As stated above, staff is committed to ensuring that the additional monitored complication measures that are areas of concern and are deemed appropriate for a pay-for-performance program are proposed for re-inclusion. Therefore, Staff is recommending that PPC 47 be included in the MHAC payment program beginning in RY 2025. Staff's analyses show that the O/E ratio of PPC 47 has consistently increased since CY 2016 and meets all of the aforementioned criteria for re-inclusion in the payment program; the results of these analyses are included in Appendix III. Although there are concerns regarding the increases seen in PPC 31, staff is not recommending inclusion in the payment program because of the significant overlap with PSI.

Small Hospital Criteria

The current MHAC program handles small hospitals in two ways: 1. Hospitals are excluded because they do not meet the minimum criteria of 2 expected and 20 at-risk for any PPC; and 2. Hospital performance is assessed using two years of data, if across all 14 payment PPCs the hospital has less than 20,000 at-risk or 20 expected. With the addition of PPC 47 encephalopathy, the staff propose increasing the criteria for using two years of data proportionally to the number of PPCs. So with 15 payment PPCs, two years of data will be used if a hospital has less than 21,500 at-risk or 22 expected PPCs.

[5] In addition to adjusting the expected rates at each hospital by their APR-DRG Severity of Illness (SOI) patient mix, staff has noted that the MHAC program also relies on the work of 3M to review the PPC clinical logic and perform PPC Grouper updates annually. Staff has encouraged stakeholders, particularly clinicians, to review 3M updated global exclusion logic and PPC-specific assignment and exclusion logic and to weigh in on the monitored PPCs they believe are best to include in the payment program

COVID-19 Update

The RY 2025 policy will use data during the COVID PHE to determine performance standards (i.e., the two year base period will be July 2020 through June 2022) under PPC Grouper Version 40. Thus, the performance standards will be determined post-COVID, thereby reducing the concerns of using a pre-COVID time period. As with PPC Grouper Version 39, the Version 40 grouper has clinical logic that determines if a discharge with a COVID diagnosis can be assigned a PPC, which in effect means that the PPC Grouper is acknowledging that these PPCs for COVID patients are not potentially preventable. Below is the list of PPCs that can be assigned for discharges with a COVID diagnosis, with the five payment PPCs bolded.

- 20 Other Gastrointestinal Complications
- 23 Genitourinary Complications except Urinary Tract Infection
- 26 Diabetic Ketoacidosis & Coma
- 27 Post-Hemorrhagic & Other Acute Anemia with Transfusion
- **28 In-Hospital Trauma and Fractures**
- 29 Poisonings except from Anesthesia
- 30 Poisonings due to Anesthesia
- 31 Pressure Ulcer
- 32 Transfusion Incompatibility Reaction
- 36 Altered Mental Status
- **37 Post-Procedural Infection & Deep Wound Disruption without Procedure**
- 38 Post-Procedural Infection & Deep Wound Disruption with Procedure
- 39 Reopening Surgical Site
- **42 Accidental Puncture/Laceration during Invasive Procedure**
- 44 Other Surgical Complication - Moderate
- 45 Post-Procedural Foreign Bodies and Substance Reaction
- 48 Other Complications of Medical Care
- **49 Iatrogenic Pneumothorax**
- 50 Mechanical Complication of Device, Implant & Graft
- 51 Gastrointestinal Ostomy Complications
- 52 Infection, Inflammation & Other Complications of Devices, Implants or Grafts except Vascular Infection
- 54 Central Venous Catheter-Related Infection

- 59 Medical & Anesthesia Obstetric Complications
- **60 Major Puerperal Infection and Other Major Obstetric Complications**
- 64 Other In-Hospital Adverse Events
- 65 Urinary Tract Infection
- 66 Catheter-Related Urinary Tract Infection

While staff believes the post-COVID base for performance standards and the grouper logic largely handle COVID concerns, hospitals should alert staff of any COVID concerns for review and possible retrospective changes.

Palliative Care Update

Last year for RY 2024, the MHAC program adjusted its methodology to exclude palliative care cases because the palliative care diagnosis became exempt from present-on-admission coding. Under the 3M PPC Grouper Version 40, palliative care has moved from a global exclusion to a PPC specific exclusion. Moving forward, the MHAC program will rely on the 3M clinical logic to determine what PPCs can be assigned to discharges with a palliative care diagnosis (whether or not present-on-admission). Below is the list of PPCs that can be assigned for discharges with a palliative care diagnosis, with the two payment PPCs (PPC 28 and 42) bolded.

Palliative care exclusion is applicable to all PPCs except:

- **PPC 28 In-Hospital Trauma and Fractures**
- PPC 29 Poisonings except from Anesthesia
- PPC 39 Reopening Surgical Site
- **PPC 41 Post-Operative Hemorrhage & Hematoma w/ Hemorrhage Control Procedure or I&D**
- **PPC 42 Accidental Puncture/Laceration during Invasive Procedure**
- PPC 48 Other Complications of Medical Care
- PPC 64 Other In-Hospital Adverse Events
- PPC 66 Catheter-Related Urinary Tract Infection

Case-Mix Adjusted PPC Rates

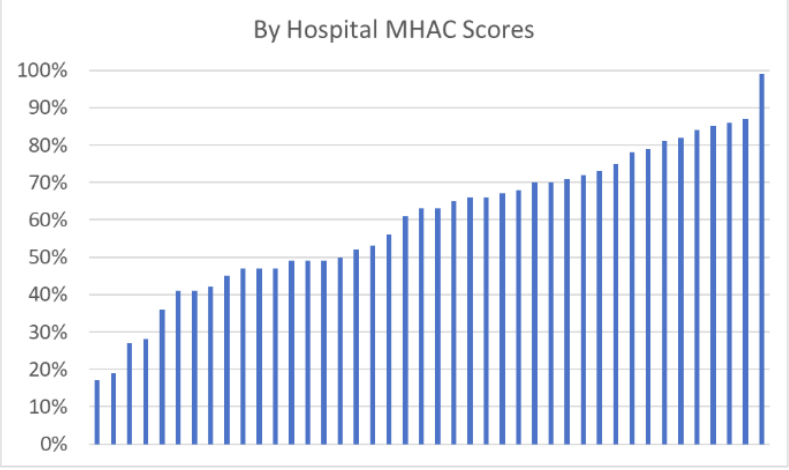
As Maryland hospitals continue to improve on payment PPCs, staff plan to pursue statistical methods that will better address small cell size issues and statistical reliability and validity. Thus, during CY 2023, staff will work with our contractor MPR to explore whether changes are needed to the program. The methods that will be considered are similar to methods used by CMS for the

same concerns (i.e., Bayesian smoothing) and modeling will be presented to the PMWG in the winter/spring for consideration in RY 2026.

Hospital Scores and Revenue Adjustments

The hospital scores are calculated across all payment PPCs and 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 redesign the scale has remained the same--that is it goes from 0 to 100 percent with a hold harmless zone between 60 and 70 percent. Despite historical concerns regarding the lack of a continuous scale from some stakeholders, staff still believe that the hold harmless zone is reasonable given the lack of national benchmarks for establishing a cut-point. Using historical data under v39 of the PPC grouper, staff modeled scores for hospitals with encephalopathy included. Figure 5 shows the distribution of hospital scores and statistics indicating for example that the median score was 63 percent. Given the time periods used for this modeling (Base: FY 2021 and 2022; Performance CY 2021), these results should be interpreted with caution since CMS and the HSCRC suspended the RY 2023 MHAC program that was based on CY 2021 data. Furthermore, hospital revenue adjustments are not included since the statewide numbers are skewed by the large hospitals. However, using the current RY 2024 scale, 19 hospitals would receive a penalty, 10 hospitals would be held harmless (i.e., no penalty or reward), and 13 hospitals would receive a reward. Given the average scores are within the hold harmless zone, staff do not recommend changing the current revenue adjustments scale for RY 2025.

Figure 5. Modeled MHAC Scores



Score Statistics	
Average	60%
Median	63%
25th Percentile	47%
75th Percentile	74%
Highest	99%
Lowest	17%

Health Equity

Over the past year, Staff began to analyze the quality programs and measures for racial and sociodemographic disparities. Specifically for the MHAC program, the results for the payment PPCs were stratified by race, payer and area deprivation index (ADI) and was risk-adjusted for age, sex, Admit-DRG, and Severity of Illness level. Results of this analysis suggested that there are statistically insignificant differences between racial categories; however, there were statistically significant differences between payers and ADI categories. While statistically significant differences were found between payers and ADI categories, the odds ratios are relatively low and are, therefore, not an area of large concern for staff compared to the disparities uncovered in other quality measures, for example, Timely Follow-Up. Staff remains committed to addressing health equity, but at this time does not recommend including additional incentives for reducing disparities in PPC performance because of the overall low rates in PPCs and the relatively low odds ratios between payer and ADI categories. Over the next year, Staff will continue to monitor disparities in the quality programs' measures and develop disparity measure(s) and incentives that will drive improvement in disparities.

Stakeholder Feedback and Responses

Staff discussed the draft policy with PMWG and received one comment letter in response to the RY 2025 draft MHAC policy. The one letter received from the Maryland Hospital Association was supportive of the draft recommendation, which largely remains unchanged. There was support from both PMWG members and the MHA with the inclusion of the PPC 47 encephalopathy. As always the staff appreciate the expertise of stakeholders who provide input on our quality policies.

Recommendations

The MHAC policy was redesigned in Rate Year (RY) 2021 to modernize the program for the new Total Cost of Care Model. This RY 2025 final recommendation, in general, maintains the measures and methodology that were developed and approved for RY 2024.[6]

These are the final recommendations for the RY 2025 Maryland Hospital Acquired Conditions (MHAC) program:

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

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   c. Engage hospitals on specific PPC increases as indicated/appropriate to understand trends and discuss potential quality concerns.
2. Use more than one year of performance 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 2022 and 2023.
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5. Maintain a prospective revenue adjustment scale with a maximum penalty at 2 percent and maximum reward at 2 percent and continuous linear scaling with a hold harmless zone between 60 and 70 percent.

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 2020 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

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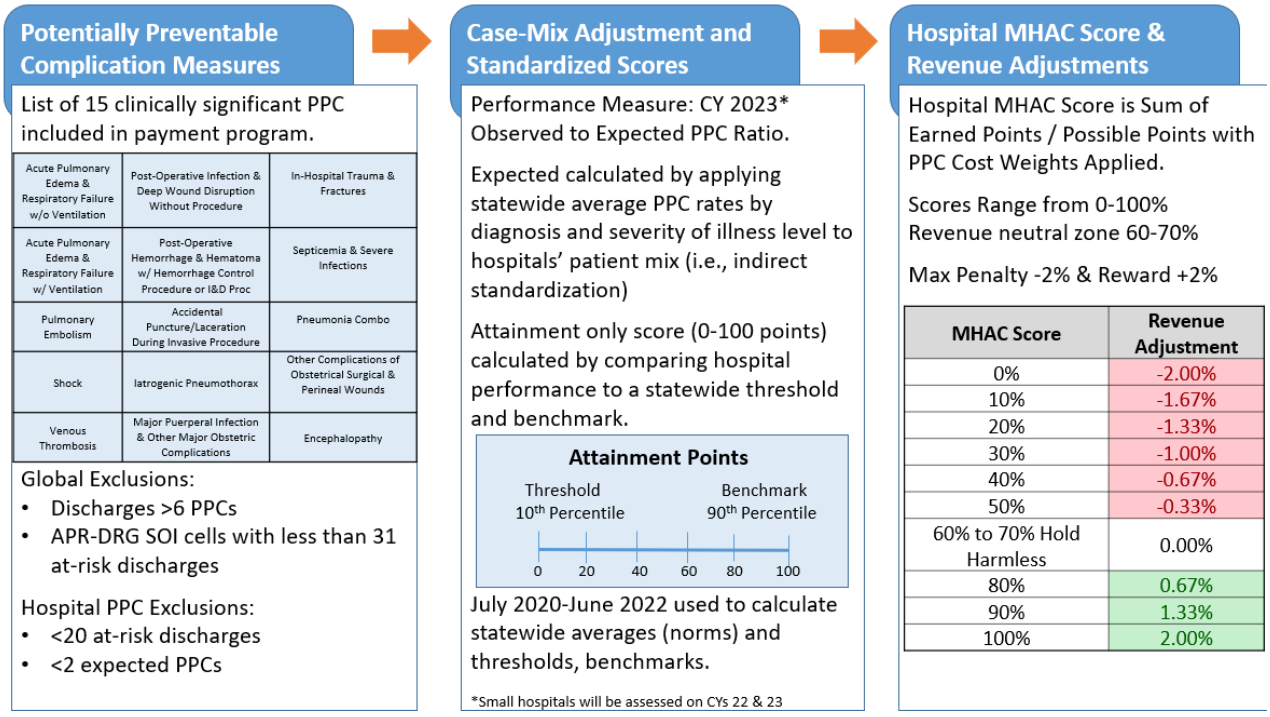
Appendix II: RY 2025 MHAC Program Methodology

Figure 1 below provides a summary overview of the approved RY 2025 MHAC methodology.

Figure 1. Overview of RY 2025 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 July 2020 to December 2021:

- The number of cases at-risk is less than 15; and
- The expected number of PPCs is less than 1.5.

The PPCs for which a hospital will be assessed are determined using the July 2020 to December 2021 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 to calculate 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). Figure 5 provides a hypothetical example of the points based scoring approach with the 3M cost weights.

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 than 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). “

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Appendix III: Monitoring PPCs

The table below shows the monitored PPCs O/E ratios for CY 22 YTD (through June) and the percent changes in the observed-to-expected ratio from CY 2018.

PPC	2022 YTD O/E Ratio	2018-2022 % Change
45: Post-Procedure Foreign Bodies	25.47%	-78.77%
2: Extreme CNS Complications	46.04%	-60.54%
5: Pneumonia & Other Lung Infections	77.78%	-50.42%
66: Catheter-Related Urinary Tract Infection	39.74%	-42.35%
6: Aspiration Pneumonia	73.74%	-35.06%
21: Clostridium Difficile Colitis	100.53%	-18.26%
39: Reopening Surgical Site	80.32%	-17.98%
65: Urinary Tract Infection without Catheter	99.37%	-10.84%
33: Cellulitis	99.45%	7.59%
11: Acute Myocardial Infarction	97.61%	10.91%
25: Renal Failure with Dialysis	138.51%	11.65%
19: Major Liver Complications	69.02%	13.86%
14: Ventricular Fibrillation/Cardiac Arrest	80.11%	14.32%

40: Post-Operative Hemorrhage & Hematoma without Hemorrhage Control Procedure or I&D Proc	95.96%	20.43%
10: Congestive Heart Failure	84.03%	25.69%
27: Post-Hemorrhagic & Other Acute Anemia with Transfusion	99.22%	29.40%
54: Infections due to Central Venous Catheters	89.46%	36.95%
8: Other Pulmonary Complications	124.86%	38.89%
44: Other Surgical Complication- Mod	61.23%	40.33%
1: Stroke & Intracranial Hemorrhage	97.45%	46.48%
52: Inflammation & Other Complications of Devices, Implants or Grafts Except Vascular Infection	98.06%	47.07%
17: Major Gastrointestinal Complications without Transfusion or Significant Bleeding	90.32%	51.06%
29:Poisonings due to Anesthesia	142.19%	52.18%
20: Other Gastrointestinal Complications without Transfusion or Significant Bleeding	101.41%	53.47%
23: GU Complications Except UTI	102.47%	69.48%
48: Other Complications of Medical Care	90.20%	69.56%
34: Moderate Infections	92.15%	69.64%

50: Mechanical Complication of Device, Implant & Graft	99.59%	90.65%
13: Other Cardiac Complications	103.61%	103.73%
59: Medical & Anesthesia Obstetric Complications	105.55%	125.40%
18: Major Gastrointestinal Complication with Transfusuib or Significant Bleeding	117.47%	130.00%
51: Gastrointestinal Ostomy Complications	119.35%	131.61%
38: Post-Operative Wound Infection & Deep Wound Disruption with Procedure	81.23%	133.71%
53: Infection, Inflammation & Clotting Complications of Peripheral Vascular Catheters & Infusions	181.68%	145.34%
15: Peripheral Vascular Complications Except Venous Thrombosis	124.30%	152.27%
26: Diabetic Ketoacidosis & Coma	121.83%	152.62%
64: Other In-Hospital Adverse Events	131.92%	155.78%
31: Decubitius Ulcer	98.59%	214.82%
47: Encephalopathy	130.43%	243.51%
30: Poisonings due to Anesthesia	0 Observed	
32: Transfusion Incompatibility Reaction	0 Observed	

Below are results for PPC 47: Encephalopathy on the criteria used to re-include a monitoring PPC into the payment program.

Monitoring PPC: Analysis of PPC 47

- Greater than 50% increase in O/E ratio comparing to 2018
  - 177.27% in 2021, 243.51% for 2022
- Clinical considerations
- Observed counts: 233 in 2021, 138 in 2022
- 3M v39 cost weight: 0.8728
- Percent of hospitals with O/E ratios less than .85 or greater than 1.15 (variation): 86.62 in 2021, 82.5% in 2022
- Rate per 1000 at risk: 1.12 in 2021, 1.43 in 2022
- Predictive validity: Adequate
- Reliability: Substantial
- 3M Group: Other Medical and Surgical Complications
- 3M Level: Major