

**Final Recommendation for the
Maryland Hospital Acquired Conditions Program
for Rate Year 2022**

February 12, 2020

Health Services Cost Review Commission

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This document contains the final staff recommendations for the Maryland Hospital Acquired Conditions Program for RY 2022.

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List of Abbreviations

AHRQ	Agency for Healthcare 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

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.

Recommendations

The MHAC policy was redesigned for RY 2021 to modernize the program for the new Total Cost of Care Model. This RY 2022 final recommendation provides updated performance data, methodology refinement considerations, and modeling of scores and revenue adjustments, but in general maintains the measures and methodology that were developed and approved for RY 2021¹.

These are the final recommendations for the Maryland Rate Year (RY) 2022 Hospital-Acquired Conditions (MHAC) policy:

- A. Continue to use 3M Potentially Preventable Complications (PPCs) to assess hospital-acquired complications.
 1. Maintain focused list of PPCs in payment program that are clinically recommended and that generally have higher statewide rates and variation across hospitals.
 2. Monitor all PPCs and provide reports for hospitals and other stakeholders.
 - a) Evaluate PPCs in “Monitoring” status that worsen and consider inclusion back into the MHAC program for RY 2023 or future policies.
- B. Use two years of performance data for small hospitals (i.e., less than 20,000 at-risk discharges and/or 20 expected PPCs).
- C. Continue to assess hospital performance on attainment only.
- D. Continue to weight the PPCs in payment program by 3M cost weights as a proxy for patient harm.
- E. 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

Introduction

Since 2014, Maryland hospitals have been funded under a Population-Based Revenue system, a fixed annual revenue cap that is adjusted for inflation, quality performance, reductions in potentially avoidable utilization, market shifts, and demographic growth. Under the Population-Based Revenue system, hospitals are incentivized to transition services to the most appropriate setting, and may keep savings that they achieve via improved health care delivery (e.g., reduced avoidable utilization, readmissions, hospital-acquired infections). 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 that reinforce the incentives of the Population-Based Revenue system, while guarding against unintended consequences and penalizing poor performance.

The Maryland Hospital Acquired Conditions (MHAC) program is one of several pay-for-performance initiatives that provide incentives for hospitals to improve patient care and value over time. The MHAC policy currently holds 2 percent of hospital revenue at-risk for complications that 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.

With the commencement of the Total Cost of Care (TCOC) Model Agreement with CMS on January 1, 2019, the performance standards and targets in HSCRC's portfolio of quality and value-based payment programs are being reviewed and updated. This is in response to stakeholder requests that these policies be reviewed to ensure they remain in line with the goals of the Model and that they maintain methodological validity. Additionally, because the State must also request annual exemptions from the CMS Hospital Acquired Conditions (HAC) program as well as the other quality programs in the State, another key aspect of these reviews is to demonstrate that Maryland's program results continue to be aggressive and progressive — that is, meeting or surpassing those of the nation. In CY 2018, staff focused on the MHAC program redesign and convened a Clinical Adverse Events Measure (CAEM) subgroup with clinical and measurement expertise who made recommendations that were then further evaluated by the Performance Measurement Workgroup (PMWG) and approved by the Commission.

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 prospective revenue adjustment scale with a hold harmless zone. Given the large changes that were implemented for RY 2021, this RY 2022 MHAC policy does not propose major changes to the

program, although staff proposes a process for re-evaluating the PPCs included in the program for future years and a methodology to address small hospital concerns.

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 population based revenue 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 meet or surpass the nation. Specifically, the State must ensure that the improvement in complication rates observed under the All-Payer Model is maintained. CMS granted Maryland exemption from the federal pay-for-performance programs (including the HAC Reduction Program) for Federal Fiscal Year 2020 on Aug 29, 2019.

Overview of the Maryland 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 codes available in claims data. 3M originally developed specifications for 65 PPCs², 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 pulmonary embolisms and surgical-site infections 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 Redesign

As mentioned previously, the MHAC policy was substantially changed for RY 2021. With the exception of maintaining the linear scaling with a hold harmless zone to determine hospital

² For RY 2020 there were 45 PPCs or PPC combinations included in the program as 3M had discontinued some PPCs and others were deemed not suitable for a pay-for-performance program.

rewards and penalties, the MHAC policy was substantially overhauled for RY 2021. The policy updates included:

- Selecting a narrowed list of 14 PPC complication measures to focus on the most clinically meaningful and significant measures for use in the payment program.
- Using two years of data for establishing normative values to address case-mix concerns.
- Moving to an attainment only approach for assessing hospital performance.
- Modifying the scoring methodology to better differentiate hospital performance.
- Weighting complications using 3M cost weights as proxies for patient harm.

MHAC Methodology

Figure 1 provides an overview of the three steps in the RY 2021 MHAC methodology that convert hospital performance to standardized scores, and then payment adjustments, as outlined below:

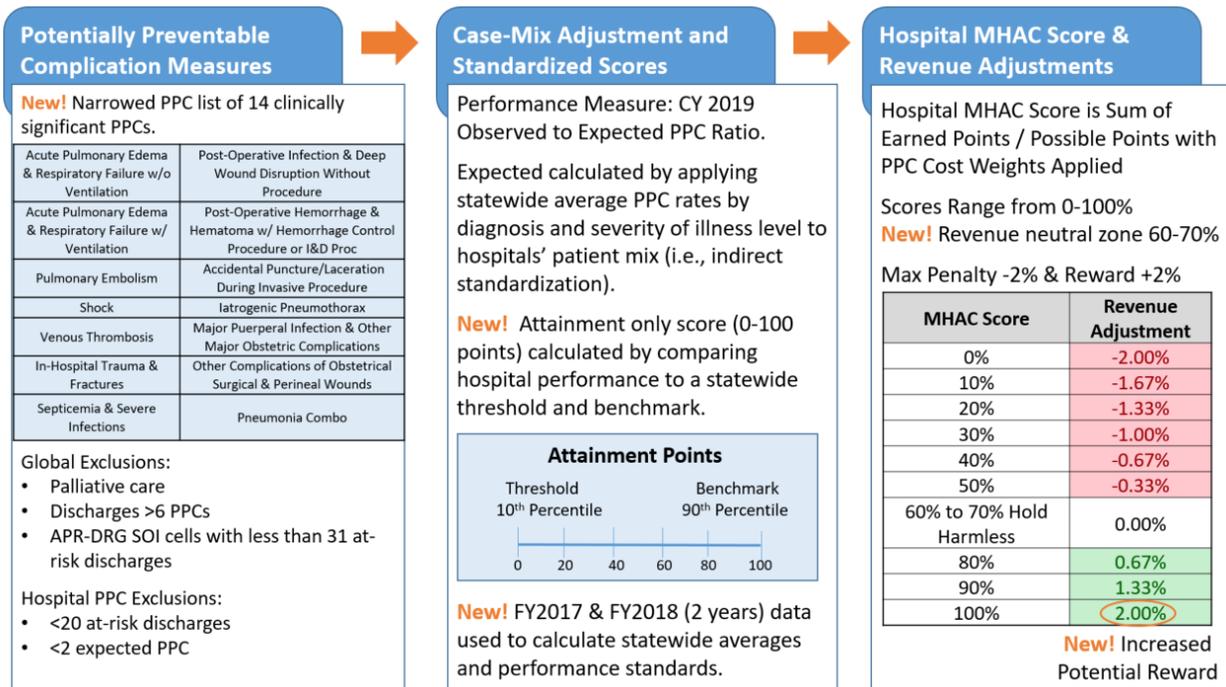
Step 1. For the PPCs identified for payment, global and hospital-level exclusions are determined.

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.

Additional information on the MHAC redesign and methodology can be found in Appendix II and in the RY 2021 policy. However, the major changes to the RY 2021 MHAC program are marked as "new" within the diagram.

Figure 1. Overview Rate Year 2021 MHAC Methodology



Assessment

In order to develop the RY 2022 MHAC policy, staff solicited input from the PMWG and other stakeholders. In general, stakeholders supported the staff's recommendation to not make major changes to the RY 2022 MHAC program. This section of the report provides an overview of the data and issues discussed by the PMWG, including analysis of statewide PPC trends, estimated hospital scores, and revenue adjustment modelling.

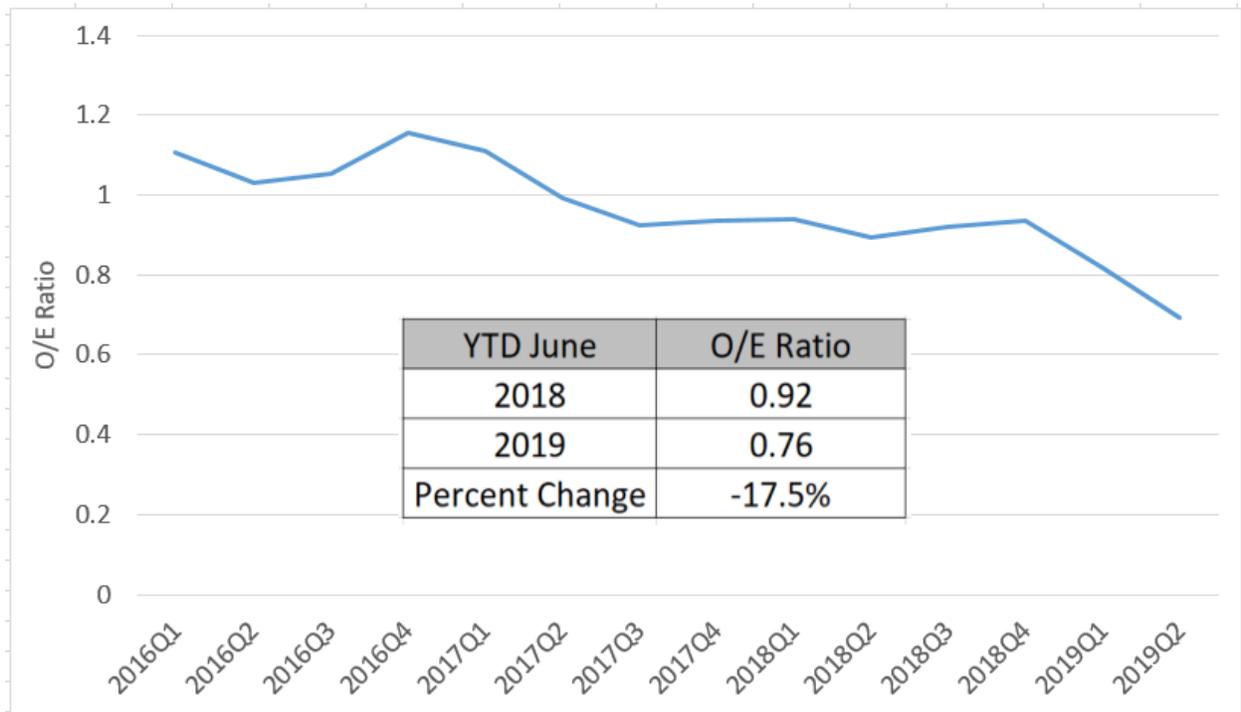
Statewide PPC Performance Trends

Complications Included in Payment Program

Under the All-Payer Model, Maryland hospitals saw a dramatic decline in complications and, as a State, 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 CAEM subgroup. The criteria included clinical significance, opportunity for improvement, sample size considerations, and variation across hospitals.

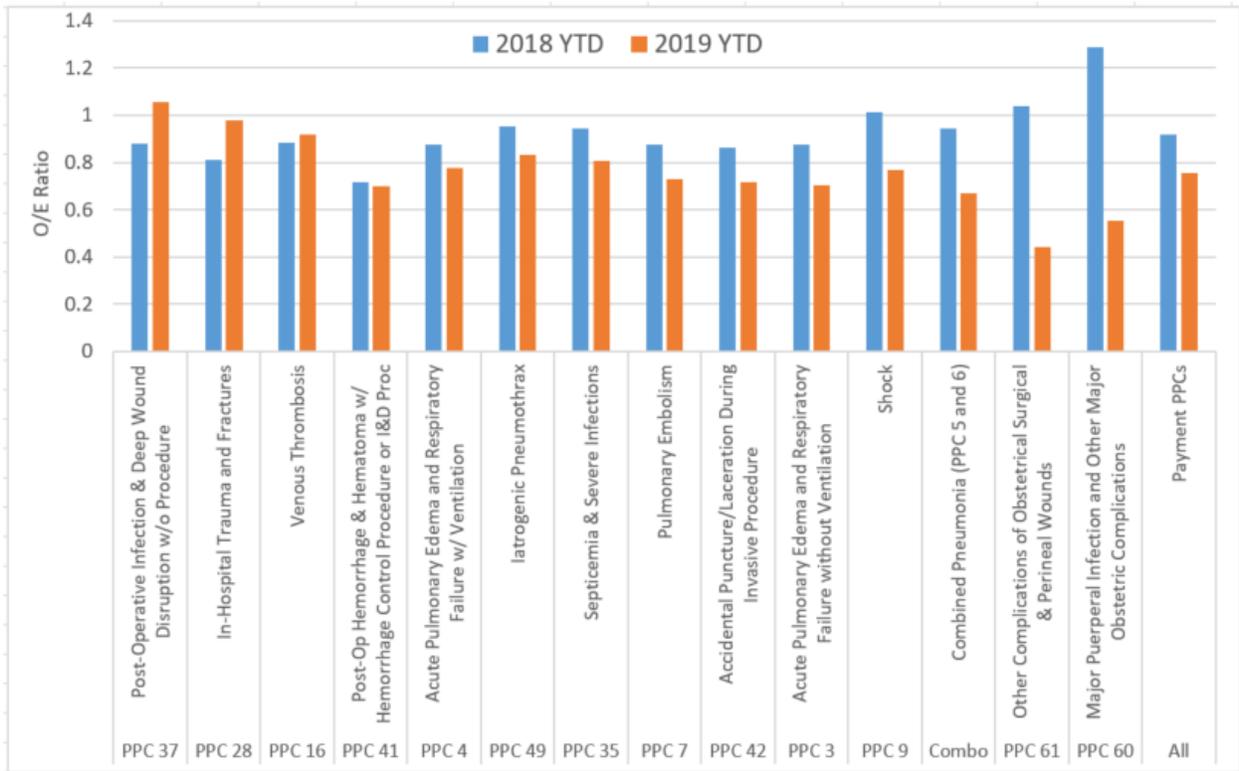
Under the TCOC Model, Maryland must maintain these improvements by not exceeding the CY 2018 PPC rates. Figure 2 below shows the statewide observed to expected (O/E) ratio from 2016 through June of CY 2019 (most recently available final data). The O/E ratio presents the count of observed PPCs divided 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. The figure 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. Specifically, the CY 2019 YTD performance data for payment program PPCs shows that there has been about a 17.5 percent reduction in the observed to expected ratio (CY 2018 YTD O/E ratio = 0.92 and CY 2019 YTD O/E ratio = 0.76).

Figure 2. Payment Program PPCs Observed to Expected Ratios CY 2016 to CY 2019 YTD through June



In terms of specific improvements among the 14 payment PPCs, Figure 3 shows the O/E ratios for CY 2018 and CY 2019 YTD through June, sorted from greatest percent increase (on the left) to greatest decrease (on the right). The three PPCs that have had an increased O/E ratio include PPC 37 Post-Operative Infection & Deep Wound Disruption Without Procedure, PPC 28 In-Hospital Trauma and Fractures, and PPC 16 Venous Thrombosis. The three PPCs with the greatest decreases include PPC 60 Major Puerperal Infection and Other Major Obstetric Complications, PPC 61 Other Complications of Obstetrical Surgical & Perineal Wounds, and the combined Pneumonia PPC.

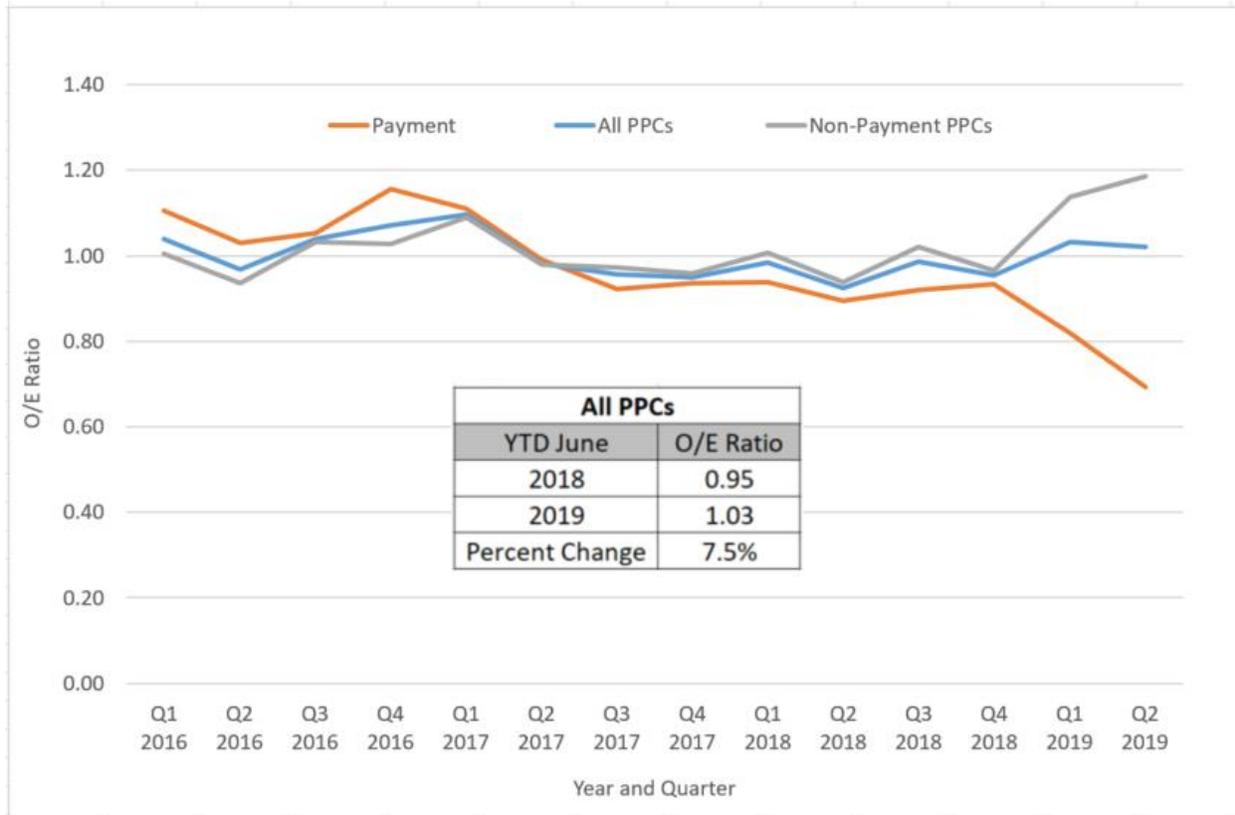
Figure 3. Payment Program PPC Observed to Expected Ratios CY 2018 and CY 2019 YTD through June



Monitored Complications

In addition to focusing on a narrowed list of PPCs for payment, 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, as in the analysis below. The overall PPC trend across all 56 PPCs shows that there has been an increase in the overall statewide O/E ratio from 0.95 in the first six months of CY 2018 to 1.03 in the first 6 months of CY 2019; the slight worsening in performance is driven primarily by increases in PPCs under monitoring, and not increases in the payment program PPCs, as illustrated in Figure 4.

Figure 4. PPC O/E Ratio Trends 2016 Through Qtr 2 CY 2019



In response to the increase in PPCs overall, staff has reached out to select hospitals and requested that they provide a response, including any insight into underlying factors leading to these trends for the first 6 months of 2019 compared with 2018. Early hospital feedback regarding the trends include:

- **Clinicians’ interpretations of clinic documentation that triggers the PPC vary, and many of the occurrences are not clinically significant events**—e.g., for PPC 40 Post-operative Hemorrhage without Procedure, this is subjectively evaluated by clinicians as to whether there was an occurrence of a hemorrhage or hematoma; also, even when a hematoma or bruising after a procedure is expected in the normal course of a particular surgical treatment, acknowledging this occurrence in the coding still causes these PPCs to be triggered.
- **The events are low volume and highly volatile**—e.g., for PPC 31 Decubitus Ulcer, for some hospitals with no occurrences in the base period, one or two occurrences in the performance period represents a large increase for that PPC, even when evaluated in the context of an O/E ratio.
- **The events were triggered and may not be the fault of the hospital**—e.g., for PPC 29 Poisonings Except from Anesthesia, one hospital indicated that there were cases assigned

this PPC that were triggered when the patients used opiates not prescribed but brought to them from outside the hospital during the patients' hospital stay.

- **Changes in Documentation and Coding Practices not associated with change in quality of care**—hospitals may focus on payment program PPCs when coding cases, especially given some of the clinical and definitional concerns documented for some of the PPCs removed from the MHAC program.

Additionally staff notes that some of the PPCs were removed from the payment program prior to the RY 2021 redesign due to clinical concerns or small cells, but they are included in the analysis, which may also contribute to the volatility of the monitoring only PPC evaluation.

Based upon all the feedback received to date, staff believes the criteria set up by the CAEM to select the PPCs for payment were set up to overcome the weaknesses in the broader list of PPCs; staff therefore supports ongoing monitoring and dialogue with hospitals, but not moving these PPCs back to payment, or using the PPCs to measure success on statewide complications. For RY 2022, staff proposes maintaining the same 14 PPCs for continuity over a two year period, however staff will continue to monitor all PPCs and may recommend non-payment PPCs with clinical significance and statistical reliability be reintroduced into the RY 2023 or future policies.

Small Hospital Methodology

Since the MHAC program moved to the observed to expected ratios to assess performance at the start of the All-Payer Model, minimum cell size exclusions have been applied at the hospital level for each complication. These requirements were maintained in RY 2021 but were doubled to reflect the use of two years of data to determine performance standards and to prospectively determine which PPCs a hospital was being held accountable. Specifically, hospitals are required to have at least 20 at-risk discharges and 2 expected PPCs in order for that PPC to be included in the payment program. Staff does not propose changes to these requirements for RY 2022.

In the draft policy staff expressed concerns that there were a handful of smaller hospitals eligible to be scored on less than half of the PPC measure types, resulting in scores that tended towards the extremes of 0 or 100 percent since the numbers are low. Thus, staff proposed that those hospitals should be excluded from the MHAC program given the volatility in their scores. However, based on Commissioner and stakeholder input, staff re-evaluated the performance data and have amended this final policy to recommend the following:

1. 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 20,000 at-risk discharges and/or 20 expected PPCs across all payment program PPCs) as opposed to the number of PPC measure types, and;
2. 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 2022 use CY 2019 and 2020).

The rationales for not excluding these smaller hospitals are that the National HAC program has no hospital exclusions, and stakeholders expressed concern that the policy should hold small hospitals accountable for their performance under the GBR model, especially if small hospitals have more

observed PPCs relative to State peers despite their small size. Conversely, if a small hospital has significantly fewer PPCs relative to its expected value, staff believes averted complications should be rewarded. Based on this revised policy recommendation, five small hospitals would be scored using two years of performance data. The small hospital criteria are applied to the base period in order to maintain the prospective nature of the MHAC program (i.e., for RY 2022, FY 18 and FY19 are used to flag hospitals with less than 20,000 at-risk and/or 20 expected). Figure 5 shows the scores for these small hospitals using one versus two years of data.³

Figure 5. Modeled Scores with One versus Two Years Performance Data

HOSPITAL ID	HOSPITAL NAME	At-Risk (FY18 and FY19)	Observed (FY18 and FY19)	Expected (FY18 and FY19)	TOTAL NUMBER OF PPCs (max 14)	Scores with 1 Year Performance Data (FY19)	Scores with 2 Years Performance Data (FY18 and FY19)
210010	UM-Dorchester	6733	5	6.84	3	100%	86%
210064	Levindale	8709	31	11.86	4	0%	7%
210017	Garrett	10889	4	13.97	5	100%	95%
210060	Ft. Washington	11594	1	14.25	5	100%	100%
210013	Bon Secours	22139	43	17.75	5	3%	0%

Palliative Care Exclusion

In prior years, the Performance Measurement Work Group had expressed interest to understand the assignment of PPCs for patients with a palliative care diagnosis (Z515), which the MHAC policy had explicitly excluded. This was in part because in October 2016 coding guidelines changed such that the palliative care diagnosis code was no longer exempt from POA and as such there had been indications from 3M that the PPCs would count if a patient had palliative care diagnosis not present on admission. However, most recently, 3M has indicated that the current PPC Grouper will not assign a PPC to a patient with a palliative care diagnosis regardless of present on admission except in the case of PPC 45, Post-Procedure Foreign Body. In light of 3M's direction on this matter, including palliative care cases back into the MHAC program will not have a material impact on the MHAC program. Therefore, the post-grouper exclusion of discharges with a palliative care diagnosis will be removed and instead the 3M clinical logic will be used for this exclusion.

Modeling of Scores and Revenue Adjustments

For RY 2022, staff implemented PPC Grouper Version 37 and calculated normative values and attainment standards using SFYs 2018 and 2019 (moved forward one year from the RY 2021 policy). Figure 6 provides the attainment standards for RY 2022 that were used for the modeling presented in this policy.

³ Modeling (v37) is for the performance period of FY19 (one year) vs. FY18 and FY19 (two years) with base period of FY18 and 19. The score changes for these small hospitals are not significant, and thus all remaining modeling in this policy does not reflect this change (i.e., only one year of performance data is used).

Figure 6. RY 2020 Attainment Standards: PPC Benchmarks (10th Percentile) and Thresholds (90th Percentile)

PPC Number	PPC Description	Threshold	Benchmark
3	Acute Pulmonary Edema and Respiratory Failure without Ventilation	1.8882	0.3348
4	Acute Pulmonary Edema and Respiratory Failure with Ventilation	1.4274	0.4933
7	Pulmonary Embolism	1.5660	0.3091
9	Shock	1.6965	0.3727
16	Venous Thrombosis	1.7715	0.1242
28	In-Hospital Trauma and Fractures	1.5749	0.4468
35	Septicemia & Severe Infections	1.5732	0.3891
37	Post-Operative Infection & Deep Wound Disruption Without Procedure	1.9911	0.4162
41	Post-Operative Hemorrhage & Hematoma with Hemorrhage Control Procedure or I&D Proc	2.4933	0.4362
42	Accidental Puncture/Laceration During Invasive Procedure	2.1677	0.3735
49	Iatrogenic Pneumothrax	1.6971	0.3351
60	Major Puerperal Infection and Other Major Obstetric Complications	1.6266	0
61	Other Complications of Obstetrical Surgical & Perineal Wounds	1.8975	0
67	Combined Pneumonia (PPC 5 and 6)	1.6422	0.3986

Score Modeling

For the RY 2021 policy, the policy evolved to an attainment-only system with wider performance standards (i.e., 10th and 90th percentiles) to better differentiate hospital performance. For this final policy, two models are provided that both use v37 data and CY 2019 performance data through June. Staff are comfortable using the CY 2019 YTD through June data, as opposed to the 12-month FY 19 data, because analyses indicate a high correlation between the MHAC scores when using 6 or 12 months of data. Thus, the two models listed differ only in the time period used to calculate normative values and the attainment standards. Both are presented to show that given the historical trend of continued PPC improvements the scores tend to be higher if there is an overlap between the attainment standards and the performance period.

Two sets of scores are presented below:

- Model 1: CY 2019 June YTD performance scores using RY 2022 (FY 18 and FY19) performance standards
- Model 2: CY 2019 June YTD performance scores using RY 2021 (FY 17 and FY18) performance standards (i.e., RY 2021 time periods)

Figure 7 provides descriptive statistics for the total hospital scores. As discussed the Model 1 scores are lower than Model 2, most likely due to the overlap in the time period used for determining the attainment standards. This is consistent with the RY 2021 modeling provided in last year's final policy, which showed less favorable performance than the actual RY 2021 YTD scores.

Figure 7. Hospital Score Models

Hospital Scores CY 2019 YTD through June	Model 1: FY 18 & 19 Attainment Standards	Model 2: FY 17 & 18 Attainment Standards
Median	60%	69%
Average	57%	68%
Min	0%	11%
Max	100%	100%
25th percentile	41%	56%
75th percentile	73%	83%

Revenue Adjustment Scale Modeling

Using scores presented above, staff modeled revenue adjustments using the RY 2021 preset scale, which is proposed by staff to remain the same for RY 2022. Figure 8 provides the count of hospitals in the penalty, hold harmless or zero adjustment, and reward zones. Also provided are the statewide net revenue adjustments. Appendix III contains the by hospital scores and revenue adjustments. These scores and revenue adjustments do not include the recommended change to use two years of data for small hospitals since this change will have a minimal impact on statewide adjustments. Overall the results show that under Model 1 the estimated penalties are around \$15.3 million and the rewards are \$20.7 million. However these estimates likely underestimate rewards and overestimate penalties. This is because the performance period overlaps with the time period for determining the normative values and benchmark/thresholds. While Model 2 shows \$9.0 million in penalties and \$30.0 million in rewards, this is because the median score is 69 percent and 20 hospitals are rewarded. Given that hospitals are generally performing well on complications, staff feels it is reasonable that almost half the hospitals are rewarded, although the Commission could consider whether the cut point should be raised now or in future years.

Figure 8: Revenue Modeling

Statewide Revenue Adjustments <small>Updated Modeling all Under v37 PPC Groupier</small>	Model 1: RY2022 Modeling		Model 2: RY2021 YTD Results	
	\$	%	\$	%
Net	\$5,436,695	0.06%	\$20,961,586	0.22%
Penalties	-\$15,261,760	-0.16%	-\$9,000,698	-0.09%
Rewards	\$20,698,455	0.21%	\$29,962,284	0.31%
Median Score	63%		69%	
# Hospitals Penalized	19		14	
# Hospitals Revenue Neutral	10		11	
# Hospitals Rewarded	16		20	

Additional Future Considerations

For future years it will be important to continue to try and find a national comparison for PPCs, or to move to measures such as the AHRQ Patient Safety Indicators (PSIs). Staff believes that the upcoming review of the QBR program in 2020 will provide an opportunity to reevaluate complication measures and the respective roles of the QBR safety domain and MHAC program. Specifically, staff believes that the QBR program redesign should include adoption of the all-payer ICD-10 compatible version of the PSI 90 composite measure. This PSI measure includes some complications that are similar to PPCs in payment program but with ability to do national comparison (e.g., respiratory failure) and some PPCs that are not in payment program, assessing different facets of complications as well (e.g., pressure ulcers). In addition, staff should continue to monitor other safety measures in use or under consideration nationally for reporting or payment; these measures will be considered for possible inclusion in the MHAC program for FY 2023 or beyond.

Stakeholder Feedback and Staff Responses

Comment letters on the draft MHAC recommendations were submitted by the Maryland Hospital Association (MHA), Garrett Regional Medical Center (GRMC), the Johns Hopkins Health System (JHHS), and CareFirst BlueCross BlueShield (CF). All four commenters generally support the RY 2022 MHAC policy and continued use of the revised MHAC methodology.

However, some targeted concerns were raised and suggestions provided for modifying specific aspects of the draft recommendations. These comments and suggestions are summarized below along with staff's responses.

Hospital-Specific Requirement of Six or More PPC Measures for Inclusion in Payment Program

While the MHA and JHHS did not raise any concerns on this new exclusion, CF specifically supported the newly proposed draft recommendation for a hospital to be scored on at least six of the fourteen PPC measures to be eligible for rewards or penalties under the program. However, GRMC, who would be excluded under this new policy since they are only eligible for five PPC measures, requested that the Commission reconsider this change to the MHAC policy. GRMC argues that they have been in good standing under the program over the last several years as a result of their efforts focused on preventing complications for vulnerable patients and working with their physicians on appropriate documentation. In addition to the comment letters, Commissioner Colmers recommended at the December Commission meeting that staff consider alternatives such as the use of two years of data for small hospitals.

Staff Response: Staff have revised the RY 2022 MHAC recommendations to suggest that small hospitals remain in the MHAC program, but that two years of performance data be used to assess their performance. Specifics of this change are discussed above in the assessment section of this final policy. Staff believes that the modification will increase the validity and reliability of small hospital scores, and thus acknowledge the favorable performance of hospitals such as GRMC. Staff will monitor this change and continue to

assess options for improving the validity and reliability of the scores for small hospitals experiencing low numbers of events.

Underestimated Expected Values

JHHS' comment letter continues to raise concerns on the mathematical methodology for calculating expected PPC counts. JHHS believes that the current methodology of indirect standardization to calculate statewide normative values results in a hospital's expected values being underestimated. In previous letters, JHHS has specifically stated that they support implementation of a Bayesian adjustment that adjusts for or smooths small volume events, making them more statistically stable. The other stakeholder comment letters did not raise the underestimate of expected values as a concern.

Staff Response: As stated last year, staff again notes that the zero norm issue has been minimized by narrowing down the list to the fourteen clinically significant PPCs, increasing the statewide at risk number from 2 to 31 for each diagnosis and severity of illness level, and using a two year period to establish the normative values. Staff would also note that in the policy last year, staff presented various analyses that supported the continued use of the indirect standardization methodology. Furthermore, other stakeholders have previously expressed support of this methodology because of its simplicity and transparency. Thus, for the RY 2022 policy, staff does not recommend any changes; however, staff will continue to monitor the small cell size issue in the MHAC program.

Concerns over 3M PPC Logic and PPC Appeals

Consistent with their input last year, JHHS raises concerns with the PPC logic and suggests that an appeals process be established for the MHAC program where HSCRC convenes clinicians to review individual PPC cases in dispute.

Staff Response: Staff does not support a process for individual PPC cases to be disputed by clinicians. Staff notes the MHAC program is rate-based (i.e., observed PPCs to expected PPCs) and acknowledges that not all PPCs are completely preventable. Staff further notes that we undertake with MHA, hospital clinicians and 3M an annual process to review the PPC clinical assignment and exclusion logic, which results in annual changes to the PPC methodology. Therefore, staff believes the current process for clinical vetting with the industry and 3M is adequate. Finally, staff notes that we accept hospital feedback and input throughout the year regarding specific issues related to coding assignment and exclusion logic and work with 3M to resolve the issues as they occur.

Linear Scale Hold Harmless Zone

CF supports a continuous linear scaling approach, but maintains their position that a hold harmless zone from 60 to 70 percent is unnecessary.

Staff Response: Staff is in agreement regarding the continued use of a linear scale for calculating revenue adjustments. However, staff does not support removal of the hold

harmless zone at this time. Lacking national benchmarks of performance on the PPC measures, the hold harmless zone helps mitigate uncertainty around where the cut point should be established. As also noted in the RY 2021 MHAC policy, the hold harmless zone of 10 percent is important because it reduces the penalty/reward cliff effect between a score of below and above the cut point, i.e., 59 and 61 percent. And while some stakeholders have suggested that the hold harmless zone reduces incentives to improve for those with performance in this range, staff believes that the RY 2021 change to increase rewards to 2 percent should be a strong incentive to perform better than 70 percent. It should also be noted that the CMS HACRP program, which only penalizes the lowest quartile of hospitals, has ostensibly a very large hold harmless zone.

Recommendations

These are the final recommendations for the Maryland Rate Year (RY) 2022 Hospital-Acquired Conditions (MHAC) policy:

- A. Continue to use 3M Potentially Preventable Complications (PPCs) to assess hospital-acquired complications.
 1. Maintain focused list of PPCs in payment program that are clinically recommended and that generally have higher statewide rates and variation across hospitals.
 2. Monitor all PPCs and provide reports for hospitals and other stakeholders.
 - a) Evaluate PPCs in “Monitoring” status that worsen and consider inclusion back into the MHAC program for RY 2023 or beyond.
- B. Use two years of performance data for small hospitals (i.e., less than 20,000 at-risk discharges and/or 20 expected PPCs).
- C. Continue to assess hospital performance on attainment only.
- D. Continue to weight the PPCs in payment program by 3M cost weights as a proxy for patient harm.
- E. 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

<p>Recalibrated Patient Safety Indicator (PSI) measure:^</p> <ul style="list-style-type: none"> • 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
<p>Central Line-Associated Bloodstream Infection (CLABSI)^*</p>
<p>Catheter-Associated Urinary Tract Infection (CAUTI)^*</p>

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: Redesigned RY 2021 MHAC Program Methodology

The MHAC policy was redesigned for RY 2021 to modernize the program for the new Total Cost of Care model. To accomplish this work, staff convened a Clinical Adverse Events Measure (CAEM) subgroup with clinical and measurement expertise who made recommendations that were then further evaluated by the Performance Measurement Workgroup (PMWG) and approved by the Commission.

The major accomplishments of the MHAC program redesign included: 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 prospective revenue adjustment scale with a hold harmless zone. Below are additional details on the MHAC redesign and approved methodology.

Overview of MHAC Redesign

As part of the RY 2021 MHAC redesign, with stakeholder and staff support, the Commission approved the continued use of the 3M Potentially Preventable Complication (PPC) measures. In order to assess which PPCs should be included in a pay-for-performance program, the CAEM and PMWG members developed criteria for PPC inclusion, as shown in Figure 1. Based on these criteria, a focused list of 14 PPCs was selected for inclusion in the RY 2021 payment program, with all non-payment PPCs to be monitored.

Figure 1. Criteria for PPC Inclusion

Clinical Criteria	<ul style="list-style-type: none"> ● All-payer focus ● Clinically significant complication ● Area of national focus ● Evidence-based prevention protocols/opportunity for improvement
Statistical Criteria	<ul style="list-style-type: none"> ● At least half of hospitals eligible for PPC ● Higher statewide rate ● Variation across hospitals in performance

MHAC Performance Scoring

In redesigning the MHAC program the CAEM subgroup and PMWG considered many issues on how to assess hospital performance including the performance metric and its case-mix adjustment, the relative weighting of individual PPCs, the scoring of PPC rates via improvement and attainment or attainment-only, and the methodology to convert measure rates to standardized scores. Based on these discussions, the Commission approved the following RY 2021 recommendations:

- Continue to use the observed-to-expected ratio with indirect standardization based on two years of data to calculate normative values
- Move to an attainment only program
- Weight PPCs by 3M cost weights as proxy for harm
- Continue to use a points system that is based on historical performance standards but make the system more continuous and better able to distinguish gradations in performance

Performance Metric

The MHAC program assesses performance using an observed to expected ratio for each PPC.⁴ The expected number of PPCs at a hospital is calculated through indirect standardization, in which a statewide rate for each PPC (i.e., normative value or “norm”) is calculated for each diagnosis and severity of illness level. The advantage of this method is that it is conceptually simple to understand and can be implemented easily in a prospective system. However, hospitals have raised concerns that the gradually lower statewide rates and increasingly granular indirect standardization at the diagnosis and severity level have led to what has been termed a “zero-norm” issue, i.e., hospitals are potentially penalized for a singular random event as opposed to materially poor clinical performance.⁵ In the RY 2021 policy, this issue was addressed by selecting complications with higher statewide rates, using two years of data to calculate the normative values, and continuing to require at least 31 discharges per diagnosis and severity of illness cell.

Attainment Only Prospective System

The CAEM subgroup and PMWG considered recommendations from Commissioners that performance should be assessed based on attainment only, using a scoring methodology that recognizes improvement for poor performers through reduced attainment penalties. This aligns with the CMS HACRP program that is also attainment only. Furthermore, given the large improvements in PPCs over the past several years, future rewards will focus on optimal performance and not provide additional positive revenue adjustments for improvement.

However, stakeholders continue to desire a system that sets prospective targets and allows hospitals to track performance during the performance period. Thus, the normative values and performance standards under an attainment only prospective system need to be set on a historical time period, which differs from the National attainment only program.

⁴ The CAEM subgroup also evaluated alternatives to the observed to expected ratio, such as an excess PPC rate that takes into account the number of discharges. However, staff believes that the current performance metric takes into account the number of discharges through its calculation of the expected rate, and that further adjustment for number of discharges is not warranted. Additionally, the use of an observed to expected ratio aligns with other measures such as the NHSN standardized infection ratios.

⁵ In RY 2020 there were 328 diagnosis groups and 45 PPC/PPC combinations proposed, which resulted in over 56,000 cells for which a statewide average PPC rate is calculated, the majority of which have a normative value of zero.

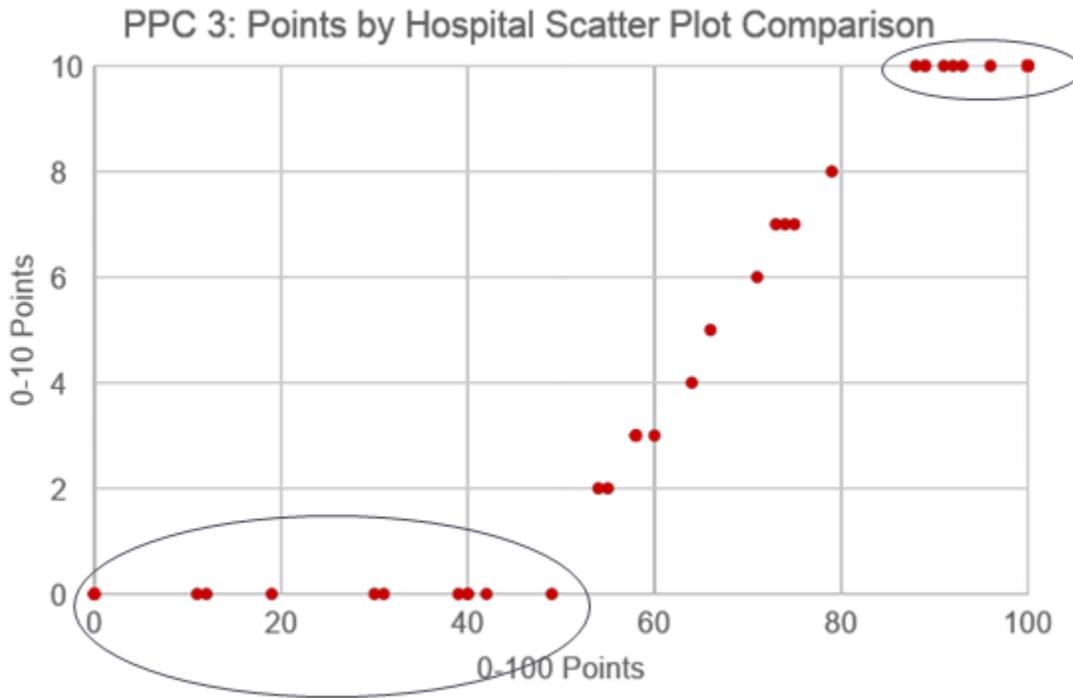
Standardized Scoring Methodology

Commissioners and other stakeholders who have expressed a preference for an attainment only system believe that such a system could incentivize poor performers to improve through reduced penalties for improvement. However, the previous scoring methodology for attainment assigned all hospitals that were worse than the statewide median a score of zero points, and thus did not differentiate hospital performance below the statewide median. This methodology, if maintained in an attainment only scoring methodology, may have generated adverse incentives for poor performers, especially outliers, as improvement toward but not surpassing the statewide median would have resulted in the same zero score. Therefore, CAEM and PMWG members collaborated with staff to develop a wider and more continuous scoring approach.

Specifically, staff adapted the MHAC point 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.

As shown in Figure 2, the wider range in the performance standards differentiates hospital performance at the lower and upper ends and provides more continuous incentives for improvement. However, because hospitals can begin to earn points for relatively poor performance at the value of the 10th percentile, hospital scores are higher under this modified scoring methodology, and the preset revenue adjustment scale is adapted so that hospitals do not receive financial rewards for lackluster performance, as discussed in the next section.

Figure 2. Expanded Scoring Example



3M Cost Weights and Hospital Scores

Previously, the MHAC methodology placed PPCs into two tiers to emphasize the more significant PPCs. Under the revised methodology, the Commission approved weighting the 14 PPCs differentially using 3M cost weights as a proxy for degree of patient harm. Overall hospital scores are then calculated by taking the points for each PPC and multiplying by the 3M PPC cost weights (100 per PPC * 3M cost weight), then summing numerator (points scored) and denominator (possible points) across the PPCs to calculate a percent score. The percent score (e.g., 85 points earned /100 possible points = 85%) should not be interpreted as the percentile of hospital performance.

Prospective Revenue Adjustment Scale

Since RY 2019, the revenue adjustment scale has been based on the mathematical distribution of possible scores (0 to 100 percent) with a hold harmless zone. This approach is referred to as a prospective revenue adjustment scale, as opposed to a retrospective revenue adjustment scale that determines the scale *after* the performance period. For the RY 2021 policy, the Commission approved continued use of a prospective scale based on the range of possible scores, because using a prospective scale provides greater transparency and predictability for hospitals, which are already assuming risk under a population-based revenue system.

During the MHAC redesign for RY 2021, staff and stakeholders considered several issues related to the revenue adjustment scale including whether the scale should be linear or non-linear, the use of a hold harmless zone, and the appropriate cut point for penalties and rewards. The Commission approved the staff recommendation to continue to use a linear scale that ranges from 0 to 100 with a hold harmless zone between 60 and 70 percent to account for higher scores under the revised attainment only scoring methodology. In addition, the scale was modified to increase potential rewards from 1 to 2 percent.

Appendix III: By Hospital Score and Revenue Adjustment Modeling

RY 2022 Policy Modeling			Model 1: FY1819 Attainment Standards			Model 2: FY1718 Attainment Standards		
HOSP ID	HOSPITAL	RY19 Estimated Permanent Inpatient Revenue	Score	% Revenue Adjustment	Estimated Revenue Adjustment	Score	% Revenue Adjustment	Estimated Revenue Adjustment
210001	MERITUS	\$219,551,750	50%	-0.33%	-\$731,839	56%	-0.13%	-\$292,736
210002	UNIVERSITY OF MARYLAND	\$1,203,673,856	81%	0.73%	\$8,826,942	82%	0.80%	\$9,629,391
210003	PRINCE GEORGE	\$282,929,188	61%	0.00%	\$0	67%	0.00%	\$0
210004	HOLY CROSS	\$355,608,692	63%	0.00%	\$0	72%	0.13%	\$474,145
210005	FREDERICK MEMORIAL	\$232,665,827	42%	-0.60%	-\$1,395,995	52%	-0.27%	-\$620,442
210006	HARFORD	\$54,181,186	64%	0.00%	\$0	64%	0.00%	\$0
210008	MERCY	\$226,492,002	64%	0.00%	\$0	68%	0.00%	\$0
210009	JOHNS HOPKINS	\$1,456,687,424	65%	0.00%	\$0	72%	0.13%	\$1,942,250
210010	DORCHESTER	\$22,653,845	100%	2.00%	\$453,077	100%	2.00%	\$453,077
210011	ST. AGNES	\$238,757,730	62%	0.00%	\$0	72%	0.13%	\$318,344
210012	SINAI	\$399,817,673	55%	-0.17%	-\$666,363	64%	0.00%	\$0
210013	BON SECOURS	\$64,363,349	10%	-1.67%	-\$1,072,722	11%	-1.63%	-\$1,051,268
210015	FRANKLIN SQUARE	\$306,898,504	38%	-0.73%	-\$2,250,589	47%	-0.43%	-\$1,329,894
210016	WASHINGTON ADVENTIST	\$164,197,283	67%	0.00%	\$0	69%	0.00%	\$0
210017	GARRETT COUNTY	\$23,714,400	100%	2.00%	\$474,288	100%	2.00%	\$474,288
210018	MONTGOMERY GENERAL	\$84,721,645	24%	-1.20%	-\$1,016,660	30%	-1.00%	-\$847,216
210019	PENINSULA REGIONAL	\$249,228,264	83%	0.87%	\$2,159,978	86%	1.07%	\$2,658,435
210022	SUBURBAN	\$208,954,270	58%	-0.07%	-\$139,303	66%	0.00%	\$0
210023	ANNE ARUNDEL	\$294,544,506	73%	0.20%	\$589,089	79%	0.60%	\$1,767,267
210024	UNION MEMORIAL	\$243,156,679	46%	-0.47%	-\$1,134,731	50%	-0.33%	-\$810,522

RY 2022 Policy Modeling			Model 1: FY1819 Attainment Standards			Model 2: FY1718 Attainment Standards		
HOSP ID	HOSPITAL	RY19 Estimated Permanent Inpatient Revenue	Score	% Revenue Adjustment	Estimated Revenue Adjustment	Score	% Revenue Adjustment	Estimated Revenue Adjustment
210027	WESTERN MARYLAND HEALTH SYSTEM	\$169,462,000	52%	-0.27%	-\$451,899	57%	-0.10%	-\$169,462
210028	ST. MARY	\$79,141,046	76%	0.40%	\$316,564	84%	0.93%	\$738,650
210029	HOPKINS BAYVIEW MED CTR	\$366,607,627	62%	0.00%	\$0	69%	0.00%	\$0
210032	UNION HOSPITAL OF CECIL COUNT	\$65,426,887	40%	-0.67%	-\$436,179	55%	-0.17%	-\$109,045
210033	CARROLL COUNTY	\$140,291,849	59%	-0.03%	-\$46,764	66%	0.00%	\$0
210034	HARBOR	\$110,392,040	28%	-1.07%	-\$1,177,515	34%	-0.87%	-\$956,731
210035	CHARLES REGIONAL	\$76,930,098	70%	0.00%	\$0	65%	0.00%	\$0
210037	EASTON	\$103,481,053	71%	0.07%	\$68,987	78%	0.53%	\$551,899
210038	UMMC MIDTOWN	\$111,141,002	71%	0.07%	\$74,094	75%	0.33%	\$370,470
210039	CALVERT	\$67,111,996	25%	-1.17%	-\$782,973	32%	-0.93%	-\$626,379
210040	NORTHWEST	\$138,719,920	89%	1.27%	\$1,757,119	91%	1.40%	\$1,942,079
210043	BALTIMORE WASHINGTON MEDICAL CENTER	\$250,217,336	67%	0.00%	\$0	71%	0.07%	\$166,812
210044	G.B.M.C.	\$237,787,317	49%	-0.37%	-\$871,887	58%	-0.07%	-\$158,525
210048	HOWARD COUNTY	\$182,870,977	59%	-0.03%	-\$60,957	63%	0.00%	\$0
210049	UPPER CHESAPEAKE HEALTH	\$128,686,091	78%	0.53%	\$686,326	82%	0.80%	\$1,029,489
210051	DOCTORS COMMUNITY	\$141,094,311	84%	0.93%	\$1,316,880	90%	1.33%	\$1,881,257
210056	GOOD SAMARITAN	\$146,901,579	59%	-0.03%	-\$48,967	69%	0.00%	\$0
210057	SHADY GROVE	\$251,748,234	48%	-0.40%	-\$1,006,993	54%	-0.20%	-\$503,496
210058	REHAB & ORTHO	\$72,350,285	78%	0.53%	\$385,868	90%	1.33%	\$964,670

RY 2022 Policy Modeling			Model 1: FY1819 Attainment Standards			Model 2: FY1718 Attainment Standards		
HOSP ID	HOSPITAL	RY19 Estimated Permanent Inpatient Revenue	Score	% Revenue Adjustment	Estimated Revenue Adjustment	Score	% Revenue Adjustment	Estimated Revenue Adjustment
210060	FT. WASHINGTON	\$19,890,383	100%	2.00%	\$397,808	100%	2.00%	\$397,808
210061	ATLANTIC GENERAL	\$36,931,910	89%	1.27%	\$467,804	95%	1.67%	\$615,532
210062	SOUTHERN MARYLAND	\$162,087,856	31%	-0.97%	-\$1,566,849	41%	-0.63%	-\$1,026,556
210063	UM ST. JOSEPH	\$223,399,907	83%	0.87%	\$1,936,133	88%	1.20%	\$2,680,799
210064	LEVINDALE	\$57,510,719	39%	-0.70%	-\$402,575	34%	-0.87%	-\$498,426
210065	HC- Germantown	\$59,062,315	90%	1.33%	\$787,498	93%	1.53%	\$905,622
	State Total	\$9,732,042,811		State Total	\$5,436,695		State Total	\$20,961,586
				% Inpatient	0.06%		% Inpatient	0.22%
				Penalty	-\$15,261,760		Penalty	-\$9,000,698
				% Inpatient	-0.16%		% Inpatient	-0.09%
				Reward	\$20,698,455		Reward	\$29,962,284
				% Inpatient	0.21%		% Inpatient	0.31%