maryland
health services
cost review commission

To: Hospital CFOs
Cc: Hospital Quality Liaisons, Case Mix Liaisons
From: HSCRC Quality Team
Date: March 16, 2021
Re: Rate Year 2023 Maryland Hospital Acquired Conditions (MHAC) Policy Recommendations and Program Details

On November 12th, 2020, the Commission approved the staff recommendations for the Rate Year (RY) 2023 Maryland Hospital Acquired Conditions (MHAC) program. This memo summarizes the continuing and new/revised recommendations (highlighted in bold) for the RY 2023 program, as well as additional COVID-19-related recommendations for RY 2022.

Below are the specific recommendations approved in the RY 2023 MHAC policy:

1. Continue to use 3M Potentially Preventable Complications (PPCs) to assess hospital –acquired complications.
    a. Maintain focused list of PPCs in payment program that are clinically recommended and that generally have higher statewide rates and variation across hospitals.
    b. Monitor all PPCs and provide reports for hospitals and other stakeholders.
        i. Evaluate PPCs in “Monitoring” status that worsen and consider inclusion back into the MHAC program for RY 2024 or future policies.
2. Use more than one year of performance data for small hospitals (i.e., less than 20,000 at-risk discharges and/or 20 expected PPCs). **The performance period for small hospitals will be CY 2021 plus the to-be-determined performance period for RY 2022 (i.e., January-June 2020 data will not be used).**
3. Continue to assess hospital performance on attainment only.
4. Continue to weight the PPCs in payment program by 3M cost weights as a proxy for patient harm.

5. Maintain a prospective revenue adjustment scale with a minimum penalty at 2 percent and maximum reward at 2 percent and continuous linear scaling with a hold harmless zone between 60 and 70 percent.
6. **Adjust the MHAC pay-for-performance program methodology as needed due to COVID-19 Public Health Emergency and report to Commissioners as follows:**
    a. **For RY 2022 (CY 2020 performance period)**
        i. **Exclude COVID-19 positive cases from the program.**
        ii. **Exclude the data for January to June 2020 and evaluate the reliability and validity of the data for July-December 2020 to determine feasibility of its use and any needed changes for the RY 2022 payment adjustments.**
    b. **For RY 2023 (CY 2021 performance period)**
        i. **Update PPC Grouper to v38 and include COVID-19 positive cases consistent with the clinical updates to the grouper.**
        ii. **Retrospectively evaluate case-mix adjustment and performance standards concerns arising from inclusion of COVID-19 patients and the use of a pre-COVID time period to determine normative values.**

Revised Recommendation for Small Hospitals

In the RY 2022 policy, the recommendation was approved to use two years of performance data for small hospitals, which is defined as those with less than 20,000 at-risk discharges and/or 20 expected PPCs across all payment program PPCs in the two-year time period used to determine performance standards. For RY 2023, this recommendation was modified due to the COVID-19 public health emergency (PHE) to indicate that the performance period for small hospitals would be CY 2021 plus the to-be-determined performance period for RY 2022. Currently staff are proposing that CY 2019 be used for RY 2022 and, as such, the monthly reports on the CRISP portal are including CY 2019 + CY 2021 YTD data. If this policy changes, HSCRC staff will alert the small hospitals. Appendix I contains a table with the CY 2018 and CY 2019 counts of at-risk, observed, and expected payment program PPCs by hospital. The chart, which is sorted by number of at-risk discharges smallest to largest, shows the six hospitals that are flagged as small hospitals, which means that CY 2019 and CY2021 are being used to assess their performance for RY 2023. Two years of data should increase the reliability of the MHAC scores for small hospitals.

COVID-19

The COVID-19 PHE requires that retrospective changes be made to all HSCRC quality programs for both RY 2022 and RY 2023. At this time final decisions have not been made for either rate year. For more

information on how COVID-19 may be handled, please see the slides and webinar recording from the February 17, 2021 meeting of the Performance Measurement Workgroup.[1]

For RY 2022, which is based on CY 2020 performance, the HSCRC will remove CY 2020 January to June data from all quality programs consistent with CMS guidance and federal policy. For RY 2022, all COVID positive patients will be removed from the data for July-December 2020.[2] At this time, the HSCRC is still assessing July-December 2020 data and evaluating the reliability and validity of this data with CMMI and our stakeholder workgroup.

For RY 2023, which is based on CY 2021 performance, the HSCRC will include the entire 12-month performance period and include COVID positive patients. However, we will retrospectively evaluate case-mix adjustment and performance standards concerns arising from inclusion of COVID-19 patients and the use of a pre-COVID time period to determine normative values.

Palliative Care Exclusion

The RY 2023 program includes cases flagged with a palliative care diagnosis since the base period now contains present-on-admission indicators for palliative care, and the 3M logic has been adapted for their inclusion. While this does impact the number of at-risk discharges and assigned PPCs, the performance standards (normative values, benchmarks, and thresholds) also include these cases.

Scaling Methodology and Revenue At-Risk

The RY 2023 scale uses a full distribution of potential scores (scale of 0-100%), with a hold harmless zone between 60 and 70 percent. Both the minimum and maximum penalty remain at 2 percent. The preset scale is included in Appendix II of this memorandum. Additional information on the MHAC methodology can be found in Appendix III and in the RY 2023 policy.

Performance Standards and Payment Program Performance Periods

For RY 2023, two years of data (calendar year 2018 and 2019) is used to establish the normative values, which are used to calculate a hospital's expected PPC rate, and to determine the threshold and

[1] https://hscrc.maryland.gov/Pages/hscrc-workgroup-performance-measurement.aspx
[2] COVID-positive patients are patients with a diagnosis code of U07.1 in any primary or secondary diagnosis.

benchmark for scoring hospital performance. The performance period for assessing attainment will be CY 2021, except as noted above for small hospitals.

The monthly CRISP reports contain tabs in the excel workbook that provide program details and resources (i.e., 3M cost weights, performance standards (thresholds and benchmarks), the pre-set revenue adjustment scale, hospital PPC exclusions, normative values, and a calculation sheet). The January 2021 preliminary report has been released as part of the monthly summary reports posted on the CRISP Reporting Services portal.

Grouper Version and Software Revision

The APR-DRG and PPC Grouper Version 38 will be used for RY 2023.

MHAC Program Reporting though CRISP Reporting Services (CRS) Portal

All monthly and quarterly MHAC summary reports and case-level data will continue to be made available to hospitals through the CRS portal. Most hospital contacts may access the summary report, and a limited number of hospital contacts may access the case-level detail that contains PHI. For access to the CRS portal, contact support@crisphealth.org.

If you have any questions, please email hscrc.quality@maryland.gov.

Appendix I. Table for Determining RY 2023 Small Hospitals

The table below is sorted by at-risk discharges. Small Hospitals (<20,000 at-risk and/or 20 expected) are highlighted in yellow.

HOSPITAL ID	HOSPITAL NAME	At-Risk (CY18-CY19)	Observed (CY18-CY19)	Expected (CY18-CY19)
210030	UM-Chestertown	2040	7	4.8277
210010	UM-Dorchester	8742	6	10.8864
210055	UM-Laurel	8940	24	13.0979
210017	Garrett	9868	4	18.1455
210060	Ft. Washington	11032	2	19.0073
210064	Levindale	13394	38	24.9451
210058	UMROI	21978	33	33.146
210061	Atlantic General	24750	29	36.7205
210006	UM-Harford	33602	35	36.7456
210038	UMMC Midtown	40495	35	55.8386
210065	HC-Germantown	49316	32	44.726
210032	ChristianaCare, Union	50091	80	52.8998
210039	Calvert	50436	56	44.1054
210018	MedStar Montgomery	61944	74	60.832
210035	UM-Charles Regional	68024	63	71.4497
210028	MedStar St. Mary's	72612	50	68.1257
210037	UM-Easton	78927	80	88.6173
210034	MedStar Harbor	97478	108	68.1896
210056	MedStar Good Sam	118584	158	140.699
210051	Doctors	123956	104	160.1101
210033	Carroll	127297	121	124.9001
210040	Northwest	136685	113	126.0038
210049	UM-Upper Chesapeake	144938	135	165.7824
210062	MedStar Southern MD	147167	182	123.8289
210016	Adventist White Oak	149169	136	141.7962
210003	UM-PGHC	150014	178	137.6855
210027	Western Maryland	156921	168	159.1811
210024	MedStar Union Mem	158749	253	207.7144
210022	Suburban	179772	191	196.6283
210011	St. Agnes	197643	186	208.7284
210001	Meritus	216776	238	211.2328
210048	Howard County	219497	169	170.6549
210019	Peninsula	220030	226	251.4629

HOSPITAL ID	HOSPITAL NAME	At-Risk (CY18-CY19)	Observed (CY18-CY19)	Expected (CY18-CY19)
210063	UM-St. Joe	220139	210	223.0762
210008	Mercy	221192	188	209.7787
210043	UM-BWMC	225151	263	249.5312
210005	Frederick	225840	209	212.2753
210012	Sinai	235214	328	289.5821
210029	JH Bayview	270462	227	262.3296
210057	Shady Grove	279817	244	189.4347
210044	GBMC	284908	321	228.3715
210015	MedStar Fr Square	294598	327	266.8232
210002	UMMC	296989	525	557.7434
210023	Anne Arundel	385409	273	351.2955
210004	Holy Cross	399307	189	272.4005
210009	Johns Hopkins	488227	737	763.6497

Appendix II. RY 2023 MHAC Revenue Adjustment Scale

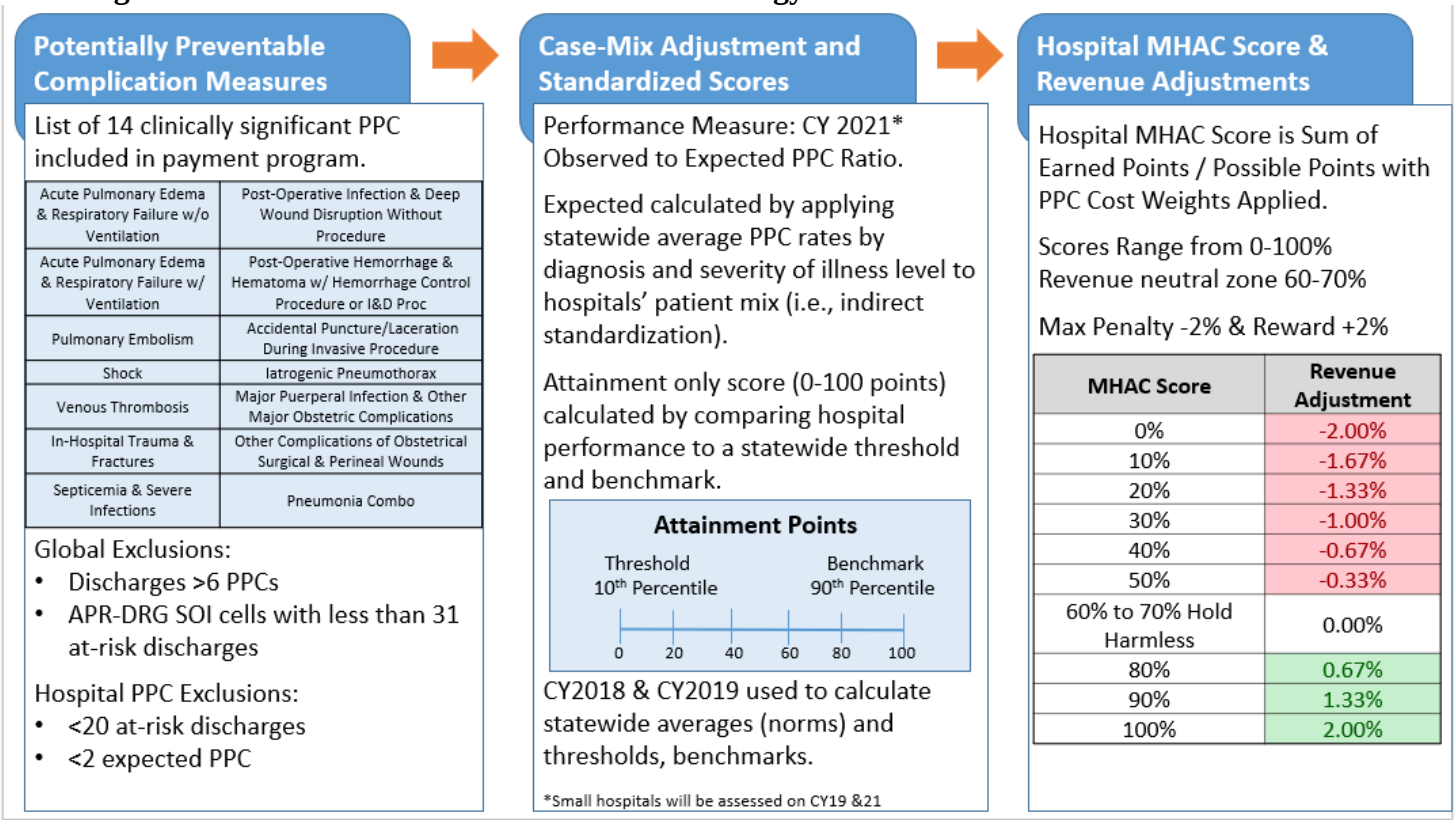
Below is a concise version of the RY 2023 MHAC scale, which ranges from 0 to 100 percent and includes a revenue neutral zone between 60 and 70 percent. A full scale with all percentage point revenue adjustments is included in the MHAC Summary workbooks.

Abbreviated Version	
Final MHAC Score	**% Revenue Adjustment**
0%	**-2.00%**
5%	-1.83%
10%	-1.67%
15%	-1.50%
20%	-1.33%
25%	-1.17%
30%	-1.00%
35%	-0.83%
40%	-0.67%
45%	-0.50%
50%	-0.33%
55%	-0.17%
60%	0.00%
65%	0.00%
70%	0.00%
75%	0.33%
80%	0.67%
85%	1.00%
90%	1.33%
95%	1.67%
100%	**2.00%**
Penalty Cut-point	**60%**
Reward Cut-point	**70%**

Appendix III: RY 2023 MHAC Program Methodology

Figure 1 below provides a summary overview of the RY 2023 MHAC methodology.

Figure 1. Overview of RY 2023 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 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 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 CY 2018 and CY 2019:

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

The PPCs for which a hospital will be assessed are determined using the FY 2018 and FY 2019 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.

Benchmarks and Thresholds

For each PPC, a threshold and benchmark value is calculated using the CY 2018 and CY 2019

data. In previous rate years when improvement as 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. Figure 3 provides the thresholds and benchmarks under this revised methodology based on CY 2018 and CY 2019 data.

Figure 3: RY 2023 Thresholds and Benchmarks for all 14 Payment Program PPCs

PPC Number	PPC Description	Threshold	Benchmark
3	Acute Pulmonary Edema and Respiratory Failure without Ventilation	1.5378	0.5396
4	Acute Pulmonary Edema and Respiratory Failure with Ventilation	1.5280	0.3206
7	Pulmonary Embolism	1.3902	0.4725
9	Shock	1.5327	0.4274
16	Venous Thrombosis	1.6562	0.1885
28	In-Hospital Trauma and Fractures	1.7887	0.3984
35	Septicemia & Severe Infections	1.6996	0.3948
37	Post-Operative Infection & Deep Wound Disruption Without Procedure	1.6127	0.4524
41	Post-Operative Hemorrhage & Hematoma with Hemorrhage Control Procedure or I&D Proc	1.4536	0.4465
42	Accidental Puncture/Laceration During Invasive Procedure	1.9414	0.3119
49	Iatrogenic Pneumothrax	1.6217	0.2567
60	Major Puerperal Infection and Other Major Obstetric Complications	1.8412	0.2880
61	Other Complications of Obstetrical Surgical & Perineal Wounds	2.0162	0.0000
67	Combined Pneumonia (PPC 5 and 6)	1.5656	0.5159

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.

Figure 5: Hypothetical Example of Scoring Methodology

Hospital A								
PPC	**Threshold**	**Benchmark**	**Hospital O/E Ratio**	**ATTAINMENT POINTS**	**POSSIBLE DENOMINATOR**	**3M Weight**	**Weighted Points**	**Weighted Denominators**
	A	**B**	**C**	**D = C relative to A and B**	**E**	**F**	**G = D * F**	**H = E * F**
PPC 1	1.75	0.5	0.2	100	100	0.5	50	50
PPC 2	2	0.3	1.1	53	100	2	106	200
PPC 3	2.5	0.4	0.65	88	100	1	88	100
Total							**244**	**350**
					TOTAL WEIGHTED SCORE G total /H total			**70%**

Hospital B								
PPC	**Threshold**	**Benchmark**	**Hospital O/E Ratio**	**ATTAINMENT POINTS**	**POSSIBLE DENOMINATOR**	**3M Weight**	**Weighted Points**	**Weighted Denominators**
	A	**B**	**C**	**D = C relative to A and B**	**E**	**F**	**G = D * F**	**H = E * F**
PPC 1	1.75	0.5	2	0	100	0.5	0	50
PPC 2	2	0.3	1.5	30	100	2	60	200
PPC 3	2.5	0.4	1	71	100	1	71	100
Total							**131**	**350**
					TOTAL WEIGHTED SCORE G total /H total			**37%**

Rounding
For the purposes of calculating scores, the benchmarks and O: E ratios are rounded to four decimal places. The final score for each hospital is rounded to the whole percentage point (e.g., 10%, 20%).

Financial Impact of MHAC Performance (Scaling)
Starting in RY 2021, the preset scale was modified to account for the higher scores under the new scoring methodology and increased potential rewards from 1 percent to 2 percent of inpatient revenue. The RY 2023 scale, which is the same as RY 2021 and RY 2022, uses the full distribution of potential scores (scale of 0-100%), with a hold harmless zone between 60 and 70 percent. The maximum penalty and reward remain at 2 percent.