To: Hospital CFOs

Cc: Case Mix Liaisons; Quality Liaisons

From: Alyson Schuster, Associate Director – Performance Measurement

Date: February 9, 2016; Revised April 13,2016

Re: Maryland Hospital Acquired Conditions Program Summary for FY2018

This memo summarizes changes to the Maryland Hospital Acquired Conditions Program (MHAC) that will impact hospital rates in rate year FY2018.

1) Scaling and Magnitude of Revenue At-Risk

On January 13, 2016 the Commission approved the staff recommendation to keep the current FY2017 MHAC methodology for FY2018, as this current approach balances hospital-specific incentives with state goals, sets continuous specific quality improvement goals, and focuses the payment adjustments to best and worst performers. Below are the specific recommendations to update the MHAC policy for FY 2018:

  I.   The program should continue to use the same scaling approach:

   a) The program should continue the contingent scaling approach, where a higher level of revenue is at risk if the statewide improvement target is not met. Rewards should only be distributed if the statewide improvement target is met.

   b) Hold-harmless zones should be created to focus the payment adjustments to both ends of the performance spectrum.

   c) Rewards should not be limited to the penalties collected.

  II.   The statewide reduction target should be set at 6 percent, comparing FY 2015 with CY 2016 case-mix adjusted Potentially Preventable Complication (PPC) rates.

Currently the percent of revenue at risk for the FY2018 MHAC program has not been approved by the Commission. The magnitude of revenue at risk for all HSCRC quality programs will be included in an updated "aggregate at risk" policy that is delayed because the FY 2018 Readmission Reduction Incentive Program recommendation is still under development.

2) Base and Performance Periods for FY2018 MHAC Program

For FY2018, the base period will be FY2015 and the performance period will be CY2016. An excel workbook with base period data and other program details is being distributed by email with this memo and will be posted on the CRISP Reporting Services portal.

3) Statewide Improvement Goal

In January, the Commission approved the staff recommendation that the statewide reduction target should be set at 6% comparing FY2015 (base period) to CY2016 (performance period) case-mix adjusted PPC rates.

4) Methodology for Hospital MHAC Performance Scoring and PPC Measurement

Overall, the FY2018 MHAC scoring methodology has not changed significantly from the FY2016 policy (see Appendix A and B for expected value and score calculation details). However, the following changes have been made to the PPC measurement and benchmark calculations:

   I. For FY 2018, the PPCs included in the payment program will be grouped into two tiers instead of the three tiers used in FY 2016 and FY 2017. The PPCs included in each tier have also been re-evaluated based on reliability and validity analyses and stakeholder input. The revised tier 1 and tier 2 PPCs will be weighted at 100% and 50%, respectively (see Appendix C for PPCs in tier 1).

   II. Five PPCs (2, 15, 20, 29, 33) with lower reliability are being moved to a monitoring-only status and will not be scored for payment program purposes. The monthly and quarterly PPC reports will be revised to provide data on these five PPCs and these PPCs will continue to be reported to CMMI for purposes of our new model contract.

   III. Starting in FY 2017, five PPCs with low rates were combined into a single PPC (PPC 67). Starting in FY 2018, we will keep the existing combination PPC and add three additional clinical related combination PPCs:

a) Combo 1: General Combination: PPC 25, 26, 43, 63, 64

b) Combo 2: Gastrointestinal Complications: PPC 17, 18

c) Combo 3: OB Hemorrhage: PPC 55, 56

d) Combo 4: OB Lacerations: PPC 57, 58

The hospital level exclusion criteria for each PPC (<10 at-risk and less < 1 expected) are applied at the combined PPC level and not at the individual PPC level. However, the count of total PPCs for each discharge counts all individual PPCs. The monthly and quarterly PPC reports will be revised to provide detailed data on each PPC within a combination PPC.

IV. The benchmark calculation for each PPC will be calculated using a new methodology rather than using the weighted mean of the O/E ratio for the top 25th percentile of best performing hospitals.   Starting in FY 2018, the benchmark will be calculated by taking the weighted mean of the O/E ratios for top performing hospitals that account for a minumum 25% of statewide discharges. This change in methodology results in only modest increases and decreases in the benchmarks for about 1/3rd of the PPCs but was done to avoid small hospitals in the top 25th percentile of hospitals driving the benchmark calculation.

V. As a reminder, PPC 24 was suspended from the MHAC program in RY2017 based upon 3M input that the measure was not valid. The original memo for RY18 did not have PPC 24 removed. Please see revised appendices with the corrected benchmarks and attainment scores.

Appendix D contains the updated benchmarks and thresholds with the above PPC measurement changes using FY2015 base period data. Appendix E provides the FY 2015 attainment only scores indicating what your hospital score would be if you had no improvement in CY 2016. These scores will used to develop preset payment scale once the percent of revenue at-risk is determined.

5) Version

PPC and APR version 32 will be used for FY2018 base period and PPC and APR version 33 (ICD-10) will be used for performance period. The HSCRC will be monitoring potential impacts of the ICD-10 conversion on APR-DRG SOI and PPC assignment and will make adjustments if necessary.

6) MHAC Program Reporting though CRISP Reporting Services (CRS) Portal

All summary reports and case level data will continue to be made available to hospitals/health systems through the CRS portal. Most hospital contacts will have access to only the summary report and a more limited number of hospital contacts will have access to 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 or call Alyson Schuster at 410-764-2673.

Appendix A: Expected Values

The expected value of PPCs is the number of PPCs a hospital, given its mix of patients as defined by APR DRG category and severity of illness level, would have experienced had its rate of PPCs been identical to that experienced by a reference or normative set of hospitals.

The technique by which the expected value or expected number of PPCs is calculated is called indirect standardization. For illustrative purposes, assume that every discharge can meet the criteria for having a PPC, a condition called being "at risk" for a PPC. All discharges will either have no PPCs or will have one and possibly more PPCs. For this exercise, therefore, each discharge either has a PPC or does not have a PPC. The PPC rate is proportion or percent of admissions which have at least one PPC.

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

Let:

N = norm
P = Number of discharges with one or more PPCs
D = Number of discharges that can potentially have a PPC
i = An APR DRG category and a single severity of illness level

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

For this example, this number is displayed as PPCs per discharge to facilitate the calculations in the example. Most reports will display this number as a rate per one thousand.

Once a set of norms has been calculated, they can be applied to each hospital. For this example, the computation is for an individual APR DRG category and its severity of illness levels. This computation could be expanded to include multiple APR DRG categories or any other subset of data, by simply expanding the summations.

Consider the following example for an individual APR DRG category.

Table 1 Expected Value Computation Example

1 Severity of illness Level	2 Discharges at risk for PPCs	3 Discharges with PPCs	4 PPCs per discharge	5 Normative PPCs per discharge	6 Expected # of PPCs
1	200	10	.05	.07	14.0
2	150	15	.10	.10	15.0
3	100	10	.10	.15	15.0
4	50	10	.20	.25	12.5
Total	**500**	**45**	**.09**		**56.5**

For the APR DRG category, the number of discharges with PPCs is 45, which is the sum of discharges with PPCs (column 3). The overall rate of PPCs per discharge, 0.09, is calculated by dividing the total

number of discharges with PPCs (sum of column 3) by the total number of discharges at risk for PPCs (sum of column 2), i.e., 0.09 = 44/500. From the normative population, the proportion of discharges with PPCs for each severity of illness level for that APR DRG category is displayed in column 5. The expected number of PPCs for each severity of illness level shown in column 6 is calculated by multiplying the number of discharges at risk for PPCs (column 2) by the normative PPCs per discharge rate (column 5) The total number of PPCs expected for this APR DRG category is the expected number of PPCs for the severity of illness levels.

In this example, the expected number of PPCs for this APR DRG category is 56.5 compared to the actual number of discharges with PPCs of 45. Thus the hospital had 11.5 fewer actual discharges with PPCs than were expected for this APR DRG category. This difference can be expressed as a percentage difference as well.

APR DRG by SOI categories are excluded from the computation of the actual and expected rates when there are only zero or one at risk admission statewide for the associated APR DRG by SOI category.

Appendix B: MHAC SCORE Calculations

    I.   Performance Metric
    The new 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 the base year statewide PPC rates by APR-DRG SOI. (See Appendix A for calculations).

    II.   PPC Exclusions

    Five PPCs (2, 15, 20, 29, 33) with lower reliability are being moved to a monitoring-only status and will not be scored for payment program purposes. There are no changes to the exclusion criteria for FY2018, however the exclusion criteria for <10 at-risk is now done prior to the calculation of the normative values and the normative values are then re-calculated after removing PPCs with <1 expected. The following exclusions will be applied:

    For each hospital, cases will be removed if:
- APR-DRG SOI cell has less than 2 total cases
- Palliative care cases
- Cases with more than 6 PPCs

    For each hospital, PPCs will be removed if:
- The number of cases at-risk is less than 10
- The expected number is less than 1 expected.

    The list of PPCs excluded for each hospital is provided in the excel sheet with the monthly reports. The PPC exclusion criteria is only applied to the base period and not the performance period. This was done so that scores can be reliably calculated during the performance period prior to knowing whether the above exclusions should be applied.

    III.   Attainment and Improvement Points
    For each hospital, PPC performance is evaluated based on the higher of "Attainment Points" in the performance period, or "Improvement Points" based on a comparison of that hospital's PPC performance in the performance period relative to the base period.

    <u>Attainment Points (possible points 0-10):</u>
    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 10 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 = [9 * ((Hospital's performance period score - Attainment threshold)/ (benchmark –Attainment threshold))] + .5

    <u>Improvement Points (possible points 0-9):</u>

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

If the PPC ratio for the performance period is less than or equal the benchmark, the hospital scores 9 points for that PPC for improvement. However in this case the attainment score of 10 will be higher than the improvement score and thus the attainment score will always be used to calculate the final score.

If the PPC ratio is between the threshold and benchmark, the hospital scores partial points for improvement. The formula to calculate the Improvement points is as follows:
- Improvement Points = [10 * ((Hospital performance period score -Hospital baseline period score)/(Benchmark - Hospital baseline period score))] -.5

IV. Rounding
For the purposes of calculating scores, the benchmarks and O/E ratios are rounded to 4 decimal places. The attainment and improvement points are rounded to the nearest whole number. The tier percent's and final score for each hospital is rounded to 2 decimal places.

V. Benchmarks and Thresholds
For each PPC a threshold and benchmark value is calculated based upon the base period data. For serious reportable events, the threshold and benchmark are 0. For all other PPCs, the threshold value is the weighted mean of all O/E ratios (O/E =1) and the benchmark has been changed to be the weighted mean of the O/E ratio for top performing hospitals that account for at least 25% of all discharges. This change was done to avoid many small hospitals being in the top 25th percentile of hospitals driving the benchmark calculation.

The serious reportable event PPCs for the base and performance period are the following: PPC 30, 31, 32, 45, and 46.

See Appendix C for the thresholds and benchmarks based upon FY2015 data, which will be used to assess CY2016 performance and assign improvement and attainment points.

VI. Calculation of Hospital Overall MHAC Score
To calculate the final score for each hospital, the final points (better of attainment or improvement) for each PPC in a tier are added up and divided by the total possible points in that tier to calculate a percent score for each tier. The PPCs are grouped in tiers so that PPCs that are high cost, high volume, have opportunity to improve, and are of national priority can be weighted more heavily (Table 1). The total possible points for each PPC is 10, and hospitals may have different total possible points depending upon which PPCs, if any, are excluded for that hospital (see exclusion criteria in Section 2 above). A list of excluded PPCs by hospital will be provided with the monthly and quarterly PPC results.

The final score is then calculated using the following formula:

Final Score = ((Score Tier 1 * 1) / (Denominator Tier 1 * 1)) +
((Score Tier 2 * 0.5) / (Denominator Tier 2 * 0.5))

Table 1. PPCs in each tier and their weight

Tier	Weighting	PPCs Included
1	100%	3,4,5,6,7,9,14,16, 21,27, 35,37,38,40,41, 42,49,54,65,66
2	50%	1, 8, 10,11, 12, 13, 19, 23, 28, 30, 31, 32,34, 36, 39, 44, 45, 46, 47, 48, 50, 51,52,53,59, 60, 61, 62, Combo 1 (25, 26, 43, 63, 64), Combo 2 (17, 18), Combo 3 (55, 56), Combo 4 (57, 58),

7) Financial Impact of MHAC Performance (Scaling)

I.   Preset Scaling Scores and Variation by whether state-wide target is met

The preset payment scale is determined based on attainment scores calculated using FY 2015 PPC data. The percent of revenue at-risk will vary for all hospitals depending on whether the statewide MHAC minimum improvement target is met.

For CY2016 performance period, the state-wide MHAC minimum improvement target is **6%** improvement. The statewide MHAC improvement rate is the percentage change in the O/E ratio in the performance year compared to the base year and calculated as follows:

$$\{[\text{Observed in CY2016/Expected in CY2016}]/ [\text{Observed in FY2015/Observed in FY2015}]\} - 1$$

A report will be provided from preliminary monthly data submissions and final quarterly data calculating the state-wide improvement rate.

II.   Revenue At-Risk for FY2018
For FY2018, which will be based on CY2016 performance period, the Commission has not yet voted on the maximum revenue at risk.

Appendix C: PPCs in Tier 1 (all other PPCs in tier 2)

PPC	PPC Description
3	Acute Pulmonary Edema and Respiratory Failure without Ventilation
4	Acute Pulmonary Edema and Respiratory Failure with Ventilation
5	Pneumonia & Other Lung Infections
6	Aspiration Pneumonia
7	Pulmonary Embolism
9	Shock
14	Ventricular Fibrillation/Cardiac Arrest
16	Venous Thrombosis
21	Clostridium Difficile Colitis
27	Post-Hemorrhagic & Other Acute Anemia with Transfusion
35	Septicemia & Severe Infections
37	Post-Operative Infection & Deep Wound Disruption Without Procedure
38	Post-Operative Wound Infection & Deep Wound Disruption with Procedure
40	Post-Operative Hemorrhage & Hematoma without Hemorrhage Control Procedure or I&D Proc
41	Post-Operative Hemorrhage & Hematoma with Hemorrhage Control Procedure or I&D Proc
42	Accidental Puncture/Laceration During Invasive Procedure
49	Iatrogenic Pneumothrax
54	Infections due to Central Venous Catheters
65	Urinary Tract Infection without Catheter
66	Catheter-Related Urinary Tract Infection

Appendix D: MHAC Thresholds and Benchmarks for CY2016 Performance Year—
Revised 04/11/2016

PPC Number	PPC Description	Threshold	Benchmark
1	Stroke & Intracranial Hemorrhage	1	0.5708
3	Acute Pulmonary Edema and Respiratory Failure without Ventilation	1	0.5454
4	Acute Pulmonary Edema and Respiratory Failure with Ventilation	1	0.6065
5	Pneumonia & Other Lung Infections	1	0.5589
6	Aspiration Pneumonia	1	0.4949
7	Pulmonary Embolism	1	0.3620
8	Other Pulmonary Complications	1	0.4368
9	Shock	1	0.5549
10	Congestive Heart Failure	1	0.2484
11	Acute Myocardial Infarction	1	0.5731
12	Cardiac Arrythmias & Conduction Disturbances	1	0.3270
13	Other Cardiac Complications	1	0.0777
14	Ventricular Fibrillation/Cardiac Arrest	1	0.6726
16	Venous Thrombosis	1	0.3097
19	Major Liver Complications	1	0.3540
21	Clostridium Difficile Colitis	1	0.5696
23	GU Complications Except UTI	1	0.2300
27	Post-Hemorrhagic & Other Acute Anemia with Transfusion	1	0.5629
28	In-Hospital Trauma and Fractures	1	0.0641
30	Poisonings due to Anesthesia	0	0.0000
31	Decubitus Ulcer	0	0.0000
32	Transfusion Incompatibility Reaction	0	0.0000
34	Moderate Infectious	1	0.3825
35	Septicemia & Severe Infections	1	0.4449
36	Acute Mental Health Changes	1	0.2277
37	Post-Operative Infection & Deep Wound Disruption Without Procedure	1	0.4181
38	Post-Operative Wound Infection & Deep Wound Disruption with Procedure	1	0.2358
39	Reopening Surgical Site	1	0.0784
40	or I&D Proc	1	0.6225
41	I&D Proc	1	0.2030
42	Accidental Puncture/Laceration During Invasive Procedure	1	0.4620
44	Other Surgical Complication - Mod	1	0.3443
45	Post-procedure Foreign Bodies	0	0.0000
46	Post-Operative Substance Reaction & Non-O.R. Procedure for Foreign Body	0	0.0000
47	Encephalopathy	1	0.1372
48	Other Complications of Medical Care	1	0.3350
49	Iatrogenic Pneumothrax	1	0.3515
50	Mechanical Complication of Device, Implant & Graft	1	0.3832
51	Gastrointestinal Ostomy Complications	1	0.3665
52	Infection	1	0.5587
53	Infusions	1	0.2016
54	Infections due to Central Venous Catheters	1	0.0963
59	Medical & Anesthesia Obstetric Complications	1	0.5325
60	Major Puerperal Infection and Other Major Obstetric Complications	1	0.0798
61	Other Complications of Obstetrical Surgical & Perineal Wounds	1	0.2060
62	Delivery with Placental Complications	1	0.3366
65	Urinary Tract Infection without Catheter	1	0.5764
66	Catheter-Related Urinary Tract Infection	1	0.0000
Combo 1	General Combination PPC: PPC 25, 26, 43, 63, 64	1	0.1106
Combo 2	Gastrointestinal Complications: PPC 17 amd 18	1	0.4751
Combo 3	OB Hemorrhage: PPC 55 and 56	1	0.6421
Combo 4	OB Lacerations: PPC 57 and 58	1	0.5331

Appendix E: FY 2018 MHAC Attainment Scores—Revised 04/11/2016

HOSPITAL ID	HOSPITAL NAME	TOTAL NUMBER OF PPCs	FINAL POINTS TIER 1	DENOMINATOR TIER 1	TOTAL NUMBER OF PPCs TIER1	FINAL POINTS TIER 2	DENOMINATOR TIER 2	TOTAL NUMBER OF PPCs TIER2	FINAL WEIGHTED POINTS	TOTAL DENOMINATOR	FINAL WEIGHTED SCORE
210001	MERITUS	50	72	190	19	75	310	31	109.5	345	0.32
210002	UNIVERSITY OF MARYLAND	52	57	200	20	159	320	32	136.5	360	0.38
210003	PRINCE GEORGE	49	51	190	19	106	300	30	104	340	0.31
210004	HOLY CROSS	51	54	200	20	162	310	31	135	355	0.38
210005	FREDERICK MEMORIAL	50	79	190	19	100	310	31	129	345	0.37
210006	HARFORD	24	76	130	13	60	110	11	106	185	0.57
210008	MERCY	51	64	200	20	131	310	31	129.5	355	0.36
210009	JOHNS HOPKINS	52	32	200	20	109	320	32	86.5	360	0.24
210010	DORCHESTER	16	46	90	9	50	70	7	71	125	0.57
210011	ST. AGNES	51	90	200	20	157	310	31	168.5	355	0.47
210012	SINAI	52	97	200	20	153	320	32	173.5	360	0.48
210013	BON SECOURS	26	59	140	14	73	120	12	95.5	200	0.48
210015	FRANKLIN SQUARE	51	78	200	20	128	310	31	142	355	0.4
210016	WASHINGTON ADVENTIST	50	15	190	19	138	310	31	84	345	0.24
210017	GARRETT COUNTY	22	76	130	13	52	90	9	102	175	0.58
210018	MONTGOMERY GENERAL	44	64	180	18	137	260	26	132.5	310	0.43
210019	PENINSULA REGIONAL	52	110	200	20	175	320	32	197.5	360	0.55
210022	SUBURBAN	45	31	190	19	97	260	26	79.5	320	0.25
210023	ANNE ARUNDEL	51	42	200	20	87	310	31	85.5	355	0.24
210024	UNION MEMORIAL	45	48	190	19	74	260	26	85	320	0.27
210027	WESTERN MARYLAND HEALTH SYSTEM	49	55	190	19	85	300	30	97.5	340	0.29
210028	ST. MARY	41	95	160	16	113	250	25	151.5	285	0.53
210029	HOPKINS BAYVIEW MED CTR	50	75	190	19	133	310	31	141.5	345	0.41
210030	CHESTERTOWN	18	50	110	11	50	70	7	75	145	0.52
210032	UNION HOSPITAL OF CECIL COUNT	35	53	160	16	102	190	19	104	255	0.41
210033	CARROLL COUNTY	48	61	190	19	102	290	29	112	335	0.33
210034	HARBOR	47	61	190	19	159	280	28	140.5	330	0.43
210035	CHARLES REGIONAL	41	74	160	16	142	250	25	145	285	0.51
210037	EASTON	43	48	170	17	126	260	26	111	300	0.37
210038	UMMC MIDTOWN	35	37	170	17	112	180	18	93	260	0.36
210039	CALVERT	36	101	160	16	125	200	20	163.5	260	0.63
210040	NORTHWEST	42	84	190	19	160	230	23	164	305	0.54
210043	BALTIMORE WASHINGTON MEDICAL CENTER	50	55	200	20	120	300	30	115	350	0.33
210044	G.B.M.C.	51	53	200	20	78	310	31	92	355	0.26
210045	MCCREADY	5	0	0	.	50	50	5	25	25	1
210048	HOWARD COUNTY	50	41	190	19	168	310	31	125	345	0.36
210049	UPPER CHESAPEAKE HEALTH	48	79	190	19	143	290	29	150.5	335	0.45
210051	DOCTORS COMMUNITY	42	25	190	19	75	230	23	62.5	305	0.2
210055	LAUREL REGIONAL	35	60	150	15	124	200	20	122	250	0.49
210056	GOOD SAMARITAN	44	46	190	19	118	250	25	105	315	0.33
210057	SHADY GROVE	50	65	190	19	125	310	31	127.5	345	0.37
210058	REHAB & ORTHO	23	75	100	10	89	130	13	119.5	165	0.72
210060	FT. WASHINGTON	21	100	120	12	60	90	9	130	165	0.79
210061	ATLANTIC GENERAL	30	50	150	15	98	150	15	99	225	0.44
210062	SOUTHERN MARYLAND	50	40	190	19	121	310	31	100.5	345	0.29
210063	UM ST. JOSEPH	51	90	190	19	121	320	32	150.5	350	0.43
210064	LEVINDALE	11	0	50	5	40	60	6	20	80	0.25

11