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To: Hospital CFOs
Cc: Case Mix Liaisons; Quality Liaisons
From: Alyson Schuster, Associate Director – Performance Measurement
Date: February 5, 2015
Re: Maryland Hospital Acquired Conditions Program Summary for FY2017

This memo summarizes the Maryland Hospital Acquired Conditions Program (MHAC) that will impact hospital rates in rate year FY2017.

1) Scaling and Magnitude of Revenue At-Risk

On January 14, 2015 the Commission approved the following staff recommendations on the scaling structure to be used for the MHAC program.

- 1) The program should continue to use a tiered approach where a lower level of revenue at risk is set if the statewide target is met versus not met as modelled in FY2016 policy.
- 2) Rewards should be distributed only if the statewide target is met, and should not be limited to the penalties collected.

This second recommendation to remove the revenue neutrality provision of the MHAC program is new for FY2017. However, the magnitude of revenue at risk for the FY2017 MHAC program has not yet been approved by the Commission. The magnitude of revenue at risk for all HSCRC quality programs will be included in an “aggregate at risk” policy that will be finalized at the March 2015 commission meeting. This change is due to the fact that the new All-payer Model agreement with CMMI requires Maryland to match or exceed the total revenue at risk for our quality programs compared to Medicare’s quality programs. Thus the Commission felt they could not vote on each program’s revenue at-risk individually.

2) Base and Performance Periods for FY2017 MHAC Program

For FY2017, the base period will be FY2014 and the performance period will be CY2015. An excel workbook with base period data and other program details is being distributed by email with this memo.

3) Statewide Improvement Goal

In January, the Commission also approved the staff recommendation that the statewide reduction target should be set at 7% comparing FY2014 (base period) to CY2015 (performance period) risk adjusted PPC rates.

4) Methodology for Hospital MHAC Performance Scoring and PPC Measurement

Overall, the FY2017 MHAC scoring methodology has not changed 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:

- 1) New for FY2017, PPC 25, 26, 43, 63, 64 (all in tier 3) were combined into a single PPC (PPC 67) due to low rates in these PPCs and based on the feedback from hospitals and discussions at the performance work group,
- 2) The HSCRC has made two clinical changes to the PPC logic outside of the 3M PPC software related to the hierarchy of PPC assignment. These changes are based on clinical feedback that hospitals provided to the HSCRC and were reviewed by the 3M clinical team. The changes include:
 - a) Assigning cases as not at risk for PPC 33 (cellulitis) if PPC 35 (septicemia & severe infection) or PPC 52 (vascular infection) are assigned.
 - b) Assigning cases as not at risk for PPC 52 (vascular infection) if PPC 39 (reopening of surgical site) is assigned.

Appendix C contains the updated benchmarks and thresholds with the above PPC measurement changes using FY2014 base period data.

5) Version

PPC and APR version 32 will be used for FY2017 program.

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

Starting with CY2015 performance period, all summary reports and case level data will be made available to hospitals/health systems through the CRS portal and *not* distributed through Repliweb/email. A memo explaining this process and requesting updated contacts for receiving the MHAC and other quality reports is forthcoming. As was done for CY2014, the summary reports will include the state-wide improvement rate since the revenue at-risk will vary depending on whether the state-wide MHAC minimum improvement target is achieved.

If you have any questions, please email hsrc.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

1) 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).

2) ~~Adjustments to~~ PPC Exclusions Measurement

There are no changes to the exclusion list for FY2017. For the ~~FY2014~~ base period 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.

3) 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.

Attainment Points (possible points 0-10):

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 = $[9 * ((\text{Hospital's performance period score} - \text{Attainment threshold}) / (\text{benchmark} - \text{Attainment threshold}))] + .5$

Improvement Points (possible points 0-9):

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 = $[10 * ((\text{Hospital performance period score} - \text{Hospital baseline period score}) / (\text{Benchmark} - \text{Hospital baseline period score}))] - .5$

4) 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.

5) 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 is the weighted mean of the top quartile O/E ratio.

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 FY2014 data, which will be used to assess CY2015 performance and assign improvement and attainment points.

6) 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:

$$\text{Final Score} = ((\text{Score Tier 1} * 1) / (\text{Denominator Tier 1} * 1)) + ((\text{Score Tier 2} * 0.6) / (\text{Denominator Tier 2} * 0.6)) + ((\text{Score Tier 3} * 0.4) / (\text{Denominator Tier 3} * 0.4))$$

Table 1. PPCs in each tier and their weight

Tier	Weighting	PPCs Included
1	100%	3,4,5,6,7,9,14,16,24,28,31,35,37,38,40,42,49,54,65,66
2	60%	8,10,11,17,18,19,27,41,48
3	40%	1,2,12,13,15,20,21,23,29,30,32,33,34,36,39,44,45,46,47,50,51,52,53,55,56,57,58,59,60,61,62,67

7) Financial Impact of MHAC Performance (Scaling)

1) Preset Scaling Scores and Variation by whether state-wide target is met

Scaling will be determined based on the same preset values as were used for the FY2016 MHAC program. These preset values were calculated using CY2013 attainment points. The percent of revenue at-risk will vary for all hospitals depending on whether the statewide MHAC minimum improvement target is met.

For CY2015 performance period, the state-wide MHAC minimum improvement target is **7%** 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:

$$\left\{ \frac{\text{Observed in CY2014}}{\text{Expected in CY2014}} \right\} / \left\{ \frac{\text{Observed in CY2013}}{\text{Observed in CY2013}} \right\} - 1$$

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

2) Revenue At-Risk for FY2017

For FY2017, which will be based on CY2015 performance period, the Commission has not yet voted on the maximum revenue at risk.

Appendix C: MHAC Thresholds and Benchmarks for CY2015 Performance Year

PPC Number	PPC Description	Threshold	Benchmark
1	Stroke & Intracranial Hemorrhage	1	0.5241
2	Extreme CNS Complications	1	0.3027
3	Acute Pulmonary Edema and Respiratory Failure without Ventilation	1	0.4884
4	Acute Pulmonary Edema and Respiratory Failure with Ventilation	1	0.4837
5	Pneumonia & Other Lung Infections	1	0.4365
6	Aspiration Pneumonia	1	0.5393
7	Pulmonary Embolism	1	0.3464
8	Other Pulmonary Complications	1	0.3321
9	Shock	1	0.3119
10	Congestive Heart Failure	1	0.2272
11	Acute Myocardial Infarction	1	0.4624
12	Cardiac Arrhythmias & Conduction Disturbances	1	0.5443
13	Other Cardiac Complications	1	0.165
14	Ventricular Fibrillation/Cardiac Arrest	1	0.5482
15	Peripheral Vascular Complications Except Venous Thrombosis	1	0.3271
16	Venous Thrombosis	1	0.2739
17	Major Gastrointestinal Complications without Transfusion or Significant Bleeding	1	0.5111
18	Major Gastrointestinal Complications with Transfusion or Significant Bleeding	1	0.086
19	Major Liver Complications	1	0.3394
20	Other Gastrointestinal Complications without Transfusion or Significant Bleeding	1	0.441
21	Clostridium Difficile Colitis	1	0.3427
23	GU Complications Except UTI	1	0.1973
24	Renal Failure without Dialysis	1	0.5927
25	Renal Failure with Dialysis		
26	Diabetic Ketoacidosis & Coma	See Combined PPC 67	
27	Post-Hemorrhagic & Other Acute Anemia with Transfusion	1	0.5607
28	In-Hospital Trauma and Fractures	1	0.3471
29	Poisonings Except from Anesthesia	1	0.185
30	Poisonings due to Anesthesia	0	0
31	Decubitus Ulcer	0	0
32	Transfusion Incompatibility Reaction	0	0
33	Cellulitis	1	0.3511
34	Moderate Infectious	1	0.0533
35	Septicemia & Severe Infections	1	0.3298
36	Acute Mental Health Changes	1	0.2437
37	Post-Operative Infection & Deep Wound Disruption Without Procedure	1	0.5343
38	Post-Operative Wound Infection & Deep Wound Disruption with Procedure	1	0.1119
39	Reopening Surgical Site	1	0.3355
40	or I&D Proc	1	0.6201
41	I&D Proc	1	0.0583
42	Accidental Puncture/Laceration During Invasive Procedure	1	0.5286
43	Accidental Cut or Hemorrhage During Other Medical Care	See Combined PPC 67	
44	Other Surgical Complication - Mod	1	0.3496
45	Post-procedure Foreign Bodies	0	0
46	Post-Operative Substance Reaction & Non-O.R. Procedure for Foreign Body	0	0
47	Encephalopathy	1	0.2274
48	Other Complications of Medical Care	1	0.4184
49	Iatrogenic Pneumothrax	1	0.1123
50	Mechanical Complication of Device, Implant & Graft	1	0.3371
51	Gastrointestinal Ostomy Complications	1	0.1031
52	Infection	1	0.5224
53	Infusions	1	0.1142
54	Infections due to Central Venous Catheters	1	0.1906
55	Obstetrical Hemorrhage without Transfusion	1	0.5011
56	Obstetrical Hemorrhage with Transfusion	1	0.4447
57	Obstetric Lacerations & Other Trauma Without Instrumentation	1	0.6149
58	Obstetric Lacerations & Other Trauma With Instrumentation	1	0.3936
59	Medical & Anesthesia Obstetric Complications	1	0.4924
60	Major Puerperal Infection and Other Major Obstetric Complications	1	0.166
61	Other Complications of Obstetrical Surgical & Perineal Wounds	1	0.3701
62	Delivery with Placental Complications	1	0.2963
63	Post-Operative Respiratory Failure with Tracheostomy		
64	Other In-Hospital Adverse Events	See Combined PPC 67	
65	Urinary Tract Infection without Catheter	1	0.5268
66	Catheter-Related Urinary Tract Infection	1	0
67	Combined PPC* (PPC 25, 26, 43, 63, 64)	1	0.1301

*Starting FY2017 these Tier 3 PPCs with a low benchmark and rate were combined into 1 PPC.