

NOTICE OF WRITTEN COMMENT PERIOD

Notice is hereby given that the public and interested parties are invited to submit written comments to the Commission on the staff draft recommendation that will be presented at the March 13, 2019 Public Meeting:

- 1) Draft Recommendation on the MPA Efficiency Adjustment Policy

WRITTEN COMMENTS ON THE AFOREMENTIONED STAFF DRAFT RECOMMENDATIONS ARE DUE IN THE COMMISSION'S OFFICES ON OR BEFORE MARCH 22, 2019, UNLESS OTHERWISE SPECIFIED IN THE RECOMMENDATION.

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Health Services Cost Review Commission

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**559th MEETING OF THE HEALTH SERVICES COST REVIEW COMMISSION
March 13, 2019**

EXECUTIVE SESSION

11:00 a.m.

(The Commission will begin in public session at 11:00 a.m. for the purpose of, upon motion and approval, adjourning into closed session. The open session will resume at 1:00 p.m.)

- 1. Discussion on Planning for Model Progression – Authority General Provisions Article, §3-103 and §3-104**
- 2. Update on Administration of Model - Authority General Provisions Article, §3-103 and §3-104**

PUBLIC SESSION

1:00 p.m.

- 1. Review of the Minutes from the Public and Closed Meetings held on January 9, 2019, as well as the Closed Session of February 13, 2019**
- 2. Ratification of vote taken at Closed Session of February 13, 2019 regarding Bon Secours and LifeBridge**
- 3. New Model Monitoring**
- 4. Docket Status – Cases Closed
2419A – University of Maryland Medical System 2420A – Johns Hopkins Health System**
- 5. Docket Status – Cases Open

2473A - University of Maryland Medical Center 2474A – Johns Hopkins Health System
2475R – Calvert Health Medical Center**
- 6. Confidential Data Request: Johns Hopkins University: Bloomberg School of Public Health, Center for Population Health IT**
- 7. Confidential Data Request: Oregon Health & Science University (OHSU): School of Medicine, Center for Policy and Research in Emergency Medicine**
- 8. Final Recommendation on Updates to the Maryland Hospital Acquired Conditions Program Policy for RY 2021**

9. Draft Recommendation on the MPA Efficiency Adjustment Policy

10. Policy Update and Discussion

a. Update from Executive Director

b. Legislative Update

11. Hearing and Meeting Schedule

New Model Monitoring Report

The Report will be distributed during the Commission Meeting

Cases Closed

The closed cases from last month are listed in the agenda

H.S.C.R.C's CURRENT LEGAL DOCKET STATUS (OPEN)

AS OF MARCH 4, 2019

A: PENDING LEGAL ACTION : NONE
 B: AWAITING FURTHER COMMISSION ACTION: NONE
 C: CURRENT CASES:

Docket Number	Hospital Name	Date Docketed	Decision Required by:	Rate Order Must be Issued by:	Purpose	Analyst's Initials
2473A	University of Maryland Medical Center	2/8/2019	N/A	N/A	ARM	DNP
2474A	Johns Hopkins Health System	2/25/2019	N/A	N/A	ARM	DNP
2475R	Calvert Health Medical Center	3/4/2019	4/3/2019	9/2/2019	MSG/DEF	WH

PROCEEDINGS REQUIRING COMMISSION ACTION - NOT ON OPEN DOCKET

NONE

**IN RE: THE APPLICATION FOR
ALTERNATIVE METHOD OF RATE
DETERMINATION
UNIVERSITY OF MARYLAND
MEDICAL CENTER
BALTIMORE, MARYLAND**

*** BEFORE THE MARYLAND HEALTH
* SERVICES COST REVIEW
* COMMISSION
* DOCKET: 2019
* FOLIO: 2283
* PROCEEDING: 2473A**

Staff Recommendation

March 13, 2019

I. INTRODUCTION

The University of Maryland Medical Center (“the Hospital”) filed an application with the HSCRC on February 8, 2019 for an alternative method of rate determination, pursuant to COMAR 10.37.10.06. The Hospital requests approval from the HSCRC to continue to participate in a global rate arrangement for solid organ and blood and bone marrow transplant services with LifeTrac, Inc. Network for a period of one year, effective April 1, 2019.

II. OVERVIEW OF APPLICATION

The contract will continue to be held and administered by University Physicians, Inc. (UPI). UPI will manage all financial transactions related to the global price contract including payments to the Hospital and bear all risk relating to regulated services associated with the contract.

III. FEE DEVELOPMENT

The hospital component of the global rates was developed by calculating mean historical charges for patients receiving like procedures. The remainder of the global rate is comprised of physician service costs. Additional per diem payments were calculated for cases that exceed a specific length of stay outlier threshold.

IV. IDENTIFICATION AND ASSESSMENT OF RISK

The Hospital will continue to submit bills to UPI for all contracted and covered services. UPI is responsible for billing the payer, collecting payments, disbursing payments to the Hospital at its full HSCRC approved rates, and reimbursing the physicians. The Hospital contends that the arrangement among UPI, the Hospital, and the physicians holds the Hospital harmless from any shortfalls in payment from the global price contract. UPI maintains it has been active in similar types of fixed fee contracts for several years, and that UPI is adequately capitalized to bear the risk of potential losses.

V. STAFF EVALUATION

Although there was no experience under this arrangement in the last year, staff believes

that the Hospital can achieve favorable performance under this arrangement.

V I. STAFF RECOMMENDATION

Staff recommends that the Commission approve the Hospital's application to continue to participate in an alternative method of rate determination for solid organ and blood and bone marrow transplant services with LifeTrac, Inc. for a one year period commencing April 1, 2019. Consistent with its policy paper regarding applications for alternative methods of rate determination, the staff recommends that this approval be contingent upon the execution of the standard Memorandum of Understanding ("MOU") with the Hospital for the approved contract. This document would formalize the understanding between the Commission and the Hospital, and would include provisions for such things as payments of HSCRC-approved rates, treatment of losses that may be attributed to the contract, quarterly and annual reporting, confidentiality of data submitted, penalties for noncompliance, project termination and/or alteration, on-going monitoring, and other issues specific to the proposed contract. The MOU will also stipulate that operating losses under the contract cannot be used to justify future requests for rate increases.

**IN RE: THE APPLICATION FOR
ALTERNATIVE METHOD OF RATE
DETERMINATION
JOHNS HOPKINS HEALTH
SYSTEM
BALTIMORE, MARYLAND**

*** BEFORE THE MARYLAND HEALTH
* SERVICES COST REVIEW
* COMMISSION
* DOCKET: 2019
* FOLIO: 2284
* PROCEEDING: 2474A**

Staff Recommendation

March 13, 2019

I. INTRODUCTION

Johns Hopkins Health System (“System”) filed an application with the HSCRC on February 25, 2019, on behalf of its member hospitals, Johns Hopkins Hospital, Johns Hopkins Bayview Medical Center, and Howard County General Hospital (the “Hospitals”) for an alternative method of rate determination, pursuant to COMAR 10.37.10.06. The System requests approval from the HSCRC to continue to participate in a global rate arrangement for heart failure services and solid organ and bone marrow transplants with Optum Health, a division of United HealthCare Services, for a period of one year beginning April 1, 2019.

II. OVERVIEW OF APPLICATION

The contract will continue to be held and administered by Johns Hopkins HealthCare, LLC (“JHHC”), which is a subsidiary of the System. JHHC will manage all financial transactions related to the global price contract including payments to the System hospitals and bear all risk relating to regulated services associated with the contract.

III. FEE DEVELOPMENT

The hospital portion of the global rates was developed by calculating mean historical charges for patients receiving the procedures for which global rates are to be paid. The remainder of the global rate is comprised of physician service costs. Additional per diem payments were calculated for cases that exceed a specific length of stay outlier threshold.

IV. IDENTIFICATION AND ASSESSMENT OF RISK

The Hospitals will continue to submit bills to JHHC for all contracted and covered services. JHHC is responsible for billing the payer, collecting payments, disbursing payments to the Hospitals at their full HSCRC approved rates, and reimbursing the physicians. The System contends that the arrangement among JHHC, the Hospitals, and the physicians holds the

Hospitals harmless from any shortfalls in payment from the global price contract. JHHC maintains it has been active in similar types of fixed fee contracts for several years, and that JHHC is adequately capitalized to bear risk of potential losses.

V. STAFF EVALUATION

The staff found the experience for this arrangement last year to be favorable.

VI. STAFF RECOMMENDATION

The staff recommends that the Commission approve the Hospitals' application for an alternative method of rate determination for heart failure, solid organ and bone marrow transplant services for a one year period commencing April 1, 2019. The Hospitals will need to file a renewal application for review to be considered for continued participation.

Consistent with its policy paper regarding applications for alternative methods of rate determination, the staff recommends that this approval be contingent upon the execution of the standard Memorandum of Understanding ("MOU") with the Hospitals for the approved contract. This document would formalize the understanding between the Commission and the Hospitals, and would include provisions for such things as payments of HSCRC-approved rates, treatment of losses that may be attributed to the contract, quarterly and annual reporting, confidentiality of data submitted, penalties for noncompliance, project termination and/or alteration, on-going monitoring, and other issues specific to the proposed contract. The MOU will also stipulate that operating losses under the contract cannot be used to justify future requests for rate increases.

**Final Staff Recommendation on the Johns Hopkins Blomberg School of Public
Health Request to Access HSCRC Confidential Patient Level Data.**

Health Services Cost Review Commission

4160 Patterson Avenue, Baltimore, MD 21215

February 13, 2019

This is a final recommendation for Commission consideration at the February 13, 2019 Public Commission Meeting.

SUMMARY STATEMENT

The Johns Hopkins University: Bloomberg School of Public Health, Center for Population Health IT, is requesting to use limited confidential data to explore patterns of clinical encounters and characteristics of individuals who have committed suicide.

OBJECTIVE

This research will help identify predictive models to detect factors that may lead to suicide death and develop new methods to identify clinical and social patterns that lead to suicide. The aim is the iterative integration and merging of various data sources and to develop analytics to find patterns of clinical encounters and attributes. The limited dataset will include confidential variables such as dates of service, age, and location at a census block group level which will be provided by CRISP. Investigators received approval from the Johns Hopkins Bloomberg School of Public Health - Institutional Review Board (IRB) on October 29, 2018. These data will not be used to identify individual hospitals or patients. The data will be retained by John Hopkins University until December 31, 2023; at that time, the files will be destroyed and a Certification of Destruction will be submitted to the HSCRC.

REQUEST FOR ACCESS TO THE CONFIDENTIAL PATIENT LEVEL DATA

All requests for Confidential Data are reviewed by the Health Services Cost Review Commission Confidential Data Review Committee. The role of the Review Committee is to review applications and make recommendations to the Commission at its monthly public meeting. Applicants requesting access to the confidential data must demonstrate:

1. that the proposed study/ research is in the public interest;
2. that the study/ research design is sound from a technical perspective;
3. that the organization is credible;
4. that the organization is in full compliance with HIPAA, the Privacy Act, Freedom Act, and all other state and federal laws and regulations, including Medicare regulations;
5. that there are adequate data security procedures to ensure protection of patient confidentiality.

The independent Confidential Data Review Committee, comprised of representatives from HSCRC staff, the Maryland Department of Health (“MDH”), Prince George’s County Health Dept. The Hilltop Institute at the University of Maryland Baltimore County, and the US Department of Health and Human Services, reviewed the application to ensure it meets the above minimum requirements as outlined in the application form.

The Confidential Review Committee unanimously agreed to recommend access to a confidential limited data set. As a final step in the evaluation process, the applicant will be required to file annual progress reports to the Commission, detailing any changes in goals or design of project, any changes in data handling procedures, work progress, and unanticipated events related to the confidentiality of the data. Additionally, the requester will submit to HSCRC a copy of the final report for review prior to public release.

STAFF RECOMMENDATIONS

1. HSCRC staff recommends that the request for the limited inpatient and outpatient confidential data files for Calendar Year 2011 through 2017 be approved.
2. This access will be limited to identifiable data for subjects enrolled in the research.

**Final Staff Recommendation on the Oregon Health & Science University,
School of Medicine Request to Access HSCRC Confidential Patient Level
Data.**

**Health Services Cost Review Commission
4160 Patterson Avenue, Baltimore, MD 21215**

February 13, 2019

This is a final recommendation for Commission consideration at the February 13, 2019 Public Commission Meeting.

SUMMARY STATEMENT

The Oregon Health & Science University (OHSU): School of Medicine, Center for Policy and Research in Emergency Medicine (CPR-EM), is requesting to use limited confidential data to evaluate the emergency care system for children in terms of quality, outcomes and cost. They are requesting key protected health information variables to link these data to state death registry records to provide 12-month mortality outcome for each subject. Death registry data has been requested and approved through a separate application with the Maryland Department of Health Vital Statistics Administration.

OBJECTIVE

This research on ER readiness will demonstrate that aligning children with higher readiness hospitals (i.e., to match patient need with hospital capability) is associated with better outcomes and higher quality of care. The limited dataset will include confidential variables such as dates of service, date of birth, hospital name, home zip code, and gender. All PHI (including all dates, DOB, zip code and hospital names) will be removed and destroyed after linking ED and inpatient records to death records. Investigators received approval from The Oregon Health & Science University - Institutional Review Board (IRB) on August 22, 2017. These data will not be used to identify individual hospitals or patients. The data will be retained by OHSU School of Medicine, (CPR-EM) until June 30, 2022; at that time, the files will be destroyed and a Certification of Destruction will be submitted to the HSCRC.

REQUEST FOR ACCESS TO THE CONFIDENTIAL PATIENT LEVEL DATA

All requests for Confidential Data are reviewed by the Health Services Cost Review Commission Confidential Data Review Committee. The role of the Review Committee is to review applications and make recommendations to the Commission at its monthly public meeting. Applicants requesting access to the confidential data must demonstrate:

1. that the proposed study/ research is in the public interest;
2. that the study/ research design is sound from a technical perspective;
3. that the organization is credible;
4. that the organization is in full compliance with HIPAA, the Privacy Act, Freedom Act, and all other state and federal laws and regulations, including Medicare regulations;
5. that there are adequate data security procedures to ensure protection of patient confidentiality.

The independent Confidential Data Review Committee, comprised of representatives from HSCRC staff, the Maryland Department of Health (“MDH”), Prince George’s County Health Dept. The Hilltop Institute at the University of Maryland Baltimore County, and the US Department of Health and Human Services, reviewed the application to ensure it meets the above minimum requirements as outlined in the application form.

The Confidential Review Committee unanimously agreed to recommend access to a confidential limited data set. As a final step in the evaluation process, the applicant will be required to file annual progress reports to the Commission, detailing any changes in goals or design of project, any changes in data handling procedures, work progress, and unanticipated events related to the confidentiality of the data. Additionally, the requester will submit to HSCRC a copy of the final report for review prior to public release.

STAFF RECOMMENDATIONS

1. HSCRC staff recommends that the request for the limited inpatient and outpatient confidential

data files for Calendar Year 2012 through 2017 be approved.

2. This access will be limited to identifiable data for subjects meeting the criteria for the research.

**Final Recommendation for the
Maryland Hospital Acquired Conditions Program
for Rate Year 2021**

March 13, 2019

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 2021.

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List of Abbreviations

AHRQ	Agency for Health Care Research and Quality
APR-DRG	All Patients Refined Diagnosis Related Groups
CMS	Centers for Medicare & Medicaid Services
CY	Calendar Year
DRG	Diagnosis-Related Group
FFY	Federal Fiscal Year
FY	State Fiscal Year
HAC	Hospital-Acquired Condition
HAI	Hospital Associated Infection
HSCRC	Health Services Cost Review Commission
ICD	International Statistical Classification of Diseases and Related Health Problems
MHAC	Maryland Hospital-Acquired Condition
NHSN	National Healthcare Safety Network
NQF	National Quality Forum
PMWG	Performance Measurement Work Group
POA	Present on Admission
PPC	Potentially Preventable Complication
PSI	Patient Safety Indicator
QBR	Quality-Based Reimbursement
RY	Rate Year
SIR	Standardized Infection Ratio
SOI	Severity of Illness
TCOC	Total Cost of Care
VBP	Value-Based Purchasing
YTD	Year to Date

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

These are the final recommendations for the Maryland Rate Year (RY) 2021 Hospital-Acquired Conditions (MHAC) policy:

- A. Continue to use 3M Potentially Preventable Complications (PPCs) to assess hospital-acquired complications.
 1. Include 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.
 3. Explore development of national benchmarks for PPCs in future years.
- B. Assess hospital performance on attainment only using a wider and more continuous performance range to better differentiate hospital performance, rewarding high attainment but also incentivizing improvement.
- C. Weight the PPCs in payment program by 3M cost weights as a proxy for patient harm.
- D. Convert weighted PPC scores to revenue adjustments using a prospective revenue adjustment scale with a maximum penalty at 2 percent and maximum reward at 1 percent and continuous linear scaling with a hold harmless zone between 60 and 70 percent.

This final MHAC policy provides updates to methodology and modeling in the assessment section, and responds to stakeholder input. Staff appreciates the stakeholder input that was received on the draft MHAC policy at the performance measurement workgroup meetings and through two rounds of comment letters. In general the workgroup members and comment letters were supportive of the process for selecting complication measures, the attainment only approach, and use of 3M cost weights as proxies for patient harm. However, as is outlined in this final recommendation, there was no consensus on the linear versus non-linear scaling options for revenue adjustments. Based on the stakeholder input and additional staff analysis, staff is recommending to continue with the linear scaling with the hold harmless zone because we believe that hospital concerns regarding case-mix adjustment are mediated with the narrowed down list of PPCs and other methodology changes being proposed, and take very seriously the input that the non-linear scaling reduces incentives drastically. The non-linear scaling option and hospital concerns are presented for Commissioner consideration and staff is prepared to implement either scale. Last, staff thanks stakeholders who participated over the last year to redesign the MHAC program and believe that these final recommendations represent substantial improvements to the MHAC policy.

Introduction

A central tenet of the healthcare reform in Maryland since 2014 is that hospitals are funded under Population Based Revenue, 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 across the continuum of care and may keep savings that they achieve via improved quality of care (e.g., reduced hospital-acquired infection or other complications, avoidable utilization, readmissions). On the other hand, constraining hospital resources can have unintended consequences, including declining quality of care. Thus, Maryland's Quality programs must measure and reward better quality and reinforce the incentives of the Population Based Revenue system, as well as penalize poor performance and potential unintended consequences.

The Maryland Health Services Cost Review Commission's (HSCRC's or Commission's) Hospital Acquired Conditions (MHAC) program incentivizes hospitals to improve patient safety and value over time. The MHAC policy currently holds 2 percent of hospital revenue at-risk for performance measures related to complications that occur during a hospital stay as a result of treatment. Under the 2014-2018 All-Payer Model Agreement between Maryland and the Centers for Medicare & Medicaid Services (CMS), there were specific quality performance requirements, including reducing all-payer complications by 30 percent by the end of 2018 as measured by 3M Potentially Preventable Complication (PPC) measures. Maryland has well exceeded this target with a 51.54 percent reduction in the all-payer case-mix adjusted complication rate based on data through June of 2018. However, the hospital industry has expressed concerns that the inclusion of 45 PPC/PPC combinations in a pay-for-performance program well exceeds the number and type of complications measured nationally, hindering the ability to focus on priority areas.

As Maryland enters into a new Total Cost of Care (TCOC) Model Agreement with CMS on January 1, 2019, performance standards and targets in HSCRC's portfolio of quality and value-based payment programs will be updated. In CY 2018, staff focused on revising two of the Commission's Quality programs, the Maryland Hospital-Acquired Conditions program and the Potentially Avoidable Utilization program, per directives from HSCRC Commissioners.¹

For the complications program redesign, staff worked to address industry concerns regarding the large number of complication measures and to focus on the most meaningful and significant measures of patient safety. To do this work staff contracted with Dr. Zahid Butt of Medisolv to provide subject matter expertise and to convene a group of clinical and measurement experts as well as hospital and payer representatives to review existing all-payer complications measures and

¹ In the fall of 2017, HSCRC Commissioners with staff support conducted several strategic planning sessions to outline priorities and guiding principles for the upcoming Total Cost of Care Model. Based on these sessions, the HSCRC developed a Critical Action Plan that delineates timelines for review and possible revisions of financial and quality methodologies, as well as other staff operations.

provide suggestions for evaluating hospital performance. The Clinical Adverse Event Measures (CAEM) subgroup met from February through September and their suggestions were then brought to the Performance Measurement Workgroup (PMWG) for further discussion. Details on the complication subgroup process and suggestions are provided throughout this policy and Appendix I contains a report on the process from Dr. Butt.

The final MHAC policy reflects consensus recommendations from the CAEM subgroup and PMWG, including: maintaining the use of 3M Potentially Preventable Complications but reducing the number of complication measures; moving to an attainment only system given Maryland's sustained improvement over the past several years; and weighting complications by their associated cost weights. Justifications for retaining the PPCs are explained in the Assessment section, but in short, stakeholders and staff believes these are valid patient safety measures that address important clinical areas. Moreover, the subgroup expressed concern about utilizing other viable complication measure sets, i.e., the National Health Safety Network (NHSN) measures and Agency for Health Care Research and Quality (AHRQ) Patient Safety Indicators (PSI). Specifically, the subgroup did not support duplicating the use of the NHSN measures, which are already in the Quality Based Reimbursement program, and was generally concerned about increasing the weight on NHSN because of the potential for incomplete risk adjustment and the possibility of surveillance bias, among other things. In terms of AHRQ PSI's, the subgroup noted that the all-payer risk-adjustment is not yet available for and therefore is not viable for inclusion in a pay-for-performance program at this time.

The final policy also recommends the use of a prospective linear scale with a hold harmless zone, as staff believes this provides the appropriate level of financial incentives for hospitals to address complications. However, included in this recommendation for reference is the modeling of the non-linear, continuous scale, which is supported by Maryland Hospital Association and Johns Hopkins Health System because of their continued concerns on the case-mix adjustment and lack of national norms. Staff believe that the narrowed down PPC list and use of two years of data for establishing normative values largely addresses the case-mix concerns, but will continue in future iterations of the MHAC policy to develop methodologies that strengthen case-mix adjustment and align Maryland PPC's with national performance standards.

Background

Overview of the Federal Hospital-Acquired Condition Programs

The Federal Government operates two hospital complications payment programs. Detailed information may be found in Appendix II.

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.

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 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, the measures in both Domains 1 and 2 of the Hospital-Acquired Condition Reduction Program are used in the CMS Value Based Purchasing program, and the measures in Domain 2 are also used in the Maryland Quality Based Reimbursement (QBR) program.

Figure 1. CMS Hospital-Acquired Condition Reduction Program (HACRP) FFY 2018 Measures

HACRP Domain 1 – Recalibrated Patient Safety Indicator (PSI) measure:[^]
Recalibrated PSI 90 Composite
HACRP Domain 2 – National Healthcare Safety Network (NHSN) Healthcare-Associated Infection (HAI) measures:^{^*}
Central Line-Associated Bloodstream Infection (CLABSI)
Catheter-Associated Urinary Tract Infection (CAUTI)
Surgical Site Infection (SSI) – colon and hysterectomy
Methicillin-resistant Staphylococcus aureus (MRSA) Bacteremia
Clostridium Difficile Infection (CDI)

[^]All Measures included in the CMS VBP Program

* All Measures included in the Maryland QBR Program

Because of the State’s unique all-payer hospital model and its population based revenue system, Maryland does not directly participate in these Federal programs. Instead, the State administers the Maryland Hospital Acquired Conditions program (MHAC), which relies on quality indicators validated for use with an all-payer inpatient population. However, there is some overlap between MHAC and the federal programs. Following the recommendation of Commissioners and stakeholders, staff is continually evaluating opportunities to align patient safety measurement more closely with federal programs and to compare the State’s performance against national benchmarks.

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 adverse drug reactions and surgical-site infections 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.

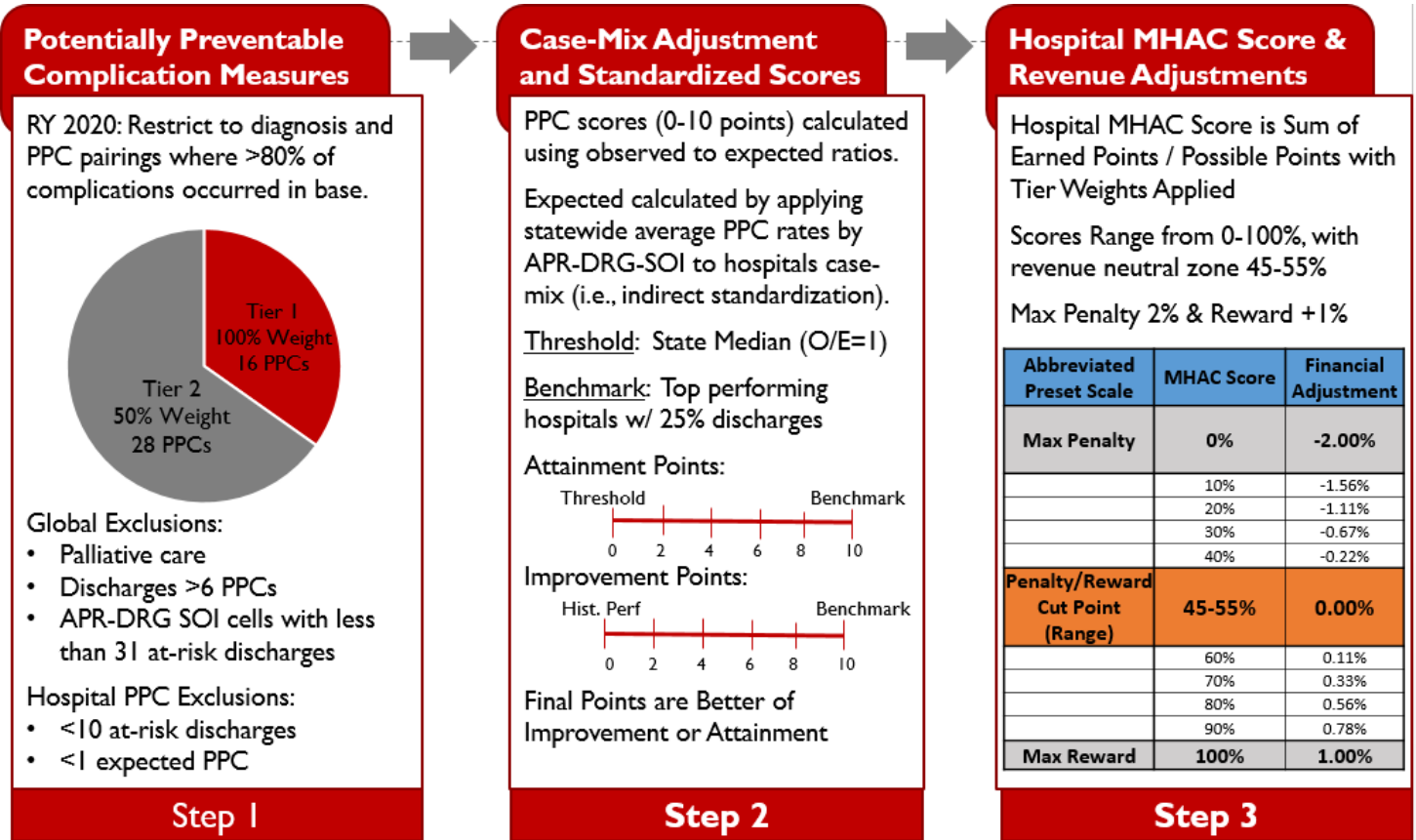
RY 2020 MHAC Methodology

The initial methodology for the MHAC program estimated the percentage of inpatient revenue associated with excess PPCs, penalized hospitals that had higher estimated PPC costs than the statewide average, and provided revenue neutral rewards to hospitals with lower-than-average PPC costs. In RY 2016, the Commission changed the MHAC methodology to evaluate hospital performance based on case-mix-adjusted PPC rates rather than excess PPC costs. Annual adjustments have been made to the patient populations and PPCs included in the MHAC payment program based on stakeholder input and staff analytic findings in order to strengthen its clinical and statistical merits. The revenue adjustment scales have also been modified over time to better incentivize improvements. For RY 2020, the Commission approved an interim solution to address the low normative values by focusing the payment program on the diagnosis and complication pairs where at least 80 percent of PPCs occurred in the base period. Staff recommends discontinuing this approach for reasons that will be discussed in the Assessment section

Beyond the annual updates outlined above, the scoring methodology has remained the same since RY 2016. Figure 2 provides an overview of the three steps in the MHAC methodology that convert hospital performance, to standardized scores, and then payment adjustments. Step 1, PPCs are grouped and weighted into tiers according to their level of priority and exclusions are applied. Step 2, case-mix adjustment is used to calculate observed to expected ratios that are then converted to a standardized point based score (0-10 points) based on the better of improvement or attainment using the same scoring methodology that is used for CMS Value-Based Purchasing and Maryland QBR. Step 3 uses a preset linear point scale that is set prospectively to calculate a percent revenue adjustment. This prospective scaling approach differs from national programs that relatively rank hospitals after the performance period. A list of the PPCs used in the RY 2020 program is provided in Appendix III.

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

Figure 2. Overview Rate Year 2020 MHAC Methodology



RY 2021 MHAC Program Redesign

With conclusion of the All-Payer model and beginning of the TCOC model in 2019, the Commission prioritized redesigning the MHAC program because of concerns regarding the large number of PPCs being assessed and the lack of national benchmarks for performance. Under the new TCOC model, the State has the opportunity to use measures other than PPCs, but must ensure the improvement in complication rates seen under the All-Payer model is maintained and that outcomes continue to be comparable or better than the nation.

As mentioned above, the staff contracted with Dr. Zahid Butt of Medisolv to provide subject matter expertise and to convene the Clinical Adverse Event Measures subgroup to review existing all-payer complications measures and provide suggestions for evaluating hospital performance. Appendix I contains the final CAEM report, which provides an overview of the process that was used to select measures and recommendations on how to score hospital performance. These suggestions/recommendations on measures and scoring were then provided to the PMWG for consideration. The PMWG was then tasked with assessing subgroup recommendations and developing methodology for converting scores to revenue adjustments.

Details on the recommendations and how they were developed are outlined in the assessment section below. Staff would like to thank Dr. Butt and the dozens of CAEM and PMWG members who have collaborated with the Commission on the MHAC program redesign. As evidenced below, significant thought and effort went into the decisions on what measures should be in the RY 2021 MHAC policy and how hospitals should be scored. These changes are supported by many stakeholders, however there was no consensus on the linear versus non-linear scaling options for revenue adjustments. Based on the stakeholder input and additional staff analysis, staff is recommending to continue with the linear scaling with the hold harmless zone because we believe that hospital concerns regarding case-mix adjustment are mediated with the narrowed down list of PPCs and other methodology changes being proposed, and take very seriously the input that the non-linear scaling reduces incentives drastically.

Assessment

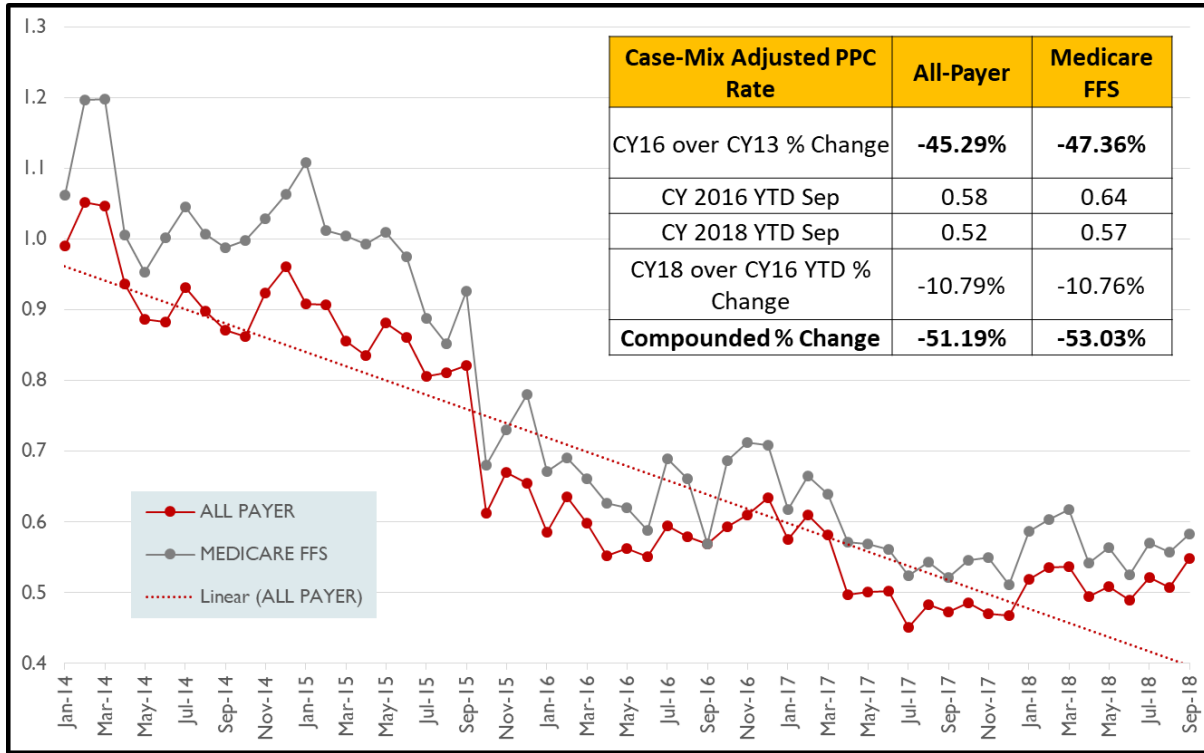
In this section, staff analyzes statewide PPC trends, discusses the rationale for the RY 2021 recommendations, and provides modelling on proposed measurement and methodology changes, including:

- Measurement Selection and Weighting
- Scoring (Risk Adjustment, Attainment versus Improvement, Additional Gradations of Performance)
- Scaling (Reward/Penalty Cut Point, Linear versus Non-Linear)

Statewide PPC Performance Trends

As noted previously, the State has made dramatic progress in reducing PPCs under the MHAC Program and has continued this improvement under the All-Payer Model, reaching its 30 percent reduction target under the Agreement in the second year. Most recently, available performance trends reveal a cumulative All-Payer case-mix adjusted PPC rate reduction of 51.19 percent (compared to the base period of CY 2013) as illustrated in Figure 3 below.

Figure 3. Case Mix Adjusted Cumulative PPC Rates as of September 2018



Note: Line graph based on v32 prior to October 2015; and v35 October 2015 to June 2018; all data are final, but are subject to validation.

PPCs, like national claims-based hospital-acquired condition measures, rely on present-on-admission codes to identify these post-admission complications. Reliance on present on admission codes has made all hospital-acquired complications programs susceptible to criticism, because better documentation and coding, rather than clinical improvement, may drive performance. However, audits conducted by the HSCRC show the improvements in PPC rates are not driven primarily by inappropriate coding. While hospitals acknowledge improvements in documentation and coding, several systems report quality improvement efforts that have resulted in reduced PPCs. These efforts were detailed in the RY 2020 MHAC policy.

RY 2021 MHAC Measures

Over the last several years, Commissioners and other stakeholders raised concerns regarding the use of the 3M PPCs, including a lack of national standards and difficulty in focusing quality improvement resources on the large number of PPC measures - there were 45 separate PPCs/PPC combinations in the RY 2020 payment program. Maryland, in consultation with CMMI, has the option to change or reduce the complication measures in the MHAC program under the TCOC model. However, as documented below, many experts and stakeholders support continued use of a focused list of PPCs.

Commissioners have previously recommended focusing on reliable complication measures that align with the TCOC model requirements and may be compared to national benchmarks. The complications subgroup was tasked with developing criteria for measure selection consistent with Commission guidance, reviewing measure specifications, analyzing performance, and providing recommendations on what measures to include in RY 2021 and beyond. The criteria to select measures is listed here and additional details are provided in CAEM subgroup report (Appendix I):

- Used in current CMS or public reporting program or reflects key clinical areas within acute care hospital setting
- The measure has a strong scientific evidence-base to demonstrate that when implemented can lead to the desired outcome(s) and addresses unwarranted or significant variation in care that is evidence of a patient safety challenge
- The measure contributes to efficient use of measurement resources and/or supports alignment of measurement across programs.
- The measure can be feasibly reported without adding significant reporting burden
- The measure is reliable and valid for reporting and analysis at the Hospital level
- The measure has high Usability: Clinically actionable and shows variation
- No unreasonable implementation issues that outweigh the benefits have been identified

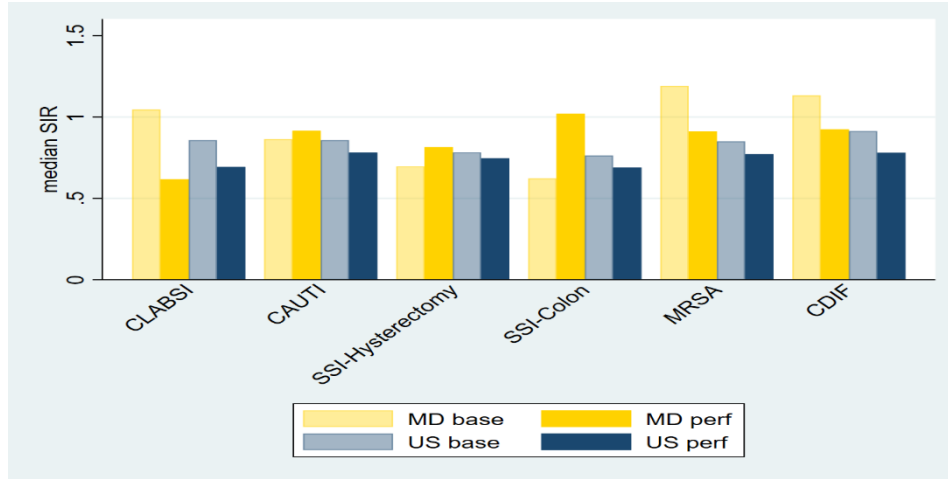
Following a comprehensive scan of candidate measures, the CAEM subgroup evaluated the following three sets of measures in greater detail:

- CDC National Health and Safety Network Hospital Acquired Infection measures
- AHRQ Patient Safety Indicators
- 3M Potentially Preventable Complications

CDC National Health and Safety Network (NHSN)

The CMS HACRP and VBP programs include six CDC National Health Safety Network (NHSN) healthcare associated infection (HAI) measures. As discussed in the RY 2021 Quality Based Reimbursement policy and shown in Figure 4 below, Maryland's performance on the NHSN measures has been mixed (lower scores are better). While median hospital standardized infection ratios (SIR) for all six HAI categories declined nationally, Maryland hospitals SIRs increased in three out of six of the infection categories. For the three infections in which Maryland hospitals experienced declining standardized rates, the declines in Maryland were larger than national peers.

Figure 4. Maryland vs. National Median Hospital SIRs on NHSN HAI Safety Measures (Base period Calendar Year 2015, Performance period October 1, 2016 to September 30, 2017)



While the CAEM subgroup and PMWG members all agree that Maryland must improve performance on NHSN measures relative to the nation, the consensus was that including the same measures in two programs would confuse clinicians and hospital administrators because the results and revenue adjustments may differ or not align. This has been a concern raised regarding the national program, and CMS indicated they might remove the NHSN measures from VBP in the Medicare IPPS 2019 proposed rule. But the final rule retained the measures in both programs for at least another year in order to provide incentives for improvement and opportunity for positive revenue adjustments through VBP.

Based on CMS policy and Maryland’s need for improvement, staff recommended including the NHSN measures in the RY 2021 QBR program and weighting the domain more heavily than it is in VBP (35 percent vs. 25 percent), along with an aggressive revenue adjustment cut point for rewards. Furthermore, staff agrees with the stakeholders who expressed concerns on duplication of measures, and thus does not recommend including these measures in the MHAC program.

This recommendation means Maryland hospitals have less revenue at-risk for NHSN measures. Staff believes this is appropriate given that Maryland has improved on some NHSN measures under current QBR incentives, and that subgroup members raised concerns methodologic issues related to NHSN. These include low NHSN event counts at some hospitals, which may result in one event having a large impact on SIR, the potential for incomplete risk adjustment, and the possibility of surveillance bias, which would arise if hospitals allocating more resources to identifying infections experienced inappropriately high SIRs. Staff will continue to monitor CMS policy and may recommend moving the measures to the MHAC program or consolidating the QBR and MHAC programs, and increasing revenue at-risk if Maryland performance does not improve.

AHRQ Patient Safety Indicator Measures

As discussed in greater detail in Appendix I, the AHRQ Patient Safety Indicator 90, a composite of 10 PSI measures, is used in the CMS HACRP and will be reintroduced in the FFY2023 VBP program.

The PSI measures calculated using Medicare data are also used for other public reports such as those published by The Leapfrog Group and US News and World Report, and given their national significance Maryland needs to monitor performance on these measures.

In the Leapfrog Group's Safety Grades Fall 2018 release, which includes 7 PSI measures of the 28 total measures used in the report, 19 Maryland hospitals received high grades, with 15 hospitals showing improvement from the Spring 2018 release.³ Staff anticipates that these PSI measures can be calculated on an all-payer basis going forward, but national benchmarks for risk-adjustment under ICD-10 are not yet available.

Because of the lack of risk adjustment the CAEM subgroup recommended to not include these measures for CY 2019 but recommend monitoring once the risk-adjustment becomes available. In future years, the clinical logic and overlap with PPCs should be more thoroughly evaluated to determine whether PSIs should be included in the MHAC program.

3M Potentially Preventable Complications

The 3M PPCs have been used in the MHAC program since its inception in RY 2011. PPC rates for a given hospital have been shown in published literature to be stable over time, indicating that the measures have acceptable reliability. Patients with a PPC experience large increases in length of stay, risk of mortality, and charges. In the case of acute lung edema, for example, patients experienced a five-fold increase in mortality and a doubling of charges and length of stay.⁴ The association of the PPC metrics with downstream consequences of complications suggests that PPCs are valid measures of in-hospital complications

However, the hospital industry has been concerned about the large number of PPCs included in the Maryland program compared to national programs, as this has made clinical focus difficult. Furthermore, some PPCs have low statewide rates and little variation across hospitals. These PPCs may be less reliable or "topped off", and instead should be monitored. In addition, stakeholders expressed concern that some PPCs may measure complications that are not actionable with evidence-based care interventions (e.g., PPC 14 Ventricular Fibrillation/Cardiac arrest, PPC 11 Acute Myocardial Infarction), and that it may be difficult to determine whether various complications are present on admission (e.g., PPC 21 Clostridium Difficile Infection). And last, there are some PPCs with coding concerns that impact comparability across hospitals, such as PPC 40 (Post-Operative Hemorrhage & Hematoma without Hemorrhage Control Procedure), which has a degree of subjectivity because any documented bleeding flags this PPC, and clinicians use discretion in determining the degree of bleeding that merits such documentation. Nevertheless, clinical experts in the CAEM subgroup recommended moving forward with targeted list PPCs in a reformed MHAC program because of the comprehensibility and all-payer nature of them and because they have sufficient risk adjustment and opportunity for improvement, as evidenced below.

³ Of the 7 PSI measures included The Leapfrog Group Report, 6 of the PSI measures overlap with the set of 10 PSI measures included in the PSI 90 composite measure.

⁴ John S., Richard F. Averill, Norbert I. Goldfield, James C. Gay, John Muldoon, Elizabeth McCullough, and Jean Xiang. 2006. "Identifying Potentially Preventable Complications Using a Present on Admission Indicator." *Health Care Financing Review* 27 (3): 63–82.

Criteria for Selection of Potentially Preventable Complications

In order to assess which PPCs should be included in a pay-for-performance program, CAEM and PMWG members were provided with statewide rates and histograms of hospital performance for each PPC. Figure 5 provides the Selection Criteria and Considerations recommended by CAEM subgroup. The overlap and similarity with AHRQ PSIs was also evaluated since the PSIs are areas of national focus. And while this overlap was surprisingly low for some similar clinical measures due to the surgical focus and other clinical logic differences for the PSIs, the CAEM members did decide to retain PPCs that address similar clinical areas of national focus (e.g., sepsis and hospital falls).⁵

Figure 5. 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 (generally 0.5 events per 1,000 discharges) ● Variation across hospitals in performance

Based on these criteria, the CAEM members narrowed the list from 45 candidate PPCs to 15 PPCs, and the PMWG agreed with all but one of these measures⁶. Figure 6 lists the 14 PPCs that staff is proposing to include for CY 2019 performance with descriptive statistics and final rationale for inclusion and Appendix IV provides histograms for each PPC that show variation across Maryland hospitals. It should be noted that the PPC rates and histograms that CAEM reviewed used PPC Grouper Version 35; updated PPC rates under Version 36 in Appendix V show similar statewide rates.

⁵ For example, the PSI for sepsis is only for surgical patients and the PPC is for surgical and medical patients. However analysis of case mix data for same time period identified 305 sepsis PSI cases that were not flagged as a PPC because of clinical logic differences such as separating out septic shock into different PPC and requiring a four day length of stay before sepsis is flagged as hospital acquired.

⁶ Clinicians in the CAEM subgroup and PMWG voiced concerns that PPC 40 post-operative hemorrhage without procedure is subjectively evaluated and documented by various clinicians. Thus they did not think PPC 40 should be retained in payment policy. This is not the case with PPC 41 Post-operative Hemorrhage with Procedure to control the bleeding, which clinicians recommended including in the program, further arguing that this PPC is more similar to the intent of PSI 09 Perioperative Hemorrhage or Hematoma.

Figure 6. PPCs Recommended for FY 2021 MHAC Program with Rationale

PPC #	PPC Description V35	Eligible Hospitals/ At Risk Discharges (2 yrs)	Obs/At-Risk*1,000	CAEM, PMWG, HSCRC Staff Recommendation
			Rate >1.0 per 1,000	
			Rate >0.5 per 1,000	
3	Acute Pulmonary Edema and Resp Failure w/o Ventilation	46 hospitals 696,950 at risk discharges	1.78	Meets rate and variation criteria. Clinically supported. Small overlap with PSI 11 Postoperative Respiratory Failure. PSI is limited to post-operative patients but PPC applies to broader patient population. Include in payment program
4	Acute Pulmonary Edema, Resp Failure w/ventilation	47 hospitals 698,946 at risk discharges	1.21	Meets rate and variation criteria. Clinically supported. Small overlap with PSI 11 Postoperative Respiratory Failure. PSI is limited to post-operative patients but PPC applies to broader patient population. Include in payment program
7	Pulmonary Embolism	44 hospitals 824,106 at risk discharges	0.49	Nearly meets rate criteria and has variation. Clinically preventable with well-defined interventions. Overlap 25% with PSI 12 Perioperative Pulmonary Embolism and Deep Vein Thrombosis but PPC includes broader patient population. DRA HAC is measured only in patients with total knee or hip replacements. Include in payment program.
9	Shock	46 hospitals 833,605 at risk discharges	1.18	Meets rate criteria and has variation Clinically preventable. Include in payment program.
16	Venous Thrombosis	44 hospitals 822,712 at risk discharges	0.36	Below rate threshold but has variation. Clinically preventable with well-defined interventions. Some overlap with PSI 12 but PPC rate is lower but with applicability to a broader population. DRA HAC is measured only in patients with total knee or hip replacements. Include in the payment program.
28	In-Hospital Trauma and Fractures	38 hospitals 827456 at risk discharges	0.13	In hospital injuries are highly preventable and serious. PPC includes more injury types than PSI 08 In Hospital Fall with Hip Fracture Rate but PPC rate is lower as it is applicable to a broader patient population. DRA HAC applies to a broader set of in hospital injuries. Include in payment program.
35	Septicemia & Severe Infections	47 hospitals 289,205 at risk discharges	2.77	Meets rate and variation criteria. Clinically important. Include in payment program.
37	Post-Operative Infection & Deep Wound Disruption Without Procedure	39 hospitals 128,674 at risk discharges	2.48	Meets rate and variation criteria. Clinically preventable. Overlaps slightly with PSI 14- Postop Wound Dehiscence, and with NHSN SSI and with DRA HAC but PPC is broader in scope. Include in payment program.

Final Recommendations for the Maryland Hospital-Acquired Conditions Program for Rate Year 2021

PPC #	PPC Description V35	Eligible Hospitals/ At Risk Discharges (2 yrs)	Obs/At-Risk*1,000	CAEM, PMWG, HSCRC Staff Recommendation
			Rate >1.0 per 1,000	
			Rate >0.5 per 1,000	
41	Post-Operative Hemorrhage & Hematoma w/ Hemorrhage Control Procedure or I&D	32 hospitals 241,162 at risk discharges	0.69	Meets rate and variation criteria. Clinically preventable. Overlap with PSI 09- Perioperative Hemorrhage or Hematoma Rate with PSI having similar applicability but higher rate. Include in payment program.
42	Accidental Puncture/ Laceration During Invasive Procedure	43 hospitals 897,351 at risk discharges	0.49	Meets rate and variation criteria. Clinically supported. Overlap with PSI 15 Unrecognized Abdominopelvic Accidental Puncture or Laceration Rate. PPC is applicable to a much broader patient population so has a lower rate. Include in the payment program.
49	Iatrogenic Pneumothorax	40 hospitals 829,953 at risk discharges	0.19	Does not meet rate criteria but applicable to large at-risk denominator population, but observed events are >100. Clinicians agreed this is an important clinical measure with national focus. There is hospital variation in performance, some PSI 06 Iatrogenic Pneumothorax Rate overlap and DRA HAC is applicable to patients with infusion catheter insertion procedures only. Include in the payment program.
60	Major Puerperal Infection and Other Major Obstetric Complications	27 hospitals 125,667 at risk discharges	0.98	Meets rate and variation criteria; 3M believes clinical concerns are addressed in the risk adjustment, and will address this PPC's overlap with other PPCs in v. 36. Obstetric morbidity is clinically important in an all-payer environment. Include in the payment program.
61	Other Complications of Obstetrical Surgical & Perineal Wounds	25 hospitals 122,183 at risk discharges	0.82	Meets rate and variation criteria; 3M believes clinical concerns are addressed in the risk adjustment, and will address this PPC's overlap with other PPCs in v. 36. Obstetric morbidity is clinically important in an all-payer environment. Include in the payment program.
67	Pneumonia Combo (with and without aspiration)	47 hospitals 713,219 at risk discharges	1.80	Meets rate and variation criteria. Clinically supported in combined PPC as 3M also to combine in next grouper version. Include in payment program.

The CAEM and PMWG members discussed at length whether very low occurrence PPCs referred to as “serious reportable events” or “never events” (e.g., transfusion incompatibility) should be included in the policy. The RY 2020 policy has designated five PPCs as such events, setting their thresholds and benchmarks at zero. Because these PPCs are rare they would never meet the selection criteria of high rate, variation, and occurrences in the majority of hospitals. Furthermore

hospital stakeholders expressed that there were clinical protocols in place if these very serious events occurred such that they are intensely reviewed regardless of the MHAC policy. Thus, for RY 2021 staff concurred that these PPCs should be monitored by HSCRC and addressed separately with hospitals if they occur.

PPC Weighting

Since RY 2016, PPCs have been placed into tiers that were weighted in order to prioritize PPCs that have high volume, high cost, opportunity for improvement, and are of national focus. With the narrowed list of 14 PPCs, the workgroups discussed whether to continue weighting PPCs. Weighting options included continuing with the tiered approach, weighting each PPC equally, and using 3M cost weights.

The 3M cost weights are calculated based on national data and represent the relative incremental cost associated with a complication and can be considered as a proxy for patient harm⁷. Figure 7 provides the PPC cost weights sorted from highest to lowest. Based on support from stakeholders, clinical experts, and MHA, the staff recommends using the 3M cost weights to differentially weight the PPCs. However, as discussed in the stakeholder feedback section, the industry would like for clinicians to have opportunity to review version 36 weights before implementation.

Figure 7. 3M PPC Marginal Cost Weights for Proposed MHAC Measures

PPC NUMBER	PPC Description	3M v33 PPC Marginal Costs
4	Acute Pulmonary Edema and Respiratory Failure with Ventilation	2.74
9	Shock	1.51
16	Venous Thrombosis	1.43
35	Septicemia & Severe Infections	1.37
7	Pulmonary Embolism	1.37
67	Pneumonia Combo (with and without aspiration)	1.30
37	Post-Operative Infection & Deep Wound Disruption Without Procedure	1.27
41	Post-Operative Hemorrhage & Hematoma with Hemorrhage Control Procedure or I&D Proc	1.10
3	Acute Pulmonary Edema and Respiratory Failure without Ventilation	0.80
49	Iatrogenic Pneumothorax	0.61
42	Accidental Puncture/Laceration During Invasive Procedure	0.45
28	In-Hospital Trauma and Fractures	0.34
60	Major Puerperal Infection and Other Major Obstetric Complications	0.17
61	Other Complications of Obstetrical Surgical & Perineal Wounds	0.12

⁷ Currently the 3M cost weights are under an older version of the PPC grouper, which uses the ICD-9 measure specifications. 3M anticipates releasing Version 36 cost weights in the near future, and the HSCRC staff proposes to review updated weights and if similar implement these new cost weights for CY 2019 (otherwise the current cost weights will be used)..

MHAC Performance Scoring

In redesigning the MHAC program the CAEM subgroup and PMWG considered the performance metric and case-mix adjustment, whether measures should be assessed for improvement and attainment or attainment only, and the methodology to convert measure rates to standardized scores. The next sections summarize the rationale for:

- Continuing to use the observed-to-expected ratio with indirect standardization
- Moving to an attainment only program
- Using a points system that is similar to the current program but more continuous and better able to distinguish gradations in performance and incentivize improvement

Performance Metric

The MHAC program assesses performance using an observed to expected ratio for each PPC⁸. 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, over time hospitals have raised concerns that the low statewide rates and 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 performance⁹. In RY 2020, two changes were made to the program were approved by the Commission to address this zero-norm concern:

1. The minimum number of at-risk discharges statewide for diagnosis and severity of illness level was raised from 2 to 31 discharges. This “denominator” change focuses payment program on diagnosis and severity of illness levels with larger numbers of patients so that a zero norm is reflective of performance and not small numbers.
2. Exclude low frequency Diagnosis Related Group-PPC pairings from pay-for-performance program. Staff implemented this policy by restricting the diagnosis and complication pairs to those that account for at least 80 percent of complications. This “numerator” change was at the diagnosis level and thus there are still a significant number of zero norms at the diagnosis and severity of illness level. In the RY 2020 final policy it was estimated that the two changes above reduced the cells with a zero norm from 88% to 70%, a 21% reduction.

⁸ 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. Furthermore, the use of an observed to expected ratio aligns with other measures such as the NHSN standardized infection ratios.

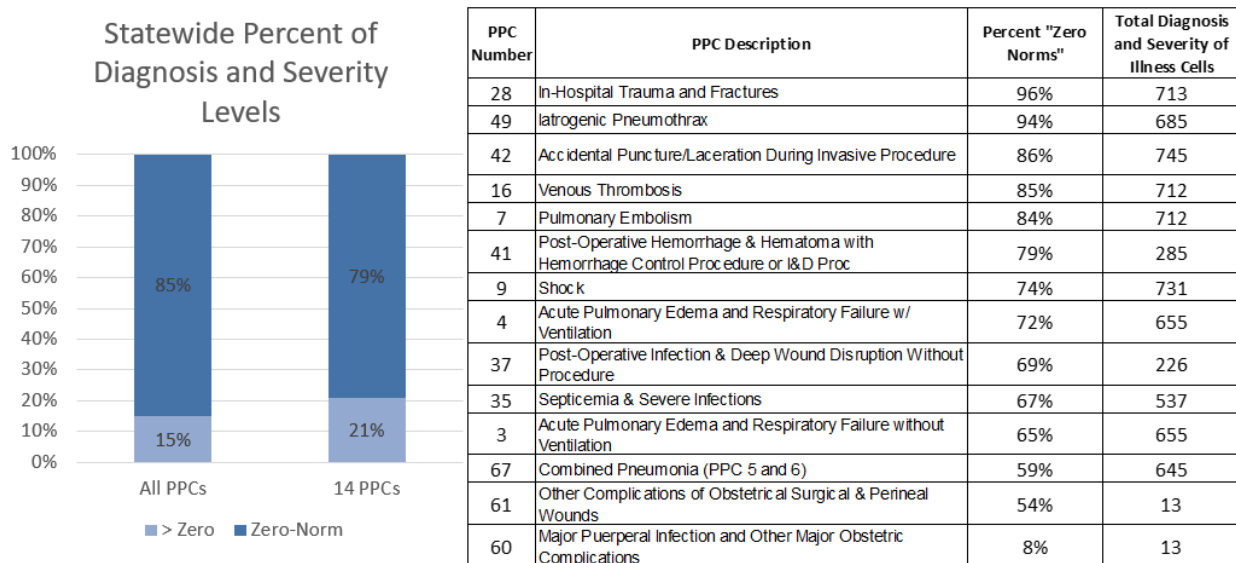
⁹ In RY 2020 there were 328 diagnosis groups and 45 PPC/PPC combinations proposed, which results in over 56,000 cells for which a statewide average PPC rate is calculated, majority of which have a normative value of zero.

For the RY 2021 policy, staff recommends continuing to require at least 31 discharges per diagnosis and severity of illness cell. While staff considered raising this even further, concerns about the comprehensiveness of the measurement were expressed by some stakeholders.

Staff does not recommend the 80 percent exclusion for RY 2021 because it was designed as an interim solution when the program had 45+ PPCs and the RY 2020 YTD results (through June) show that only 73 percent¹⁰ of PPCs are included in the payment program, with only eleven hospitals having > 80 percent of PPCs included. In other words, because of the variation in PPC occurrences each year, staff's interim solution results in a higher proportion of PPCs being excluded than the desired 20 percent.

In addition to concerns that the 80 percent approach removes too large a number of complications, staff believes that it is not necessary to restrict PPC measurement beyond the 3M clinical logic with the narrowed down PPC list of fourteen PPCs. While some stakeholders from Johns Hopkins and UMMS continue to advocate for the 80 percent exclusion, other clinical experts on the CAEM subgroup support the staff recommendation to discontinue this exclusion because the PPCs selected already represent a more narrow focus on areas where clinicians believe improvements can be made. Figure 8 shows the reduction in the zero norm cells with the paired down PPC list and the by PPC percent of cells with zero norms¹¹. The by PPC results shows the zero norm issue is highly variable across PPCs, with those with lower rates and higher number of diagnosis and severity of illness cells having the highest zero norms.

Figure 8. Percent Zero Norms Statewide and for Select PPCs



¹⁰ The draft policy erroneously claimed that only 65% of PPCs were captured in the performance period.

¹¹ Figure 9 is based on data from the draft policy comparing all PPCs and the 14 PPCs in CY 2016 and differs from the zero norms presented for the actual base period.

An additional consideration proposed in the draft policy was to increase the time period for determining norms from 1 year to 2 years. As shown in Figure 9, using 2 years for calculating norms lowers percentage of zero norms for the 14 PPCs (from 81 percent to 73 percent under the updated version 36 modeling) and increases the number of diagnosis and severity of illness cells included in payment program because the minimum number of at-risk discharges per cell is kept at 31. The use of the two years norms reduces the percentage of zero norms to a value similar to what was seen with the 80 percent exclusion (70 percent). It also potentially raises normative values because it averages across time periods where improvements have been achieved, and thus staff believes the use of this longer time period provides more stable values given the small numbers. Based on these analyses staff believes that the RY 2021 policy should use state fiscal year 2017 and 2018 to calculate statewide normative values and that this methodology change significantly reduces case-mix adjustment concerns.

Figure 9. Percent Zero Norms Using 1 Year vs 2 Years of Data

PPC Number	PPC Description	2 Year Norms (FY17 & 18)		1 Year Norms (FY18)	
		Percent "Zero Norms"	Total Diagnosis and Severity of Illness Cells	Percent "Zero Norms"	Total Diagnosis and Severity of Illness Cells
3	Acute Pulmonary Edema and Respiratory Failure without Ventilation	58%	755	69%	665
4	Acute Pulmonary Edema and Respiratory Failure w/ Ventilation	64%	768	73%	676
7	Pulmonary Embolism	78%	819	86%	727
9	Shock	66%	817	75%	718
16	Venous Thrombosis	81%	819	91%	719
28	In-Hospital Trauma and Fractures	93%	829	96%	720
35	Septicemia & Severe Infections	60%	662	70%	521
37	Post-Operative Infection & Deep Wound Disruption Without Procedure	64%	275	73%	215
41	Post-Operative Hemorrhage & Hematoma with Hemorrhage Control Procedure or I&D Proc	70%	336	80%	288
42	Accidental Puncture/Laceration During Invasive Procedure	82%	853	88%	752
49	Iatrogenic Pneumothrax	91%	789	93%	699
60	Major Puerperal Infection and Other Major Obstetric Complications	8%	13	31%	13
61	Other Complications of Obstetrical Surgical & Perineal Wounds	57%	14	54%	13
67	Combined Pneumonia (PPC 5 and 6)	52%	747	64%	656
	Total	73%	6163	81%	5957

The RY 2020 policy proposed that statistical techniques such as Bayesian smoothing should be considered for RY 2021. This was discussed by CAEM, but the statistical complexity remained a concern for clinicians and quality improvement experts. While staff did not model the use of Bayesian statistics, it was our understanding that MHA contracted with statistical experts to develop more reliable risk adjustment and found that it was difficult to employ in a prospective system. Thus, they could not get agreement from members and did not bring a proposal to CAEM or PMWG. With additional statistical experts now at the Commission, staff will reconsider during 2019 whether Bayesian statistics or other techniques could be used in a prospective system, at the same time as 3M national norms are evaluated. It should be noted that the AHRQ PSI do use Bayesian statistics in its risk adjustment based on national data.

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 attainment only. Furthermore, staff believes that given the large improvements in PPCs over the past several years, hospital rewards should now focus on optimal performance and not provide positive revenue adjustments for improvement.

However, it should be noted that 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.

Standardized Scoring Methodology

Commission 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 current scoring methodology for attainment assigns all hospitals that are worse than the statewide median zero points, and thus does not differentiate hospital performance and may have perverse incentives for poor performers, especially outliers. Therefore, CAEM and PMWG members collaborated with staff to develop a wider and more continuous scoring approach. Two approaches for better differentiating performance were considered: 1) the approach used by the national HACRP to calculate Winsorized z-scores; 2. the current point-based approach with wider performance standards (i.e., lowering the threshold where hospitals begin to earn points and raising the benchmark where hospitals receive full points).

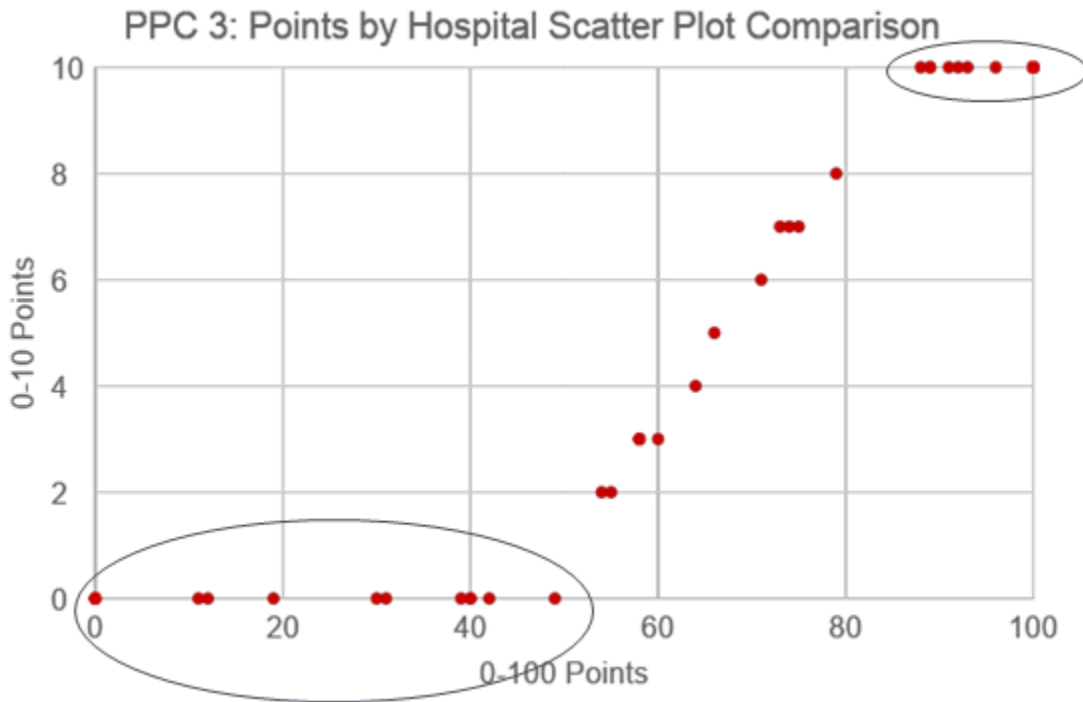
Appendix VI provides details on the Winsorized z-score calculation. However, there was general consensus that hospitals would prefer adapting the points based scoring approach because of its consistency with the current program and because of its more intuitive nature. Thus, staff is not currently recommending to use Winsorized z-scores.

Instead, 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. Appendix VII provides the thresholds and benchmarks under the current methodology and this revised methodology based on 2016 data to show the impact of this methodology change. Appendix VIII provides the actual FY 2017 and FY 2018 for which CY 2019 performance will be compared, along with a comparison of what the thresholds and benchmarks would have been with just one year (FY 2018) of data for the normative values. .

As shown in Figure 10, 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, i.e. at the value of the 10th percentile, hospital scores are higher under this modified

scoring methodology and the preset revenue adjustment scale needs to be adapted so that hospitals do not receive financial rewards for lackluster performance, as discussed in the next section.

Figure 10. Expanded Scoring Example



Appendix IX provides an example of the points based scoring approach with the 3M cost weights. Hospital scores across PPCs are calculated by summing the total weighted points awarded to a hospital, divided by the total possible weighted points (100 per PPC * 3M cost weight). This results in a percent score (e.g., 85 points earned /100 possible points = 85%) and 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 in the middle of the scale from 45 to 55 percent. 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 or by using historical scores to set the scale. Staff continues to support using 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.

As mentioned above, the use of a wider and more continuous scoring methodology requires that the revenue adjustment scale be modified. Specifically, the cut point for penalties and rewards should be adjusted to ensure those who receive positive revenue adjustments are attaining or performing

well on complications. However, without a national comparison it is difficult to determine an exact cut point for PPC measurements in an attainment only system, the latter of which were supported by the CAEM subgroup as two central tenets of the revised MHAC program¹².

Given the lack of national norms for the PPCs, staff and stakeholders considered several approaches for changing the cut point, such as:

- applying the average change in scores under the modified scoring approach to the 50 percent cut point
- modeling a cut point that results in a distribution of penalties and rewards similar to that of the current methodology, and
- calculating the value of the observed to expected ratio for each PPC at a desired percentile of performance for rewards for all PPCs (e.g., the values at the 50th or 75th percentile) and then calculating the percent score that would be associated with that performance.

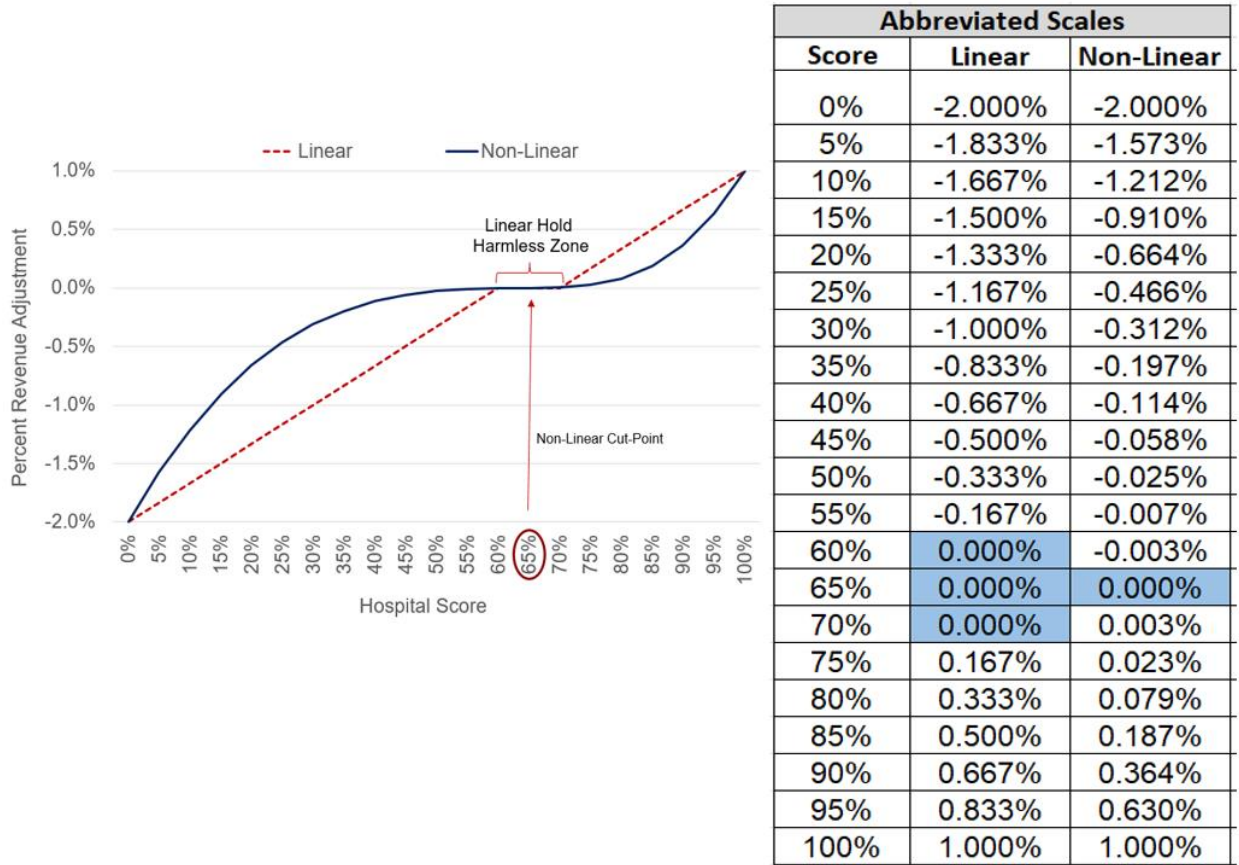
Based on all of these approaches staff believes the cut point must be higher than 50% but lower than 80 percent, and at this time are modeling a cut point of 65 percent. Given a cut point of 65 percent the hold harmless zone would be 60 to 70 percent under the current 10 percent zone paradigm. The hold harmless zone of 10 percent is important because it reduces the penalty/reward cliff effect between a score of 49 and 51 percent. However, some Commissioners and stakeholders have suggested that the hold harmless zone reduces incentives to improve for those with performance in this range. It should be noted though that the CMS HACRP program, which only penalizes the lowest quartile of hospitals, has ostensibly a very large hold harmless zone.

In the draft policy, staff considered non-linear scaling of penalties and rewards, to address uncertainty regarding the cut point and concerns with the hold harmless zone. This approach, which was discussed in the RY 2020 policy, reduces the revenue adjustments near the middle of the scale and maintains higher adjustments for hospitals performing at the high or low ends of the scale, i.e. outliers. However, as previously noted staff is recommending to continue with the linear scaling with the hold harmless zone because we believe that hospital concerns regarding case-mix adjustment are mediated with the narrowed down list of PPCs and other methodology changes being proposed, and take very seriously the input that the non-linear scaling reduces incentives drastically.

Figure 11 shows the linear scale with a hold harmless zone between 60 and 70 percent, non-linear with cut point at 65 percent.

¹² Currently 3M is working with Medicare claims, large commercial datasets, Maryland data, and other state Medicaid data to develop national norms, and the Commission will need to consider how these norms could be used in future years, recognizing Maryland's coding has been influenced by the use of the PPCs in the MHAC program.

Figure 11: Linear versus Non-Linear Scaling



Modeling of Scores and Revenue Adjustments

Scoring Models

Three models were first analyzed to test the impact of moving to an attainment only system. These models use FY 2017 and FY 2018 for normative values and performance standards (i.e., threshold and benchmark) and October 2017 to September 2018 for the performance period.

- Model 1: Current performance standards and scoring 0 to 10 points for the better of improvement and attainment
- Model 2: Current performance standards and scoring 0 to 10 points for attainment only
- Model 3: Wider performance performance standards and scoring 0 to 100 points for attainment only

Figure 12 provides descriptive statistics for the total hospital scores under each of these models. As would be expected, when moving from improvement and attainment (Model 1) to attainment only (Model 2) the hospital scores drop from a median score of 51 percent to 43 percent. Under the wider performance standards (Model 3) scores increase to a median of 63 percent since hospitals can begin to score points at a lower percentile of hospital performance, i.e. for performance that is better than the value of the 10th percentile; this represents a 24 percent increase in the median

score when compared to Model 1. By hospital scores under the three models are shown in Appendix X.

Figure 12. Hospital Score Models

Hospital Scores	Model 1: Imp & Att	Model 2: Att Only	Model 3: Expanded	Percent Change Model 1 and Model 3
Median	51%	43%	63%	24%
Average	49%	45%	62%	27%
Min	20%	4%	17%	-15%
Max	100%	100%	100%	0%
25th	28%	27%	47%	68%
75th	66%	63%	76%	15%

Revenue Adjustment Scale Modeling

Using scores from the three models presented above, staff modeled revenue adjustments using the following preset scales:

1. **Current Scale:** Maximum penalty at 2 percent and maximum reward at 1 percent, continuous linear scaling with a hold harmless zone between 45 and 55 percent
2. **Linear scale with Adjusted cut point:** Maximum penalty at 2 percent and maximum reward at 1 percent and use continuous linear scaling with a hold harmless zone between 60 and 70 percent¹³
3. **Non-Linear Scale with Adjusted cut point:** Maximum penalty at 2 percent and maximum reward at 1 percent and use continuous non-linear scaling with a 65 percent cut point

The modeling of the current scale is for reference only. Staff recommends that the linear scale with the hold harmless zone be used for RY 2021, but are providing the non-linear option outlined in the draft policy as well. Figure 13 provides the count of hospitals in the penalty, hold harmless or zero adjustment, and reward zones. Also provided are the statewide net revenue adjustment, penalties, rewards, average percent adjustment, and average absolute revenue adjustment (used for realized risk). Appendix XI contains the by hospital revenue adjustments for the two scales under consideration under Model 3.

Model 1 scoring with improvement and attainment and the current preset scale, results in 21 hospitals penalized, 6 hospitals in the hold harmless zone, and 20 hospitals rewarded and a negative net statewide revenue adjustment of \$24.5 million (\$31.2 M in penalties/\$6.7 M in rewards). Staff does not recommend this model because it maintains improvement, which as

¹³ Staff recommends that the average score under the attainment only expanded performance range with an improvement factor should be used as the cut point for rewards and penalties.

mentioned is unnecessary after several years of improvement in PPC performance, but is provided for reference.

As would be expected, the Model 2 attainment only scores with the current preset scale increases the number of hospitals penalized and the statewide net revenue adjustment is \$36.8 million (\$42.1 M in penalties/\$5.3 M in rewards). The staff believes that an attainment only system with the current scoring methodology (0 to 10 points) and preset scale is too punitive but presents the modeling of scores and revenue adjustments for comparison.

Model 3 scores use attainment only under wider performance standards and the current preset scale results in a majority of hospitals being rewarded, with a net positive statewide revenue adjustments of \$18.0 million (\$4.6 M in penalties/\$22.6 M in rewards). Staff believes that this model is too generous and that with the wider performance standards that the preset scale cut point needs to be raised, but again provides the scores and revenue adjustments for comparison.

Figure 13: Revenue Modeling

	Reference Only			Staff Recommendation	MHA/JHHS Recommendation
Hospital Revenue Adjustments	Model 1: Imp & Att	Model 2: Att Only	Model 3a: Expanded	Model 3b: Expanded	Model 3c: Expanded
	Linear 45-55% Cutpoint	Linear 45-55% Cutpoint	Linear 45-55% Cutpoint	Linear 60-70% Cutpoint	Non-Linear 65% Cutpoint
# Hospitals Penalized	21	24	8	20	24
# Hospitals No Adjustment	6	6	8	9	2
# Hospitals Rewarded	20	17	31	18	21
Net Revenue Statewide	-\$24,476,914	-\$36,825,615	\$18,008,476	-\$7,041,420	-\$668,994
	-0.27%	-0.40%	0.20%	-0.08%	-0.007%
Total Penalties	-\$31,165,676	-\$42,101,658	-\$4,602,874	-\$15,701,800	-\$3,139,074
% Inpatient Revenue	-0.34%	-0.46%	-0.05%	-0.17%	-0.034%
Total Rewards	\$6,688,762	\$5,276,043	\$22,611,350	\$8,660,380	\$2,470,080
% Inpatient Revenue	0.07%	0.06%	0.25%	0.09%	0.027%
Average % Adjustment	-0.17%	-0.31%	0.17%	-0.09%	-0.001%
Realized Risk	0.43%	0.53%	0.35%	0.28%	0.113%

Model 3 scores using the linear scale and hold harmless zone between 60 and 70 percent results in negative net revenue adjustment statewide of \$7.0 million (\$15.7 M in penalties/\$8.6 M in rewards). When this is converted to percent of total inpatient revenue the net change is only -0.08 percent. The reason that staff does not recommend the non-linear scaling is that it drastically reduces the revenue adjustments statewide with a negative net revenue adjustment statewide of \$700 thousand (\$3.1 M in penalties/\$2.5 million in rewards), which is a net change of of -0.007% of revenue. While staff indicated in the draft policy that this may be appropriate given the lack of national performance standards, some stakeholders felt that this reduced the impact of the program too much given the seriousness of these complications.

Additional Future Considerations

As mentioned previously, staff thanks the members of CAEM and PMWG and other stakeholders for their input on the RY 2021 MHAC program. The narrowing down of the PPC measures and move to an attainment only system are important accomplishments that should allow hospitals to focus on clinically significant complications and be held accountable for performance rates. 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 PSIs. In addition, staff should continue to monitor other safety measures for possible inclusion in the MHAC program, especially for areas such as maternal and child health. Staff also believes that while there will be a focus on redesigning the readmission methods in CY 2019, that the review of the QBR program in 2020 will provide an opportunity to reevaluate complication measures and whether the QBR and MHAC programs should be merged.

Stakeholder Feedback and Staff Response

HSCRC received written stakeholder feedback from Anne Arundel Medical Center (AAMC), Johns Hopkins Health System (JHHS), Maryland Hospital Association (MHA), Medstar Health, Inc., and CareFirst BCBS. Staff also continued to vet the draft MHAC policy with stakeholders at the January and February Performance Measurement Workgroup (PMWG) meetings.

There was stakeholder agreement in voicing support for the narrowed down list of PPC measures proposed for RY 2021, and the use of a wider, attainment only performance scale. There was also conditional support for weighting PPCs differentially in hospitals' scores using 3M cost weights, provided the updated weights are evaluated when issued by 3M to ensure they continue to match clinicians' expectation of patient harm.

There was not consensus among stakeholders regarding the issues outlined below.

Risk Adjustment

MHA and JHHS both express concerns related to the adequacy of the risk adjustment of the PPCs. JHHS argues that the lack of corrective factors for the indirect standardization used in the methodology introduces a degree of randomness and instability that can result in a hospital's expected values being underestimated. They note further that their concern is heightened with the discontinuation in RY 2021 of the adjustment applied in RY2020 known as the "80 percent rule," an adjustment that restricts the possible combinations of PPCs and diagnoses in the MHAC program to those where 80% of PPCs occur statewide in the base year. JHHS further supports implementation of a Bayesian adjustment which adjusts for or smooths small volume events, making them more statistically stable. MHA also supports continued pursuit of ways to address risk adjustment concerns. CareFirst BCBS alternatively argues that applying the 80 percent exclusion adjustment removed a significant percentage of the actual PPCs that occurred in the previous year. In addition, they assert that focusing on the narrower list of fourteen PPCs and increasing the number of at risk discharges required for each diagnosis and severity of illness level statewide from 2 to 31 sufficiently addresses the zero-norm concerns.

Staff Response:

Staff concurs with the CareFirst assessment 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. Specifically the new rate of zero norms of 73 percent is similar to the 71 percent modeled in the approved RY 2020 policy under the 80 percent exclusion. Furthermore, staff conducted analyses where we ran hospital scores multiple times with one additional observed PPC being added in each iteration to each of the PPCs, and found that the percent revenue adjustments did not vary substantially as discussed in Appendix XII.

National Benchmarks

Both MHA and JHHS note their concerns about the non-availability of national benchmarks for PPCs. MHA recommends that HSCRC staff evaluates Maryland's hospitals' performance relative to the 3M national data set of hospital PPC performance under ICD 10 when it is released to inform opportunities for continued improvement and risk adjustment. CareFirst supports staff efforts to consider national norms for calibrating the MHAC methodology in the future, but cautions that we also consider the program's impact on coding and documentation related to PPCs in the state as compared with the nation where the program and incentives are different.

Staff Response:

Staff agrees that national benchmarks should be explored when available, and agrees with the concerns that PPC-specific incentives within Maryland may impact coding and documentation patterns and ultimately how Maryland hospital performance may appear relative to national norms.

Reward Penalty Scale

MHA and JHHS both support use of a non-linear payment scale in order to focus on outliers because of concerns with case-mix adjustment and lack of national standards. CareFirst supports the use of a continuous linear scale with no "hold harmless" zone, and does not understand why scores around the middle part of the scale are any less precise than the other portions of the distribution.

At the February PMWG meeting, some non-hospital stakeholders expressed concerns when staff indicated that they were strongly considering the non-linear scale. They stated they felt that the non-linear scale revenue adjustments were not substantial enough to lead to improvement or sustained strong performance. They felt that the function of the proposed non-linear scale was a much wider hold harmless zone, and recommended that staff use the proposed linear scale, consider an alternative non-linear function, or continue with linear scaling but with wider hold harmless zone.

Staff Response:

Staff agrees that transitioning to a non-linear scale, with the drastic reduction in revenue adjustments, would dilute incentives and therefore potentially impede continued PPC improvements. This would run counter to the effort that has been undertaken to narrow the PPC list to those that are clinically significant and amenable to improvement through interventions. Also, staff believes that any additional scaling options would require a delay in the policy and that the modeled

revenue adjustments under the linear scale are reasonable, and further cautions that additional emphasis on the performance outliers may accentuate reliability concerns. These are issues that should continue to be evaluated and staff is amenable to trying to develop a prospective approach for Bayesian smoothing/reliability adjustment should reliability concerns still exist. And last, while the revenue at-risk test is across all quality programs, CMMI may look at individual programs when granting waivers from the CMS programs, especially programs that have significantly reduced at-risk due to non-linear scaling that is unwarranted.

Symmetrical Rewards/Penalties

HSCRC Commissioners and the JHHS and MHA letters also recommend that the reward potential be balanced with the penalty risk at 2% of revenue.

Staff Response

Staff does not agree with increasing the rewards to 2% at this time. This is based on the fact that the national program is a penalty only program. Furthermore, staff does not believe symmetry is necessary or warranted to strengthen the incentives given the large hospital improvements and rewards historically under the program.

Reward/Penalty Cut Point

JHHS notes in their letter that the proposed penalty/reward cut point at 65 percent is a substantial increase from 55 percent, and recommends the cut point remain at or near 55 percent based on a variety of modelling, sensitivity analyses, and their concerns raised about risk adjustment. CareFirst supports the staff proposed cut point of 65 percent, as it is based on the statewide average/median score (62 percent) in modeling and that it builds in improvement based

Staff Response:

As presented in the modeling section, the majority of hospitals would be rewarded if the cut point for penalties and rewards was not adjusted to take into account the higher percent scores under the wider and more continuous scoring methodology. Staff believes that the modeling that JHHS has done indicating lower average scores, and hence a request for a lower cut point, used FY 2018 as both base and performance. This is potentially a circular reference or rather tautological because it does not allow for improvement. Staff further notes that its modeling uses performance period data that overlaps for 3 quarters with the base period data used for generating performance standards. Thus, staff may be underestimating the improvement factor that should be applied to the cut point. Since the latest modeling is consistent with previous modeling where there was no overlap in the base and performance periods, staff does not recommend increasing the cut point.

PPC Appeals

JHHS 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, 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 that 3M

implements and has also resulted in changes that HSCRC has made outside the PPC grouping software. 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.

Recommendations

These are the final recommendations for the Maryland Rate Year (RY) 2021 Hospital-Acquired Conditions (MHAC) policy:

- E. Continue to use 3M Potentially Preventable Complications (PPCs) to assess hospital-acquired complications.
 - 1. Include 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.
 - 3. Explore development of national benchmarks for PPCs in future years.
- F. Assess hospital performance on attainment only using a wider and more continuous performance range scale to better differentiates hospital performance, rewarding high attainment but also incentivizing improvement.
- G. Weight the PPCs in payment program by 3M cost weights as a proxy for patient harm.
 - 1. Convert weighted PPC scores to revenue adjustments using a prospective revenue adjustment scale with a maximum penalty at 2 percent and maximum reward at 1 percent and continuous linear scaling with a hold harmless zone between 60 and 70 percent.

Appendix I. Clinical Adverse Events Measure Subgroup Report



Health Services Cost Review Commission
Clinical Adverse Events Measure Subgroup Report

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Introduction

The Maryland Health Services Cost Review Commission's (HSCRC's or Commission's) quality-based measurement and payment initiatives are important policy tools for providing strong incentives to hospitals for continued improvement to their quality and safety performance. Under the current 5 year (2014-2018) All-Payer Model Agreement (the Agreement) between Maryland and the Centers for Medicare & Medicaid Services (CMS) there are quality performance requirements for reductions to inpatient readmissions and hospital acquired conditions (HAC's). There are also program and performance requirements for all of HSCRC's quality and value-based programs.

As long as Maryland makes incremental progress towards the Agreement goals, the State receives automatic exemptions from the CMS Hospital Acquired Conditions Reduction Program (HACRP) and the Hospital Readmission Reduction program (HRRP). The exemption from the CMS Medicare Value-Based Purchasing (VBP) program is requested annually. Furthermore, because Maryland sets all-payer rates and has all acute hospitals under all-payer global budgets, Maryland is also exempt from the Federal Deficit Reduction Act Hospital-Acquired Condition program (DRA HAC). This program eliminates additional fee-for-service payments associated with select hospital-acquired conditions. These exemptions from national quality programs are important because the State of Maryland's all-payer global budget system benefits from having autonomous, quality-based measurement and payment initiatives that set consistent quality incentives across all-payers.

The Maryland Hospital Acquired Conditions (MHAC) program, one of three core quality programs that the HSCRC administers, was first implemented in state fiscal year 2011 (FY 2011). For the Rate Year 2020, it places 2 percent of revenue at-risk by scoring a hospital's performance based on a broad set of Potentially Preventable Complication (PPC) measures developed by 3M Health Information Systems. One of the requirements under the current Agreement is for Maryland to reduce the incidence of PPCs for all-payers by 30 percent by 2018. As noted in the RY 2020 MHAC policy recommendations, this goal was achieved within the first two years of the Agreement - the cumulative reduction as of June 2017 is 47.05 percent. However, it should be noted that this progress must be sustained through the five-year term of the Agreement in order to satisfy the State's contractual obligation. For RY 2020, which encompasses the performance results from the final year of the Agreement (CY 2018), staff recommended minimal changes to the MHAC policy, with the notable exception of focusing the pay-for-performance incentives on the subset of patients for whom most complications occur (> 80 percent of PPC).

For RY 2021 and beyond, staff has begun to focus on future policy development to establish quality strategies and performance goals under the new Total Cost of Care (TCOC) Model, effective beginning in the CY 2019 performance period. Staff has begun work with key stakeholders to develop new approaches for reducing HACs in Maryland to support the goals of the TCOC Model. Specifically, this entails considering new approaches to evaluate Maryland hospital performance relative to the nation, while at the same time affording the State the opportunity to be aggressive and progressive in its program(s).

For the MHAC program updates, staff convened a Clinical Adverse Events Measures (CAEM) subgroup of the Performance Measurement Workgroup (PMWG) to: 1) consider a broad array of clinically relevant and preventable hospital patient safety measures including PPC, CMS HAC measures and other complication measures that cover important all-payer clinical areas that may not be addressed by the CMS HAC programs; and 2) provide input into stakeholder concerns regarding the methodology for risk adjustment, scoring and scaling impacting performance linked payment adjustments. Medisolv was retained as a contractor to assist HSCRC staff in convening the CAEM subgroup and to provide subject matter expertise.

CAEM Subgroup

A call for nominations was issued and members selected from respondents based on their experience and interest. A list of the CAEM Subgroup members included in Appendix A.

Measures Selection Process

A formal measure selection process was developed in conformance with processes followed by national consensus organizations such as the National Quality Forum (NQF). The CAEM workgroup approved and followed the process listed below to select Patient Safety Measures for performance year 2019 impacting payment year 2021.

- a) A preliminary MHAC Measures Under Consideration (MHAC MUC) list was created from measures currently implemented across a variety of patient safety programs including MHAC, the patient safety domain of QBR and the CMS programs including DRA HAC, HACRP, HVBP and the HHS/CMS Measures inventory.
- b) Measure selection criteria, listed in Appendix B, were developed and approved for use by the CAEM subgroup. Measures associated with high-priority, preventable, hospital-safety events that could be addressed through changes in clinical best practices were identified and reviewed by the CAEM subgroup through this measure evaluation framework.
- c) CAEM subgroup, with assistance from HSCRC staff, applied the measure selection criteria to the MHAC MUC list in order to produce a final consensus recommendation for consideration in the MHAC program CY 2019/PY 2021 displayed in Appendices C and D. Results of measure performance with statistical analysis based on actual historical data from Maryland hospitals were made available to supplement other information including NQF endorsements when available. Additional details in some of the key considerations are discussed in Appendix E.

Payment Methodology Review

The group discussed overall principles and specific methodology components for the MHAC program.

The group concurred with the following overall principles that should guide methodology decisions:

1. Overall transparency in measure selection and payment adjustment methodology.
2. Visibility in alignment or harmonization with national pay-for-performance programs especially CMS.
3. Measures selected should be actionable and effective in achieving better performance.
4. Measures selected should be balanced and fair to various stakeholders.
5. Measures selected should support the State's commitments under the TCOC Waiver.

The CAEM subgroup came to consensus on recommending a narrowed list of PPCs for the RY 2021 MHAC program. The group raised concerns about duplicating the NHSN infection measures in the QBR and MHAC programs and did not recommend inclusion of these measures in the MHAC program. The group also acknowledged that the AHRQ PSI measures would not be viable for the RY 2021 since all-payer risk adjustment was not available for these measures. Staff presented to the CAEM subgroup methodology components that could potentially impact performance results and payment determinations. After review and further discussion, the subgroup recommended an "Attainment" only framework for payment determination in order to further align with the CMS HAC Reduction Program.

For the PPCs, the group concurred that risk adjustment of observed performance rates is necessary, especially for outcomes measures, in order to account for variation in patient populations across hospitals. Indirect standardization is a commonly-used method and is currently incorporated in the 3M PPC methodology utilizing the 3 M APR-DRG Severity of Illness (SOI) subclass categorization.

Some concern was expressed regarding the 3 M methodology for risk adjustment using PPC/APR DRG/ SOI cells which have only the State of Maryland as the normative reference database to generate Numerator Expected values. Stakeholders have expressed concern with the "Zero Norm" issue, which arises because the risk adjustment process segments Maryland's relatively small inpatient population into a large number of unique combinations of PPC, APR-DRG and SOI groups. Many of these unique combinations have a statewide mean event rate of zero. It is difficult to differentiate between a true zero as the expected value versus one resulting simple from data sparsity. Examples of data analyzed by UMMS and JHH shows significant numbers of such cells resulting in potentially unexpected results when payment adjustments are applied. Recommendations to address this issue include increasing the minimum cell size for "At risk" patients to 30 and to limit the cells to where at least 80 percent of the PPCs occur.

These recommendations will be analyzed further using historical data and are expected to reduce the number of zero norm cells. Results will be discussed further at the HSCRC Performance Measurement Work Group meetings. 3M proposed, and the group accepted, the use of the 3M

Relative Cost Weights to assign relative weights across PPCs in order to generate overall scores for each hospital.

Future Considerations

The following ideas are included in this report for future consideration by the HSCRC in order to maintain Maryland's leadership nationally under the TCOC Model more broadly and more specifically to improve patient safety through the use of payment adjustments aligned with CMS programs while also striving towards more aggressive and progressive measurements.

1. Track and share with Maryland hospitals their performance on both the all payer and CMS-specific Patient Safety and Adverse Events (PSI 90) composite and the ten component PSIs individually in parallel to the PPCs used for payment determination in CY 2019. Should variance in performance of "overlapping" PPC/PSI combinations persist to the extent seen in the MPR analysis, HSCRC could undertake an in-depth analysis to fully understand the reasons for this variance. Ideally this analysis could also be used for validation to determine which set of measures (PSI or PPC) more accurately reflects actual adverse events. Finally, "parallel tracking" of PSIs would also provide direct comparability with CMS national rates.
2. Analysis of the Maryland 2016-2017 PSI data suggests areas of possible interest for tracking individual PSIs beyond PSI 90 measures representing additional patient safety concerns:
 - a. Death Rate among Surgical Inpatients with Serious Treatable conditions (PSI 4) of 106 per 1,000 discharges with a total of 334 Numerator cases. These are potentially preventable post-op complications and CMS has communicated their intent to undertake the re-endorsement process at the NQF.
 - b. Another area of potential safety concern is PSI 18 (OB trauma rate – vaginal delivery with instrument) rate of 107 per 1,000 discharges (545 Numerator events) and 1,336 total numerator events for PSI 19 (OB trauma rate – vaginal delivery without instrument) with a rate of 16.26 per 1000 discharges. Analysis of the potential overlap of these two PSIs with PPC 60 and 61 may be helpful in understanding any potential gaps in OB patient safety coverage within MHAC. Safety related to childbirth is an important area to cover in the all-payer models (compared to CMS programs) and is currently a major topic of national conversation as shown in this ProPublica/NPR study link <https://www.propublica.org/article/die-in-childbirth-maternal-death-rate-health-care-system>.

The Joint Commission has added the following measures to its Perinatal Care (PC) Core Measure Set for reporting in its ORYX® hospital accreditation requirements and has indicated additional measures related to childbirth will be introduced:

Set Measure ID: PC-06

Set Measure ID	Performance Measure Name
PC-06.0	Unexpected Complications in Term Newborns - Overall Rate
PC-06.1	Unexpected Complications in Term Newborns - Severe Rate
PC-06.2	Unexpected Complications in Term Newborns - Moderate Rate

3. HSCRC should consider development of an Electronic Clinical Quality Measure (eCQM) strategy more broadly and specifically to support future patient safety measures. CMS continues to develop new measures including eCQMs in patient safety which is a key domain within the CMS meaningful measures framework with Hospital Acquired Infections and Preventable Harms/Complications being the two main areas of focus. Yale New Haven Health Services Corporation – Center for Outcomes Research and Evaluation (CORE) has been contracted to develop four hospital-level, outcome eCQMs in patient harm or adverse patient safety events that can be improved with high quality care. The contract name is Development, Reevaluation, and Implementation of Outcome/Efficiency Measures for Hospital and Eligible Clinicians, Option Year 4. The contract number is HHSM-500-2013-13018I, Task Order HHSM-500-T0001. The specific goal of this project is to develop hospital harm eCQMs for potential future use in CMS quality reporting programs. Specifically, CORE has developed four new eCQMs in the areas of hypoglycemia, opioid-related adverse events, hospital-acquired pressure injury, and acute kidney injury which are currently undergoing testing.

The following two measures were open for public comment through October 30, 2018.

- Hospital Harm – Severe Hyperglycemia
- Hospital Harm – Medication-Related Bleeding

More information on these measures can be found at this link.

<https://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/MMS/PC-Updates-on-Previous-Comment-Periods.html#Hospital%20Harm>

While these measures are still under development HSCRC should proactively consider enhancing its data management capability including consumption of standardized EHR datasets for quality reporting from hospitals and having the ability to compute measure results from these data. This important capability would be important as EHR data becomes more available and is used increasingly by CMS and other payers for both eCQMs and risk adjustment of claims-based hybrid measures in the future.

Appendix A: CAEM Members

<p>Richard M. Day Senior Director, Systems Engineering and Quality Improvement <i>The Johns Hopkins Hospital and Health System</i> Armstrong Institute for Patient Safety and Quality</p>
<p>Terry Fairbanks, MD, MS Assistant Vice President, Ambulatory Quality & Safety, MedStar Health <i>Founding Director, National Center for Human Factors in Healthcare, MedStar Institute for Innovation</i></p>
<p>Kristen Geisler Managing Director <i>Berkeley Research Group, LLC</i></p>
<p>Joy Gill Sr. Manager, Clinical Data Analysis <i>Adventist HealthCare, Inc.</i></p>
<p>Tina Gionet Patient Safety Officer <i>Sinai Hospital of Baltimore</i></p>
<p>Lisa Grubb Senior Director of Quality Management <i>Howard County General Hospital</i> Johns Hopkins Medicine</p>
<p>Abel Joy, MD Assistant Professor, Director of Inpatient Hospitalist Services Operations <i>University of Maryland Medical Center</i></p>
<p>Stephanie Klapper Deputy Director for Community Outreach <i>Maryland Citizens' Health Initiative</i></p>
<p>Traci LaValle Vice President, Financial Policy & Advocacy <i>Maryland Hospital Association</i></p>
<p>Sheila McLean Vice President <i>Health Quality Innovators</i></p>
<p>Stephen T. Michaels, MD</p>

<p>Chief Operating Officer, Chief Medical Officer <i>MedStar St. Mary's Hospital</i></p>
<p>Dale N. Schumacher, MD, MPH President <i>Rockburn Institute</i></p>
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Appendix B: CAEM Measure Selection Process

Assessment Criteria	Definition	Decision Logic
<p>1) The measure addresses a critical MHAC program objective.</p>	<p>A. Patient safety measures used in current CMS payment or public reporting programs OR The measure reflects Adverse Events performance in key clinical areas within acute care hospital setting AND is currently endorsed by the NQF.</p>	<p>Yes: Support inclusion of Measure in MHAC 2021.</p>
	<p>B. The measure reflects Adverse Events performance in key clinical areas within acute care hospital setting but is NOT currently endorsed by the NQF.</p>	<p>Yes: Review can continue No: Measure will receive a Do Not Support</p>
<p>2) The measure is evidence-based and is strongly linked to a specific safety challenge or outcome.</p>	<p>The measure has a strong scientific evidence-base to demonstrate that when implemented can lead to the desired outcome(s) and addresses unwarranted or significant variation in care that is evidence of a patient safety challenge.</p>	<p>Yes: Review can continue No: Measure will receive a Do Not Support</p>
<p>3) The measure contributes to efficient use of measurement resources and/or supports alignment of measurement across programs.</p>	<p>The measure is superior to an existing measure in the MHAC program; OR Captures a broad population (e.g. All-Payer vs. Medicare only); OR Contributes to alignment between measures in other reporting programs)</p>	<p>Yes: Review can continue No: Highest rating can be Refine and Reconsider.</p>

Assessment Criteria	Definition	Decision Logic
<p>4) The measure can be feasibly reported without adding significant reporting burden</p>	<p>The measure can be operationalized for MHAC 2021 i.e. the measure is currently in “production” for at least one year and will be available by Sept 30, 2018 for use in CY 2019 discharges AND The value to patients/consumers outweighs any burden of implementation for hospitals.</p>	<p>Yes: Review can continue No: Highest rating can be Refine and Reconsider.</p>
<p>5) The measure is reliable and valid for reporting and analysis at the Hospital level</p>	<p>The measure is fully developed, and specifications including Risk Adjustment methodology, if needed, are provided; AND Measure testing has demonstrated Reliability and Validity OR Case occurrences indicate clinical face validity. AND Comparative Benchmarks, preferably National are available</p>	<p>Yes: Measure could be Supported No: Highest rating can be Refine and Resubmit.</p>
<p>6) The measure has high Usability</p>	<p>Measure is clinically actionable at the Hospital level AND Shows enough variation in risk adjusted performance to be usable by HSCRC for Payment Adjustments AND/OR usable by consumers in public reporting programs</p>	<p>Yes: Measure could be Supported No: Highest rating can be Refine and Resubmit.</p>

Assessment Criteria	Definition	Decision Logic
<p>7) If a measure is in current use, no unreasonable implementation issues that outweigh the benefits of the measure have been identified.</p>	<p>Feedback from implementers or end users has not identified: Any unreasonable implementation issues that outweigh the benefits of the measure; OR Any negative unintended consequences (e.g., premature discharges, overuse or inappropriate use of care or treatment, limiting access to care);</p>	<p>Yes: Measure can be Supported No: The highest rating can be Conditional Support.</p>

Decision Category Assignment Guide

Decision Category	Evaluation Criteria
Support to Include in MHAC	The measure meets all the required CAEM SG Measure Evaluation Criteria.
Conditional Support for Inclusion in MHAC	The measure is fully developed and tested and meets Criteria 1 B - 6 but not Criteria 7. PMWG has the discretion to propose the measure.
Refine and Resubmit for Inclusion in MHAC	<p>The measure meets Criteria 1B-3 but needs modifications. A designation of this decision category assumes at least one Criteria 3-6 is not met. CAEM SG will provide a rationale that outlines each suggested refinement</p> <p>Modifications suggested by CAEM SG would be made before the deadline for acceptance in the MHAC 2021 program.</p>
Do Not Support for Inclusion in MHAC	The measure under consideration does not meet Measure Selection Criteria 1 and 2.

Appendix C: PPC Candidate and Final Measure Recommendations

CAEM Subgroup Initial PPC Analysis and Recommendation:
CY 2016-CY 2017 PPC data with >1 expected and >10 at-risk^

PPC #	PPC Description	Eligible Hospitals	PSI-90	Observed PPCs	At Risk Discharges	Obs/At-Risk*1,000	Reliability Assessment~	Predictive Validity Assessment~	Suggest
25	Renal Failure with Dialysis	27	X	70	597,324	0.12	Slight	Low	
4	Acute Pulmonary Edema and Respiratory Failure with Ventilation	47	X	936	707,294	1.32	Substantial	Adequate	include
9	Shock	46		1042	840,672	1.24	Substantial	Adequate	include
16	Venous Thrombosis	44	X	306	830,067	0.37	Substantial	Adequate	include
35	Septicemia & Severe Infections	47	X	868	298,994	2.90	Substantial	Adequate	include
7	Pulmonary Embolism	44	X	426	831,445	0.51	Moderate	Low	Consider
5	Pneumonia & Other Lung Infections	47		843	384,744	2.19	Substantial	Low	include as Combined PPC 67
6	Aspiration Pneumonia	47		537	720,408	0.75	Moderate	Adequate	
3	Acute Pulmonary Edema and Respiratory Failure without Ventilation	47	X	1313	707,296	1.86	Substantial	Adequate	include
49	Iatrogenic Pneumothorax	41	X	162		0.19	Fair	Low	include

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PPC #	PPC Description	Eligible Hospitals	PSI-90	Observed PPCs	At Risk Discharges	Obs/At-Risk*1,000	Reliability Assessment~	Predictive Validity Assessment~	Suggest
					844,412				
42	Accidental Puncture/Laceration During Invasive Procedure	44	X	459	908,377	0.51	Moderate	Low	include
31	Decubitus Ulcer	47	X	76	251,790	0.30	Moderate	Adequate	include
37	Post-Operative Infection & Deep Wound Disruption Without Procedure	41		341	133,289	2.56	Moderate	Low	include
41	Post-Operative Hemorrhage & Hematoma with Hemorrhage Control Procedure or I&D Proc	36	X	183	250,945	0.73	Moderate	Adequate	include
40	Post-Operative Hemorrhage & Hematoma without Hemorrhage Control Procedure or I&D Proc	44		1103	315,393	3.50	Moderate	Adequate	Do not include
28	In-Hospital Trauma and Fractures	39	X	116	848,033	0.14	Fair	Low	include
60	Major Puerperal Infection and Other Major Obstetric Complications	27		124	125,707	0.99	Moderate	Adequate	Include
61	Other Complications of Obstetrical Surgical & Perineal Wounds	28		104	128,344	0.81	Moderate	Low	Include

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PPC #	PPC Description	Eligible Hospitals	PSI-90	Observed PPCs	At Risk Discharges	Obs/At-Risk*1,000	Reliability Assessment~	Predictive Validity Assessment~	Suggest
14	Ventricular Fibrillation/Cardiac Arrest.	47		1342	740,927	1.81	Substantial	Adequate	monitoring
1	Stroke & Intracranial Hemorrhage	46		675	861,638	0.78	Moderate	Low	monitoring
8	Other Pulmonary Complications	47		568	588,283	0.97	Moderate	Low	monitoring
11	Acute Myocardial Infarction	46		607	848,365	0.72	Moderate	Low	monitoring
18	Major Gastrointestinal Complications with Transfusion or Significant Bleeding	41		148	817,454	0.18	Moderate	Adequate	
17	Major Gastrointestinal Complications without Transfusion or Significant Bleeding	47		391	846,085	0.46	Substantial	Adequate	
63	Postoperative Respiratory Failure with Tracheostomy	16		48	3,961	12.12	Slight	Low	
54	Infections due to Central Venous Catheters	28		72	761,808	0.09	Slight	Low	
38	Post-Operative Wound Infection & Deep Wound Disruption with Procedure	15	?	38	165,445	0.23	Moderate	Low	
51	Gastrointestinal Ostomy Complications	42		179	863,404	0.21	Fair	Low	
21	Clostridium Difficile Colitis	47		783		5.54	Substantial	Adequate	

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PPC #	PPC Description	Eligible Hospitals	PSI-90	Observed PPCs	At Risk Discharges	Obs/At-Risk*1,000	Reliability Assessment~	Predictive Validity Assessment~	Suggest
					141,260				
48	Other Complications of Medical Care	37		157	840,758	0.19	Moderate	Low	
34	Moderate Infectious	31		85	295,818	0.29	Fair	Low	
2	Extreme CNS Complications	32		100	691,152	0.14	Fair	Adequate	
20	Other Gastrointestinal Complications without Transfusion or Significant Bleeding	41		271	804,867	0.34	Fair	Low	
39	Reopening Surgical Site	36		331	230,628	1.44	Moderate	Low	
50	Mechanical Complication of Device, Implant & Graft	44		469	862,621	0.54	Moderate	Low	
15	Peripheral Vascular Complications except Venous Thrombosis	34		160	806,577	0.20	Fair	Low	
44	Other Surgical Complication - Mod	30		80	231,235	0.35	Slight	Low	
52	Inflammation & Other Complications of Devices, Implants or Grafts Except Vascular Infection	47		597	871,769	0.68	Substantial	Adequate	

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PPC #	PPC Description	Eligible Hospitals	PSI-90	Observed PPCs	At Risk Discharges	Obs/At-Risk*1,000	Reliability Assessment~	Predictive Validity Assessment~	Suggest
53	Infection, Inflammation & Clotting Complications of Peripheral Vascular Catheters & Infusions	39		131	849,265	0.15	Substantial	Adequate	
19	Major Liver Complications	34		139	798,285	0.17	Fair	Low	
47	Encephalopathy	38		173	572,155	0.30	Substantial	Adequate	
66	Catheter-Related Urinary Tract Infection	0							
27	Post-Hemorrhagic & Other Acute Anemia with Transfusion	43		537	641,587	0.84	Excellent	Adequate	
26	Diabetic Ketoacidosis & Coma	29		57	753,939	0.08	Moderate	Low	
33	Cellulitis	44		352	728,231	0.48	Slight	Low	
65	Urinary Tract Infection without Catheter	32		94	694,707	0.14	Excellent	Adequate	
23	GU Complications Except UTI	35		119	807,671	0.15	Fair	Low	
45	Post Procedure Foreign Body	47		27	300,859	0.09	Slight	Low	
13	Other Cardiac Complications	39		161	787,985	0.20	Substantial	Low	

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PPC #	PPC Description	Eligible Hospitals	PSI-90	Observed PPCs	At Risk Discharges	Obs/At-Risk*1,000	Reliability Assessment~	Predictive Validity Assessment~	Suggest
10	Congestive Heart Failure	42		225	725,467	0.31	Substantial	Low	
64	Other In-Hospital Adverse Events	45		303	885,064	0.34	Excellent	Adequate	
36	Acute Mental Health Changes	0							
29	Poisonings except from Anesthesia	34		90	764,985	0.12	Slight	Low	
59	Medical & Anesthesia Obstetric Complications	32		222	132,493	1.68	Moderate	Low	
68	Gastrointestinal Complications: PPC 17 and 18	47		542	846,085	0.64	Substantial	Adequate	
67	General Combination PPC: PPC 25, 26, 63, 64	47		497	902,336	0.55	Excellent	Adequate	
71	Infection combination: PPC 34, 54,66	42		177	919,882	0.19	Moderate	Low	

^This data based on preliminary analysis; final numbers may vary slightly.

~Calculated by Mathematica Policy Research. Given large improvements over time, some measures may have low predictive validity or reliability; however, input regarding content and face validity by clinicians was also used to determine PPC inclusion.

Key

PPC #	Obs/At-Risk Discharges*1,000	Reliability Assessment	Predictive Validity Assessment
Monitor only	Rate >1.0 per 1,000	Excellent or Substantial	Adequate
	Rate >0.5 per 1,000	Moderate	

Appendix D. Updated PPC Analysis; Final PPC List Recommendations with Rationale

PPC #	PPC Description	Eligible Hospitals	Observed PPCs (2 yrs)	At Risk Discharges (2 yrs)	3M v33 PPC Wt-Based Marginal Cost	HSCRC Staff Recommendation
3	Acute Pulmonary Edema and Resp Failure w/o Ventilation	46	1238	696950	0.7958	Meets rate and variation criteria. Clinically supported. Small overlap with PSI 11 Postoperative Respiratory Failure. PSI is limited to post-operative patients but PPC applies to broader patient population. Include in payment program
4	Acute Pulmonary Edema, Resp Failure w/ventilation	47	848	698946	2.7409	Meets rate and variation criteria. Clinically supported. Small overlap with PSI 11 Postoperative Respiratory Failure. PSI is limited to post-operative patients but PPC applies to broader patient population. Include in payment program
7	Pulmonary Embolism	44	407	824106	1.3671	Nearly meets rate criteria and has variation. Clinically preventable with well-defined interventions. Overlap 25% with PSI 12 Perioperative Pulmonary Embolism and Deep Vein Thrombosis but PPC includes broader patient population. DRA HAC is measured only in patients with total knee or hip replacements. Include in payment program.
9	Shock	46	984	833605	1.5133	Meets rate criteria and has variation Clinically preventable. Include in payment program.

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PPC #	PPC Description	Eligible Hospitals	Observed PPCs (2 yrs)	At Risk Discharges (2 yrs)	3M v33 PPC Wt-Based Marginal Cost	HSCRC Staff Recommendation
16	Venous Thrombosis	44	297	822712	1.4346	Below rate threshold but has variation. Clinically preventable with well-defined interventions. Some overlap with PPC 12 but PPC rate is lower but with applicability to a broader population. DRA HAC is measured only in patients with total knee or hip replacements. Include in the payment program.
28	In-Hospital Trauma and Fractures	38	110	827456	0.3353	In hospital injuries are highly preventable and serious. PPC includes more injury types than PSI 08 In Hospital Fall with Hip Fracture Rate but PPC rate is lower as it is applicable to a broader patient population. DRA HAC applies to a broader set of in hospital injuries. Include in payment program.
35	Septicemia & Severe Infections	47	801	289205	1.3722	Meets rate and variation criteria. Clinically important. Include in payment program.
37	Post-Operative Infection & Deep Wound Disruption Without Procedure	39	319	128674	1.2701	Meets rate and variation criteria. Clinically preventable. Overlaps slightly with PSI 14- Postop Wound Dehiscence, and with NHSN SSI and with DRA HAC but PPC is broader in scope. Include in payment program.

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PPC #	PPC Description	Eligible Hospitals	Observed PPCs (2 yrs)	At Risk Discharges (2 yrs)	3M v33 PPC Wt-Based Marginal Cost	HSCRC Staff Recommendation
41	Post-Operative Hemorrhage & Hematoma w/ Hemorrhage Control Procedure or I&D	32	167	241162	1.0951	Meets rate and variation criteria. Clinically preventable. Overlap with PSI 09- Perioperative Hemorrhage or Hematoma Rate with PSI having similar applicability but higher rate. Include in payment program.
42	Accidental Puncture/Laceration During Invasive Procedure	43	440	897351	0.4466	Meets rate and variation criteria. Clinically supported. Overlap with PSI 15 Unrecognized Abdominopelvic Accidental Puncture or Laceration Rate. PPC is applicable to a much broader patient population so has a lower rate. Include in the payment program.
49	Iatrogenic Pneumothorax	40	154	829953	0.6090	Does not meet rate criteria but observed events are >100. This is an important clinical measure with national focus. There is hospital variation in performance, some PSI 06 Iatrogenic Pneumothorax Rate overlap and DRA HAC is applicable to patients with infusion catheter insertion procedures only. Include in the payment program.

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PPC #	PPC Description	Eligible Hospitals	Observed PPCs (2 yrs)	At Risk Discharges (2 yrs)	3M v33 PPC Wt-Based Marginal Cost	HSCRC Staff Recommendation
60	Major Puerperal Infection and Other Major Obstetric Complications	27	123	125667	0.1729	Meets rate and variation criteria; 3M believes clinical concerns are addressed in the risk adjustment, and will address this PPC's overlap with other PPCs in v. 36. Obstetric morbidity is clinically important in an all-payer environment. Include in the payment program.
61	Other Complications of Obstetrical Surgical & Perineal Wounds	25	100	122183	0.1172	Meets rate and variation criteria; 3M believes clinical concerns are addressed in the risk adjustment, and will address this PPC's overlap with other PPCs in v. 36. Obstetric morbidity is clinically important in an all-payer environment. Include in the payment program.
67	Pneumonia Combo	47	1282	713219	1.3002	Meets rate and variation criteria. Clinically supported in combined PPC. Include in payment program.

Appendix E: Additional Details and Key Considerations

Three sets of measures in the MHAC MUC list were evaluated in more detail. These include 3M PPCs used in the current MHAC program and two sets of patient safety measures used in the CMS HACRP and HVBP programs; AHRQ Patient Safety Indicators (PSI) and select CDC/NHSN Hospital Acquired Infection measures (HAI).

CDC calculates standardized infection ratios (SIRs) and CMS includes Central Line Associated Blood Stream Infection (CLABSI), Catheter Associated Urinary Tract Infection (CAUTI), Colon and Abdominal Hysterectomy Surgical Site Infections (SSI), Methicillin Resistant Staphylococcus Aureus (MRSA) bacteremia, and Clostridium Difficile Infection (CDI) measures in both the HACRP and patient safety domain of the HVBP pay-for-performance programs. SIRs are ratios of observed-to-predicted numbers of healthcare-associated infections (HAIs). The number of predicted infections is calculated using multivariable regression models generated from nationally aggregated data during a baseline time period. These models are applied to a facility's denominator and risk-factor data to generate a predicted number of infections. The CLABSI and CAUTI measures are risk adjusted at the hospital level and patient care unit level. The SSI measures are risk adjusted at the procedure level. MRSA bacteremia and CDI measures are risk-adjusted at the hospital level. The CLABSI, CAUTI, and SSI measures use NHSN chart-abstracted surveillance data. MRSA bacteremia and CDI measures use NHSN laboratory-identified surveillance data, which hospitals report to NHSN. If the predicted number of HAIs is less than one, the CDC will not calculate an SIR for CLABSI, CAUTI, SSI, MRSA bacteremia, or CDI. The CDC will also not calculate an SIR if the hospital has insufficient data. The CDC will not calculate an SIR for CDI if the community-onset prevalence rates are within outlier bounds and CMS will not include any such measures in the Domain 2 or Total HAC score calculations. CDC encourages hospitals to report data monthly within 30 days of the close of a month. Hospitals can however review and correct the CDC NHSN HAI chart-abstracted or laboratory-identified data for the full 4.5 months following the end of the reporting quarter data submitted from NHSN to the CMS Hospital Inpatient Quality Reporting (IQR) Program. Immediately following the submission deadline, the CDC creates a data file for CMS to use in quality reporting and pay-for-performance programs.

CMS had proposed to remove these measures from the HVBP program in order to reduce duplication of measures in its various programs. In its final rule for 2019 performance year CMS reversed this proposal in light of multiple stakeholder comments against this proposal. Stakeholders expressed concern that since CMS was not increasing revenue at-risk in the HACRP to offset the reduction in revenue at-risk related to patient safety in the HVBP program, it would in effect be reducing the total revenue at-risk inpatient safety. CMS also considered performance-based penalties and rewards as desirable features of the HVBP program as opposed to the HACRP being a penalty only program. In order to avoid duplication of HAI patient safety measures in multiple Maryland pay-for-performance programs and in view of HSCRC's ability to increase

weights assigned to these measures in the Quality Based Reimbursement (QBR) program it was decided not to include these measures in the MHAC program at this time.

Although most of the AHRQ PSIs met key measure selection criteria by virtue of their NQF endorsement and PSI 90 would have aligned MHAC more directly to CMS HAC Reduction Program they were nonetheless considered infeasible for the CY 2019 performance period due to unavailability of the All-Payer Risk Adjusted Version 2018 AHRQ software using one full year of ICD 10 hospital discharge data reference data (HCUP and SID) from CY 2016. AHRQ has released an All-Payer 2018 Version of the PSI software producing only Observed PSI rates without risk adjustment. A Medicare only Risk Adjusted Version 8 PSI 90 software is currently available from CMS but would not have met the MHAC all-payer requirement.

Ten individual PSIs are included in the AHRQ PSI 90 composite measure. Performance of individual PPCs considered “overlapping” with PSI 90 component measures and recommended for their clinical importance, volumes, variation in performance across Maryland hospitals and at least moderate reliability were compared by Mathematica Policy Research (MPR) using the Maryland hospital discharge data that was most recently available. Results of this analysis in the Table below show significant variability in the Numerator and Denominator populations and their performance rates for each matched set of PSI/PPC combinations.

Comparison of PSI 90 Component PSI vs. matching PPC Categorization of Discharges from Acute Maryland Hospitals in 2016-2017

Measures Compared	Measure Inclusion	Numerator Cases		Denominator Cases	
		Frequency	Percent	Frequency	Percent
PSI 03: Pressure Ulcer PPC 31: Pressure Ulcers	PSI and PPC	78	5%	232,044	40%
	PSI Only	1,580	95%	347,286	59%
	PPC Only	0	0%	4,511	1%
PSI 06: Iatrogenic Pneumothorax Rate PPC 49: Iatrogenic Pneumothorax	PSI and PPC	62	26%	678,312	67%
	PSI Only	85	35%	174,105	17%
	PPC Only	95	39%	158,280	16%
PSI 08: In Hospital Fall with Hip Fracture Rate PPC 28: In-Hospital Trauma and Fractures	PSI and PPC	46	24%	639,474	66%
	PSI Only	71	37%	76,032	8%
	PPC Only	77	40%	252,146	26%
PSI 09: Perioperative Hemorrhage or Hematoma Rate PPC 41: Peri-Operative Hemorrhage & Hematoma with Hemorrhage Control Procedure or I&D Procedure	PSI and PPC	124	21%	186,281	65%
	PSI Only	407	69%	34,501	12%
	PPC Only	62	10%	65,793	23%

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Measures Compared	Measure Inclusion	Numerator Cases		Denominator Cases	
		Frequency	Percent	Frequency	Percent
PSI 10: Postoperative Acute Kidney Injury Requiring Dialysis Rate PPC 25: Renal Failure with Dialysis	PSI and PPC	18	11%	117,181	16%
	PSI Only	86	51%	17,122	2%
	PPC Only	66	39%	610,198	82%
PSI 11: Postoperative Respiratory Failure Rate PPC 03: Acute Pulmonary Edema and Respiratory Failure without Ventilation	PSI and PPC	79	5%	103,100	14%
	PSI Only	411	24%	12,119	2%
	PPC Only	1,234	72%	603,232	84%
PSI 11: Postoperative Respiratory Failure Rate PPC 04: Acute Pulmonary Edema and Respiratory Failure with Ventilation	PSI and PPC	122	9%	103,282	14%
	PSI Only	368	28%	11,937	2%
	PPC Only	819	63%	603,420	84%
PSI 12: Perioperative Pulmonary Embolism or Deep Vein Thrombosis Rate PPC 07: Pulmonary Embolism	PSI and PPC	327	25%	193,929	22%
	PSI Only	876	67%	41,913	5%
	PPC Only	104	8%	646,464	73%
PSI 12: Perioperative Pulmonary Embolism or Deep Vein Thrombosis Rate PPC 16: Venous Thrombosis	PSI and PPC	136	10%	193,882	22%
	PSI Only	1,067	77%	41,960	5%
	PPC Only	174	13%	646,632	73%
PSI 13: Postoperative Sepsis Rate PPC 35: Septicemia & Severe Infections	PSI and PPC	132	11%	25,838	6%
	PSI Only	305	26%	104,487	26%
	PPC Only	727	62%	270,936	68%
PSI 14: Postoperative Wound Dehiscence Rate PPC 38: Post-Procedural Infection and Deep Wound Disruption with Procedure	PSI and PPC	9	8%	44,734	16%
	PSI Only	56	53%	25,974	10%
	PPC Only	41	39%	201,391	74%
PSI 15: Unrecognized Abdominopelvic Accidental Puncture or Laceration Rate PPC 42: Accidental Puncture/Laceration During Invasive Procedure	PSI and PPC	102	19%	118,342	13%
	PSI Only	89	16%	35,575	4%
	PPC Only	351	65%	770,804	83%

Known differences in populations and logic of specifications account for some of these results. As an example, both PSI 13 and PPC 38 address Sepsis, however PSI 13 covers only postoperative Sepsis while PPC 38 is for all inpatients. Other differences include Age and Major Diagnostic Category (MDC) variables. Overall, these data suggest the measure specifications are not sufficiently aligned for PSIs and PPCs to be considered comparable across most of the “overlapping” measure sets. Instead measures within each measure set would be compared to their own historical performance rates in order to understand trends. This may have implications if the PSIs were to replace PPCs in the future and would require generating historical performance data for the PSIs. A more thorough analysis to more fully understand these differences at a case level were out of scope in the current project. While PPCs are more comprehensive in some of their constructs they lack national comparative performance data and benchmarks.

AHRQ Patient Safety Indicators (PSI):

NQF endorsement status of individual PSIs is listed below. Some measures are not endorsed individually but are included in the Patient Safety and Adverse events (PSI 90) measure which is endorsed as a composite of ten individual PSI measures:

Measure ID	NQF	Measure Title	NQF Endorsed
PSI 02	0347	Death Rate in Low-Mortality Diagnosis Related Groups (DRGs)	? Yes*
PSI 03		Pressure Ulcer Rate	No - Composite
PSI 04		Death Rate among Surgical Inpatients with Serious Treatable Conditions	No - Removed
PSI 05	0363	Retained Surgical Item or Unretrieved Device Fragment Count	Yes
PSI 06	0346	Iatrogenic Pneumothorax Rate	Yes
PSI 07		Central Venous Catheter-Related Blood Stream Infection Rate	No - Removed
PSI 08		In Hospital Fall with Hip Fracture Rate	No - Composite
PSI 09	2909	Perioperative Hemorrhage or Hematoma Rate	Yes
PSI 10		Postoperative Acute Kidney Injury Requiring Dialysis	No - Composite
PSI 11	0533	Postoperative Respiratory Failure Rate	Yes
PSI 12	0450	Perioperative Pulmonary Embolism or Deep Vein Thrombosis Rate	Yes
PSI 13		Postoperative Sepsis Rate	No - Composite
PSI 14		Postoperative Wound Dehiscence Rate	No -

Measure ID	NQF	Measure Title	NQF Endorsed
			Composite
PSI 15	0345	Unrecognized Abdominopelvic Accidental Puncture/Laceration Rate	? Yes*
PSI 16	0349	Transfusion Reaction Count	Yes
PSI 17		Birth Trauma Rate - Injury to Neonate	No - Removed
PSI 18		Obstetric Trauma Rate - Vaginal Delivery with Instrument	No
PSI 19		Obstetric Trauma Rate - Vaginal Delivery without Instrument	No

* Unable to confirm endorsement status from NQF database (QPS)

PSI 04 was submitted to the National Quality Forum (NQF) for continued endorsement. After three rounds of intensive review at both the NQF Surgery Standing Committee and the NQF Consensus Standards Approval Process (CSAC), AHRQ withdrew the measure from further consideration at NQF. AHRQ states it conducted rigorous testing which demonstrated that the measure is valid and reliable. Findings were included in the materials submitted and reviewed at NQF (http://www.qualityforum.org/Publications/2017/04/Surgery_2015-2017_Final_Report.aspx). However, AHRQ has chosen not to continue with the NQF review process, pending a review of competing priorities. As with any measure withdrawn from consideration at NQF, endorsement was removed from the measure. In the 2019 IPPS proposed rule CMS has indicated it plans to continue use of this measure in CMS programs and to undertake the NQF endorsement process again under its own stewardship.

The most recent ICD 10 version 2018 of the AHRQ PSI software is available for individual PSIs without risk adjustment. The All-payer Risk adjusted version of the software is expected to be released by AHRQ in late spring/early summer of 2019 and will be released as Version2019.

Patient Safety and Adverse Events Indicator (PSI 90):

ICD-9-CM/PCS version (v6.0) of PSI 90 composite measure received final endorsement from the NQF on December 10, 2015 and retained its prior NQF endorsement number 0531. The modified patient and adverse events composite (PSI 90) measure includes the following ten PSIs:

- 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

An ICD 10 Version of the All-payer PSI 90 measure software is currently unavailable. Per guidance from AHRQ it is expected to be released in mid-2019. CMS has created a CMS version of the patient safety and adverse events composite (PSI 90) measure. The most recent CMS Recalibrated v8.0 Patient Safety Indicator (PSI) software (CMS PSI software) uses ICD-10-CM/PCS codes to identify specific patient safety events and includes risk- and reliability-adjustment models and composite weights developed from Medicare fee-for service (FFS) discharge data. The CMS v8.0 software can only calculate PSIs from ICD-10-CM/PCS data and is not compatible with ICD-9-CM. It is available upon request through the QualityNet Help Desk in the SAS version only. Parameters of CMS v8.0 PSI software differ from those of the AHRQ all-payer PSI software and include risk-adjustment model coefficients, signal variance, reference population rates used as smoothing targets, and composite weights. Composite weights include two components: harm and volume. The harm components between CMS v8.0 and CMS v6.0 PSI software are consistent however updates to the volume component were based on the number of safety-related events for the component indicators in the October 1, 2015–September 30, 2016 Medicare FFS reference population. Details of the harm components and weights used in the composite for CMS PSI 90 are shown in the table below.

Description of patient harms captured in the AHRQ Patient Safety and Adverse Events Composite (modified version of PSI 90)

Outcome	Description of events captured	Applicable Patient Safety Indicator (PSI)
Pressure ulcer treatment	Debridement of a pressure ulcer and/or surgical skin flap procedure during the hospitalization when the pressure ulcer developed, due to tissue damage.	PSI 03
180-day hospital readmission for a pressure ulcer related complication	Readmission to an acute care hospital within 180 days of discharge after a PSI03 event for any of the following conditions that were present on admission (POA): recurrent pressure ulcer, cellulitis, pyoderma, infection, bacteremia, sepsis, acute or chronic osteomyelitis, septic arthritis, necrotizing fasciitis, gangrene, or flap failure.	PSI 03
30-day all-cause mortality	Death due to any cause within 30-days of the discharge after a PSI triggering event.	PSI 06, PSI 09, PSI 15
30-day all-cause readmission	Readmission to an acute care hospital within 30 days of the discharge after a PSI triggering event (excluding any readmissions categorized separately below).	All
180-day all-cause mortality	Death due to any cause within 180-days of the discharge after the PSI triggering event.	PSI 03, PSI 08, PSI 10, PSI 11, PSI 12, PSI 13, PSI 14
Pneumothorax treatment	Acute treatment of an iatrogenic pneumothorax by needle aspiration or chest tube placement.	PSI 06
Intubation and ventilation	Intubation and/or mechanical ventilation as result of respiratory failure resulting from an iatrogenic pneumothorax.	PSI 06

Outcome	Description of events captured	Applicable Patient Safety Indicator (PSI)
Pulmonary embolus or bleeding within 30-days of hip fracture	Pulmonary embolism (PE) or surgical site bleeding during the admission when the fracture occurred or within 30 days thereafter.	PSI 08
90-day non-surgical hip fracture complication	Hospital readmission within 90-days of the discharge after a PSI08 event for a mechanical or infectious hip fracture complication not requiring surgery.	PSI 08
Hip reoperation within 90 days	Hospital readmission for reoperation on the hip within 90-days of the discharge after a PSI 08 event.	PSI 08
Avascular necrosis	Admission to the hospital within 365 days of the discharge after a PSI 08 event with aseptic or avascular necrosis.	PSI 08
30-day readmission for wound infection	Hospital readmission for wound infection within 30-days of the discharge after a PSI09 event.	PSI 09
Anoxic brain damage or shock	Development of brain (cerebral) anoxia and or shock associated with a hemorrhage or hematoma event.	PSI 09
Acute renal failure requiring dialysis	Development of acute kidney injury/failure (stage V) requiring dialysis while hospitalized after a PSI triggering event.	PSI 09, PSI 13
Dialysis post-discharge for up to 6-months.	Ongoing need for dialysis for up to 6-months after discharge following a PSI event.	PSI 09, PSI 10, PSI 13
One-year all-cause hospital readmission	All cause hospital readmission within 365-days of the discharge after a PSI10 triggering event.	PSI 10
Extended ventilation or re-intubation	Delay in extubation or need for reintubation because of renal failure.	PSI 10
Tracheostomy	Received a tracheostomy due to extended need for mechanical ventilation and/or a complication from intubation.	PSI 11
30-day hospital readmission for pneumonia	Readmitted to an acute care hospital within 30 days of the discharge after a PSI11 event for a pulmonary complication such as pneumonia.	PSI 11
6-month hospital readmission for a bleeding complication	Hospital readmission within 180 days of the discharge after due to a bleeding complication related to anticoagulation.	PSI 12

Outcome	Description of events captured	Applicable Patient Safety Indicator (PSI)
30-day hospital readmission due to a pneumothorax complication	Readmission to an acute care hospital within 30 days of discharge after the PSI 06 event for: recurrent pneumothorax, empyema with/without fistula, bronchopulmonary or tracheoesophageal fistula, pneumomediastinum, pneumoperitoneum, pyopneumothorax, infection of the pleural space, septic pulmonary embolus, pneumonia, and or soft tissue infection at the thoracotomy site.	PSI 06
Medical complication within 7 days of hip fracture	Acute myocardial infarction, pneumonia, or sepsis during the admission when the fracture occurred or within 7 days of the fracture event.	PSI 08
Emergency department visits within 180-days for a thrombotic complication	Emergency department visits related to a thrombotic event such as pulmonary embolus, deep vein thrombosis, or postphlebotic syndrome within 180-days of discharge after a PSI12 event.	PSI 12
180-day hospital readmission due to thrombotic event	Hospital readmission within 180-days of discharge after a PSI 12 event, related to recurrent or extended thrombosis.	PSI 12
30-day hospital readmission for an infectious complication	Hospital readmission for an infectious event such as a wound infection, sepsis, or bacteremia within 30-days of discharge after a PSI13 event.	PSI 13
180-day hospital readmission for an enterocutaneous fistula	Readmitted to an acute care hospital for intra-abdominal abscess or enterocutaneous fistula within 180-days of the discharge after a PSI14 event.	PSI 14
180-day hospital readmission for an incisional hernia	Readmitted to an acute care hospital (including observational stays) for incisional hernia or reclosure of postoperative disruption of the abdominal wall within 180-days of the discharge after a PSI14 event.	PSI 14
Peritonitis or a hemoperitoneum	Development of peritonitis or a hemoperitoneum during the hospitalization associated with the PSI15 event.	PSI 15
180-day hospital readmission for an intra-abdominal abscess or enterocutaneous fistula	Development of an intra-abdominal abscess or enterocutaneous fistula up to 180 days of discharge after a PSI15 event.	PSI 15
30 day reoperation	An additional surgery within 30-days of discharge for a complication such as intra-abdominal abscess related to a PSI15 event.	PSI 15

Summary of composite weights in CMS PSI 90, CMS v6.0 and CMS v8.0 PSI

PSI	Indicator	Composite weight PSI 90 (CMSv6.0)	Composite weight PSI90 (CMSv8.0)	Percentage difference in weights
PSI 03	Pressure ulcer rate	0.0504	0.1034	105
PSI 06	Iatrogenic pneumothorax rate	0.0531	0.0428	-19
PSI 08	In-hospital fall with hip fracture rate	0.0109	0.0150	38
PSI 09	Perioperative hemorrhage and hematoma rate	0.0691	0.0430	-38
PSI 10	Postoperative acute kidney injury rate	0.0575	0.0764	33
PSI 11	Postoperative respiratory failure rate	0.3045	0.2304	-24
PSI 12	Perioperative pulmonary embolism or deep vein thrombosis rate	0.1839	0.1867	2
PSI 13	Postoperative sepsis rate	0.2552	0.2569	1
PSI 14	Postoperative wound dehiscence rate	0.0104	0.0090	-13
PSI 15	Unrecognized abdominopelvic accidental puncture/laceration rate	0.0052	0.0364	600

Source: Weights presented are based on Medicare FFS discharges. Weights for CMS v6.0 software are based on harm weights using January 2012–December 2013 Medicare FFS discharges to determine the harm component and July 2013–June 2015 Medicare FFS discharges to determine the volume component. Weights for CMS v8.0 PSI software are based on harm weights using January 2012–December 2013 Medicare FFS discharges to determine the harm component and October 2015–September 2016 Medicare FFS discharges to determine the volume component.

Appendix II. Additional National and Maryland Complication Programs Background

Hospital-Acquired Conditions Present on Admission Indicator (HAC POA)¹⁴

Medicare's system for the payment of inpatient hospital services is called the inpatient prospective payment system. Under this system, patients are assigned to a payment category called a Diagnosis Related Group (DRG), which are based on a patient's primary diagnosis and the presence of other conditions. An average cost is calculated for each Diagnosis Related Group relative to the average cost for all Medicare hospital stays, and these relative costs (or Diagnosis Related Group weights) are used to calculate Medicare's payment to the hospital; patients with more co-morbidities or complications generally are categorized into higher-paying Diagnosis Related Groups. Historically, Medicare payments under this system were based solely on the Diagnosis Related Group weights and the volume of services.

In February 8, 2006, the President signed the Deficit Reduction Act (DRA) of 2005. Section 5001(c) of DRA requires the Secretary to identify conditions that are: (a) high cost or high volume or both, (b) result in the assignment of a case to a DRG that has a higher payment when present as a secondary diagnosis, and (c) could reasonably have been prevented through the application of evidence-based guidelines. Section 5001(c) provides that CMS can revise the list of conditions from time to time, as long as it contains at least two conditions.

For discharges occurring on or after October 1, 2008, hospitals do not receive additional payment for cases in which one of the selected conditions was not present on admission. That is, the case would be paid as though the secondary diagnosis were not present.

CMS also required hospitals to report present on admission information for both primary and secondary diagnoses when submitting claims for discharges on or after October 1, 2007.

Hospital-Acquired Condition Reduction Program (HACRP)

The HAC Reduction Program is a Medicare pay-for-performance program that supports CMS's long-standing effort to link Medicare payments to healthcare quality in the inpatient hospital setting. Section 1886(p)(6)(B) of the Social Security Act established the statutory requirements for the HAC Reduction Program. Beginning with Fiscal Year FY 2015 discharges (i.e., effective October 1, 2014), the HAC Reduction Program requires the Secretary of Health and Human Services (HHS) to adjust

¹⁴ For more information on the DRA HAC POA program refer to <http://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/HospitalAcqCond/index.html>.

payments to hospitals that rank in the worst-performing 25 percent of all subsection (d) hospitals with respect to HAC quality measures. Hospitals with a Total HAC Score greater than the 75th percentile of all Total HAC Scores (i.e., the worst-performing quartile) will be subject to a 1 percent payment reduction. This payment adjustment applies to all Medicare discharges between October 1, 2018 and September 30, 2019 (i.e., FY 2019). The payment reduction occurs when CMS pays hospital claims.

CMS finalized measures and scoring methodology (vol 78, FR 50717) for this program in the FY 2014 Inpatient Prospective Payment System/Long-Term Care Hospital Prospective Payment System (IPPS/LTCH PPS) Final Rule. CMS uses the Total HAC Score to determine the worst-performing quartile of all subsection (d) hospitals. For FY 2019, the Total HAC Score is based on data for six quality measures in two domains¹⁵. CMS sends confidential Hospital-Specific Reports (HSRs) to hospitals. CMS gives hospitals 30 days to review their HAC Reduction Program data, submit questions about the calculation of their results, and request corrections to the scoring. Following the Scoring Calculations Review and Corrections period, CMS will next publicly report hospitals' HAC Reduction Program data on *Hospital Compare* in January 2019.

¹⁵ For more information on the HACRP program refer to <https://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/AcuteInpatientPPS/Downloads/HAC-Reduction-Program-Fact-Sheet.pdf>

Appendix III: RY 2020 PPCs, Benchmarks, and Tiers

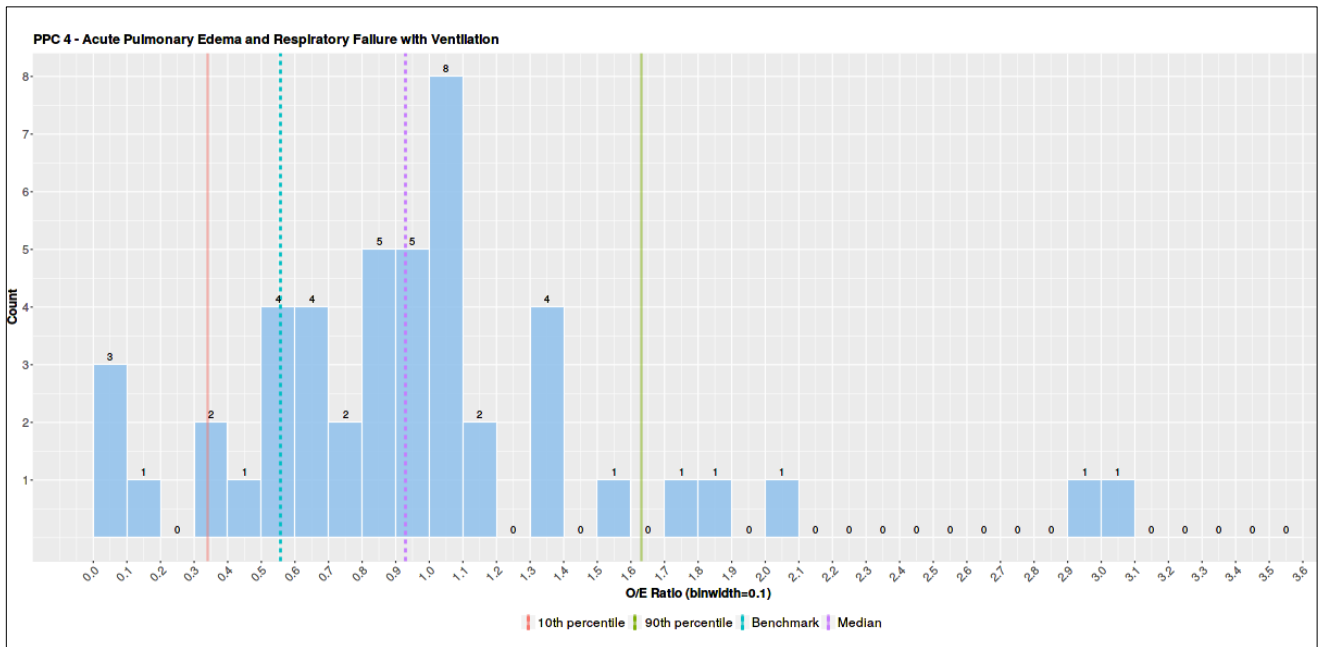
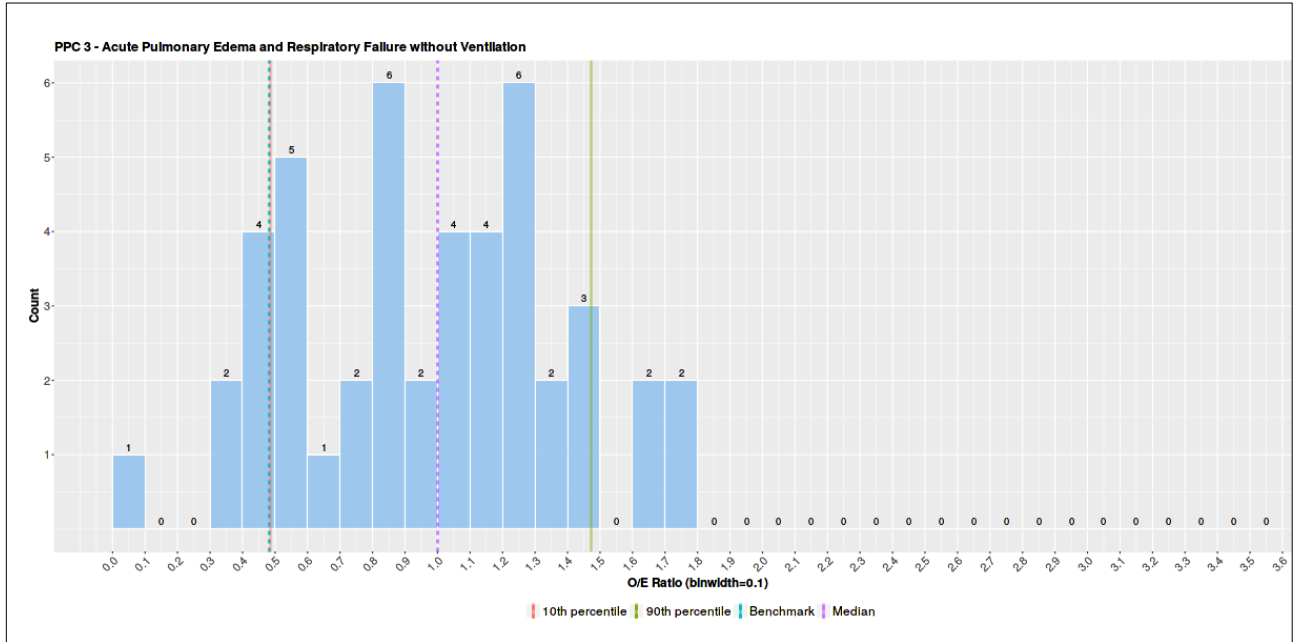
PPC Number	PPC Description	Threshold	Benchmark	Tier
1	Stroke & Intracranial Hemorrhage	1	0.4126	2
3	Acute Pulmonary Edema and Respiratory Failure without Ventilation	1	0.5466	1
4	Acute Pulmonary Edema and Respiratory Failure with Ventilation	1	0.5705	1
5	Pneumonia & Other Lung Infections	1	0.631	1
6	Aspiration Pneumonia	1	0.4287	1
7	Pulmonary Embolism	1	0.1406	1
8	Other Pulmonary Complications	1	0.2265	2
9	Shock	1	0.4131	1
10	Congestive Heart Failure	1	0.1354	2
11	Acute Myocardial Infarction	1	0.2907	2
13	Other Cardiac Complications	1	0.1521	2
14	Ventricular Fibrillation/Cardiac Arrest	1	0.5517	1
16	Venous Thrombosis	1	0.1799	1
19	Major Liver Complications	1	0	2
23	GU Complications Except UTI	1	0	2
27	Post-Hemorrhagic & Other Acute Anemia with Transfusion	1	0.2655	1
28	In-Hospital Trauma and Fractures	1	0	2
30	Poisonings due to Anesthesia	0	0	2
31	Decubitus Ulcer	0	0	2
32	Transfusion Incompatibility Reaction	0	0	2
35	Septicemia & Severe Infections	1	0.4468	1
37	Post-Operative Infection & Deep Wound Disruption Without Procedure	1	0.2917	1

Final Recommendations for the Maryland Hospital-Acquired Conditions Program for Rate Year 2021

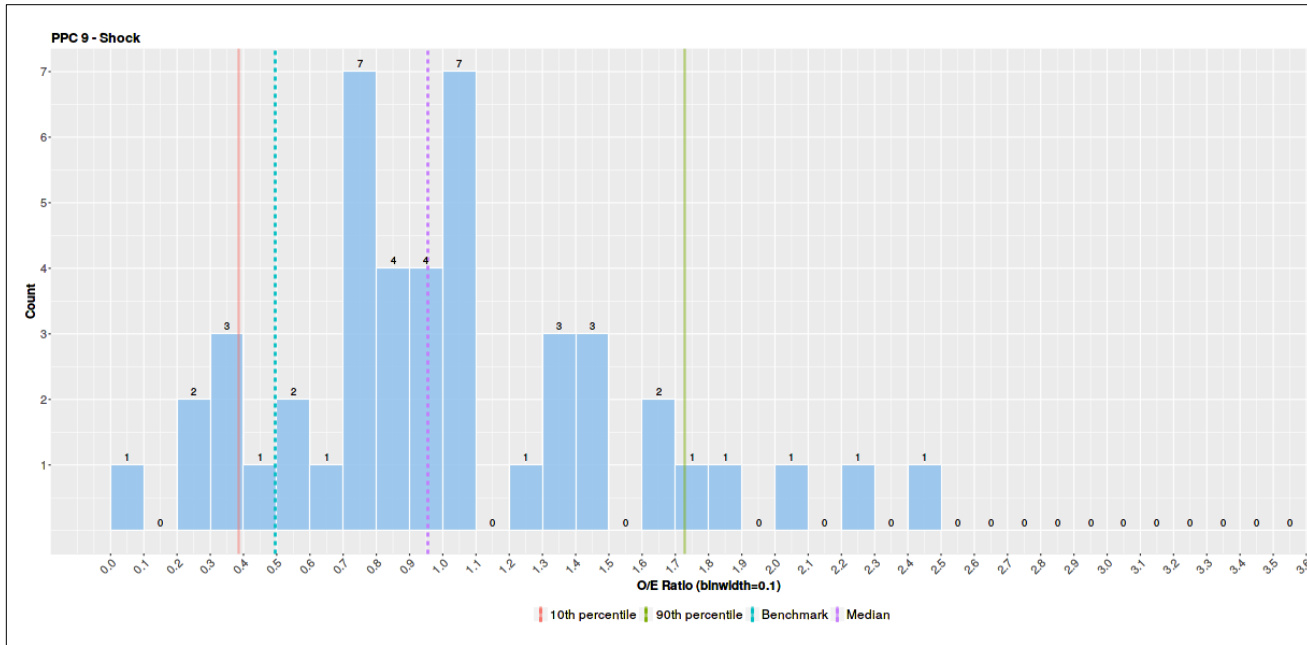
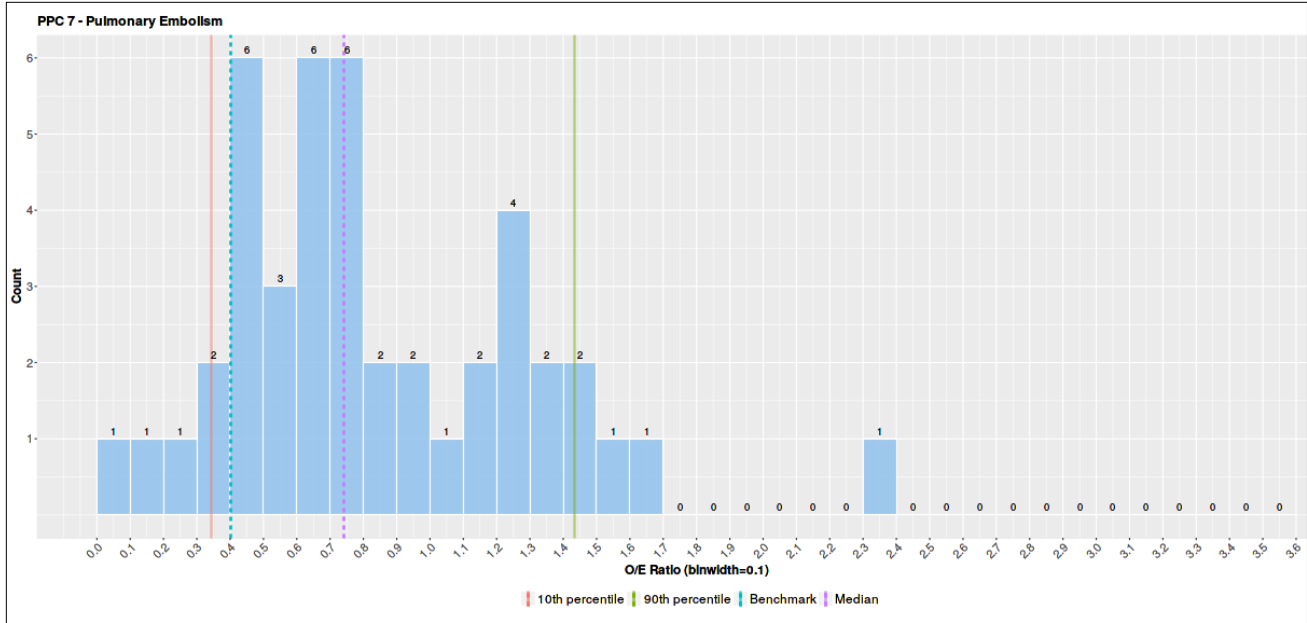
PPC Number	PPC Description	Threshold	Benchmark	Tier
38	Post-Operative Wound Infection & Deep Wound Disruption with Procedure	1	0	1
39	Reopening Surgical Site	1	0.2615	2
40	Post-Operative Hemorrhage & Hematoma without Hemorrhage Control Procedure or I&D Proc	1	0.5499	1
41	Post-Operative Hemorrhage & Hematoma with Hemorrhage Control Procedure or I&D Proc	1	0.1541	1
42	Accidental Puncture/Laceration During Invasive Procedure	1	0.385	1
44	Other Surgical Complication - Mod	1	0	2
45	Post-procedure Foreign Bodies	0	0	2
46	Post-Operative Substance Reaction & Non-O.R. Procedure for Foreign Body	0	0	2
47	Encephalopathy	1	0.0925	2
48	Other Complications of Medical Care	1	0.0904	2
49	Iatrogenic Pneumothorax	1	0.0758	1
50	Mechanical Complication of Device, Implant & Graft	1	0.4843	2
51	Gastrointestinal Ostomy Complications	1	0.1983	2
52	Inflammation & Other Complications of Devices, Implants or Grafts Except Vascular Infection	1	0.4197	2
53	Infection, Inflammation & Clotting Complications of Peripheral Vascular Catheters & Infusions	1	0	2
59	Medical & Anesthesia Obstetric Complications	1	0.2625	2
60	Major Puerperal Infection and Other Major Obstetric Complications	1	0.1321	2
61	Other Complications of Obstetrical Surgical & Perineal Wounds	1	0.1592	2
65	Urinary Tract Infection without Catheter	1	0	2
67	Combined PPC 1 (PPC 25, 26, 63, 64)	1	0.0669	2
68	Combined PPC 2 (PPC 17, 18)	1	0.2354	2
71	Combined PPC 3 (PPC 34, 54, 66)	1	0.1234	2

Appendix IV. Select PPC Histograms

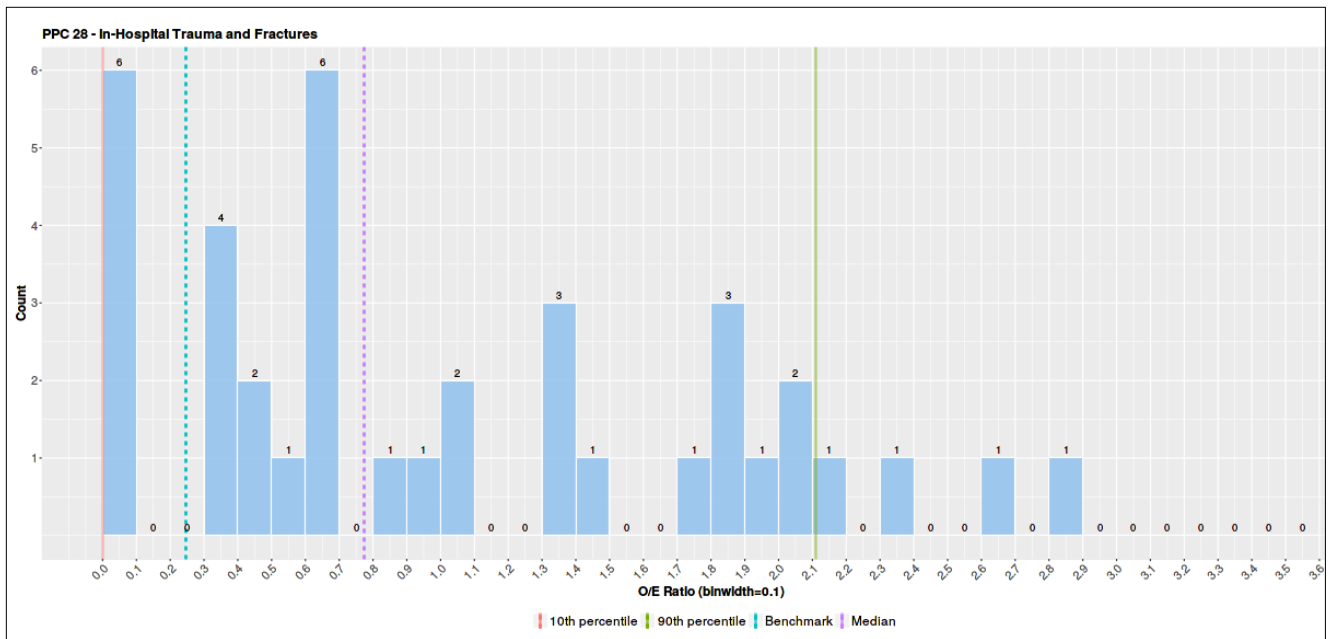
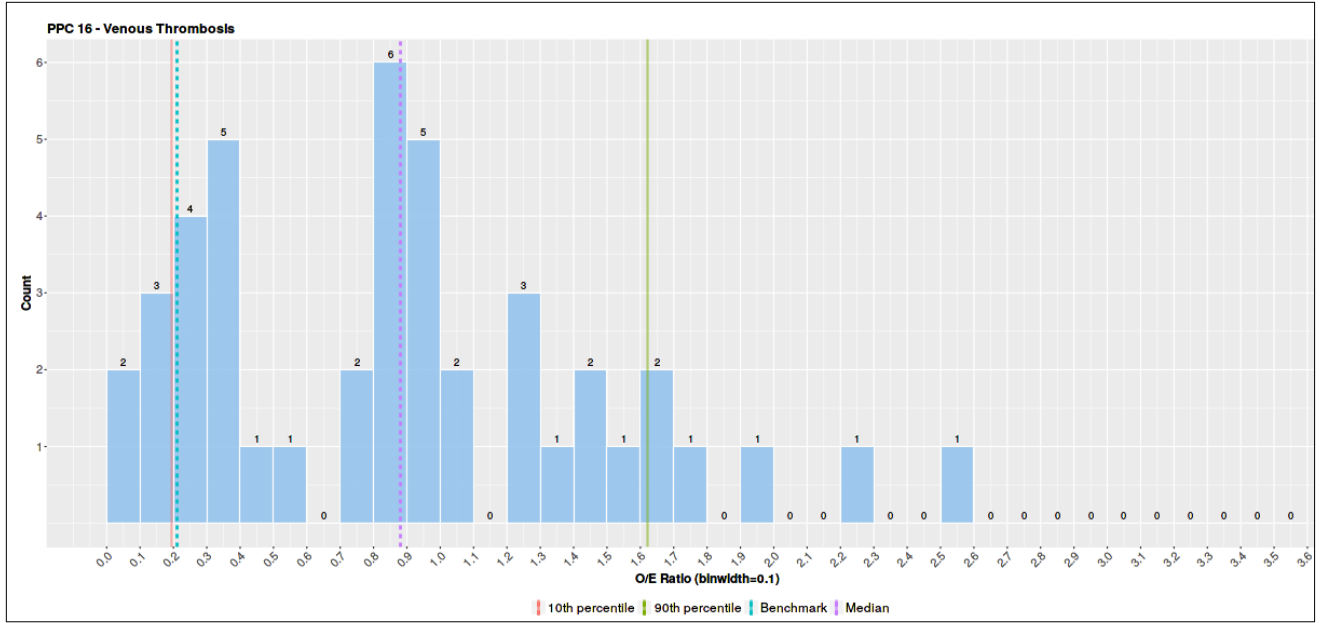
Frequency Histograms of PPCs Selected for MHAC



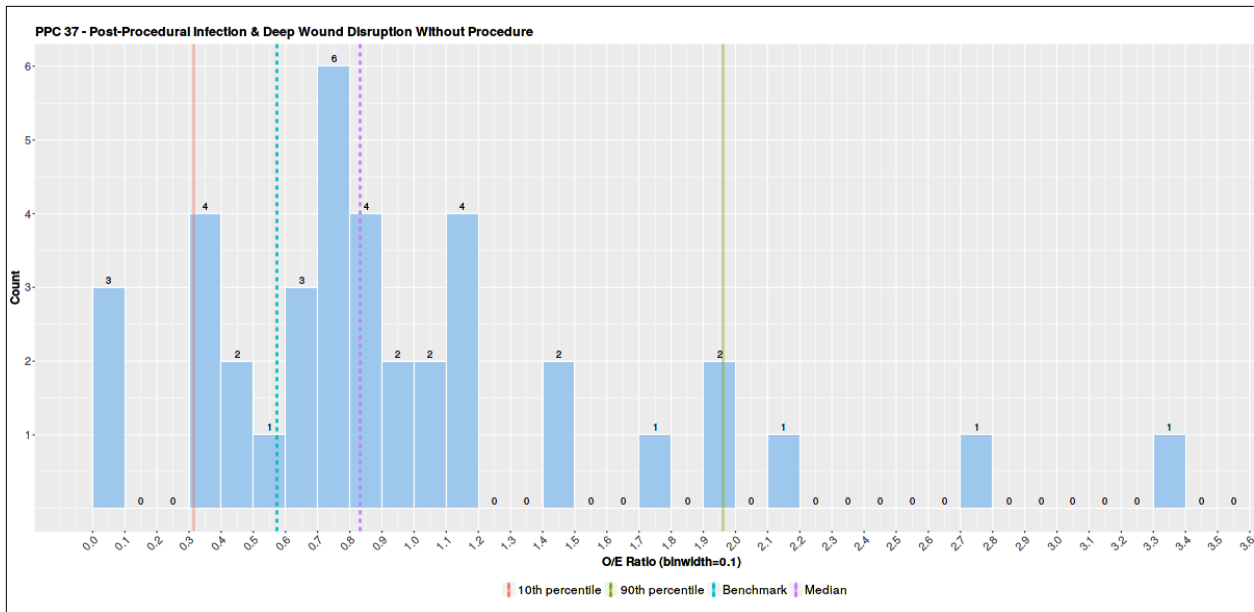
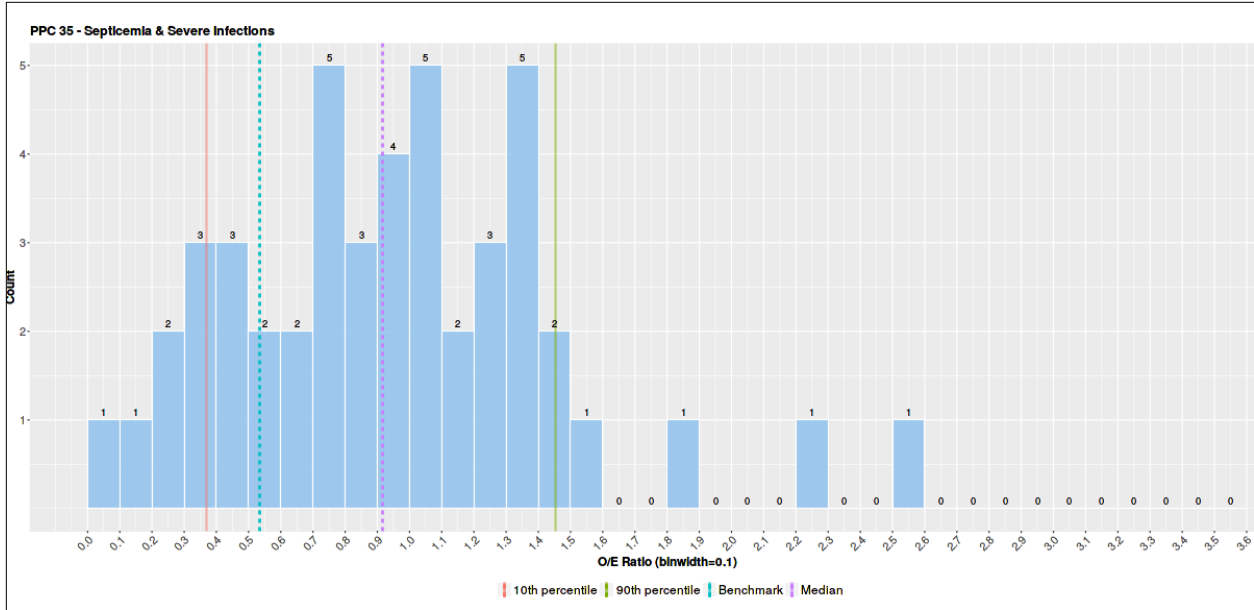
Final Recommendations for the Maryland Hospital-Acquired Conditions Program for Rate Year 2021



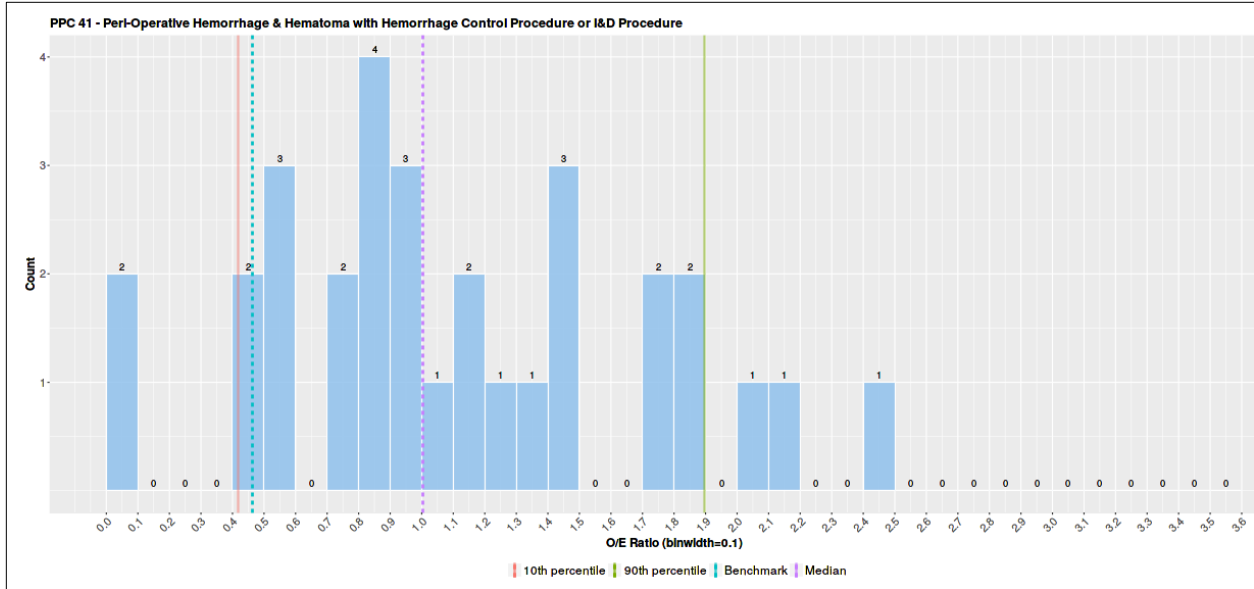
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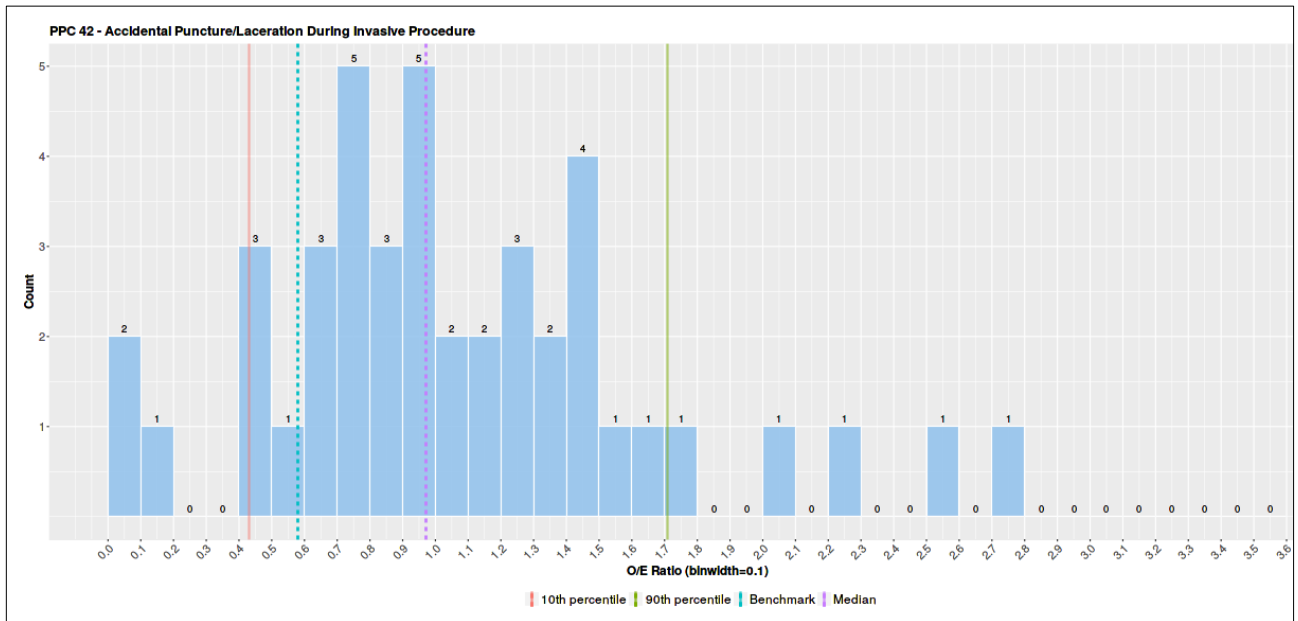
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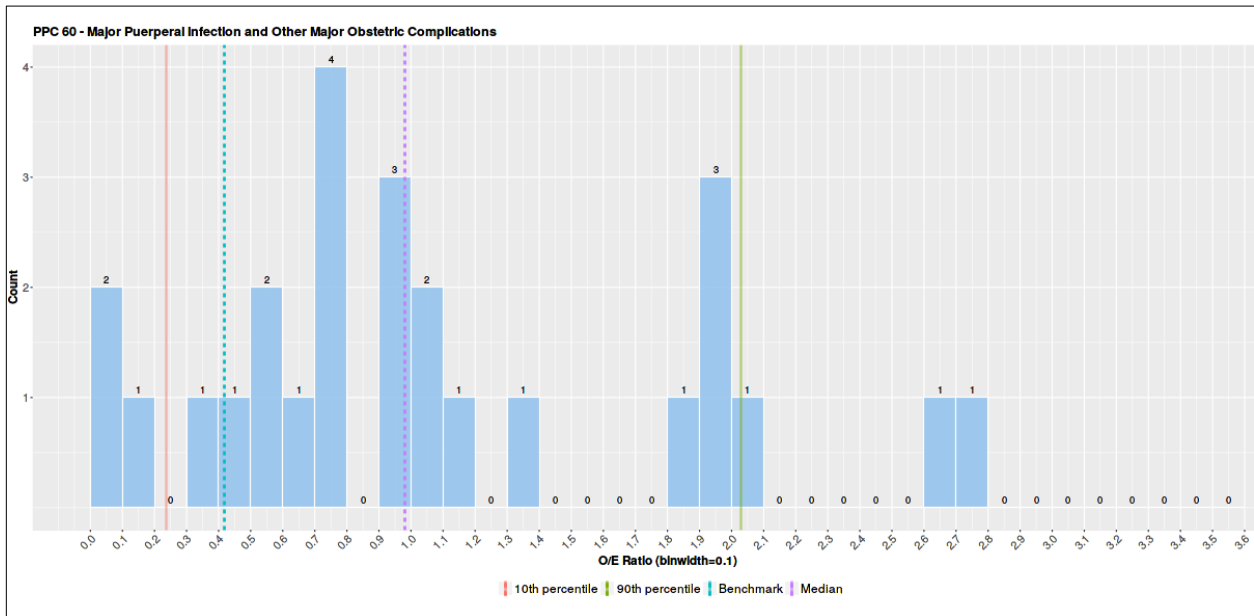
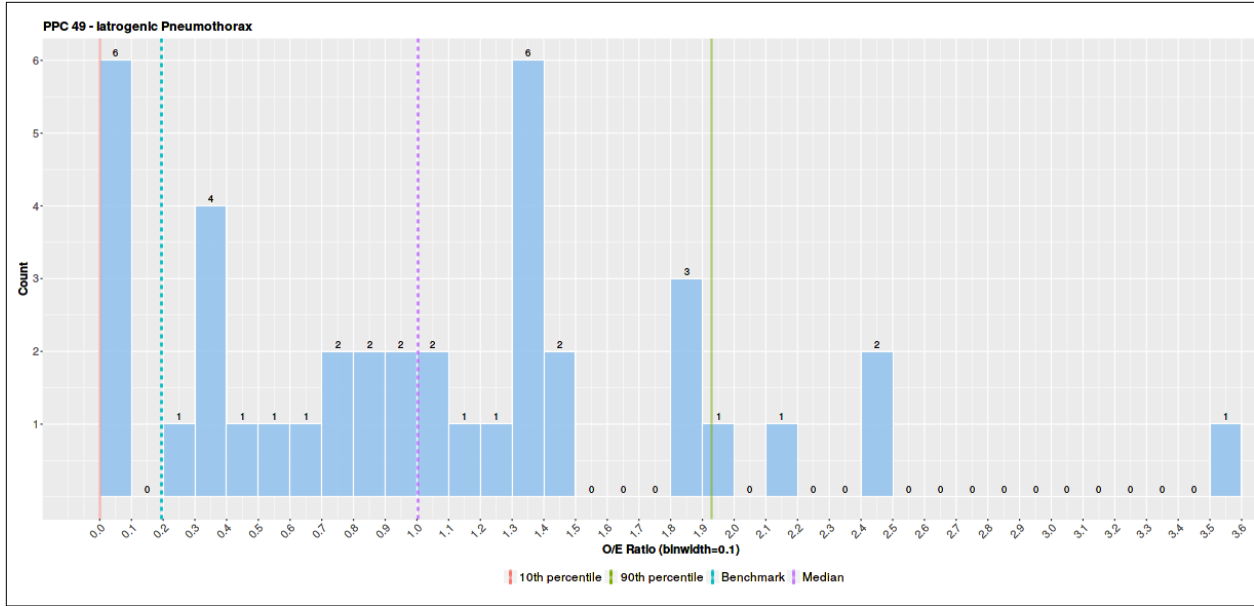
Final Recommendations for the Maryland Hospital-Acquired Conditions Program for Rate Year 2021



*MedStar Union Memorial (210024) removed as outlier with O/E of 4.988

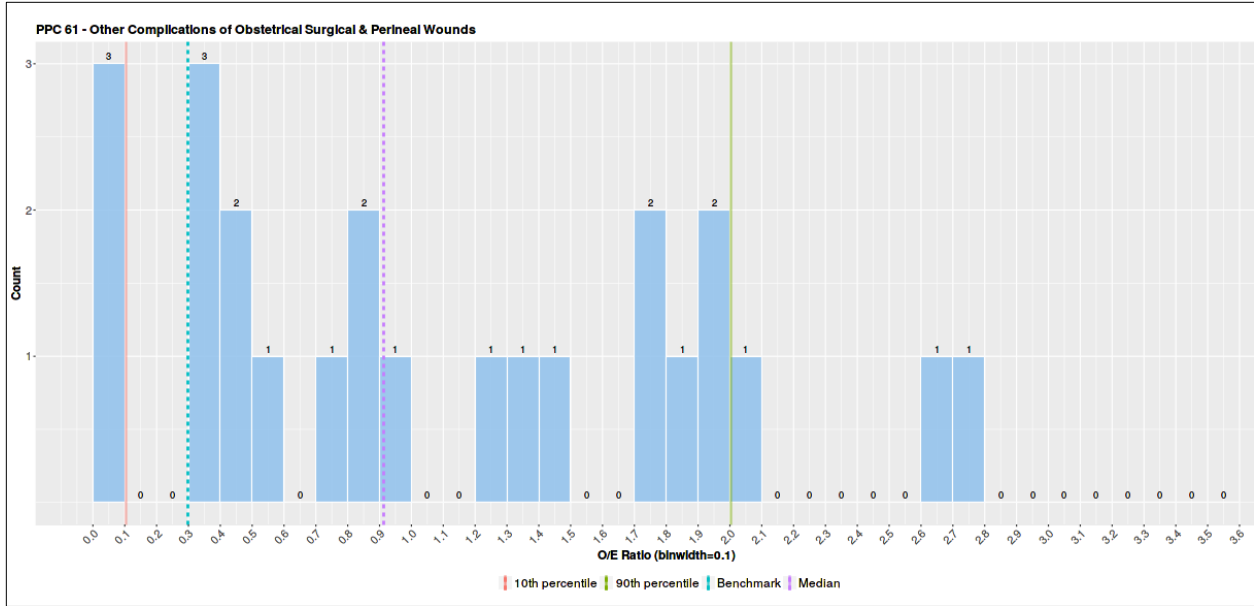


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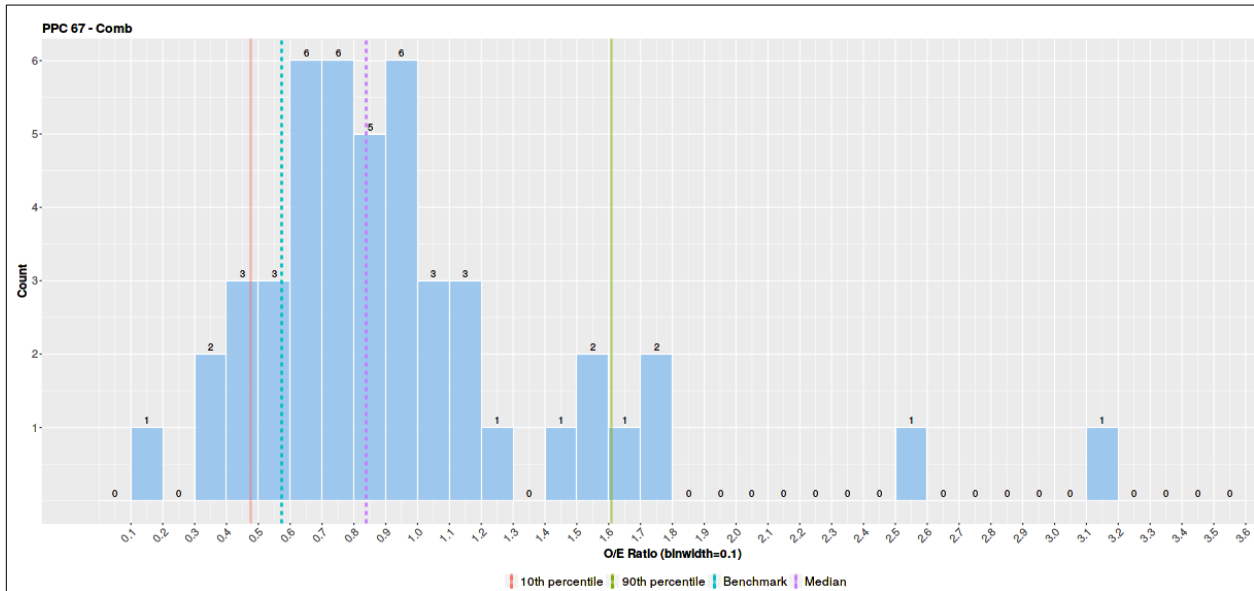


*Washington Adventist (210016) removed as outlier with O/E of 3.988

Final Recommendations for the Maryland Hospital-Acquired Conditions Program for Rate Year 2021



*UM-Charles Regional (210035) removed as outlier with O/E of 3.615



Appendix V: Comparison of PPC Rates under Version 35 and Version 36

PPC #	PPC DESCRIPTION	v35	v36
3	Acute Pulmonary Edema and Respiratory Failure without Ventilation	1.78	1.77
4	Acute Pulmonary Edema and Respiratory Failure with Ventilation	1.21	1.28
7	Pulmonary Embolism	0.49	0.56
9	Shock	1.18	1.05
16	Venous Thrombosis	0.36	0.40
28	In-Hospital Trauma and Fractures	0.13	0.13
35	Septicemia & Severe Infections	2.77	2.90
37	Post-Operative Infection & Deep Wound Disruption Without Procedure	2.48	2.53
41	Post-Operative Hemorrhage & Hematoma with Hemorrhage Control Procedure or I&D Proc	0.69	0.67
42	Accidental Puncture/Laceration During Invasive Procedure	0.49	0.50
49	Iatrogenic Pneumothrax	0.19	0.17
60	Major Puerperal Infection and Other Major Obstetric Complications	0.98	0.55
61	Other Complications of Obstetrical Surgical & Perineal Wounds	0.82	0.81
67	Combined Pneumonia (PPC 5 & 6)	1.80	1.97

Rate >1.0 per 1,000 At-risk discharges	Rate >0.5 per 1,000 At-risk discharges
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Appendix VI: HACRP Z-Score Description

The CAEM subgroup considered using the HACRP Z-Score calculation but adapted for a prospective system where the mean measure result and standard deviation were from a historical time period. It should be noted that the expanded points based scoring system proposed by staff has set the threshold and benchmark at similar percentiles of performance as the Winsorized scores.

Below is excerpt from the FY 2019 HACRP Fact Sheet (<https://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/AcuteInpatientPPS/Downloads/HAC-Reduction-Program-Fact-Sheet.pdf>):

Scoring Methodology

The FY 2017 IPPS/LTCH PPS Final Rule finalized the adoption of the Winsorized z-score methodology, beginning with the FY 2018 HAC Reduction Program. The Winsorized z-score methodology replaced the decile-based scoring methodology used in FY 2015 through FY 2017.

Winsorized z-Score Calculation

For each measure, CMS calculates Winsorized measure results for each hospital based on raw measure results and the 5th and 95th percentile result for all eligible hospitals. If a hospital's measure result falls between the minimum and 5th percentile, CMS sets the hospital's measure result equal to the 5th percentile. If a hospital's measure result falls between the 95th percentile and maximum, CMS sets the hospital's measure results equal to the 95th percentile.

Winsorization does not affect hospitals with measure results between the 5th percentile and 95th percentile. These hospitals' Winsorized measure results equal the hospital's raw measure result.

CMS subtracts the mean Winsorized measure result for all eligible hospitals from a hospital's Winsorized measure result, and divides by the standard deviation of Winsorized measure results for all eligible hospitals.

The Winsorized z-score formula for "Hospital i" is:

$$\frac{X_i - \bar{X}}{SD(x)}$$

- X_i is hospital i's Winsorized measure result.
- \bar{X} is the mean of Winsorized measure results calculated across all Maryland and subsection (d) hospitals.
- $SD(x)$ is the standard deviation of Winsorized measure results calculated across all Maryland and subsection (d) hospitals.

CMS grants exceptions for new hospitals for CLABSI, CAUTI, SSI, MRSA, and CDI; hospitals that submit approved HAI measure exception forms for CLABSI, CAUTI, and SSI; or outliers for CDI only.

Appendix VII. PPC Benchmarks and Thresholds under Current and Expanded Methodology (CY 2016)

PPC #	PPC Description	Current		Expanded	
		Threshold (50th)	Benchmark (top performers 25% discharges)	Threshold (10th)	Benchmark (90th)
3	Acute Pulmonary Edema and Respiratory Failure without Ventilation	1	0.5659	1.6406	0.3483
4	Acute Pulmonary Edema and Respiratory Failure with Ventilation	1	0.4785	1.6835	0.2530
7	Pulmonary Embolism	1	0.4724	1.9392	0.4070
9	Shock	1	0.4696	1.7393	0.2069
16	Venous Thrombosis	1	0.1658	2.1356	0.0000
28	In-Hospital Trauma and Fractures	1	0.1651	2.6935	0.0000
35	Septicemia & Severe Infections	1	0.4578	1.8121	0.2603
37	Post-Operative Infection & Deep Wound Disruption Without Procedure	1	0.3684	1.5768	0.0000
41	Post-Operative Hemorrhage & Hematoma with Hemorrhage Control Procedure or I&D Proc	1	0.2930	1.9154	0.0000
42	Accidental Puncture/Laceration During Invasive Procedure	1	0.4195	1.8772	0.4281
49	Iatrogenic Pneumothrax	1	0.1077	2.0963	0.0000
60	Major Puerperal Infection and Other Major Obstetric Complications	1	0.5005	1.9099	0.2944
61	Other Complications of Obstetrical Surgical & Perineal Wounds	1	0.1710	1.7274	0.0000
67	Combined Pneumonia (PPC 5 and 6)	1	0.4822	1.8745	0.3419

Appendix VIII. PPC Benchmarks and Thresholds under Two Years (FY 2017 and FY 2018) and One Year (FY 2018) Data

PPC Number	PPC Description	2 Yr FY 17 & 18		1 Yr FY 18	
		Threshold (10th)	Benchmark (90th)	Threshold (10th)	Benchmark (90th)
3	Acute Pulmonary Edema and Respiratory Failure without Ventilation	1.8105	0.5751	2.0865	0.2067
4	Acute Pulmonary Edema and Respiratory Failure with Ventilation	1.7978	0.4678	1.8562	0.3138
7	Pulmonary Embolism	1.7773	0.3836	2.0905	0.0000
9	Shock	1.7988	0.4235	1.6344	0.3376
16	Venous Thrombosis	1.6437	0.2133	2.1852	0.0000
28	In-Hospital Trauma and Fractures	1.7259	0.3859	2.1406	0.0000
35	Septicemia & Severe Infections	1.7416	0.3659	1.7227	0.2691
37	Post-Operative Infection & Deep Wound Disruption Without Procedure	2.1254	0.4020	2.6941	0.2870
41	Post-Operative Hemorrhage & Hematoma with Hemorrhage Control Procedure or I&D	1.7871	0.3592	1.9566	0.0000
42	Accidental Puncture/Laceration During Invasive Procedure	2.5504	0.4797	2.3152	0.3221
49	Iatrogenic Pneumothrax	1.9877	0.1946	2.2594	0.3383
60	Major Puerperal Infection and Other Major Obstetric Complications	1.5373	0.2404	1.9441	0.0000
61	Other Complications of Obstetrical Surgical & Perineal Wounds	2.0641	0.1078	2.1750	0.0000
67	Combined Pneumonia (PPC 5 and 6)	1.5607	0.5899	1.7344	0.3922

Appendix IX. Example of Calculation of Hospital Scores

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%

Appendix X. By hospital Score Modeling

RY 2021 MHAC Modeling by Hospital		Model 1: Improvement and Attainment	Model 2: Attainment Only	Model 3: Wider Performance Standards, Attainment Only
Hospital ID	Hospital Name	MHAC score	MHAC score	MHAC score
210001	MERITUS	28%	27%	57%
210002	UNIVERSITY OF MARYLAND	26%	21%	56%
210003	PRINCE GEORGE	34%	28%	46%
210004	HOLY CROSS	72%	71%	85%
210005	FREDERICK MEMORIAL	66%	63%	73%
210006	HARFORD	23%	11%	44%
210008	MERCY	48%	38%	62%
210009	JOHNS HOPKINS	56%	51%	73%
210010	DORCHESTER	70%	70%	80%
210011	ST. AGNES	53%	51%	76%
210012	SINAI	41%	34%	66%
210013	BON SECOURS	22%	12%	17%
210015	FRANKLIN SQUARE	22%	16%	49%
210016	WASHINGTON ADVENTIST	31%	29%	49%
210017	GARRETT COUNTY	76%	76%	89%
210018	MONTGOMERY GENERAL	65%	63%	79%
210019	PENINSULA REGIONAL	51%	51%	66%
210022	SUBURBAN	60%	58%	77%
210023	ANNE ARUNDEL	69%	69%	84%

Final Recommendations for the Maryland Hospital-Acquired Conditions Program for Rate Year 2021

RY 2021 MHAC Modeling by Hospital		Model 1: Improvement and Attainment	Model 2: Attainment Only	Model 3: Wider Performance Standards, Attainment Only
Hospital ID	Hospital Name	MHAC score	MHAC score	MHAC score
210024	UNION MEMORIAL	26%	20%	46%
210027	WESTERN MARYLAND HEALTH SYSTEM	25%	21%	47%
210028	ST. MARY	66%	66%	70%
210029	HOPKINS BAYVIEW MED CTR	45%	40%	71%
210030	CHESTERTOWN	41%	28%	28%
210032	UNION HOSPITAL OF CECIL COUNT	58%	43%	63%
210033	CARROLL COUNTY	28%	27%	41%
210034	HARBOR	28%	22%	37%
210035	CHARLES REGIONAL	76%	75%	85%
210037	EASTON	42%	38%	68%
210038	UMMC MIDTOWN	58%	58%	74%
210039	CALVERT	52%	50%	57%
210040	NORTHWEST	51%	51%	69%
210043	BALTIMORE WASHINGTON MEDICAL CENTER	30%	29%	55%
210044	G.B.M.C.	21%	18%	39%
210048	HOWARD COUNTY	69%	64%	76%
210049	UPPER CHESAPEAKE HEALTH	73%	68%	84%
210051	DOCTORS COMMUNITY	69%	67%	76%
210055	LAUREL REGIONAL	71%	63%	75%

Final Recommendations for the Maryland Hospital-Acquired Conditions Program for Rate Year 2021

RY 2021 MHAC Modeling by Hospital		Model 1: Improvement and Attainment	Model 2: Attainment Only	Model 3: Wider Performance Standards, Attainment Only
Hospital ID	Hospital Name	MHAC score	MHAC score	MHAC score
210056	GOOD SAMARITAN	40%	39%	51%
210057	SHADY GROVE	23%	16%	39%
210058	REHAB & ORTHO	36%	36%	45%
210060	FT. WASHINGTON	100%	100%	100%
210061	ATLANTIC GENERAL	59%	57%	61%
210062	SOUTHERN MARYLAND	20%	4%	21%
210063	UM ST. JOSEPH	37%	37%	59%
210064	LEVINDALE	64%	48%	63%
210065	HC-Germantown	77%	73%	88%

Median	51%	43%	63%
Average	49%	45%	62%
Min	20%	4%	17%
Max	100%	100%	100%
25th	28%	27%	47%
75th	66%	63%	76%

Appendix XI. By Hospital Revenue Modeling

RY 2021 MHAC Revenue Adjustment Modeling				Linear 60-70% Cutpoint		Non-Linear 65% Cutpoint	
Hospital ID	Hospital Name	RY18 estimated Permanent Inpatient Revenue	MHAC score	% Adjustment	\$ Adjustment	% Adjustment	\$ Adjustment
210001	MERITUS	\$190,799,459	57%	-0.10%	-\$190,799	-0.0037%	-\$7,060
210002	UNIVERSITY OF MARYLAND	\$919,253,797	56%	-0.13%	-\$1,225,672	-0.0053%	-\$48,720
210003	PRINCE GEORGE	\$215,464,625	46%	-0.47%	-\$1,005,502	-0.0500%	-\$107,732
210004	HOLY CROSS	\$340,412,069	85%	0.50%	\$1,702,060	0.1866%	\$635,209
210005	FREDERICK MEMORIAL	\$220,972,343	73%	0.10%	\$220,972	0.0119%	\$26,296
210006	HARFORD	\$48,557,781	44%	-0.53%	-\$258,975	-0.0674%	-\$32,728
210008	MERCY	\$223,932,822	62%	0.00%	\$0	-0.0002%	-\$448
210009	JOHNS HOPKINS	\$1,378,259,901	73%	0.10%	\$1,378,260	0.0119%	\$164,013
210010	DORCHESTER	\$26,021,222	80%	0.33%	\$86,737	0.0787%	\$20,479
210011	ST. AGNES	\$237,889,236	76%	0.20%	\$475,778	0.0310%	\$73,746
210012	SINAI	\$398,036,508	66%	0.00%	\$0	0.0000%	\$0
210013	BON SECOURS	\$65,798,042	17%	-1.43%	-\$943,105	-0.8054%	-\$529,937
210015	FRANKLIN SQUARE	\$300,623,972	49%	-0.37%	-\$1,102,288	-0.0298%	-\$89,586
210016	WASHINGTON ADVENTIST	\$158,337,604	49%	-0.37%	-\$580,571	-0.0298%	-\$47,185
210017	GARRETT COUNTY	\$21,075,334	89%	0.63%	\$133,477	0.3224%	\$67,947
210018	MONTGOMERY GENERAL	\$77,808,657	79%	0.30%	\$233,426	0.0640%	\$49,798
210019	PENINSULA REGIONAL	\$241,466,813	66%	0.00%	\$0	0.0000%	\$0
210022	SUBURBAN	\$197,431,392	77%	0.23%	\$460,673	0.0403%	\$79,565

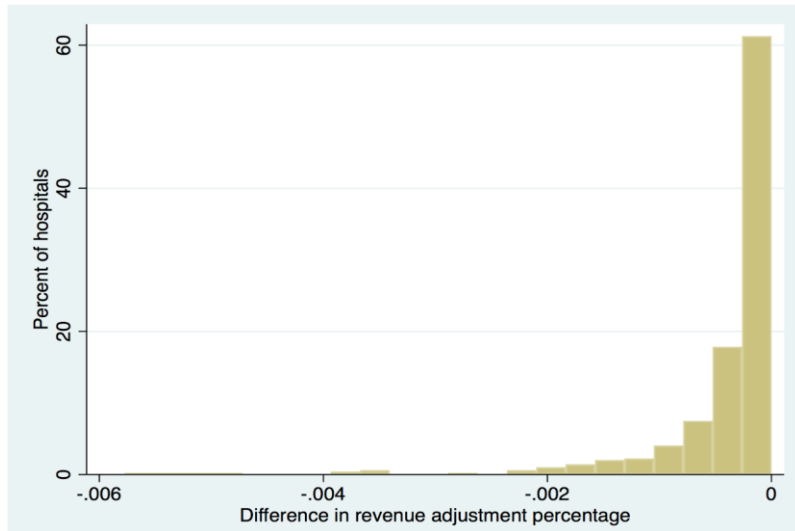
RY 2021 MHAC Revenue Adjustment Modeling				Linear 60-70% Cutpoint		Non-Linear 65% Cutpoint	
Hospital ID	Hospital Name	RY18 estimated Permanent Inpatient Revenue	MHAC score	% Adjustment	\$ Adjustment	% Adjustment	\$ Adjustment
210023	ANNE ARUNDEL	\$299,264,995	84%	0.47%	\$1,396,570	0.1600%	\$478,824
210024	UNION MEMORIAL	\$235,346,415	46%	-0.47%	-\$1,098,283	-0.0500%	-\$117,673
210027	WESTERN MARYLAND HEALTH SYSTEM	\$171,000,183	47%	-0.43%	-\$741,001	-0.0425%	-\$72,675
210028	ST. MARY	\$76,303,058	70%	0.00%	\$0	0.0029%	\$2,213
210029	HOPKINS BAYVIEW	\$357,620,585	71%	0.03%	\$119,207	0.0050%	\$17,881
210030	CHESTERTOWN	\$21,139,936	28%	-1.07%	-\$225,493	-0.3689%	-\$77,985
210032	UNION HOSPITAL OF CECIL COUNT	\$66,514,320	63%	0.00%	\$0	-0.0001%	-\$67
210033	CARROLL COUNTY	\$132,801,017	41%	-0.63%	-\$841,073	-0.1007%	-\$133,731
210034	HARBOR	\$112,526,840	37%	-0.77%	-\$862,706	-0.1599%	-\$179,930
210035	CHARLES REGIONAL	\$75,199,112	85%	0.50%	\$375,996	0.1866%	\$140,322
210037	EASTON	\$105,222,295	68%	0.00%	\$0	0.0006%	\$631
210038	UMMC MIDTOWN	\$117,217,727	74%	0.13%	\$156,290	0.0170%	\$19,927
210039	CALVERT	\$63,677,722	57%	-0.10%	-\$63,678	-0.0037%	-\$2,356
210040	NORTHWEST	\$133,828,758	69%	0.00%	\$0	0.0015%	\$2,007
210043	BALTIMORE WASHINGTON MEDICAL	\$229,151,792	55%	-0.17%	-\$381,920	-0.0073%	-\$16,728
210044	G.B.M.C.	\$225,145,722	39%	-0.70%	-\$1,576,020	-0.1280%	-\$288,187
210048	HOWARD COUNTY	\$183,348,539	76%	0.20%	\$366,697	0.0310%	\$56,838
210049	UPPER CHESAPEAKE	\$130,150,364	84%	0.47%	\$607,368	0.1600%	\$208,241
210051	DOCTORS COMMUNITY	\$144,686,192	76%	0.20%	\$289,372	0.0310%	\$44,853

Final Recommendations for the Maryland Hospital-Acquired Conditions Program for Rate Year 2021

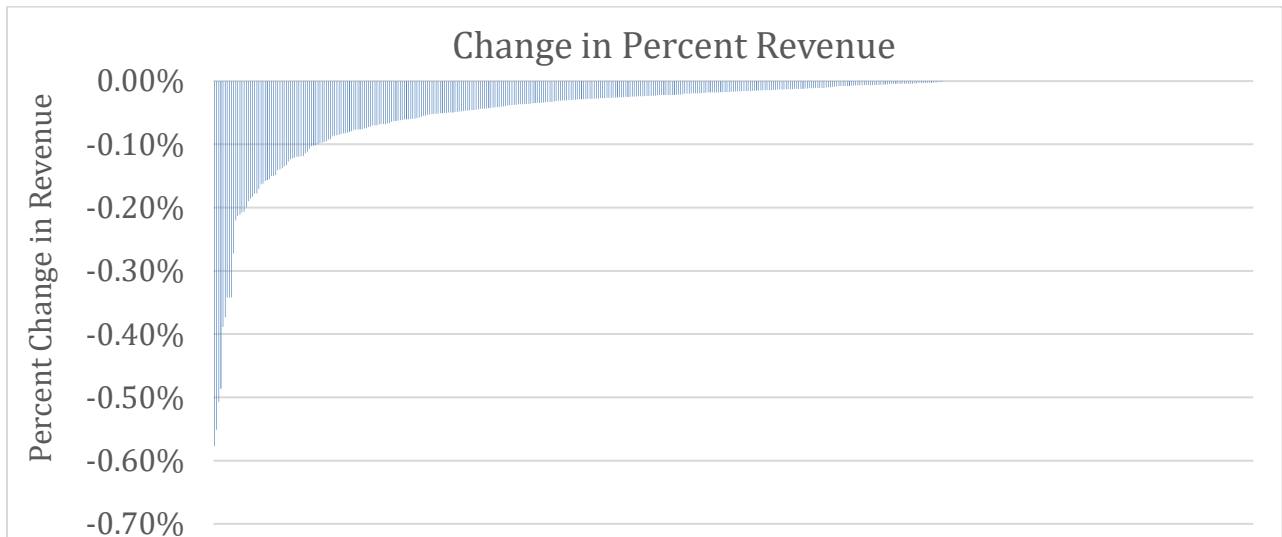
RY 2021 MHAC Revenue Adjustment Modeling				Linear 60-70% Cutpoint		Non-Linear 65% Cutpoint	
Hospital ID	Hospital Name	RY18 estimated Permanent Inpatient Revenue	MHAC score	% Adjustment	\$ Adjustment	% Adjustment	\$ Adjustment
210055	LAUREL REGIONAL	\$58,931,276	75%	0.17%	\$98,219	0.0233%	\$13,731
210056	GOOD SAMARITAN	\$140,674,848	51%	-0.30%	-\$422,025	-0.0200%	-\$28,135
210057	SHADY GROVE	\$231,939,525	39%	-0.70%	-\$1,623,577	-0.1280%	-\$296,883
210058	REHAB & ORTHO	\$69,966,359	45%	-0.50%	-\$349,832	-0.0583%	-\$40,790
210060	FT. WASHINGTON	\$19,548,527	100%	1.00%	\$195,485	1.0000%	\$195,485
210061	ATLANTIC GENERAL	\$37,316,219	61%	0.00%	\$0	-0.0005%	-\$187
210062	SOUTHERN MARYLAND	\$163,844,003	21%	-1.30%	-\$2,129,972	-0.6204%	-\$1,016,488
210063	UM ST. JOSEPH	\$237,924,618	59%	-0.03%	-\$79,308	-0.0016%	-\$3,807
210064	LEVINDALE	\$56,105,767	63%	0.00%	\$0	-0.0001%	-\$56
210065	HC-Germantown	\$60,632,167	88%	0.60%	\$363,793	0.2838%	\$172,074
State Total		\$9,219,170,455		State Total	-\$7,041,420		-\$668,994
				Penalty	-\$15,701,800		-\$3,139,074
				% Inpatient	-0.17%		-0.03%
				Reward	\$8,660,380		\$2,470,080
				% Inpatient	0.09%		0.03%
				# Penalized	20		24
				# \$0	9		2
				# Rewarded	18		21

Appendix XII. Sensitivity Analysis of MHAC Scores

This histogram shows percent of hospital scores by percent change in revenue adjustments when modeling was done to test the sensitivity of the hospital MHAC scores to an increase in one PPC. Scores were run for each hospital for each PPC, meaning that if a hospital qualified for all fourteen PPCs the score was run fourteen times adding one to each PPC. The histogram shows that more than 60% of the hospital scores had no change in revenue when there was one additional PPC.



This bar chart is of each run of the hospital scores and shows that there are four scenarios where the addition of one PPC results in a revenue change that is greater than 0.40 percent. These four scenarios are for the three small hospitals that only are being measured on four PPCs (Levindale, Garrett, and Chestertown). Thus it is not surprising that the scores for these hospitals are influenced by a single PPC. However in reviewing the PPCs these hospitals are being evaluated on, staff believes it is clinically important to include these hospitals in the program.



January 18, 2019

Alyson Schuster, PhD
Associate Director, Performance Measurement
Health Services Cost Review Commission
4160 Patterson Avenue
Baltimore, MD 21215

Dear Ms. Schuster:

On behalf of Anne Arundel Medical Center (AAMC), thank you for the opportunity to comment on the draft recommendation for the Maryland Hospital Acquired Conditions (MHAC) program for Rate Year 2021. We recognize the importance of this program in meeting the goals of the Total Cost of Care Model and appreciate the Staff's work to refine the methodology. In response to the draft MHAC RY2021 policy:

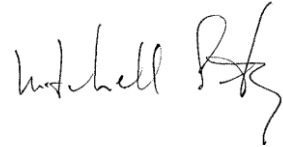
- 1) We **agree with the decision to narrow the number of potentially preventable conditions (PPCs)** to 14 clinically relevant and evidence-based conditions. Focusing the scope in this manner makes the program more manageable and meaningful to hospitals and their care partners.
- 2) We **support the Staff's recommendation to transition to attainment-only**. In light of Maryland's progress to date and the longevity of this program, it is appropriate at this time to reward attainment only. Related to this change, **we support using a wider scale** that better differentiates performance.
- 3) We **recommend increasing the maximum reward to 2%** to mirror the maximum penalty of 2%. This change would further simplify the methodology and would provide greater incentives for positive change.

Thank you again for the opportunity to comment. We look forward to providing additional comments specific to the payment scale in the near future. Please contact us if you have any questions or if we can be of assistance.

Sincerely,

Handwritten signature of Maulik Joshi in black ink.

Maulik Joshi, DrPH
Executive Vice President of Integrated Care Delivery &
Chief Operating Officer

Handwritten signature of Mitch Schwartz in black ink.

Mitch Schwartz, MD
Chief Medical Officer

Cc: Victoria Bayless, President & Chief Executive Officer, AAMC
Bob Reilly, Chief Financial Officer, AAMC
Nelson Sabatini, Chairman, HSCRC
Katie Wunderlich, Executive Director, HSCRC

Maria Harris Tildon
Executive Vice President
Marketing, Communications & External Affairs

CareFirst BlueCross BlueShield
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January 18, 2019

Health Services Cost Review Commission
4160 Patterson Avenue
Baltimore, Maryland 21215

Dear Commissioners:

The purpose of this letter is to provide observations and comments regarding the HSCRC Staff's Draft Recommendations for the Maryland Hospital Acquired Condition (MHAC) methodology and policy for Rate Year 2021. CareFirst recognizes and appreciates the substantial effort by staff and others to modify and improve the MHAC program over the past year. Overall, we believe that this effort will result in significant improvements to the MHAC Program. We offer the following comments to the specific topic areas and recommendations listed below:

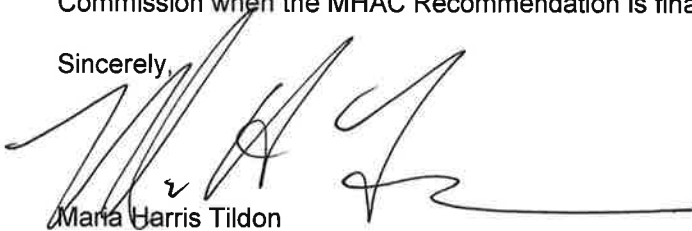
- 1. The MHAC Metrics Used:** We concur with the continued use of Potentially Preventable Complications (PPCs) to assess performance in reducing hospital-acquired complications and the decision to use of a smaller and more targeted list of 14 PPC categories. The selected PPCs represent clinically significant complications for which there is clinical evidence that demonstrates that clinicians can feasibly reduce the rate at which these PPCs occur. We also support the Staff's decision to monitor hospital performance on the PPCs now excluded from the Program, including the five PPCs that qualify as "serious reportable events." However, we would request that the Staff periodically report on such performance at future HSCRC public meetings.
- 2. Elimination of the "80% Exclusion" Adjustment:** We support the Staff's recommendation to eliminate the so-called "80% Exclusion" adjustment as this approach resulted in only 65% of PPC to be included in the payment program in the previous year. The requirement that the minimum number of at-risk discharges statewide for diagnosis and severity of illness level be raised from 2 to 31 discharges, along with the use of a smaller number of PPCs in the Program should sufficiently address the "Zero-Norm" issue in future years.
- 3. The MHAC Scoring Methodology:** We also agree with the recommendation to differentially weight PPCs based on national cost-weights, the use of a wider and more continuous scoring methodology and the move to an "Attainment Only" scale. As we have suggested previously, the hospitals with lower PPC rates should always fare better than hospitals with higher PPC rates in the incentive/ penalty framework. The use of an Attainment Only scale should help to achieve this result.
- 4. The Scaling Methodology:** With respect to scaling, Staff presented 2 options. CareFirst believes that hospitals' incentives should include provisions to promote continuous improvements. Therefore, we support the use of a linear scaling approach without the use of a "Hold Harmless Zone." Sheltering hospitals from rewards and penalties within such a zone diminishes the incentives to lower their rates of PPCs. At the January public meeting, Staff noted that the Hold Harmless Zone was used because it believes the MHAC scoring methodology is not precise enough to determine penalties or rewards in the middle area of the distribution. Under a continuous and linear scaling approach, we do not understand how or why the methodology is "less precise" in any particular range of the distribution. We support removal of the Hold Harmless Zone.

5. **“Cut-Point”**: We agree with staff that the use of a wider and more continuous scoring methodology requires that the “cut-point” (the point at which penalties end and rewards begin) be adjusted upward. Staff’s suggested that a 65% level makes sense given that under the wider performance standards hospital scores increase to a median of 62 percent. We support that level.

6. **Efforts to Develop National Norms**: Finally, we support the staff’s efforts to develop national norms for calibrating the MHAC methodology in the future. As Staff notes however, any comparison between Maryland and U.S. PPC performance must take into consideration the extent to which PPC rates have dropped in the state due to changes in documentation and coding. In this regard, we would encourage Staff to undertake analytic efforts to better understand the reasons for the reported MHAC reductions and correlate these reductions with improvements in other quality and utilization measures (such as readmission rates and or length of stay) that should be occurring concurrent with changes in reported rates of MHACs.

Thank you for the opportunity to submit these comments on the staff’s Draft Recommendations for the HSCRC’s RY 2021 MHAC policy. We request the opportunity to provide oral comments before the Commission when the MHAC Recommendation is finalized and is before the HSCRC for final action.

Sincerely,



Maria Harris Tildon

Renee J. Demski, MSW, MBA
Vice President of Quality
The Johns Hopkins Hospital and Johns Hopkins Health System
Armstrong Institute for Patient Safety and Quality
Office (410) 955-4313
Email: rdemski@jhmi.edu



January 18, 2019

Nelson Sabatini
Chairman
Health Services Cost Review Commission
4160 Patterson Avenue
Baltimore, Maryland 21215

Dear Chairman,

On behalf of the Johns Hopkins Health System (JHHS), thank you for the opportunity to provide input on the Draft Recommendation for the Maryland Hospital Acquired Conditions (MHAC) Program for Rate Year 2021 dated January 9, 2019.

JHHS strongly supports many aspects of the draft MHAC policy recommendation and is very appreciative of the collaborative process utilized to continuously improve the program:

- The focused list of 14 Potentially Preventable Conditions (PPCs) are considered more clinically relevant and useful for quality improvement. This focus should help advance statewide performance in eliminating potentially preventable harm.
- The wider and more continuous scale (0-100) for scoring each PPC is a welcome improvement that is expected to better differentiate and incentivize hospital performance.
- We support the continued exploration of potential national benchmarks for PPCs in future years. The current Maryland sample is relatively small in statistical terms and presents challenges such as those described later in this letter.
- We are hopeful that 3M-provided cost weights will serve as an effective proxy for the relative harm of each PPC. There is some concern that the cost factors under development by 3M may be substantially different than the set currently modeled. We strongly recommend modeling and testing the impact prior to implementation.

The change to attainment only scoring, rather than the previous scoring of the better of attainment and improvement, will likely have a negative impact on the performance scores of Maryland hospitals. The science of quality improvement references intrinsic versus extrinsic motivation as a critical component to drive results. Aligning incentives with the dedication of front-line staff to provide the highest quality and safest care would include both attainment and improvement. Many hospitals have scored better on year over year improvement than on absolute attainment. If an attainment only approach is chosen, then we recommend that the revenue scaling take this change into account.

JHHS has the most concern with the reliability of the indirect standardization methodology at the core of the MHAC program. The implementation lacks a correction that statisticians advise is required to address the multiplication by zero problem in the calculation of expected values. Our analysis indicates that 81% of the 7,382 possible combinations of PPC, diagnosis group and severity of illness used to establish statewide normative rates will have a zero value. At-risk cases that fall into these 81% of combinations will not contribute to the accumulation of an expected value. The majority of the remaining 19% of possible combinations only have a single observed PPC. This introduces a degree of randomness and instability that results in each hospital's expected values to be potentially underestimated. This is important since the ratio of observed to expected values is the foundation for performance measurement in the MHAC program.

JHHS and others expressed this concern last year and we greatly appreciate the work of HSCRC staff to implement a modest adjustment in RY2020. This adjustment is known as the "80% rule" and restricts the possible combinations to those where 80% of statewide PPCs occur. The draft RY2021 policy discontinues this adjustment. We strongly recommend a Bayesian or other statistical correction be applied to the methodology. If this is not possible for RY2021, then we request that the 80% rule be retained until a more permanent statistically-based correction approach can be developed.

The proposed cubic scaling curve for revenue penalties and rewards seems to be a good approach to provide more continuous scaling. The curve can be converted to tabular form so that hospitals can easily assess the penalty or reward associated with their performance. The proposed penalty/reward cut point at 0.65, however, is a substantial increase from 0.55 and may require a greater (~33%) statewide reduction in observed PPCs than intended for a single year. The 3M PPC grouper update to version 36 also seems to have a negative financial impact for many hospitals. We recommend that the revenue scaling cut point be reviewed considering all of these factors and uncertainties to include the zero-norm issue.

Finally, we greatly appreciate the annual opportunity for the Maryland healthcare industry to engage with 3M to improve the PPC specifications. We involve many physicians across clinical disciplines to share their clinical and research judgement. These engagements over the years have been generally productive. We reached consensus on the majority of issues over time, but it can be a lengthy process and disappointing when the recommendations of leading experts are not adopted. Therefore, we suggest an appeal process where HSCRC staff convenes a small panel of relevant clinical specialists to advise HSCRC on the merits of a recommended change and the rationale for denial. If the recommendation is upheld, then HSCRC would then have a variety of means available to address the discrepancy.

Thank you to HSCRC commissioners and staff who have demonstrated their willingness to ensure that all stakeholders contribute the ongoing success of the MHAC Program. This collaborative approach fosters ongoing engagement. We look forward to continued collaboration in our mutual efforts to support these critically important performance improvement initiatives.

Sincerely,



Renee Demski

cc: Joseph Antos, Ph.D., Vice Chairman
Victoria W. Bayless
John M. Colmers

James Elliott, MD
Adam Kane
Jack C. Keane



February 15, 2019

Nelson Sabatini
Chairman
Health Services Cost Review Commission
4160 Patterson Avenue
Baltimore, Maryland 21215

Dear Chairman,

On behalf of the Johns Hopkins Health System (JHHS), thank you for the opportunity to provide further input on the Draft Recommendation for the Maryland Hospital Acquired Conditions (MHAC) Program for Rate Year 2021 dated January 9, 2019. This letter supplements our input dated January 18, 2019 and focuses on the development of statewide norms and the revenue scale.

JHHS supports developing statewide norms for RY2021 based on two years of data as proposed by staff. This approach provides some small mitigation of the zero norm problem, the most significant concern in our prior letter. We continue to strongly recommend a statistically based correction to improve the reliability of the indirect standardization methodology at the core of the MHAC program.

JHHS supports the proposed non-linear scaling curve for revenue penalties and rewards. It is a good approach to provide more continuous scaling and focus the largest rewards and penalties on the performance outliers. We also recommend that the reward potential be balanced with the penalty risk at 2% of revenue.

The proposed penalty/reward cut point at 0.65, however, is a substantial increase from 0.55. We recommend the cut point remain at or near 0.55 based on a variety of modelling, sensitivity analyses, and the following factors and uncertainties:

- Lack of corrective factors for the indirect standardization methodology introduces a degree of randomness and instability that can result in a hospital's expected values to be underestimated.
- Discontinuation of the adjustment applied in RY2020 known as the "80% rule" that restricts the possible combinations of PPC, APR-DRG and SOI to those where 80% of statewide PPCs occur.
- The change to attainment only scoring will likely have a negative impact on the performance scores of Maryland hospitals.
- Lack of national benchmarks for PPCs and relatively small sample size within Maryland.
- 3M-provided cost weights are not yet available and need to be modelled and tested prior to implementation.
- Potential impacts of the 3M PPC grouper update to version 36.

We recommend that the revenue scaling cut point be reviewed considering all of these factors and uncertainties.

Thank you to HSCRC commissioners and staff for the collaborative approach that fosters ongoing engagement. The science of quality improvement highlights the importance of intrinsic versus extrinsic motivation as a critical component to drive results. Aligning incentives with the dedication of front-line staff to provide the highest quality and safest care will best achieve our mutual objectives.

Sincerely,



Renee Demski

cc: Joseph Antos, Ph.D., Vice Chairman
Victoria W. Bayless
John M. Colmers

James Elliott, MD
Adam Kane
Jack C. Keane



MedStar Health

8010 Suite O Corporate Dr.
Nottingham, MD 21236
410-933-2300 PHONE
medstarhealth.org

January 18, 2019

Alyson Schuster, Ph.D.
Associate Director, Performance Measurement
Health Services Cost Review Commission
4160 Patterson Avenue
Baltimore, Maryland 21215

Dear Alyson,

On behalf of MedStar Health, Inc. and our seven member hospitals, I appreciate the opportunity to comment on the Health Services Cost Review Commission's (HSCRC's) Draft Recommendation for the *Maryland Hospital's Acquired Conditions Program for Rate Year 2021*.

We have been advocating for many years for changes to the MHAC policy to focus on addressing clinical complications that are within the control of hospitals. The consensus MHAC choices will allow hospitals to develop processes to prevent harm and improve patient care. We appreciate the process that HSCRC undertook to gain input by all the members and to allow for very detailed discussions. We support the HSCRC recommendation and the Maryland Hospital Association's Comment Letter. We do want to emphasize conditional support of the cost weights pending review once we receive data to ensure they are reflective of the cost of a complication.

Thank you for the opportunity to comment. It was a pleasure to participate and assist in moving forward improvements to this pay for performance policy. We will be sending a letter in February related to the Scaling threshold.

Sincerely,

Stephen T. Michaels, M.D.
Chief Operating Officer and
Chief Medical Officer
MedStar St. Mary's Hospital
Senior Vice President
MedStar Health

Cc: Dr. Stephen Evans
Executive Vice President, Medical Affairs and Chief Medical Officer

Knowledge and Compassion
Focused on You



Maryland
Hospital Association

January 18, 2019

Alyson Schuster, Ph.D.
Associate Director, Performance Measurement
Health Services Cost Review Commission
4160 Patterson Avenue
Baltimore, Maryland 21215

Dear Alyson:

On behalf of the Maryland Hospital Association's 62 member hospitals and health systems, we appreciate the opportunity to comment on the Health Services Cost Review Commission's (HSCRC) *Draft Recommendation for the Maryland Hospital Acquired Conditions Program for Rate Year 2021*. HSCRC staff have invested considerable time and resources to conduct a thorough and inclusive process to improve the MHAC program. We have been part of the process and support most of the changes recommended. More detailed comments follow.

The payment scale should focus rewards and penalties on the highest and lowest performing hospitals because of concerns with the policy's risk adjustment and the lack of an external benchmark to evaluate hospitals' performance. We need more time to fully consider how the payment scale options that have been proposed best accomplish this objective and affect the overall program.

We have the following comments:

- Support narrowing the Potentially Preventable Conditions (PPCs) to the 14 included in the draft recommendation. The vetting process to identify the conditions that are clinically relevant and have evidence-based prevention strategies was driven by clinicians.
- Support an attainment-only policy for this year's MHAC policy in recognition of the substantial reduction in complications that have occurred since July 2009 when PPCs were first included in HSCRC value-based payment policy.
- Support expanding the ability to earn points between the 10th and 90th percentile. With the transition to attainment-only, the expansion is important to better differentiate scores, particularly scores below the median.
- Conditionally support weighting the PPCs by the additional cost of a PPC occurrence pending review of the cost weights under an ICD-10 version of the PPC grouper. The cost weights are a proxy for harm caused to patients by a complication and, as such, are a good way to weight the complications relative to one another. While the cost weights will likely change under ICD-10, we want to ensure that the weights relative to one another continue to match clinicians' view of harm.

Alyson Schuster, Ph.D.

January 18, 2019

Page 2

- We recommend increasing the maximum reward to 2 percent to match the 2 percent maximum penalty.
- HSCRC staff should continue to pursue ways to address the statistical concerns with risk adjustment. Of the 7,382 diagnostic related group and severity of illness cells included in the policy's risk adjustment, 81 percent have no observed complications. It is unclear whether the lack of a complication in a cell is because the true "expected" value is zero, or if there is simply not enough data to determine an expected rate. To continue to engage clinicians in the importance of this work, addressing these methodological issues will facilitate that buy-in. One approach could be to supplement the HSCRC methodology with national data. We stand ready to work with HSCRC to address these important issues.
- When 3M releases its national data set of hospital PPC performance, which includes ICD-10 coding, HSCRC staff should evaluate Maryland's hospitals' performance relative to this group. This data will inform opportunities for continued improvement and risk adjustment.

We appreciate the opportunity to be included in the redesign of the MHAC policy and to comment on the draft recommendations. We look forward to continuing to work with the commission on this and other policies.

Sincerely,



Traci La Valle

Vice President, Rate Setting

cc: Nelson J. Sabatini, Chairman
Joseph Antos, Ph.D., Vice Chairman
Victoria W. Bayless
John M. Colmers
James N. Elliott, M.D.

Adam Kane
Jack Keane
Katie Wunderlich, Executive Director
Dianne Feeney, Assoc. Director, Quality Initiatives
Allan Pack, Dir., Population-Based Methodologies



Maryland
Hospital Association

February 15, 2019

Alyson Schuster, Ph.D.
Associate Director, Performance Measurement
Health Services Cost Review Commission
4160 Patterson Avenue
Baltimore, Maryland 21215

Dear Alyson:

On behalf of the Maryland Hospital Association's 62 member hospitals and health systems, we appreciate the opportunity to submit additional comments on the Health Services Cost Review Commission's (HSCRC) *Draft Recommendation for the Maryland Hospital Acquired Conditions Program for Rate Year 2021*. In our January 18 letter, we commented on many of the features of the revised Maryland Hospital Acquired Conditions (MHAC) policy and asked for additional time to consider options for the payment scale or how each hospital's performance would be recognized with rewards, penalties, or held harmless.

After considering the options, we support the non-linear payment scale with a maximum reward and penalty of 2 percent of inpatient revenue. While both options have similar intents, the non-linear scale focuses rewards and penalties on the highest and lowest performing hospitals and more effectively addresses concerns with the policy's risk adjustment and lack of an external performance comparison to evaluate hospitals' performance. Since the rewards and penalties are tied to specific scores, either scale can be expressed as a two-column table. For hospital staff, both are easy to understand.

The ability to compare Maryland's hospitals' performance to a large data set outside of the state is critical to understanding whether our performance is mediocre, stellar, or poor. The HSCRC infers that Maryland has room to improve performance because there is variation in performance on individual complications across hospitals. However, it is not clear whether there is adequate risk adjustment or volume for this approach to be valid. Until we can make this comparison, reducing the rewards and penalties for hospitals performing in the mid-range will mitigate the revenue impact based on what may be arbitrary differences in performance.

We appreciate the additional time to consider the application of penalties and rewards in the MHAC policy. We look forward to continuing to work with the commission on this and other policies.

Sincerely,

Traci La Valle, Vice President, Financial Policy & Advocacy

cc: Nelson J. Sabatini, Chairman
Joseph Antos, Ph.D., Vice Chairman
Victoria W. Bayless
John M. Colmers
James N. Elliott, M.D.

Adam Kane
Jack Keane
Katie Wunderlich, Executive Director
Dianne Feeney, Assoc. Director, Quality Initiatives
Allan Pack, Dir., Population-Based Methodologies

**Draft Recommendation for the
MPA Efficiency Component
for Rate Year 2020**

March 13, 2019

Health Services Cost Review Commission
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SUMMARY

The following report includes a draft recommendation for the Maryland Rate Year (RY) 2020 MPA Efficiency Component recommendation that is designed to ensure that the State meets the Medicare savings targets in the Total Cost of Care (TCOC) Model Agreement, while also incentivizing hospitals to engage in care transformation initiatives. In order to accomplish these goals, the draft recommendation includes both a negative MPA Efficiency Component adjustment on hospitals' federal Medicare payments equal to the required Medicare savings under the TCOC Model as well as a positive MPA Efficiency Component adjustment to reward hospitals that produce total cost of care savings through care transformation initiatives.

At this time, the staff requests that Commissioners consider the following draft recommendations:

1. The Update Factor will be set to ensure that hospitals' Medicare payments do not exceed the Medicare TCOC Guardrail, thereby constraining the growth of hospital costs for all payers in the system. The MPA Efficiency Component will be set to attain additional incremental savings necessary to attain the \$300 million Medicare savings target by CY 2023.
2. The State will institute an MPA Efficiency Component on hospitals' Medicare payments for January to June 2020 equal to the sum of \$7.5 million, and any ECIP payments to hospitals and any payments to hospitals under the traditional MPA during the period.
3. Commission staff will work with hospitals through the Total Cost of Care Workgroup before deciding on the best method to allocate that \$7.5 million across hospitals.
4. Commission staff will continue to work with hospitals to develop opportunities to offset the MPA Efficiency Component payment reductions through care transformation, such as payments to hospitals who are successful in ECIP.

INTRODUCTION

The Maryland All-Payer Model ended on December 31, 2018, after the State successfully met or exceeded all its obligations to the federal government. The State met its savings obligations by targeting the annual growth rate of the hospitals' Global Budget Revenue (GBR) to be 0.50 percentage points less than the national growth rate in hospital costs. This approach relied on two policies: limiting the growth in the GBR, which created savings to all payers; and allowing hospitals to keep any utilization savings, which created the potential for savings to hospitals if they were successful at care transformation. Combined, the All-Payer Model both generated savings to payers and incentivized the creation of successful care transformation programs.

The Maryland TCOC Model replaced the All-Payer Model beginning January 1, 2019. The State committed to reach an annual Medicare total cost of care savings rate of \$300 million by 2023, inclusive of nonhospital costs. Because the State lacks regulatory authority over nonhospital providers, meeting the Medicare TCOC financial test will require a greater emphasis on initiatives that reduce nonhospital costs through care transformation. Currently, hospital GBRs do not capture utilization savings that occur outside of their GBR. Thus, there is relatively little incentive for hospitals to develop care transformation initiatives that target the total cost of care.¹ While a hospital's success at reducing total cost of care helps the State meet the Medicare TCOC financial test and increases the proportion of savings that come from nonhospital providers, the success of those initiatives do not benefit the hospitals themselves. The draft MPA Efficiency Component policy creates a reward mechanism for hospitals that produce total cost of care savings while ensuring that the TCOC savings targets are met.

BACKGROUND

The Medicare Performance Adjustment (MPA)

The TCOC Model Agreement (Section 8.c) allows the State to apply an MPA adjustment to hospital payments in order to reward/penalize hospitals based on their success at controlling Medicare total cost of care. The MPA itself is an adjustment in the amount paid by CMS to hospitals after a claim has been received by the Medicare Administrative Contractor (MAC). The State calculates the amount of the MPA and passes that amount to CMS, which then reduces all claims paid to the hospital by the indicated percentage. The MPA is additive with other adjustments applied by CMS prior to paying a claim, such as the sequestration adjustment.

The MPA has two components: 1) a "traditional" component (described in Section 8.c.5 of the TCOC Agreement), which creates a TCOC per capita benchmark by attributing beneficiaries to hospitals; and 2) an "efficiency" component (described in Section 8.c.6 of the TCOC Agreement), which allows the State to reward hospitals based on their efficiency in domains chosen by the State. CMS has approved the traditional MPA for RY 2020 and 2021 as well as an Efficiency Component based on a hospital's performance in the Episode Care Improvement Program (ECIP).

A hospital's net MPA is the sum of the Traditional and Efficiency Components. For example, a hospital that receives positive 0.5 percent adjustment on the traditional component and a positive 1.0 percent adjustment on the efficiency component will receive a net MPA of 1.5 percent. Once the MPA has been

¹ The State created the traditional MPA to hold hospitals accountable for the total cost of care of an attributed population. However, the amount of revenue at risk under the traditional MPA is less than what would be necessary to meet the Medicare savings targets.

determined, the State will inform CMS, which will begin applying the MPA generally at the beginning of the next quarter.

Calculating the MPA Efficiency Component

Under the agreement with the Centers for Medicare & Medicaid Services (CMS), the State committed to producing annual total cost of care savings of \$300 million by 2023. Prior to 2023, the State must meet incremental savings targets.

Staff recommends that if the current run rate is less than the required Medicare savings, the MPA Efficiency Component be equal to the difference between the Medicare TCOC run rate and the TCOC Model savings targets. For example, if the run rate is \$120 million in 2020 then the MPA Efficiency Component would be equal to \$36 million — that is, the \$156 million savings target minus the \$120 million run rate.

If the run rate in the State is ahead of schedule in 2019, staff recommends that the State continue to apply an MPA Efficiency Component equal to 25 percent of the difference between the run rate and the ultimate \$300 million savings target. The 25 percent is calculated based on using the MPA Efficiency Component over four years to reach the \$300 million target in CY 2023. For example, if the run rate is \$240 million in 2019 then the MPA Efficiency Component would be equal \$15 million in each year — that is, 25 percent x (\$300 savings target - \$240 run rate). Smoothing the MPA Efficiency Component accordingly ensures there is a predictable schedule for meeting the Medicare TCOC savings targets, and avoids large increases in the required savings in future years. Additionally, staff recommends making continuous progress toward meeting the savings targets in order to demonstrate continuous progress to CMS.

Staff is considering different options for allocating the MPA Efficiency Component to individual hospitals and requests comment from stakeholders for the final MPA Efficiency Component recommendation. Currently, staff supports a simple approach of allocating the MPA Efficiency Component to hospitals based on their share of statewide Medicare hospital payments. This part of the MPA Efficiency Component could then be applied as the same flat percentage adjustment across all Maryland hospitals.

Operations of the MPA Efficiency Component

Staff intends to calculate the MPA Efficiency Component during the spring of each year to coincide with the annual Update Factor development and stakeholder engagement. Staff believes that announcing both the MPA Efficiency Component and the annual Update Factor simultaneously will reduce hospitals' uncertainty about their Medicare revenues during the upcoming rate year and increase transparency in the HSCRC rate-setting process.

Because the Medicare TCOC savings are assessed on a calendar year basis and the Update Factor operates on a fiscal year basis, estimating the incremental savings to target with the MPA Efficiency Component will require projecting during the spring the following calendar year's total cost of care run rate. In order to reduce the uncertainty associated with run-rate projections, as opposed to actuals, staff recommends a two-step process for setting the MPA Efficiency Component:

1. Once CY 2018 Medicare data are available and projections made for CY 2019, staff will recommend an MPA Efficiency Component for the first six months of CY 2020 based on the current total cost of care run rate; and

2. Next spring, staff will recommend an update MPA Efficiency Component for the second six months of 2020 that is based on the total cost of care run rate as of January 2019.

To illustrate, this draft MPA Efficiency Component recommendation includes an adjustment that will begin on January 1, 2020. The recommended MPA Efficiency Component will be based on the TCOC run rate as of January 2019. This MPA Efficiency Component will apply for the first six months of CY 2020. Next spring, staff will recommend an updated MPA Efficiency Component that will begin on July 1, 2020, and run for the second six months of CY 2020, based on the run rate as of January 2020.

Staff expects that updates to the MPA Efficiency Component will be necessary as the run rate changes over the course of CY 2019. Staff considered either forecasting the total cost of care run rate for a complete annual MPA Efficiency Component or waiting until the end of 2019 to set the MPA Efficiency Component using actual run rate. However, both of these alternatives would have increased hospitals' uncertainty when estimating Medicare revenues through the annual Update Factor policy. Synchronizing the MPA Efficiency Component with the annual Update Factor policy ensures that hospitals will know their Medicare rate-year revenues as early as possible.

Link with Care Redesign Programs and Care Transformation Efforts

The MPA Efficiency Component will ensure that the State meets the Medicare TCOC Agreement financial test. The MPA Efficiency Component simply reduces the Medicare payments for hospital services in order to meet the Medicare savings targets beyond the levels obtained through the all-payer Update Factor. Through the GBR, the State reduces hospital prices in order to meet the hospital savings target as necessary; however, in the GBR, hospitals also are allowed to keep savings from reduced utilization in order to incentivize care transformation. Staff recommends linking the MPA Efficiency Component with the formal Care Redesign Programs as well as other care transformation initiatives.

The Care Redesign Program (CRP), which began in 2017, was developed to create incentives that allow for increased alignment among hospitals and nonhospital providers. The CRP allows hospitals to make incentive payments to nonhospital providers that participate in care transformation initiatives. The CRP began with two tracks, the Hospital Care Improvement Program (HCIP) and the Complex and Chronic Care Improvement Program (CCIP). While some savings may accrue to Medicare, these tracks were designed to align nonhospital providers with initiatives that produce TCOC and internal cost savings to hospitals under the GBR.

At the start of 2019, the State implemented a new track, the Episode Care Improvement Program (ECIP). ECIP was based on CMS's Bundled Payment for Care Improvement Advanced (BPCI-A) model and rewards hospitals for the post-acute care savings produced through better care management within 23 clinical inpatient episodes of care. If hospitals reduce the post-acute care costs in an episode, they receive a bonus payment on their Medicare hospital payments equal to the post-acute care savings in excess of 3 percent. The ECIP payments to hospitals are provided through a separate MPA Efficiency Component.

The ECIP reward mechanism incentivizes hospitals to establish care management programs. It allows hospitals to keep utilization savings produced in nonhospital settings, similar to GBRs allowing hospitals to keep internal utilization savings. Thus, ECIP pairs the incentive to develop care management initiatives that reduce the total cost of care with the MPA Efficiency Component to ensure the Medicare savings tests are met.

However, ECIP has limitations — most prominently, it only covers 23 inpatient episodes. Staff does not think ECIP alone will be sufficient to produce all total cost of care savings needed under the TCOC

Model. Additionally, ECIP does not account for other initiatives and programs that hospitals may have already created to reduce the total cost of care. Therefore, staff recommend developing additional opportunities for hospitals to achieve and quantify total cost of care savings. The MPA Efficiency Component will create Medicare total cost of care savings by reducing Medicare hospital payments prospectively, and hospitals will have an incentive to earn back some of their savings allocation through addressing total cost of care costs through care transformation.

In developing new opportunities and potential tracks for the MPA Efficiency Component, staff recommends the following principles:

1. Hospitals should keep the savings from their CRP initiatives to the extent feasible;
2. Existing care transformation programs should be rewarded and prioritized over designing new programs; and
3. New CRP tracks should be developed if waivers are necessary.

Staff intends to continue ECIP episode development while working with stakeholders to account for hospitals' existing care transformation efforts.

ANALYSIS

The TCOC Model was developed to encourage more than just a savings approach to Medicare. In addition to producing savings to Medicare, the State committed to transforming care in a valuable and sustainable way. In order to demonstrate the continued value of the Maryland Model to CMS, the State must demonstrate care transformation across the entire delivery system. This approach is especially important as nonhospital costs are included in the Medicare TCOC test. The State's regulatory authority does not extend to nonhospital providers. Thus, developing a care transformation approach for nonhospital costs is necessary to ensure that the burden of producing TCOC savings is shared by the entire delivery system.

The draft MPA policy recommends using the MPA Efficiency Component to incentivize hospitals to develop care management initiatives that reduce nonhospital costs. First, the MPA Efficiency Component will reduce hospital payments in order to meet the TCOC savings requirements. This is similar to the price lever used in the All-Payer Model, an annual Update Factor policy, which reduced the growth rate of hospital costs in order to meet the Medicare savings targets. Second, the MPA Efficiency Component will allow hospitals to keep savings they produce from nonhospital costs and offset what they may otherwise pay to meet the TCOC savings requirements. This is similar to the way that the GBR allows hospitals to keep hospital utilization savings under the GBR. Combined, the components of this policy will create savings to Medicare and incentivize the creation of successful care transformation programs that reduce the total cost of care.

Incentives to Participate in Care Transformation

Incentives to participate in care transformation in the nonhospital setting are critical to Maryland's success. Incentive payments made through the ECIP Incentive Payment will allow hospitals to keep the total cost of care savings they produce. For example, if a hospital produces \$5 million in savings under ECIP, they will receive a \$5 million incentive payment. On net, these programs will not produce total cost

of care savings. But since the incentive payments are made in the following year, those payments must be added to the TCOC run rate when calculating the MPA Efficiency Component for the following year.

Including incentive payments from CRP or other eligible care transformation activities when calculating the MPA Efficiency Component has two implications. First, it mitigates the possibility that these care transformation payments will result in a net increase in the TCOC run rate. Second, when a hospital captures the savings from their care transformation programs, it will spread a resulting increase in the MPA Efficiency Component across all hospitals. An example of the MPA Efficiency Component is shown in Table 2.

Table 1. Example MPA Efficiency Component for 2020

Medicare Run Rate		
2020 Medicare Run Rate	Predicted run rate as of January 2020	\$125 million
ECIP Incentive Payments	Payments for 2019 ECIP Performance	\$5 million
Net Medicare Run Rate	Run Rate – ECIP Incentive Payments	\$120 million
MPA Efficiency Component Calculation		
Medicare Savings Target		\$156 million
MPA Efficiency Component	2020 savings target – 2020 run rate	\$36 million

Allowing hospitals to capture the nonhospital savings they produce through care management creates an additional incentive for hospitals to participate in care transformation initiatives. As some hospitals begin to succeed in care transformation, the MPA Efficiency Component on all hospitals will increase. Hospitals that do not participate or have less successful care transformation initiatives will pay an increasing share of the required TCOC savings. Through this tradeoff, this policy will equally apply pressure for care transformation investment and prioritization.

Implications for the Update Factor

Under the previous All-Payer Model, the State set the update factor to have a “savings cushion” on the Medicare waiver test by setting the annual Update Factor policy to ensure that the Medicare hospital costs grew 0.5 percentage points less than national hospital costs. The savings cushion was set to ensure that the State produced the required \$330 million in cumulative five-year hospital Medicare savings. The draft MPA Efficiency Component recommendation includes an alternative approach to meeting the Medicare savings target. Staff therefore recommend eliminating the 0.5 percentage point savings cushion when setting the annual Update Factor policy. However, as the Model’s financial test is now assessed on the basis of the total cost of care, rather than just hospital spending, the Update Factor will need to ensure that excess nonhospital growth in Maryland is offset by slower growth in hospital costs.

Staff recommends the following two constraints on the annual Update Factor policy:

1. The Update Factor should ensure that the growth rate of Medicare total cost of care in Maryland grows less than national care growth; and
2. The Update Factor should ensure that hospital spending growth continues to grow less than the Gross State Product (GSP).

To ensure sustainable spending growth, the TCOC Model also includes additional Medicare TCOC Guardrail tests. First, Medicare TCOC growth in Maryland cannot exceed the national growth rate by more than 1 percentage point in any given year. Second, Medicare TCOC growth in Maryland cannot exceed national growth in any two consecutive years. These guardrails will not be breached if the State

sets the Update Factor to ensure that the growth rate of Medicare TCOC in Maryland remains less than national.

Calculating the MPA Efficiency Component for January-June 2020

Although the Medicare data may still be in flux, the Medicare savings run rate for CY 2018 is currently estimated at \$240 million, well in excess of the Medicare TCOC savings that the State committed to in the TCOC Model Agreement for CY 2019 (\$120 million). However, actual TCOC performance during CY 2019 could change. Nevertheless, based on this data, \$60 million in increased Medicare savings beyond national growth is needed to obtain the \$300 million target in CY 2023, or \$15 million per year for CY 2020-2023. This recommendation pertains to the portion of CY 2020 that falls in RY 2020 (January-June), which would amount to \$7.5 million based on the current numbers. If applied as a flat percentage reduction in the Medicare FFS payments to all Maryland hospitals, that percentage would be approximately 0.3 percent.

DRAFT RECOMMENDATION FOR RY 2020 MPA EFFICIENCY COMPONENT

Based on the assessment above, staff recommends the following:

1. The Update Factor will be set to ensure that hospitals' Medicare payments do not exceed the Medicare TCOC Guardrail, thereby constraining the growth of hospital costs for all payers in the system. The MPA Efficiency Component will be set to attain additional incremental savings necessary to attain the \$300 million Medicare savings target by CY 2023.
2. The State will institute an MPA Efficiency Component on hospitals' Medicare payments for January to June 2020 equal to the sum of \$7.5 million, and any ECIP payments to hospitals and any payments to hospitals under the traditional MPA during the period.
3. Commission staff will work with hospitals through the Total Cost of Care Workgroup before deciding on the best method to allocate that \$7.5 million across hospitals.
4. Commission staff will continue to work with hospitals to develop opportunities to offset the MPA Efficiency Component payment reductions through care transformation, such as payments to hospitals who are successful in ECIP.

Policy Update Report and Discussion

Staff will present materials at the Commission Meeting.

State of Maryland
Department of Health



Nelson J. Sabatini
Chairman

Joseph Antos, PhD
Vice-Chairman

Victoria W. Bayless

John M. Colmers

James N. Elliott, M.D.

Adam Kane

Jack C. Keane

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Health Services Cost Review Commission

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TO: Commissioners

FROM: HSCRC Staff

DATE: March 13 2019

RE: Hearing and Meeting Schedule

April 10, 2019 To be determined - 4160 Patterson Avenue
HSCRC/MHCC Conference Room

May 8, 2019 To be determined - 4160 Patterson Avenue
HSCRC/MHCC Conference Room

Please note that Commissioner's binders will be available in the Commission's office at 11:15 a.m.

The Agenda for the Executive and Public Sessions will be available for your review on the Thursday before the Commission meeting on the Commission's website at <http://hsrc.maryland.gov/Pages/commission-meetings.aspx>.

Post-meeting documents will be available on the Commission's website following the Commission meeting.