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Health Services Cost Review Commission

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**563rd MEETING OF THE HEALTH SERVICES COST REVIEW COMMISSION
July 10, 2019**

EXECUTIVE SESSION

11:30 a.m.

(The Commission will begin in public session at 11:30 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 June 12, 2019
2. Docket Status – Cases Closed

2481A - Johns Hopkins Health System 2482A - Johns Hopkins Health System
2483A - Johns Hopkins Health System
3. Docket Status – Cases Open

2484A - Johns Hopkins Health System 2486A - Johns Hopkins Health System
2485A - Johns Hopkins Health System 2487A - Johns Hopkins Health System
4. Monitoring Maryland
5. Draft Recommendation on Integrated Efficiency Policy
6. Policy Update and Discussion
 - Staff will provide an update on staff activities and other relevant subjects to the Commission.
7. 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 JULY 3, 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	File Status
2484A	Johns Hopkins Health System	6/4/2019	N/A	N/A	ARM	DNP	OPEN
2485A	Johns Hopkins Health System	6/27/2019	N/A	N/A	ARM	DNP	OPEN
2486A	Johns Hopkins Health System	6/27/2019	N/A	N/A	ARM	DNP	OPEN
2487A	Johns Hopkins Health System	6/28/2019	N/A	N/A	ARM	DNP	OPEN
2488A	Johns Hopkins Health System	6/28/2019	N/A	N/A	ARM	DNP	OPEN

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: 2294
* PROCEEDING: 2484A**

Staff Recommendation

July 10, 2019

I. INTRODUCTION

The University of Maryland Medical Center (“Hospital”) filed an application with the HSCRC on June 4, 2019 for an alternative method of rate determination under COMAR 10.37.10.06. The Hospital requests approval to continue to participate in a global rate arrangement with the Kaiser Foundation Hospitals and the Permanente Federation, LLC (“Kaiser”) for Heart Transplant and Mechanical Circulatory Support services for a period of one year beginning July 5, 2018.

II. OVERVIEW OF APPLICATION

The contract will be continue to be held and administered by University Physicians, Inc. (UPI), which is a subsidiary of the University of Maryland Medical System. UPI will manage all financial transactions related to the global price contract including payments to the Hospital and bear all risk relating to services associated with the contract.

III. FEE DEVELOPMENT

The hospital portion of the global rates was developed by calculating 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 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 between UPI and the Hospital holds the Hospital harmless from any shortfalls in payment from the global price contract.

V. STAFF EVALUATION

Although there was no activity under this arrangement, staff believes that the Hospital can

achieve a favorable experience under this arrangement.

VI. STAFF RECOMMENDATION

The staff recommends that the Commission approve the Hospital's application to continue an alternative method of rate determination for Heart Transplant and Mechanical Circulatory Support services, for a one year period commencing July 5, 2019. The Hospital 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 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.

Draft Recommendation on Integrated Efficiency Policy: Withholding Inflation for Relative Efficiency Outliers and Potential Global Budget Revenue Enhancements

July 10, 2019

Health Services Cost Review Commission

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This document contains the draft staff recommendations for creating an Integrated Efficiency Policy for the purposes of withholding inflation for outlier hospitals and awarding Global Budget Revenue enhancements for high performing hospitals. Please submit comments on this draft to the Commission by August 16, 2019, via email to hsrc.financial-methodologies@maryland.gov

Key Methodology Concepts and Definitions

1. Equivalent Casemix Adjusted Discharges (ECMADS) – Often referred to as casemix, ECMADS are a volume statistic that account for the relative costliness of different services and treatments, as not all admissions or visits require the same level of care and resources.
2. Inter-hospital Cost Comparison (ICC) Standard – Each hospital’s ICC revenue base is built up from a peer group standard cost, with adjustments for various social goods (e.g. trauma costs, residency costs, uncompensated care mark-up) and costs beyond a hospital’s control (e.g. differential labor market costs) that are not included in the peer group standard. The revenue base calculated through the ICC does not include profits. Average costs are reduced by a productivity factor ranging from 0 percent to 4.5 percent depending on the peer group. The term “Relative efficiency” is the difference between a hospital’s actual revenue base and the ICC calculated cost base]
3. Quality Adjusted Inter-hospital Cost Comparison (ICC) – A version of the ICC that incorporates hospitals’ Quality revenue adjustments, both negative and positive, to amend a hospital’s evaluated revenue and therefore the peer group cost standard as well as the hospital’s position relative to the ICC Cost Standard.
4. Volume Adjusted Inter-hospital Cost Comparison (ICC) - A version of the ICC that incorporates hospitals’ reduction in potentially avoidable utilization, as defined by the Potentially Avoidable Utilization Shared Savings Program and additional proxies for avoidable utilization. Volumes from this analysis, both negative and positive, amend a hospital’s final ICC calculated cost base – not the peer group cost standard - as well as the hospital’s position relative to the ICC Cost Standard.
5. Efficiency Matrix – A combined ranking of a hospital’s performance in the Inter-hospital Cost Comparison and Medicare Total Cost of Care growth rates. Both measures are weighting equally and hospitals are arrayed into quintiles to determine overall efficiency.

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Recommendations

Staff recommends the following:

1. Formally adopt policies to
 - a. Determine relative efficiency outliers;
 - b. Evaluate Global Budget Revenue enhancement requests
2. Use the Inter-Hospital Cost Comparison, including its supporting methodologies to compare relative cost per case for the above evaluations;
3. Use Total Cost of Care measures with a geographic attribution to evaluate per capita cost performance for the above evaluations;
4. Withhold the Medicare portion of the Annual Update Factor for efficiency outlier hospitals based on criteria described herein, effective January 1, 2020; and
5. Use set aside outlined in the Annual Update Factor (.1% in RY 2020) and funding secured from withhold from outlier hospitals to fund potential Global Budget Enhancement Requests.

Introduction

During the course of the All-Payer Model, the HSCRC annually made efficiency adjustments to hospital revenues based on their levels of Potentially Avoidable Utilization. In February of 2018, the HSCRC staff presented a strategic plan that had been formulated by the Commission after receiving public input. Several components of the plan addressed concerns regarding growing inefficiencies due to excessive retained revenue and a need not only for additional efficiency policies, but ones that reflect the goals of the Total Cost of Care (TCOC) Model. There were two key strategies to address these concerns. The first was to remove revenue from hospitals' global budgets when services were shifted to deregulated settings, in accordance with hospitals' agreements with the HSCRC. This ensures that a hospital's GBR does not include revenues for services that are provided outside of the hospital in unregulated space. The second was to enter into negotiated revenue reduction agreements with hospitals that were deemed outliers, as determined by cost-per-case under the Inter-hospital Cost Comparison (ICC) and by Medicare Total Cost of Care metrics.

Additionally, the Commission identified several critical building blocks that were needed to improve the ICC and the way in which per capita efficiency measures were incorporated into the Commission's efficiency methodologies. In response, staff has revised the underlying methodologies of the ICC, including completing an update to the outpatient case-mix methodology to break out accounts that are billed on a monthly basis into encounters, thereby allowing evaluation of the ICC on most hospital cases and revenues. More recently, staff has also amended the ICC to account for Quality performance and changes in Volume that have occurred as a result of a hospital responding to the incentives of the Model to reduce avoidable utilization. Additional enhancements to the ICC are described herein.

In response to directives to incorporate per capita efficiency measures into overall efficiency analyses in line with the TCOC Model, staff has developed an integrated efficiency methodology that uses and equally weights the Quality and Volume Adjusted ICC and Medicare Total Cost of Care growth calculations, together referred to as the Efficiency Matrix. Incorporating the traditional cost per case analysis with total cost of care growth analyses ensures that the HSCRC still adheres to its statutory mandate to ensure that charges are reasonably related to costs while at the same time incorporating new population based measures of reasonable cost in line with the per capita tests of both the All-Payer Model initiated in 2014 and the successor Total Cost of Care Model initiated in 2019.

While much work has been done to improve the Commission's efficiency methodologies, staff has not deployed them in an integrated fashion across all hospitals as staff continues to develop enhanced per capita measures of efficiency. To date, the HSCRC has addressed concerns that excess revenues were being inappropriately retained by hospitals by making \$80 million in adjustments for services that shifted to unregulated settings, including adjustments for oncology and infusion drugs shifted to unregulated settings. This figure also includes the first year of a negotiated revenue reduction plan for one outlier hospital, whose cost performance had been affected by service discontinuation and deregulation. Staff will continue to make adjustments for shifts to deregulated settings based on hospital disclosures and annual reviews. However, in order to expedite the process of adjusting revenues for high cost outlier hospitals, the HSCRC staff is now proposing a more formulaic approach to reduce excessive revenue by limiting rate updates for all cost efficiency outliers, effective January 1, 2020.

To implement formulaic revenue reductions, staff proposes withholding the Medicare portion of the RY 2020 Update Factor, on the basis of combined Quality and Volume Adjusted ICC cost-per-case results and Medicare Total Cost of Care growth performance, as evaluated through the Efficiency Matrix. Only Medicare fee-for-service data will be used in this evaluation as equivalent total cost of care data is not currently available for other payers. In acknowledgement of this limitation, any impact from this policy will be limited to the Medicare portion of a hospital's revenue, but the modification to a hospital's global revenue will be shared among all payers. Staff will also limit reductions only to hospitals that exceed one standard deviation of average Quality and Volume Adjusted ICC performance (1.21 times the ICC cost standard), which is in keeping with the UMMC Midtown revenue reduction agreement put in place during RY 2019 that brought the hospital's revenue down to a level of approximately 1.2 times the ICC cost standard. Over time, this policy, which will be implemented each year in concert with the Annual Update Factor Recommendation, will bring outlier hospitals to a level at or below 1.21 times the ICC cost standard.

Finally, in response to concerns about requests for GBR modifications, staff is also proposing in this policy to outline the metrics by which GBR enhancement requests will be evaluated. Specifically, staff proposes to similarly utilize the Efficiency Matrix to identify hospitals that perform best in a combined evaluation of cost-per-case and Medicare total cost of care growth. Moreover, staff also proposes that hospitals will only be deemed eligible for potential GBR enhancements outside of a full rate review if they perform better than one standard deviation

from average Quality and Volume Adjusted ICC performance (1.06 times the ICC Standard) and are in the best quintile of performance in the Efficiency Matrix. In this capacity, the HSCRC will create a symmetric policy that clearly and prospectively outlines the standards by which hospitals may potentially receive additional funding outside of a full rate review when deemed a positive performance outlier and guaranteed negative adjustments for poor performance.

This report outlines the changes to the ICC methodology and the proposed approach to expediting formulaic revenue reductions for outliers as well as identifying hospitals eligible for potential GBR enhancements. Future policy recommendations will address the processes for full and partial rate applications as well as the incorporation of additional efficiency tools.

Background

Efficiency Tools

In November 2015, full rate reviews were suspended to allow development of tools and methodologies consistent with the new All-Payer Model. Regulations were introduced at the September 2017 Commission meeting that updated filing requirements for full rate reviews and the moratorium on full rate reviews was lifted in November of 2017. At the November 2017 Commission meeting, staff put forward a final recommendation to the cost-per-case and per visit analysis - the Inter-hospital Cost Comparison (ICC) methodology, a tool that HSCRC staff proposes to continue using in evaluating hospitals' cost-per-case or per visit efficiency. At that time, staff recommended that the Commission defer formal adoption of an efficiency methodology because more work was required to develop additional efficiency tools, namely total cost of care analyses. Also, staff set out, with support of a technical workgroup, to refine the casemix methodology that serves as the basis for the volume statistic used in the ICC to evaluate cost-per-case efficiency, in accordance with Commission priorities.

While staff has utilized the ICC and various total cost of care growth analyses to support Commission proposals to modify hospitals' global revenues,¹ thereby implicitly approving these efficiency tools through adjudication, no formal policies are currently in place. It is important that formal policies reflective of all methodology enhancements are approved by the Commission to provide greater clarity to the industry and to allow for the Commission's methodologies to be more formulaic and uniform in their application.

In terms of the ICC, staff did not materially change the methodology from what was presented to the Commission in November of 2017. The ICC still places hospitals into peer groups based on geography/urbanicity and teaching status and then develops a peer group cost average, devoid of unique hospital cost drivers (e.g. labor market, casemix) and various social goods (e.g. residency programs), to ultimately build up hospital revenue for each hospital based on the calculated peer group cost average. The difference between a hospital's evaluated revenue and its revenue

¹ Anne Arundel Medical Center, Garret Regional Medical Center, UMMC Midtown Hospital

calculated from the ICC cost standard is the measure of a hospital's relative cost-per-case efficiency.

As aforementioned, one of the principal changes to the ICC evaluation was the modification to the casemix methodology, a methodology that provides more weights to services that are greater in clinical intensity and serves as the basis for the volume statistic used in the ICC. Prior iterations of the HSCRC casemix methodology had two major problems in the development of outpatient weights. First, the methodology did not account for differences in hospital billing behavior, for example cycle billing once a month versus billing for each patient visit. This led to unreliable weights for services that had a higher proportion of recurring visits (oncology, clinic, rehabilitation). The second flaw was that emergency room visits were given the same weights as clinic visits, even though emergency room visits are more costly. As a result of these concerns, 12.75 percent of revenue statewide was excluded from the RY 2018 ICC evaluation – the range for individual hospitals was 0.6 percent to 24.6 percent.

During the course of the summer of 2018, staff engaged stakeholders to address both of these problems with the casemix methodology. Staff decided to parse out all outpatient visits and associated Current Procedural Terminology (CPT) codes, rather than continuing to bundle all of the services contained in each patient bill. By unbundling cycle billed claims into visits, the HSCRC moved away from bundling claims based on unique hospital billing practices in favor of standard fixed length episodes. Furthermore, staff created additional summary categories by which ubiquitous CPT's were evaluated and weighted, i.e., CPT's that occur in multiple settings were separated based both on rate center charges and 3M categories and were weighted independent of one another.² This ensured greater homogeneity of weight development. As a result of the improvements in the reliability of the casemix methodology, the excluded outpatient revenue was reduced from over 12.75 percent to 4.88 percent of total revenue - oncology drug revenue is still excluded statewide from the RY 2019 ICC evaluation. The range for individual hospitals is 0 percent to 11 percent.³

Additional modifications to the November 2017 ICC include creating a differential cost estimate for indirect medical education costs of major academic medical centers versus other residency programs, limiting the resident and intern cost strip to the state average cost per resident, updating the input values to reflect RY 2019 revenue and RY 2018 casemix volume, and adjusting the ICC for Quality performance and changes in Volume., all of which will be discussed in greater detail in the *ICC Calculation* section below.

In terms of Medicare total cost of care, staff currently has two established tools for analysis, total cost of care growth relative to 2013 (the base year for the All-Payer Model) based on a strictly geographic attribution and total cost of care growth relative to 2015 based on the attribution in the Medicare Performance Adjustment (MPA), which incorporates patient and physician matching. There are pros and cons to each of these approaches in definitively determining per

² For more details on the revised casemix methodology see Appendix 1 and Appendix 2.

³ Please note that due to a staff proposed modification to the ICC methodology to include drug overhead costs in the ICC permanent revenue, which is discussed in the *Overview of ICC Calculation* subsection, the percentage of revenue excluded declines to 2.8%.

capita hospital performance efficiency because both are dependent upon the date by which growth is evaluated, i.e., the base year. The geographic attribution does not fully take into account the unique provider relationships a patient, physician, and hospitals have regardless of geography, especially in dense, competitive hospitals markets. On the other hand, the MPA cannot effectively go back to the start of the All-Payer Model, which is important because reductions in utilization that are contributing to hospital cost efficiency may have occurred before the MPA was implemented. For these reasons, staff will use the matrix of Quality and Volume Adjusted ICC cost-per-case results together with Medicare Total Cost of Care growth performance from 2013, as measured by the geographic attribution methodology, and work to incorporate total cost of care “attainment” benchmarks calculations into final efficiency determinations.

Efficiency Implementation

Withholding Inflation from Outlier Hospitals

In prior applications of the HSCRC efficiency methodologies, hospitals’ revenues were reduced under spend-down agreements if they were deemed to have cost-per-case beyond a set level. In another application of efficiency measures, hospitals with favorable hospital cost per case positions were given higher annual updates than those hospitals with poor relative costs per case. However, all of these prior iterations of efficiency analyses were based on fee-for-service mechanisms and did not have to account for relative cost efficiency in a per capita system. In a per capita system, a hospital aligned with the Total Cost of Care Model will reduce utilization by improving the health of the population, retain a portion of the revenue associated with the reduced utilization, and potentially appear to be less cost efficient in a cost per case analysis. Moreover, hospitals can confound this analysis in the global revenue era by reducing utilization through shifting services to non-hospital providers (referred to as deregulation), eliminating services outright, or by simply continuing to pursue additional volume growth beyond population and demographic driven changes. Despite these complexities, the HSCRC must still establish charges that are reasonably related to costs while also properly incentivizing hospitals to reduce unnecessary utilization and total cost of care.

For these reasons, staff cannot evaluate hospital cost per case or total cost of care analyses independently, and any combination of tools will not precisely identify hospitals’ efficiency ranking, especially near the mid-range of performance. Thus, staff will focus on outliers and recommend that high cost outliers have their Medicare share of the RY 2020 update factors withheld, effective January 1, 2020, based on a 50/50 weighting of Quality and Volume adjusted cost per case and geographic Medicare total cost of care growth calculations. Hospitals in the worst quintile of performance and in excess of one standard deviation of average Quality and Volume Adjusted ICC performance or 1.21 times the ICC standard will be deemed outliers. Additional work on Medicare benchmark analyses will take place over the summer of 2019. If a hospital is identified as a high cost outlier under the current tools, but appears to be highly efficient under newly developed “attainment” benchmarks, the Commission may want to defer a

revenue reduction for that hospital. Staff will also delay releasing the final standards by which a hospital qualifies for additional revenue through a rate application until benchmark analyses are completed.

Staff notes that this policy will be the first incremental step towards creating a formulaic use of efficiency methodologies in the per capita and global revenue era. Over time this policy will bring outlier hospitals in line with 1.21 times the ICC standard cost-per-case maximum.

Global Budget Revenue Enhancements

Staff's original efficiency outlier proposal was to limit the application of the policy to poor performing outlier hospitals. Positive revenue adjustments would be addressed through an additional policy on the evaluation of rate applications once total cost of care benchmarks were developed. However, concerns regarding GBR enhancement requests has prompted staff to also outline a methodology for evaluating excellent performing hospitals and describe a process by which additional revenue may be requested outside of a full rate application.

Specifically, staff proposes that all GBR revenue enhancements outside of a full rate application be limited to hospitals that are among the best performers in cost-per-case, as measured by a Quality and Volume Adjusted ICC, and Medicare total cost of care growth, as measured by a geographic attribution. This evaluation will mirror the analysis performed for determining poor performing outliers. For hospitals to receive a GBR enhancement outside of a full rate review, they must be in the best quintile of performance as evaluated in the Efficiency Matrix, they must be better than one standard deviation from average Quality and Volume Adjusted ICC performance (1.06 times the ICC standard) and they must submit a formal request to the HSCRC that outlines either: a) how a previous methodology disadvantaged the hospital; or b) a spending proposal that aligns with the aims of the Total Cost of Care Model. All revenue enhancements will be capped by the funding made available by the set aside in the Annual Update Factor approved by the Commission each year (.1% or ~\$17 million in RY 2020) and the funding derived from withholding inflation from poor performing outliers.

This process and proposed budget cap does not restrict hospitals from submitting a formal rate application request, which will be evaluated at this time by using total cost care growth, as measured by a geographic attribution, and the ICC that does not adjust for volume or Quality performance. Future policy recommendations will outline more precisely the ways in which hospitals will be evaluated in a full rate application once work has concluded on developing per capita benchmarks. Until such a policy is formally adopted, staff will continue using the tools that have been implicitly approved through adjudication.

Overview of Efficiency Calculations

Overview of ICC Calculation

The general steps for the ICC calculation, consistent with prior practices, are as follows:

1. Calculate approved permanent revenue for included volume as measured by ECMADs that will be evaluated in the ICC methodology. This excludes the hospital revenues for one-time temporary adjustments and assessments for funding Medicaid expansion, Medicaid deficits and user fees, such as fees that support the operations of the HSCRC.
2. Permanent revenues are adjusted for social goods (e.g. medical education costs) and for costs that take into consideration factors beyond a hospital's control (e.g. labor market areas as well as markup on costs to cover uncompensated care and payer differential).
3. Hospitals are divided into peer groups for comparison, recognizing that specific adjustments may not fully account for cost differences. The adjusted revenue per ECMAD is compared to other hospitals within the peer group to assess relative adjusted charge levels. The peer groups are:
 - Peer Group 1 (Non-Urban Teaching)
 - Peer Group 3 (Suburban/Rural Non-Teaching)
 - Peer Group 4 (Urban Hospitals)
 - Peer Group 5 (Academic Medical Center Virtual, which overlaps with peer group 4)
4. There are two additional steps to convert revenues to cost. The first additional adjustment is to remove profits (profit strip throughout) from regulated services from the adjusted revenues. The second is to make a productivity adjustment to the costs. These two adjustments are made to allow for consideration of efficient costs for purposes of rate setting.
5. After applying the calculated peer group cost average to each hospital, all costs that were removed in Step 2 (social goods and factors beyond a hospital's control) are added back to each hospital to build revenue up to the ICC calculated value. The profit strip and productivity adjustment outlined in Step 4 are not added back to a hospital's revenue. The difference between the ICC calculated value and the revenue included in the ICC evaluation, as described in Step 1, is the measure of a hospital's relative efficiency in relation to the ICC Cost Standard.

For a graphic outline of this process, please see Tables 1a and 1b.

Table 1a: Overview of ICC Cost Comparison Calculation Determining Peer Group Cost per Case (Stripping Down)

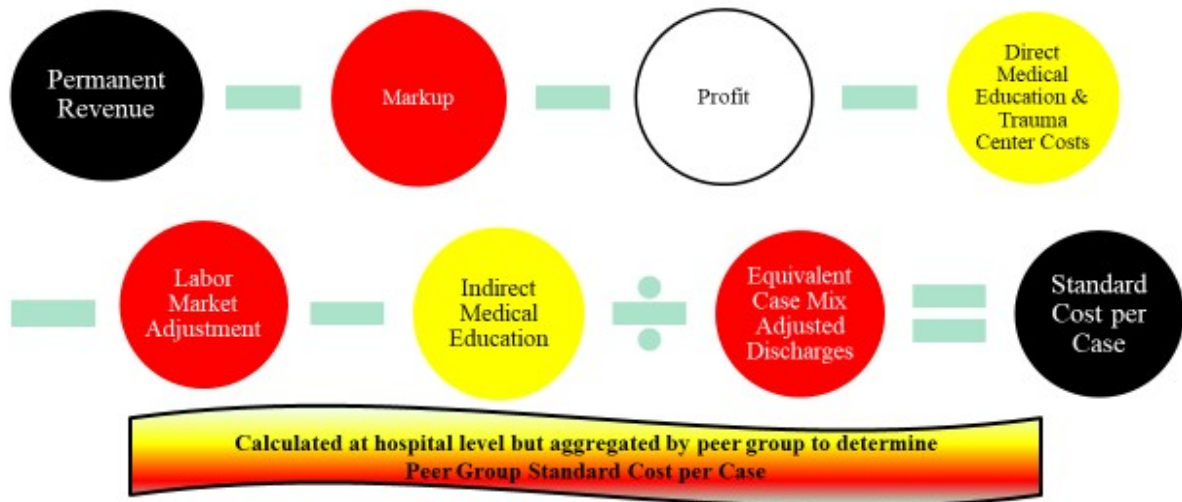
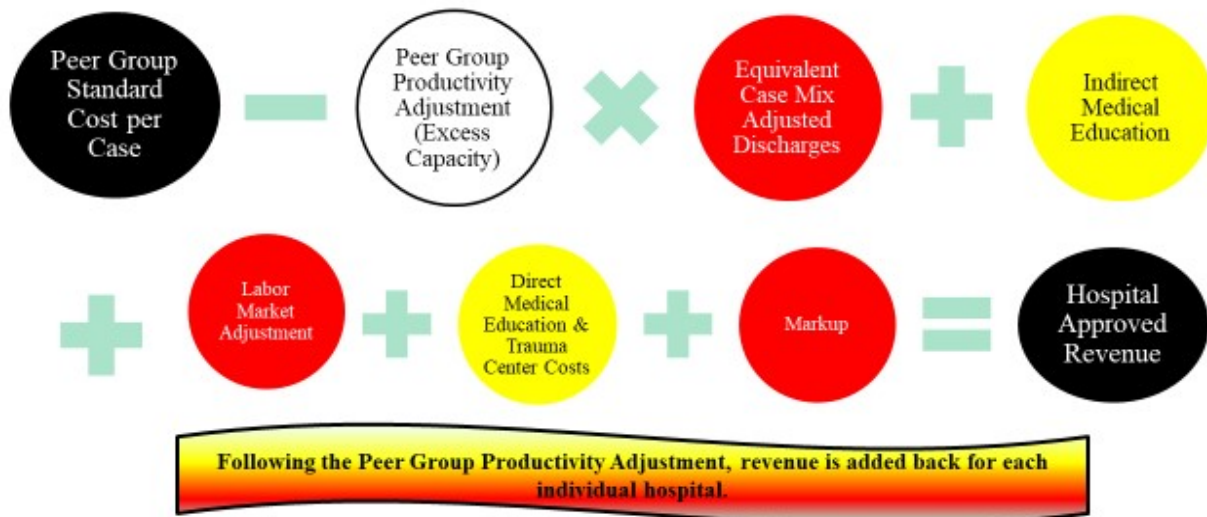


Table 1b: Overview of ICC Cost Comparison Calculation Determining Total Revenue (Building Back Up)



Proposed Changes to ICC Methodology

The staff will now discuss its considerations in proposing changes to the ICC relative to the methodology in effect in 2011.

Step 1- Calculate Permanent Revenue

A. Outpatient Drug Overhead Adjustment

As described in Appendix 1, staff has concluded its work in developing weights on outpatient cases, particularly cases that are subject to cycle billing and are ubiquitous across multiple outpatient settings. Staff did not develop usable weights for oncology and infusion drugs because these costs are highly variable by hospital due to various discounts that only certain hospitals receive, e.g., 340b discounts, and therefore do not offer a reliable efficiency comparison. As such, staff excluded oncology drugs from the cost-per case/visit comparisons but retained the charges/cost constituting drug overhead, especially since the magnitude of drug overhead allocations are not uniform across hospitals. In the HSCRC rate setting calculations, a significant portion of costs continues to be allocated based on “accumulated costs.” This process is allocating too much overhead to outpatient biological drugs, and staff has concluded that this allocation distorts cost comparisons.⁴

B. Quality Adjustments

Consistent with the desire of the Commission, staff proposes in iterations of the ICC that relatively rank hospitals to include Quality revenue adjustments in the ICC evaluation. Specifically, Quality will be incorporated by adding the inverse of RY 2019 Quality revenue adjustments into the revenue evaluated in the ICC such that hospitals with negative revenue adjustments will appear more costly in the cost per case evaluation. All Quality adjustments are incorporated, including the Readmissions Reduction Incentive Program, the Maryland Hospital Acquired Condition Program, and the Quality Based Reimbursement Program. Staff elected to modify ICC performance with Quality Revenue adjustments in lieu of evaluating Quality separately and then weighting rankings because the weighting would be arbitrary. Modifying the ICC with Quality adjustments implicitly reflects the weight the Commission has placed on the importance of the Quality programs, as the values are equal to percentage of revenue the Commissioners have deemed at risk for Quality performance.

Step 2- Adjustments to revenue

Adjustments to revenue along with changes to each adjustment methodology are proposed by staff below:

⁴ Medicare adds six percent to average sales price to pay for overhead on physician administered drugs that are not bundled into a visit cost, while non-governmental payers use a somewhat higher overhead figure on top of average sales price in their payment formulation. It is likely that HSCRC will need to change its overhead allocation and rate setting formulation for these biological and cancer drugs in the near term as costs continue to escalate. In the meantime, staff recommends retaining the overhead related revenues/costs in revenues evaluated under ICC charge-per case/visit comparisons.

A. Medical Education Costs

Consistent with past practices, direct medical education costs, including nurse and other training as well as graduate medical education (GME) costs, are stripped from the permanent revenues using amounts reported in hospitals' annual cost filings. HSCRC policies limited recognition of growth in residencies beginning in 2002, unless increases in residencies were approved through a rate setting process, consistent with Medicare policies that also limit recognition of growth in residencies. For the proposed ICC formulation, the staff is limiting the counts and costs used in the GME calculations based on the number of residents and interns that were included in the 2011 regression. Moreover, staff is capping direct medical education costs for hospitals to no more than the average direct cost per resident statewide, which in the RY 2018 annual filing was \$121, 771.

Over the years, the calculation of indirect medical education (“IME”) costs has been difficult. In 2011, the HSCRC reached a calculation after much debate of an IME allowance per resident of \$230,746. Staff believed this figure was too high for those hospitals that are not major academic medical centers with high ratios of residents per bed. As such, staff worked with a contractor to create a nationally calibrated two-peer-group model to determine major academic indirect medical education costs versus the IME costs per resident of other teaching hospitals.⁵ The criteria staff used for defining these two peer groups were as follows:

Table 2 Criteria used to define teaching intensity hospital peer groups

Teaching intensity	Major AMC	Number of beds	IRB ratio
High	Yes	500 or more	0.60 or higher
Moderate to Low	No	Fewer than 500	0.03 to 0.60

Source: AAMC website and HCRIS, 2013-2015.

AAMC = American Association of Medical Colleges; AMC = academic medical center; HCRIS = Hospital Cost Reporting Information System

IRB ratio=Number of Interns and Residents/beds

Using the most recent three years of national hospital data (2013–2015) from the Hospital Cost Reporting Information System⁶ and a regression that controlled for the other factors commonly

⁵ Several studies also show that major teaching hospitals (sometimes, though not always, defined as academic medical centers or AMCs) have higher IME costs than non-major teaching hospitals. In its 2007 Report to Congress, MedPAC (2007) reported separate IME cost estimates for AMCs and other teaching hospitals. The results showed a stronger relationship to cost in AMCs than in other teaching hospitals. The IME cost estimate for major AMCs (2.6 percent) was nearly double the estimate for other teaching hospitals (1.5 percent). Nguyen and Sheingold (2011) also reported that the impact of teaching intensity on costs was higher among large urban hospitals than other hospitals. They found that costs per case for large urban hospitals increased 1.4 percent for every 10 percent increase in the ratio of residents to beds, compared with a 1.1 percent increase over all teaching hospitals.

⁶ All Medicare-certified institutional providers are required to submit an annual cost report to a Medicare administrative contractor, which serves as the basis for the Hospital Cost Reporting Information System database.

associated with costs, such as hospitals' average patient severity and indigent care burden⁷, it was determined that IME costs among high-teaching intensity hospitals are \$302,887 and \$110,875 for low- and moderate-teaching intensity hospitals combined. These values were inflated from the 2015 analysis to be equivalent to RY 2019 dollars.

Table 3 Estimated IME costs, by hospital peer group, 2013–2015

Teaching intensity	IME coefficient (\$)	Standard error	P-value	95 percent confidence interval	
All	230,675***	11,753	0.000	207,639	253,711
High ^a	192,012***	41,873	0.000	109,942	274,082
Moderate and low (omitted group)	110,875***	17,216	0.000	77,132	144,619

Sources: HCRIS, 2013–2015; IPPS Impact File, 2013–2015.

Notes: The results are based on 124 hospitals in the high-teaching intensity group, 510 hospitals in the moderate-teaching intensity group, and 1,006 hospitals in the low-teaching intensity group.

^a To calculate the marginal effect for these groups, add the estimated IME coefficient with the estimated IME coefficient for the omitted group within a given model. Estimated IME costs for high-teaching intensity hospitals in the two-peer group model is \$302,887.

***Significantly different from zero at the .01 level, two-tailed t-test.

HCRIS = Hospital Cost Reporting Information System; IPPS = inpatient prospective payment system.

B. Labor Market Adjustment

In the prior ICC, the labor market adjustment was constructed using an HSCRC wage and salary survey that was based on two weeks of pay and included fringe benefits and contract labor. Each hospital was provided with a unique labor market adjustor that was more indicative of a hospital's ability or decision to pay salaries as opposed to the cost pressures hospitals face in various labor markets, and there were concerns about the consistency and accuracy of reported benefit levels and their impact on the measured wage levels. Staff suspended the wage and salary survey submission for 2017 and intends to replace this survey data with data that better accounts for labor costs hospitals cannot control. One potential solution is to utilize CMS's nationally reported data. Although this national CMS data is available historically, HSCRC staff has not had the opportunity to audit the data and there may be reporting errors. Staff and MHA have stressed the importance of accurate data in the 2017 reports to Medicare.

While staff will continue to use the HSCRC wage and salary survey in its formulation of the ICC until a new labor data source is available, it proposed in the 2018 ICC formulation to eliminate hospital specific adjustments for most hospitals. Specifically, the ICC will use two sets of

The cost report contains provider information such as facility characteristics, utilization data, cost and charges by cost center, in total and for Medicare.

⁷ Several variables (including hospitals' case-mix index, wage index, census region, and urban or rural designation) were derived from the IPPS Impact File, which CMS uses to estimate payment impacts of various policy changes in the IPPS proposed and final rules.

hospital groupings, with the first set of grouping for Prince George's County and Montgomery County where wages are higher than Maryland's average, and a second grouping of all other hospitals, excluding various border hospitals located in isolated or rural areas.

C. Capital Cost Adjustment

Previously, there was a capital cost adjustment for differences in capital costs, which was being phased out over time. The time has elapsed, and there is no longer an adjustment for capital cost differences.

D. Disproportionate Share Hospital (DSH) Adjustment

In the 2011 analysis, staff made an adjustment to charges for patients considered to be poor, in consideration of the cost burden that those patients may place on hospitals with higher levels of poor patients. Prior calculations utilized the percentage of Medicaid, charity pay, and self-pay to determine this cost burden.

Medicaid expansion has dramatically increased the number of individuals with coverage. First, the expansion was extended to children, then was extended to childless adults and those with higher incomes through the ACA expansion, rendering the prior definitions of limited use.

Additionally, with increased payments available to physicians for hospital and community based services and reductions in hospitals' uncompensated care, the financial reasons for potentially continuing this policy are more limited. To evaluate the need for this adjustment, HSCRC staff compared the case-mix adjusted inpatient charges of potentially poor patients at each hospital (Medicaid, a new category of dually-eligible for Medicare and Medicaid, and self-pay and charity) to the case-mix adjusted charges of all other patients. A weighted comparison using the more sensitive severity adjusted APR-DRG's showed a small higher adjusted charge-per-case for Medicaid and dually-eligible persons and a lower charge-per-case for charity and self-pay patients. This leads staff to conclude that this adjustment is no longer needed, although staff does believe that the retention of peer groups helps to adjust for other costs that might not otherwise be well accounted for, such as security costs in inner city settings.

While Medicare has retained a DSH adjustment, it has been split into two parts. One part is for uncompensated care, which the HSCRC addresses through the uncompensated care pool. The other part of the adjustment may help Medicare continue to address a concentration of governmental payers, as Medicare and Medicaid typically reimburse hospitals at a reduced rate. Given Maryland's unique All-Payer Model, which eliminates the cross subsidization between governmental payers and private payers as seen in other states, there appears to be a limited need for a DSH adjustment, and the charge comparisons do not support it.

Step 4- Productivity and Cost Adjustments

A. Profits

Staff has retained the same adjustment used to remove profits from the ICC costs, which has been used historically. Consistent with the statutory authority of HSCRC, the Commission does not regulate professional physician services. The adjustment removes profits for regulated services and does not incorporate subsidies or losses for professional physician services.

B. Productivity Adjustment

Staff recommends an alternative approach to calculate the productivity adjustment. In 2011, the methodology used a productivity adjustment of two percent that was applied across the board to all hospitals in all peer groups. Staff is recommending an excess capacity adjustment, which was formulated based on the declines in patient days (including observation cases >23 hours) from 2010 through 2018 in each peer group as well as the change in outpatient surgery days with a length of stay greater than 1 from 2013 to 2017. The adjustment varies by peer group.

- Peer Group 1 (Non-Urban Teaching) – 1.73 percent
- Peer Group 3 (Suburban/Rural Non-Teaching) – 2.94 percent
- Peer Group 4 (Urban Hospitals) – 4.46 percent
- Peer Group 5 (Academic Medical Center Virtual) – 0 percent

Due to concerns raised by stakeholders during the workgroup process, staff is modifying its original proposal such that all peer groups will be assessed a minimum threshold productivity adjustment of 2%. While staff still believes it is important to assess excess fixed costs in the system when determining hospital efficiency, thereby creating differentiation between desired levels of productivity improvement for each peer group, staff concurs that each peer group should have a minimum level of productivity improvement built into its ICC analysis. Thus, the productivity adjustment for Peer Group 1 will increase from 1.73% to 2% and Peer Group 5 from 0% to 2%.

Step 5- Building Up a Hospital's Permanent Revenue

A. Volume Adjustment

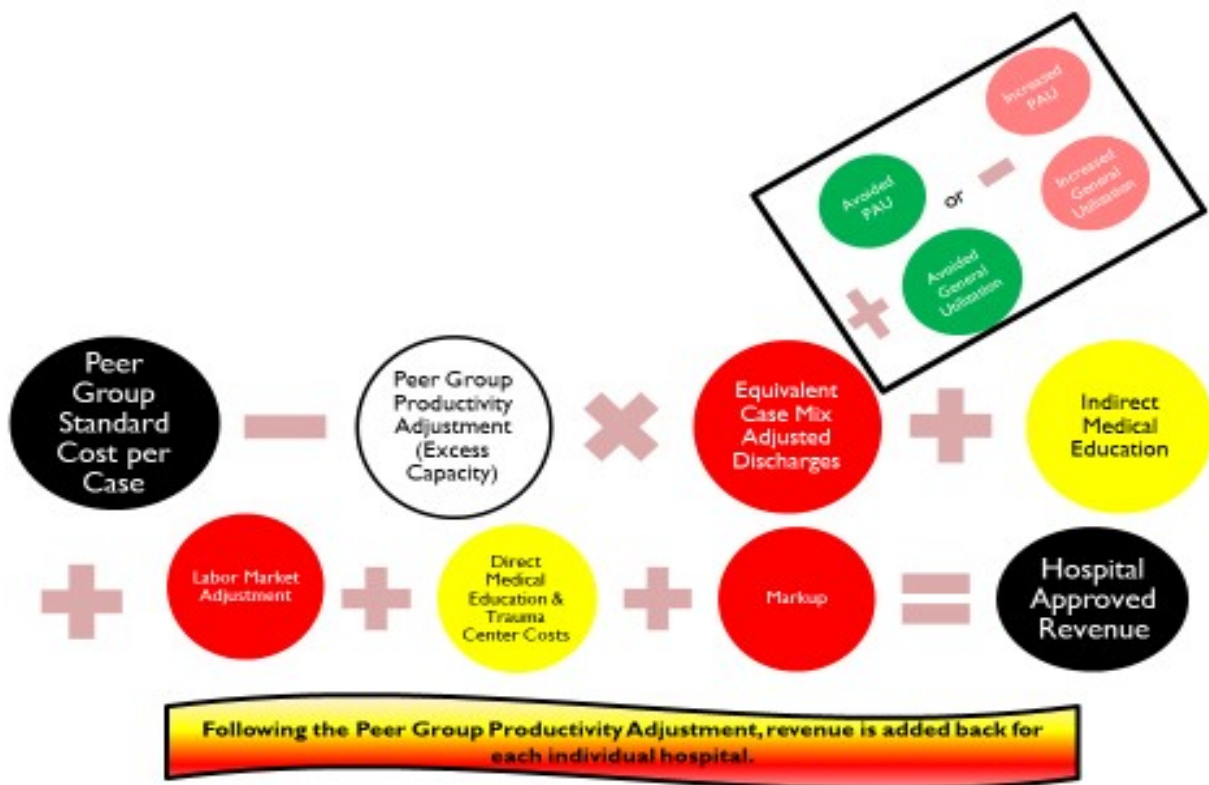
In iterations of the ICC that relatively rank hospitals for the purpose of identifying efficiency outliers, staff proposes to volume adjust the ICC. Specifically, growth rates for potentially avoidable utilization, as defined by the PAU Shared Savings program,⁸ and various types of medical services that represent additional proxies for avoidable utilization and have not been

⁸ In the PAU Shared Savings program, there are two volume measurements: readmissions that are specified as 30-day, all-payer, all-cause readmissions at the receiving hospital with exclusions for planned admissions; and hospitalizations for ambulatory-care sensitive conditions as determined by the Agency for Health Care Research and Quality's Prevention Quality Indicators (PQIs).

deregulated or shifted through the Market Shift methodology,⁹ will be assessed from CY 2013 to RY 2018. The inverse of PAU growth rates, both positive and negative, will be multiplied by a hospital’s PAU ECMADS, thereby adding or subtracting volume used in the final calculation of a hospital’s ICC approved revenue. That is, if a hospital reduced PAU over the course of the All-Payer Model, the volume will be added to its evaluation, thereby making the hospital appear more efficient in a cost per case analysis. Conversely, if a hospital increased PAU, volume will be removed from the ICC evaluation, thereby making the hospital less efficient.

For volume not identified as PAU, staff will incorporate utilization changes from 2013 by enumerating the ECMADS not recognized by the Market Shift methodology and similarly adding or subtracting the volume from the ICC evaluation. For a visual display of this calculation see table 4:

Table 4: Overview of ICC Cost Comparison Calculation Determining Total Revenue (Building Back Up) with Volume Adjustment



⁹ Included in the analysis of potentially avoidable utilization not incorporated in the PAU Shared Savings program are the following service lines: Cardiology, Dental, Dermatology, Diabetes, ED, Endocrinology, Electrophysiology/Chronic Rhythm Management, Gastroenterology, General Medicine, Gynecology, Hematology, HIV, Infectious Disease, Nephrology, Neurology, Inpatient Oncology, Ophthalmology, Orthopedics, Otolaryngology, Pulmonary, Rheumatology, Substance Abuse, and Urology. One exception to this list is CY 2016 Gastroenterology volume, which experienced large utilization declines due to the conversion from ICD-9 to ICD-10 and therefore is not a good proxy for avoided utilization.

Overview of Medicare Total Cost of Care Calculations

Staff is proposing to use the Medicare Fee-for-Service (FFS) per capita total cost of care growth (TCOC Growth) of a hospital's geographic attributed beneficiaries from CY 2013 to CY 2018 as the measure of growth in the efficiency evaluation.

Only Medicare FFS data will be used in this evaluation as equivalent total cost of care data is not currently available for other payers. In acknowledgement of this limitation, any impact from this policy will be limited to the Medicare portion of a hospital's revenue, but the modification to a hospital's global revenues will be shared among all payers.

Consistent with the Total Cost of Care (TCOC) Model, the cost used in this evaluation will include all types of medical costs (including both hospital and non-hospital services) with the exception of retail pharmacy.

Hospitals' TCOC growth will be ranked from least growth to most growth. The score from this ranking will be added to the ranking from the ICC. The worst performing quintile of hospitals will be subject to a revenue adjustment.

Geographic Attribution Approach

For the purpose of this calculation, a hospital's attributed beneficiaries will be determined based on the PSA-Plus (PSAP) method used for the geographic attribution layer of the Medicare Performance Adjustment attribution approved by the Commission in November 2017. Under this approach, beneficiaries are attributed based on their zip code of residence. Zip codes are attributed to hospitals through three steps:

1. Costs and beneficiaries in zip codes listed as Primary Service Areas (PSAs) in the hospitals' GBR agreements are assigned to the corresponding hospitals. Costs and beneficiaries in zip codes claimed by more than one hospital are allocated according to the hospital's share on equivalent case-mix adjusted discharges (ECMADs) for inpatient and outpatient discharges among hospitals claiming that zip code. ECMADs are calculated from Medicare FFS claims for the Federal fiscal years 2014 and 2015.
2. Zip codes not claimed by any hospital are assigned to the hospital with the plurality of Medicare FFS ECMADs in that zip code, if it does not exceed 30 minutes' drive time from the hospital's PSA. Plurality is identified by the ECMAD of the hospital's inpatient and outpatient discharges during the attribution period.
3. Zip codes still unassigned will be attributed to the nearest hospital based on drive-time.

Withholding Inflation from Outlier Hospitals

In this section, staff will provide the results of the Quality and Volume Adjusted ICC for RY 2019 permanent revenue as well as results for Medicare Total Cost of Care growth from 2013 to 2018 as measured by a geographic attribution. Using these two statistics and weighting each equally (50/50) staff will array hospitals into quintiles such that hospitals in the bottom quintile will be considered to be the most costly relative to hospital peers. Staff will furthermore remove hospitals that have a ratio of less than 1.21 of revenue versus the ICC cost standard, as 1/3 of hospitals are in excess of this standard and any larger representation of hospitals may run afoul of the intended outlier intention of this proposed efficiency policy. Staff will ultimately recommend that the remaining hospitals that are in worst quintile of performance, as outlined above, and are in excess of the 1.21 times the ICC cost standard, should have their Medicare portion of the RY 2020 update factor withheld, effective January 1, 2020. Over time this policy will bring hospitals within 1.21 times the ICC cost-per-case standard.

While hospitals were informed in Rate Year 2018 that the Commission intended to implement rate adjustments for high cost outliers, the proposed implementation date will allow industry and other stakeholders to validate results and will allow staff to continue to progress in developing All-Payer Total Cost of Care attainment benchmarks, which may be utilized to limit revenue adjustments for top performing hospitals. Staff will also assess the correlation between Total Cost of Care as measured by a geographic attribution and the MPA attribution to ensure that there is reasonable alignment between the results.

Global Budget Revenue Enhancements

In this section, staff will also provide the best performing quintile for RY 2019 Quality and Volume Adjusted ICC and Medicare Total Cost of Care growth from 2013 to 2018. Staff will furthermore remove hospitals that are not better than one standard deviation from average Quality and Volume Adjusted ICC performance or 1.06 times the ICC Cost Standard. The remaining hospitals will be considered favorably when submitting requests for GBR enhancements.

ICC Results

As aforementioned, the difference between the Quality and Volume Adjusted ICC evaluated revenue figure, the revenue that was actually inputted into the ICC methodology, and the Quality and Volume Adjusted ICC calculated value is a hospital's measure of efficiency relative to the ICC cost standard. Table 5 below demonstrates this measure of efficiency as both a dollar value and a percentage. The table is ranked in order of most favorable to least favorable.

**Table 5: RY 2019 Quality and Volume Adjusted ICC Efficiency Rankings
(Percentage and Dollar)***

	<u>Relative Efficiency to ICC Standard %</u>	<u>Relative Efficiency to ICC Standard \$</u>		<u>Relative Efficiency to ICC Standard \$</u>	<u>Relative Efficiency to ICC Standard \$</u>
Mercy Medical Center	-1.66%	-\$8,528,776	University Medical Center	-14.16%	-\$182,261,689
Suburban Hospital	-3.21%	-\$10,416,471	Washington Adventist Hospital	-15.29%	-\$41,673,597
Atlantic General Hospital	-4.05%	-\$4,170,939	Upper Chesapeake Medical Center	-16.72%	-\$54,845,419
Harbor Hospital Center	-4.58%	-\$8,565,405	Frederick Memorial Hospital	-17.00%	-\$59,007,366
Union Memorial Hospital	-5.06%	-\$21,660,958	Harford Memorial Hospital	-17.64%	-\$18,581,072
Fort Washington Medical Center	-5.18%	-\$2,603,823	Good Samaritan Hospital	-18.94%	-\$49,041,044
Anne Arundel Medical Center	-5.72%	-\$33,289,493	Sinai Hospital	-19.78%	-\$145,632,114
Garrett County Memorial Hospital	-7.56%	-\$4,489,716	Shore Medical Dorchester	-20.11%	-\$9,434,645
Holy Cross Hospitals	-8.22%	-\$50,354,068	Western Maryland Regional Medical Center	-21.18%	-\$66,054,020
Johns Hopkins Hospital	-9.46%	-\$207,166,669	Doctors Community Hospital	-21.46%	-\$53,107,700
Baltimore Washington Medical Center	-9.92%	-\$40,950,605	Carroll Hospital Center	-21.51%	-\$49,290,228
Johns Hopkins Bayview Medical Center	-10.48%	-\$64,968,927	Calvert Memorial Hospital	-21.55%	-\$29,878,914
Charles Regional	-10.58%	-\$16,105,690	Shore Medical Easton	-21.64%	-\$43,908,291
Howard County General Hospital	-10.61%	-\$32,025,634	Montgomery General Hospital	-23.14%	-\$39,504,043
Meritus	-11.00%	-\$36,745,066	Northwest Hospital Center	-23.72%	-\$60,893,533

Greater Baltimore Medical Center	-11.74%	-\$51,795,942	Chester River Hospital Center	-23.79%	-\$12,481,503
St. Agnes Hospital	-11.84%	-\$49,406,588	Southern Maryland Hospital Center	-23.81%	-\$64,978,865
Shady Grove Adventist Hospital	-12.70%	-\$49,188,110	Laurel Regional Hospital	-25.46%	-\$23,199,625
Peninsula Regional Medical Center	-13.11%	-\$56,167,790	Bon Secours Hospital	-25.54%	-\$27,650,670
St. Mary's Hospital	-13.43%	-\$23,806,937	UMROI	-26.31%	-\$27,002,915
Franklin Square Hospital Center	-14.01%	-\$71,535,958	UMMC Midtown	-26.32%	-\$54,432,525
St. Joseph Medical Center	-14.06%	-\$54,659,219	McCready Memorial Hospital	-26.98%	-\$4,169,096
Prince Georges Hospital	-14.08%	-\$42,288,861	Union of Cecil	-31.05%	-\$49,305,289

*Highlighted values represent hospitals that have an ICC calculated value in excess of standard deviation of average performance.

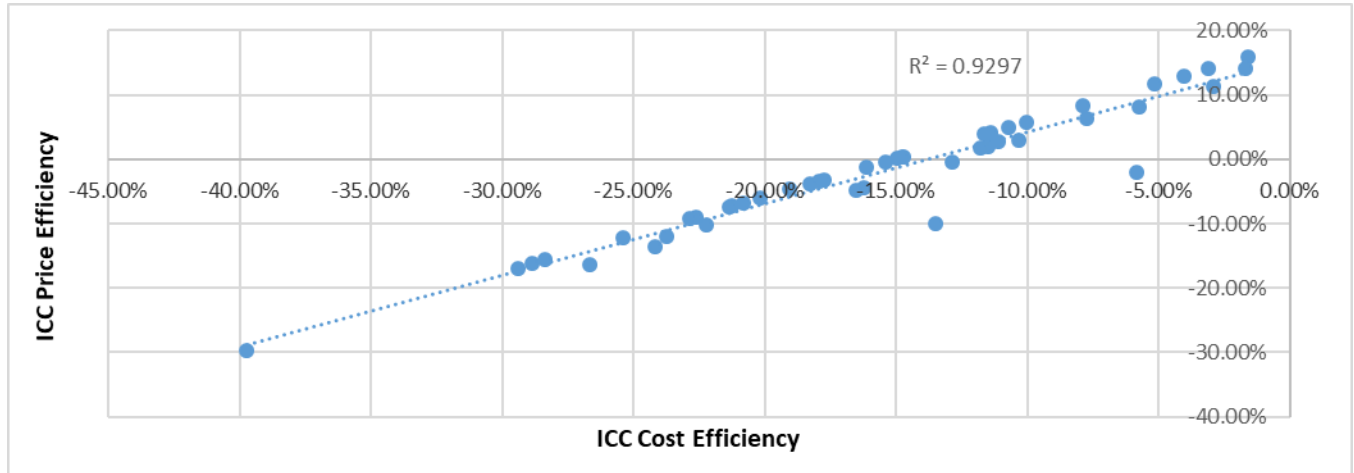
As shown, no hospitals are deemed more efficient than the ICC cost standard, but it is important to note that this is because the ICC standard has become more difficult to attain, since hospital profits have improved under the All-Payer Model.

While total profit margins are lower because of unregulated losses, most notably physician subsidies, staff has not made adjustments to the profits stripped from hospitals' revenue base to account for these losses. This is consistent with the statutory authority of HSCRC, as the Commission does not regulate professional physician services. Future work outlined in the *Future Policy Considerations* section below does indicate that staff will attempt in subsequent iterations of the ICC to credit unregulated losses that are in line with the incentives of the Total Cost of Care Model, but at this point staff will make no modifications.

Critics of the ICC have noted that not accounting for unregulated losses does not accurately portray the new costs associated with providing care in a population based per capita model. Staff agrees with this concern but notes that this is why the implementation of the efficiency policy incorporates total cost of care performance and only addresses outliers. Regardless of any imprecision in the ICC methodology, hospital prices per case grew rapidly in the global revenue era as volumes have declined or not risen. This is an expected outcome similar to the rise in per diem payments when length-of-stay initially fell under the DRG system. To ensure that charges do not become too high, especially given the proliferation of high deductible plans that consumers face, staff recommends using the combination of cost-per-case analyses and total cost of care to identify outliers. Moreover, staff notes that there is a high degree of correlation between high priced hospitals and high cost hospitals, as determined by the ICC (R=.96, R2=.93). This suggests that the hospitals identified in the outlier analysis are not just inefficient

in costs relative to their peers, but that they are also receiving reimbursement commensurate with their higher costs (see Table 6 below for the correlation analysis).

Table 6: Correlation between Hospital ICC Cost Efficiency and ICC Price Efficiency with no Productivity Adjustment



TCOC Growth Results

Using the geographic attribution described in the *Efficiency: Overview of Medicare Total Cost of Care Calculations* section, staff has determined that 20 hospitals had Medicare total cost of care growth from CY 2013 to CY 2018 less than or equal to the statewide average of 7.31%, and 26 hospitals had Medicare total cost of care growth in excess of this figure. Table 7 below shows the growth results for each performance year, compared to the base year of CY 2013. The final column showing the growth from CY 2013 to CY 2018 is used in the determination of cost outliers for RY 2020. Table 7 below shows the Medicare total cost of care growth attributed to each hospital, ranked from best to the worst total cost of care performance for CY 2018:

Table 7: Hospital Attributed Total Cost of Care Growth Performance

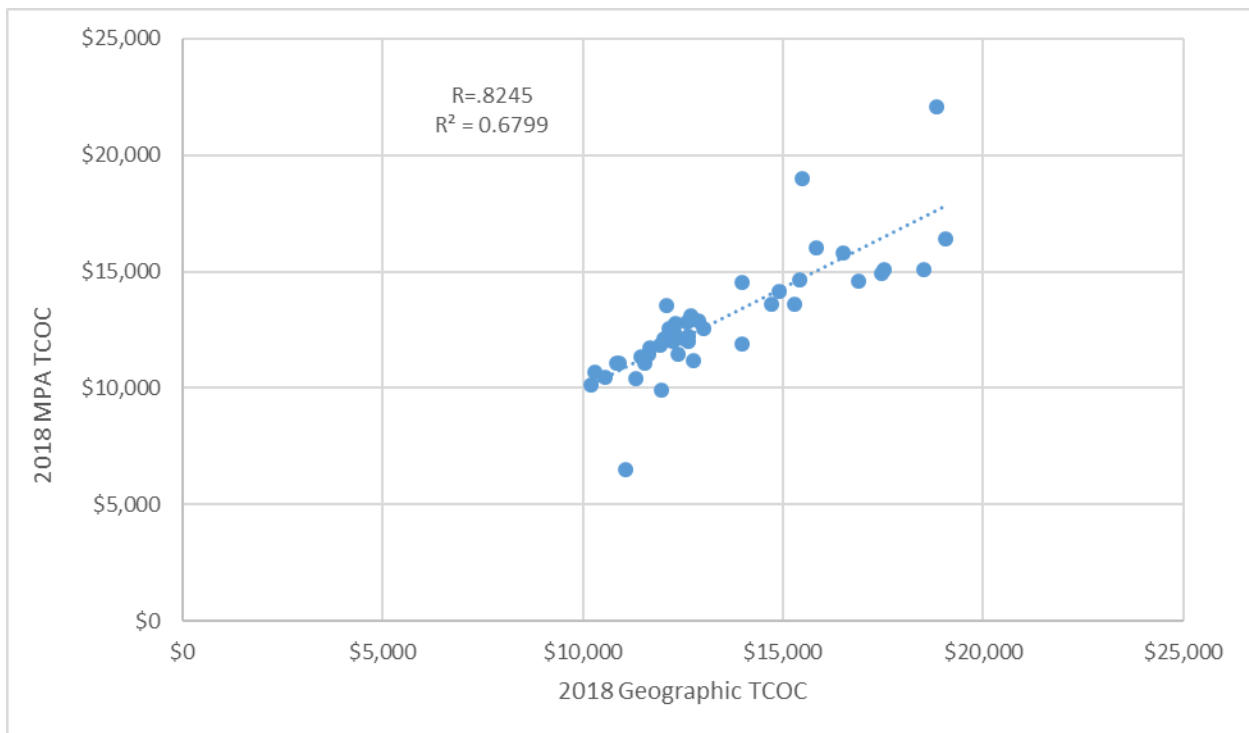
Hospital Name	2013 TCOC per Capita	2018 TCOC per Capita	14 vs 13	15 vs 13	16 vs 13	17 vs 13	18 vs 13
Greater Laurel Hospital	\$11,870	\$12,236	-4.09%	0.41%	-0.15%	6.62%	3.09%
Harford Memorial	\$12,201	\$12,621	-3.20%	-5.62%	0.04%	2.18%	3.44%
Anne Arundel Medical Center	\$10,173	\$10,533	-3.86%	0.12%	-1.55%	0.75%	3.53%
MedStar Southern Maryland	\$11,560	\$11,998	-0.85%	1.08%	0.35%	3.72%	3.79%
Johns Hopkins	\$16,842	\$17,483	-4.48%	-0.16%	-2.00%	2.24%	3.81%
Saint Agnes Hospital	\$13,418	\$13,968	-2.01%	-0.90%	0.55%	2.34%	4.10%
Washington Adventist	\$11,839	\$12,354	-1.47%	1.11%	1.18%	2.36%	4.35%
Doctors' Community Hospital	\$11,771	\$12,303	-3.29%	0.44%	3.55%	3.16%	4.52%

Atlantic General	\$10,805	\$11,346	-1.42%	-0.31%	-3.79%	3.81%	5.01%
UM Shore Medical Center at Easton	\$11,639	\$12,298	1.52%	2.22%	0.17%	2.70%	5.67%
UM Baltimore Washington Medical Center	\$11,885	\$12,596	0.04%	1.82%	1.59%	3.38%	5.98%
McCready	\$12,052	\$12,779	-8.28%	-4.48%	-4.04%	0.73%	6.03%
Johns Hopkins Bayview Acute Care	\$14,939	\$15,849	-1.18%	3.54%	3.76%	5.84%	6.09%
Meritus Medical Center	\$11,233	\$11,928	-4.03%	-1.09%	0.10%	3.38%	6.18%
Frederick Memorial	\$10,877	\$11,625	-2.35%	-0.20%	-0.49%	3.03%	6.88%
Western MD Health System	\$12,057	\$12,900	-2.54%	-0.56%	3.08%	3.68%	7.00%
Northwest Hospital	\$13,755	\$14,719	1.44%	2.33%	1.24%	6.10%	7.01%
Sinai Hospital	\$14,374	\$15,402	-0.07%	1.76%	1.49%	5.85%	7.15%
UM Shore Medical Center at Chestertown	\$11,668	\$12,504	5.22%	4.98%	2.52%	9.52%	7.16%
Levindale	\$14,242	\$15,283	-0.24%	1.42%	1.31%	5.63%	7.31%
Holy Cross Hospital	\$10,678	\$11,500	-0.51%	1.55%	1.26%	4.38%	7.69%
Calvert Memorial	\$10,763	\$11,607	-3.09%	2.40%	0.01%	2.74%	7.84%
Carroll County General	\$11,243	\$12,126	-2.50%	-0.58%	-1.75%	5.73%	7.85%
MedStar Franklin Square	\$13,827	\$14,917	-1.17%	0.87%	1.82%	6.17%	7.88%
Howard General Hospital	\$10,034	\$10,828	1.97%	0.49%	3.80%	4.49%	7.92%
Peninsula Regional	\$11,191	\$12,139	0.62%	1.09%	0.95%	7.68%	8.48%
MedStar Saint Mary's Hospital	\$11,028	\$12,008	-1.92%	0.99%	1.79%	6.81%	8.89%
Upper Chesapeake Medical Center	\$11,209	\$12,219	2.52%	2.99%	0.96%	6.40%	9.01%
Mercy Medical Center	\$16,046	\$17,526	-0.13%	2.31%	2.21%	7.42%	9.23%
MedStar Union Memorial	\$15,067	\$16,504	1.22%	7.46%	3.00%	9.32%	9.53%
Bon Secours	\$17,271	\$19,052	-2.89%	-2.62%	0.33%	4.50%	10.31%
Prince George's Hospital Center	\$12,624	\$13,937	4.64%	5.23%	7.14%	9.93%	10.40%
Fort Washington	\$10,788	\$11,911	7.30%	7.03%	7.07%	5.44%	10.42%
Shady Grove Adventist	\$9,833	\$10,887	-0.38%	4.77%	3.47%	5.92%	10.71%
Union of Cecil	\$11,467	\$12,722	3.95%	-0.28%	3.46%	10.02%	10.94%
University of Maryland	\$16,692	\$18,533	1.24%	0.77%	3.45%	6.93%	11.03%
Holy Cross Germantown Hospital	\$9,967	\$11,071	0.93%	7.45%	6.52%	5.98%	11.08%
Greater Baltimore Medical Center	\$11,417	\$12,691	-0.53%	3.98%	3.51%	8.86%	11.15%
UM Saint Joseph Medical Center	\$11,701	\$13,006	-0.56%	3.01%	3.36%	8.85%	11.16%
UM Charles Regional Medical Center	\$11,286	\$12,610	-4.10%	3.77%	3.79%	5.29%	11.72%
Suburban Hospital	\$9,131	\$10,260	0.84%	4.85%	2.00%	5.49%	12.37%
MedStar Montgomery General	\$10,149	\$11,425	1.98%	3.65%	3.15%	9.14%	12.57%
UM Medical Center Midtown Campus	\$16,708	\$18,820	3.19%	2.89%	4.79%	9.95%	12.64%
MedStar Good Samaritan	\$13,723	\$15,496	3.43%	6.62%	7.20%	12.75%	12.93%
MedStar Harbor Hospital	\$14,315	\$16,897	-1.11%	7.44%	10.00%	12.61%	18.04%
Garrett County	\$8,503	\$10,201	-1.60%	8.34%	5.33%	11.58%	19.96%
Maryland Statewide	\$11,767	\$12,627	-0.58%	1.84%	1.57%	5.02%	7.31%

As aforementioned, staff has concerns about the geographic attribution versus the provider driven attribution in the Medicare Performance Adjustment (MPA). However staff recommends using the geographic attribution because it is important to evaluate total cost of care growth relative to the beginning of the All-Payer Model. If hospital utilization from a hospital’s primary service area was successfully avoided prior to the implementation of the MPA and was not substituted elsewhere, the use of total cost of care performance helps mitigate a hospital’s perceived ICC cost inefficiency within the hospital.

Regardless, staff felt it was still important to test correlation between results in the MPA and the geographic attribution to assuage concerns that efficiency rankings could potentially be very different. As shown in Table 8, there is a strong relationship between CY 2018 total cost of care performance based on the MPA and geographic attributions, suggesting the attributions yields similar results:

Table 8: Correlation between Total Cost of Care Attainment as measured by Geographic and MPA attributions



Staff cannot run similar analyses to determine similarity between 2013 geographic and MPA attainment due to data limitations and, therefore, cannot definitively determine if the growth calculations are similar under both methodologies. However, staff notes the similarity in the 2018 results and supports the geographic attribution to enable the measurement of performance back to 2013. As previously noted, completion of attainment benchmarks will provide an important enhancement to total cost of care growth comparisons.

Implementation of Efficiency Results

Withholding Inflation from Outlier Hospitals

Staff recognizes that any combination of cost-per-case and total cost of care tools does not precisely identify a hospital's efficiency rank order, especially near the median of performance, and staff believes that implementation of an efficiency policy should align with historical HSCRC policies to focus on outliers. Moreover, a central limitation in these analyses is that the total cost of care tools are Medicare only.

Therefore, staffs recommends weighting equally the two rankings from the Quality and Volume Adjusted ICC and geographic total cost of care growth calculations to array hospitals into quintiles such that hospitals in the bottom quintile will be considered the least efficient and hospitals in the top quintile will be considered the most efficient relative to hospital peers. Staff furthermore recommends removing hospitals that have an index of revenue to the ICC cost standard of less than 1.21 from the revenue reduction proposal, to ensure that the HSCRC limits revenue reductions to outliers. Finally, staff recommends that the remaining hospitals, deemed outliers as outlined above, should have the Medicare portion of their RY 2020 update factor withheld, because the total cost of care analyses were limited to Medicare. Over time this policy will bring hospitals in line within the standard proposed for the spend-down limit.

In looking at the array of hospitals according to a 50/50 ranking of Quality and Volume Adjusted ICC and geographic total cost of care growth ranking, staff identified nine hospitals that met the initial categorization of outliers. See Table 9 for results:¹⁰

Table 9: Outlier Hospitals as Determined by ICC & Geographic TCOC Rankings – Efficiency Matrix

Hospital Name	ICC Result	ICC Rank	2013-2018 TCOC per Capita Growth Rate	TCOC Rank	Total Rank Points (Low Score is Better)
University of Maryland Shore Medical Center at Chestertown	-23.79%	39	7.16%	20	59
University of Maryland Medical Center	-14.16%	24	11.03%	36	60
University of Maryland St. Joseph Medical Center	-14.06%	22	11.16%	39	61
MedStar Good Samaritan Hospital	-18.94%	29	12.93%	44	73

¹⁰ For the complete array of hospitals based on ICC ranking and TCOC ranking, see Appendix 4

Bon Secours Hospital	-25.54%	42	10.31%	31	73
MedStar Montgomery Medical Center	-23.14%	37	12.57%	42	79
University of Maryland Rehabilitation & Orthopedic Institute	-26.31%	43	11.03%	36	79
Union Hospital of Cecil County	-31.05%	46	10.94%	35	81
University of Maryland Medical Center Midtown Campus	-26.32%	44	12.64%	43	87

Of these hospitals, two were removed from consideration because they already have preexisting arrangements with the HSCRC to address their cost inefficiencies, University of Maryland Medical Center Midtown Campus and Bon Secours Hospital. Staff also removed University of Maryland St. Joseph Medical Center, University of Maryland Medical Center, and MedStar Good Samaritan Hospital because these hospitals had an index of relative efficiency that was better than the 1.21 maximum level staff proposes for the application of formulaic revenue adjustments. Again, it is important to note that the ICC standard already removes 9 to 13 percent of revenue depending on the peer group.

Of the remaining hospitals, staff calculated that withholding the Medicare portion of the RY 2020 Update Factor, which is measured by multiplying a hospital's Medicare fee for service share of total hospital revenue estimated for RY 2020, would remove \$7.1 million.

Table 10: RY 2020 Medicare Update Factor Withhold for Outlier Hospitals

Hospital Name	RY 2019 Permanent Revenue	Utilized Medicare FFS %	Medicare Portion of RY 2019 Permanent Revenue Base	Update Factor	Potential Cap on Withhold per Efficiency Matrix	Mid-Year Implementation
<i>Algebra</i>	<i>A</i>	<i>B</i>	<i>C=A*B</i>	<i>D</i>	<i>E=D*C</i>	<i>F=E/2</i>
University of Maryland Shore Medical Center at Chestertown	\$53,535,766	54%	\$28,741,656	3.35%	\$962,845	\$481,423
University of Maryland Rehabilitation & Orthopedic Institute	\$120,383,835	32%	\$39,032,073	3.35%	\$1,307,574	\$653,787
Montgomery General Hospital	\$176,329,979	46%	\$81,160,559	3.35%	\$2,718,879	\$1,359,439
Union Hospital of Cecil County	\$160,537,054	39%	\$63,405,655	3.35%	\$2,124,089	\$1,062,045
Total	\$510,786,634	42%	\$212,339,943		\$7,113,388	\$3,556,694

Staff notes that because implementation of this methodology will not take place until January 1, 2020, the actual reduction to global budgets in RY 2020 will be \$3.6 million. Staff recommends that this process continue in future rate years with total cost of care benchmark analyses for all-payers so outlier hospitals can more quickly be brought in line with their peers.

Global Budget Revenue Enhancements

As aforementioned, this draft recommendation also attempts to outline the process by which hospitals will be evaluated when GBR enhancement requests are submitted to the HSCRC. Specifically, for a hospital to receive a GBR enhancement, it must be in the best quintile of performance as evaluated in the Efficiency Matrix, it must be better than one standard deviation from average Quality and Volume Adjusted ICC performance (1.06 times the ICC standard) and it must submit a formal request to the HSCRC that outlines either: a) how a previous methodology disadvantaged the hospital; or b) a spending proposal that aligns with the aims of the Total Cost of Care Model.

Because this proposal still requires hospitals to submit a formal proposal to the HSCRC in order to successfully receive a GBR enhancement, staff will not outline the exact amounts a hospital may receive under such a policy. However, in Table 11 below staff does outline the hospitals that currently would be eligible for a GBR enhancement:

Table 11: Hospitals Eligible for a GBR Enhancement in RY 2020

Hospital Name	ICC Result	ICC Rank	2013-2018 TCOC per Capita Growth Rate	TCOC Rank	Total Rank Points (Low Score is Better)
Mercy Medical Center	-1.66%	1	9.23%	29	30
Atlantic General Hospital	-4.05%	3	5.01%	9	12
Anne Arundel Medical Center	-5.72%	7	3.53%	3	10

Future Policy Considerations

While staff believes the efficiency methodologies and implementation proposal are sound, staff acknowledges that more work is needed to refine the ICC and total cost of care analyses. Staff describes below various work streams to improve the efficiency methodologies.

For the ICC, staff will endeavor to create a new labor market adjustment, which requires both methodological development work, as well as revised data submission and auditing protocols. Additionally, staff will work to include in national analyses that were completed for inpatient efficiency evaluations of the State's two major academic medical centers. Staff plans to complement these analyses by incorporating them into an outpatient-only ICC that will effectively evaluate the State's two academics both on a national level for inpatient services and on a Maryland peer group level for outpatient services. Finally, staff will continue the work to quantify the investments hospitals are making in unregulated settings that are in line with the incentives of the Total Cost of Care Model, thereby providing a path for hospitals to acquire credit in the ICC evaluation when retained revenues are used to improve health outcomes.

In terms of total cost of care, staff will be focused on completing total of care benchmarks. The enhanced total cost of care benchmark approach¹¹ will rely on three primary components. Currently these components are all associated with Medicare fee-for-service costs only; results for other payers will be considered in the future. The components are:

- (1) Average per capita Medicare fee-for-service total cost of care growth for each hospital based on the beneficiaries attributed to that hospital by the MPA attribution approach approved by the Commission in November 2017. Under this approach, Medicare fee-for-service beneficiaries are attributed to hospitals in a tiered fashion with the higher tiers reflecting relationships established between beneficiaries and primary care providers and hospitals. These relationships are established via a mapping similar to that used by the Maryland Primary Care Program or via an ACO. Beneficiaries not assigned on this basis are assigned based on historical utilization patterns and for beneficiaries with limited or no historic utilization, based on geography.
- (2) Cost benchmarks established for each Maryland County, based on costs for demographically similar counties throughout the country. Similar counties were identified in two steps (1) narrowing possible benchmark counties for each Maryland county to those of a similar population size and density and (2) from the narrowed list selecting the counties with the closest match to the Maryland county in terms of four demographic characteristics: level of deep poverty, median income, price parities and clinical risk as measured by the CMS Hierarchical Condition Category Score (HCC). For the five largest Maryland counties, where there are less possible comparable counties, the benchmark cohort was made up of the 20 most similar national counties, for all other Maryland counties the benchmark cohort has 50 members.
- (3) Hospital relative total cost of care performance, which is the ratio of the Hospital's total cost of care for its MPA attributed beneficiaries to a risk-adjusted benchmark derived by blending the relevant county benchmarks in proportion to the counties of residence of the hospital's MPA attributed beneficiaries and then adjusting to normalize to the hospital's demographics.

¹¹ See Appendix 5 for more detail on Total Cost of Care Benchmark Calculations

Recommendations

Staff recommends the following:

1. Formally adopt policies to
 - a. Determine relative efficiency outliers;
 - b. Evaluate Global Budget Revenue enhancement requests
2. Use the Inter-Hospital Cost Comparison, including its supporting methodologies to compare relative cost per case for the above evaluations;
3. Use Total Cost of Care measures with a geographic attribution to evaluate per capita cost performance for the above evaluations;
4. Withhold the Medicare portion of the Annual Update Factor for efficiency outlier hospitals based on criteria described herein, effective January 1, 2020; and
5. Use set aside outlined in the Annual Update Factor (.1% in RY 2020) and funding secured from withhold from outlier hospitals to fund potential Global Budget Enhancement Requests.

Appendix 1: Revised Casemix Methodology Discussion

Fundamental to a sound efficiency methodology is a reliable volume statistic that accounts for acuity and expected cost differences, as not all services require the same level of care and resources. The HSCRC historically has had a reliable inpatient casemix adjusted volume statistic that outputs relative weights to measure the relative cost or resources needed to treat a mix of patients at a given Maryland hospital using specific APR-DRG/severity of illness levels.¹²

The calculation of relative weights used by Maryland hospitals, which in many respects is just creating ratios based on average charges (adjusted for price differences among hospitals), has been the following since the adoption of the APR-DRG Grouper in 2004 for all hospitals:

- 1) Use the outlier trim methodology to adjust charges for outlier cases so that the maximum charge equals the trim limit
- 2) Calculate an average charge per case in each APR-DRG/severity category.
- 3) Calculate a statewide average charge per case (CPC).
- 4) Divide the cell average by the statewide average to generate the cell weight.
- 5) Calculate hospital-specific relative weights as follows:
 - a) For each hospital i , calculate the average charge per case-mix adjusted discharge: $C(i)$.
 - b) For the state as a whole, calculate the average charge per case-mix adjusted discharge: C .
 - c) For each hospital, calculate a standardizing factor: $S(i) = C(i) / C$.
 - d) For each hospital, adjust its charges to the state level by dividing by $S(i)$.
 - e) Recalculate the case-mix weights using the standardized charges.
 - f) Go back to step 6a and repeat until the changes in weights are minimal or non-existent.
- 7) Calculate the average weight per APR-DRG/severity category.
- 8) Adjust the weights in low volume cells (cells with less than 30 cases) by blending the average weight per APR-DRG/severity category in step 7 with the 3M National Relative Weights.
- 9) Adjust the weights to be monotonically increasing by severity of illness.

¹² At a summary level the case-mix index (CMI), which is the average value of the relative weights for the patients at a given hospital, identifies how resource needs vary across groups of patients and hospitals.

10) Normalize the weights to a statewide CMI of 1.00.

Despite the general consensus that the inpatient casemix methodology is sufficient, the HSCRC historically has had a less reliable outpatient casemix methodology. The first reason for this is because of cycle billed claims where unique hospital billing practices created inconsistent data for determining relative weights across hospitals. Additionally, procedures that can occur in multiple outpatient settings and are different in service intensity¹³ were not separated from one another in weight development, thereby creating weights not indicative of the intensity of resources that must be applied in an emergency room versus a clinic..

These concerns mattered less for the first few years of the All-Payer model because the principal use of outpatient weights in HSCRC methodologies was the Market Shift Adjustment, a methodology that evaluates growth. If the inconsistent measurement were present in both the base and performance period for the Market Shift, the issue was of less concern as long as the billing method did not change at a hospital. However, because efficiency methodologies evaluate a single period of time and inter-hospital comparisons, the concerns over inconsistent and unreliable outpatient weights became more pressing once the moratorium on rate reviews was lifted in November of 2017.

The Commission prioritized the need to develop a sufficient outpatient methodology for purposes of evaluating hospital cost efficiency and evaluating ongoing volume changes. Staff worked with industry and additional stakeholders to create a new outpatient weighting approach that utilized a similar methodology to the inpatients weighting system but also did the following:

- (1) All claims, including cycle-billed claims (i.e. accounts where patients are billed monthly) were parsed out into visits, which allows accurate and consistent visit weights to be applied to oncology services, clinics, outpatient psychiatry, and physical therapy;
- (2) Emergency room and clinic visits were given different weights, with higher weights allotted to emergency room patients, replacing an approach that used the same weight regardless of hospital site of service;
- (3) All coded claims lines (i.e. all claims lines with a CPT or HCPCS code) were used to ensure more accurate weight development, replacing an approach where only 45 claim lines were used in weight development and Enhanced Ambulatory Patient Grouping (“EAPG”)¹⁴ assignment – possible because of enhanced computing power;

¹³ In the past, HSCRC applied special weighting differences on the coded severity levels 1 through 5 of an emergency room visits. However, multiple studies have documented coding variations and upcoding in the emergency room. As a result, HSCRC is using the standard method included in the outpatient grouper, which takes into account diagnoses and other coded information to assign emergency room cases to an EAPG. The EAPG grouper assigns medical cases based on diagnosis. In the most recent casemix iteration, HSCRC has separated emergency room and clinic cases to provide higher weights to emergency room cases given the higher resources that must be provided to patients presenting in the emergency room.

¹⁴ EAPGs are a 3M product, which results from the assignment of encounters to clinically meaningful outpatient groupings, similar to inpatient DRG groupings.

(4) Outpatient services within 5 days of one another that had similar care profiles were repackaged into visit episodes to ensure that all charges associated with an episode of care (e.g. supply charges for surgery) were not weighted independently of one another.

(5) Oncology and infusion drugs were removed from the oncology services portion of the claim, allowing oncology services to be weighted independent of oncology drugs, thereby allowing oncology services to be evaluated through Market Shift and oncology and infusion drugs to continue be evaluated through the CDS-A process.¹⁵

During the process of assessing the construct validity of new casemix methodology, the HSCRC employed Mathematica Policy Research (MPR). MPR concluded that improvements to the casemix methodology resulted in better recognition of clinical severity, as evidenced by improved monotonicity and goodness of fit.

Specifically, to evaluate monotonicity, which means services of increasing complexity are assigned weights of increasing magnitude, MPR employed a clinical expert to conduct a review of the 564 EAPGs. The EAPGs were categorized and combined into 25 different clinically compatible service areas such as general medicine, gastroenterology, general surgery, and oncology. Within each service area, the EAPGs were then ranked by level of clinical complexity on a scale of 1 to 5, where 1 is least complex and 5 is most complex. For example, in the category of general medicine, a level one ranking includes vaccine administration and a level 5 ranking includes the treatment of AIDS. The rankings in each service area were then reviewed by another clinical expert to reach consensus.¹⁶ Then using a fixed effects regression, MPR evaluated the weighting difference from level 5 to level 1. Table A below demonstrates that for each level the weight is significantly higher than the weight in the level below:¹⁷

Table A. Regression results for association between procedure groups and severity levels of ECMADs on EAPG weight (all ECMADs)

EAPG Weight	Number of EAPGs	Coefficient	Std Err	t	Difference	T of difference
Level 5 (omitted)	79	-	-	-	-	-
Level 4	110	-0.435*	0.133	3.27	-0.435*	3.27
Level 3	149	-0.936*	0.127	7.36	-0.501*	4.09
Level 2	179	-1.506*	0.125	12.02	-0.570*	4.66
Level 1	189	-1.873*	0.123	15.20	-0.367*	3.28

EAPG = enhanced ambulatory patient grouping; ECMAD = equivalent casemix adjusted discharge; Std Err = standard error; T = T-statistic

¹⁵ The CDS-A accounts for usage changes in high cost oncology and infusion drugs, and provides a hospital specific adjustment based on 50 percent of estimated growth. The remainder of drug cost growth is provided through a targeted inflation adjustment. For additional detail on the new casemix methodology, please see Appendix 2.

¹⁶ Please see Appendix 3 for clinical severity listings.

¹⁷ MPR also estimated the proportion of EAPGs with weights within the range predicted by their severity level (1-5). The weight falls in the correct range when the ECMAD for a given EAPG is within the bounds of the predicted severity level. They found that 45.5 percent of EAPG high type combinations were within those bounds. They found that 70.7 percent were within the ECMAD range including EAPGs one level lower and one level higher.

* Significantly different than 0, $p < .05$

Finally, to evaluate goodness of fit or the predictive accuracy of the outpatient weights, MPR evaluated Winsorized charges, i.e. removing charges below the 5th percentile and above the 95th percentile, and determined that the R2 was .726, suggesting that the new weighting system had a very high degree of explanatory power.

Appendix 2. Outpatient Casemix Methodology Steps

A. Group and Assign Outpatient Records a Principal EAPG Type & APG High Type

- ▶ **Step 1: Group Data**
 - ▶ Outpatient data grouped using the EAPG grouper version 3.12 (change from the EAPG grouper version 3.8 previously used)
 - ▶ An EAPG is identified for every CPT that is coded in the record
 - ▶ Medical visits also use ICD-10 diagnosis codes for grouping
 - ▶ Each record can contain hundreds of EAPGs

- ▶ **Step 2: Exclude Observation Cases**
 - ▶ If the Observation Rate Center units in any outpatient visit record are greater than 23 hours, the entire record is excluded from the outpatient weight assignment calculation.
 - ▶ Future consideration may be given to maintaining outpatient visits greater than 23 hours in the outpatient data set when developing weights for purposes of the ICC

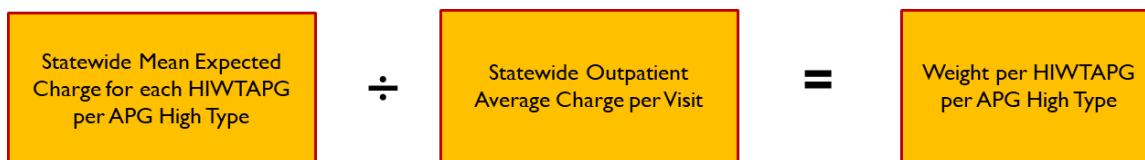
- ▶ **Step 3: Assign Principal Record Type**
 - ▶ A principal EAPG Type is assigned to all records
 - ▶ HSCRC applies a hierarchy based on EAPG Type
 - Each CPT code is linked to an EAPG, and each EAPG is linked to an EAPG Type
 - ▶ The records are categorized by APG High Type and assigned in hierarchy as follows:
 - ▶ Type 2: Oncology Related Services
 - ▶ Type 8: Oncology Drugs
 - ▶ Type 5: Rehab and Therapy
 - ▶ Type 6: Psychiatric Visits
 - ▶ Type 4: ED Visits
 - ▶ Type 1: Significant Procedures
 - ▶ Type 3: Non-ED Visits
 - ▶ Type 7: Other Visits

- ▶ **Step 4: Consolidating cases into records - for APG High Type Oncology Related Services (ORS)**
 - ▶ All aggregated outpatient records per APG High Type are unbundled and parsed out by service dates
 - ▶ Each identified EAPG within the APG High Type has its own service date
 - ▶ Visits with a length of stay (LOS) 5 days or less are assigned the same service date as their corresponding APG High Type
 - ▶ Consolidate into one record all EAPGs associated with ORS occurring on the same service date
 - ▶ Determine the EAPG with the highest weight within the record (Previously calculated weights are used as the preliminary weight for assigning the high weight)
 - ▶ The high weight EAPG is the High Weight EAPG (HIWTAPG)

- ▶ Consolidate into the record any ancillary EAPGs occurring on the same service date as the EAPG with the highest weight within the ORS
- ▶ Any ancillary EAPGs not occurring within the same service date as the high weight EAPG within the ORS is appended back into the outpatient records
- ▶ **Step 5: Calculate the total charge**
 - ▶ The sum of all EAPG charges in the ORS record
 - ▶ The HIWTAPG assumes all charges associated with that record i.e. the total charge
- ▶ **Step 6: Apply the Trim Logic to the APG High Type by HIWTAPG (Expected Charge)**
 - ▶ Trim logic = (the statewide average expected charge by HIWTAPG * 2) or the (the statewide average expected charge by HIWTAPG + 10,000); whichever is greater
 - ▶ The expected charge is usually the total charge except where a trim is applied, then the trim charge becomes the expected charge
 - ▶ (Step 1-6 is repeated for each APG High Type)

B. Merge all datasets and Calculate expected charges to outpatient categories

- ▶ **Step 7: Merge all eight APG High Types and begin the iterative process of determining weights**
 - ▶ **Step a: Calculate the statewide average charge per visit**
 - ▶ The mean of all trimmed charges as determined by the trim logic
 - ▶ **Step b: Calculate the Mean Statewide Expected Charge by APG High Type and HIWTAPG**
 - ▶ The mean of expected charges across all hospitals by APG High Type and HIWTAPG
- ▶ **Step 8: Calculate initial weights for each APG High Type and HIWTAPG**



▶ **Step 9:**



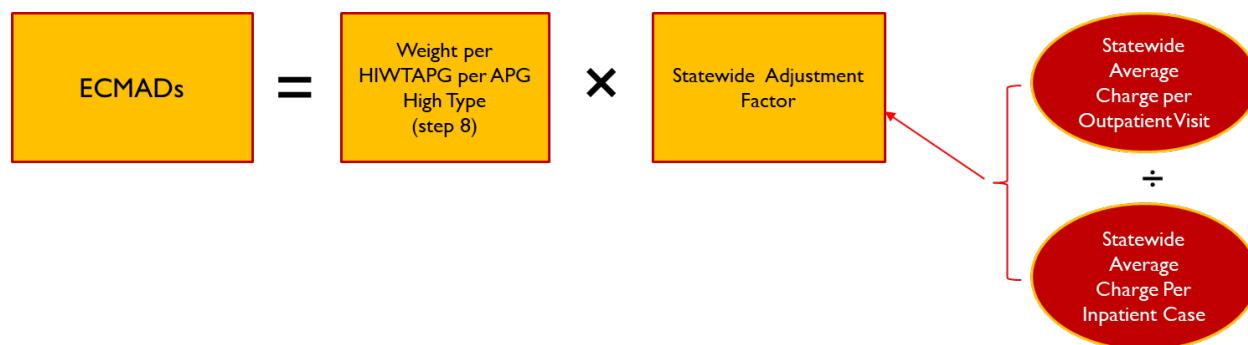
Normalize the Hospital HIWTAPG Expected Charge about the Expected Charge Per Hospital

Mean

- ▶ **Calculate Hospital Specific Average charge and casemix index (CMI) and hospital specific charge adjustment factor**
 - *Hospital Specific average charge divided by the hospital specific average CMI = Hospital specific expected charge*
 - *Hospital specific expected charge divided by the statewide average charge (as determined in step 7a) = Hospital Specific adjustment factor*
 - *Recalculate the total charge by dividing the initial trim charge by the hospital charge adjustment factor*
 - ▶ Perform 31 Iterations as shown above until convergence (hospital specific adjustment factor equals 1.00)
 - ▶ The final iteration determines the statewide expected charge (as described in step 7b) used for the **final weight calculation** (repeat step 8)
- ▶ **Step 10: Assign Principal Record Type by High Weighted EAPG**
- ▶ This overrides step number 3 because in many instances lower acuity services or ancillaries will garner all of the charges associated with that record, most notably within the Significant Procedures High Type.
 - ▶ Because weights are reassigned, they have to be checked again for monotonicity and normalized to 1.0.

C. Calculate ECMAD

- ▶ **Step 11: Calculate the Statewide Adjustment Factor = Outpatient Charge per visit divided by Average charge per Inpatient case**
- ▶ ECMAD is defined as the normalized weight from Step 16 multiplied by the Statewide Charge Ratio Adjustment Factor



Appendix 3: Clinical Severity Listings (EAPGs Service Type and Severity Classification)

Severity	EAPG	EAPG Description	Service	Service Description
1	315	COUNSELLING OR INDIVIDUAL BRIEF PSYCHOTHERAPY	1	Behavioral Health
1	322	MEDICATION ADMINISTRATION & OBSERVATION	1	Behavioral Health
1	323	MENTAL HYGIENE ASSESSMENT	1	Behavioral Health
1	324	MENTAL HEALTH SCREENING & BRIEF ASSESSMENT	1	Behavioral Health
1	825	ADJUSTMENT DISORDERS & NEUROSES EXCEPT DEPRESSIVE DIAGNOSES	1	Behavioral Health
2	320	CASE MANAGEMENT & TREATMENT PLAN DEVELOPMENT - MENTAL HEALTH OR SUBSTANCE ABUSE	1	Behavioral Health
2	426	PSYCHOTROPIC MEDICATION MANAGEMENT	1	Behavioral Health
2	820	SCHIZOPHRENIA	1	Behavioral Health
2	821	MAJOR DEPRESSIVE DIAGNOSES & OTHER/UNSPECIFIED PSYCHOSES	1	Behavioral Health
2	822	PERSONALITY & IMPULSE CONTROL DIAGNOSES	1	Behavioral Health
2	823	BIPOLAR DISORDERS	1	Behavioral Health
2	824	DEPRESSION EXCEPT MAJOR DEPRESSIVE DIAGNOSES	1	Behavioral Health
2	826	ACUTE ANXIETY & DELIRIUM STATES	1	Behavioral Health
2	827	ORGANIC MENTAL HEALTH DISTURBANCES	1	Behavioral Health
2	831	OTHER MENTAL HEALTH DIAGNOSES	1	Behavioral Health
2	829	CHILDHOOD BEHAVIORAL DIAGNOSES	1	Behavioral Health
2	840	OPIOID ABUSE & DEPENDENCE	1	Behavioral Health
2	841	COCAINE ABUSE & DEPENDENCE	1	Behavioral Health
2	842	ALCOHOL ABUSE & DEPENDENCE	1	Behavioral Health
2	843	OTHER DRUG ABUSE & DEPENDENCE	1	Behavioral Health
2	317	FAMILY PSYCHOTHERAPY	1	Behavioral Health
2	318	GROUP PSYCHOTHERAPY	1	Behavioral Health
3	316	INDIVIDUAL COMPREHENSIVE PSYCHOTHERAPY	1	Behavioral Health
3	319	ACTIVITY THERAPY	1	Behavioral Health
3	310	DEVELOPMENTAL & NEUROPSYCHOLOGICAL TESTING	1	Behavioral Health
3	828	MENTAL RETARDATION	1	Behavioral Health
4	321	CRISIS INTERVENTION	1	Behavioral Health
4	314	HALF DAY PARTIAL HOSPITALIZATION FOR MENTAL ILLNESS	1	Behavioral Health
4	328	DAY TREATMENT - HALF DAY	1	Behavioral Health
4	830	EATING DISORDERS	1	Behavioral Health
4	313	HALF DAY PARTIAL HOSPITALIZATION FOR SUBSTANCE ABUSE	1	Behavioral Health
5	312	FULL DAY PARTIAL HOSPITALIZATION FOR MENTAL ILLNESS	1	Behavioral Health
5	327	INTENSIVE OUTPATIENT TREATMENT	1	Behavioral Health
5	329	DAY TREATMENT - FULL DAY	1	Behavioral Health
5	311	FULL DAY PARTIAL HOSPITALIZATION FOR SUBSTANCE ABUSE	1	Behavioral Health
1	487	MINOR CARDIAC MONITORING	2	Cardiology
1	592	LEVEL I CARDIOVASCULAR DIAGNOSES	2	Cardiology
1	596	PERIPHERAL & OTHER VASCULAR DIAGNOSES	2	Cardiology
1	597	PHLEBITIS	2	Cardiology
1	598	ANGINA PECTORIS & CORONARY ATHEROSCLEROSIS	2	Cardiology
1	599	HYPERTENSION	2	Cardiology
1	600	CARDIAC STRUCTURAL & VALVULAR DIAGNOSES	2	Cardiology
1	601	LEVEL I CARDIAC ARRHYTHMIA & CONDUCTION DIAGNOSES	2	Cardiology

Severity	EAPG	EAPG Description	Service	Service Description
2	593	LEVEL II CARDIOVASCULAR DIAGNOSES	2	Cardiology
2	602	ATRIAL FIBRILLATION	2	Cardiology
2	603	LEVEL II CARDIAC ARRHYTHMIA & CONDUCTION DIAGNOSES	2	Cardiology
2	418	MINOR CARDIAC AND VASCULAR TESTS	2	Cardiology
2	413	CARDIOGRAM	2	Cardiology
3	80	EXERCISE TOLERANCE TESTS	2	Cardiology
3	81	ECHOCARDIOGRAPHY	2	Cardiology
3	604	CHEST PAIN	2	Cardiology
3	605	SYNCOPE & COLLAPSE	2	Cardiology
4	93	CARDIOVERSION	2	Cardiology
4	420	PACEMAKER AND OTHER ELECTRONIC ANALYSIS	2	Cardiology
4	594	HEART FAILURE	2	Cardiology
5	82	CARDIAC ELECTROPHYSIOLOGIC TESTS AND MONITORING	2	Cardiology
5	591	ACUTE MYOCARDIAL INFARCTION	2	Cardiology
5	595	CARDIAC ARREST OR OTHER CAUSES OF MORTALITY	2	Cardiology
1	435	CLASS I PHARMACOTHERAPY	3	Chemoinfusion
1	436	CLASS II PHARMACOTHERAPY	3	Chemoinfusion
1	496	MINOR PHARMACOTHERAPY	3	Chemoinfusion
1	430	CLASS I CHEMOTHERAPY DRUGS	3	Chemoinfusion
1	495	MINOR CHEMOTHERAPY DRUGS	3	Chemoinfusion
1	117	HOME INFUSION	3	Chemoinfusion
1	1090	USER CUSTOMIZABLE 340B DRUGS	3	Chemoinfusion
2	431	CLASS II CHEMOTHERAPY DRUGS	3	Chemoinfusion
2	437	CLASS III PHARMACOTHERAPY	3	Chemoinfusion
2	438	CLASS IV PHARMACOTHERAPY	3	Chemoinfusion
2	432	CLASS III CHEMOTHERAPY DRUGS	3	Chemoinfusion
3	433	CLASS IV CHEMOTHERAPY DRUGS	3	Chemoinfusion
3	439	CLASS V PHARMACOTHERAPY	3	Chemoinfusion
3	434	CLASS V CHEMOTHERAPY DRUGS	3	Chemoinfusion
3	111	PHARMACOTHERAPY EXCEPT BY EXTENDED INFUSION	3	Chemoinfusion
3	110	PHARMACOTHERAPY BY EXTENDED INFUSION	3	Chemoinfusion
4	440	CLASS VI PHARMACOTHERAPY	3	Chemoinfusion
4	441	CLASS VI CHEMOTHERAPY DRUGS	3	Chemoinfusion
4	444	CLASS VII PHARMACOTHERAPY	3	Chemoinfusion
4	443	CLASS VII CHEMOTHERAPY	3	Chemoinfusion
5	460	CLASS VIII - COMBINED CHEMOTHERAPY AND PHARMACOTHERAPY	3	Chemoinfusion
5	461	CLASS IX COMBINED CHEMOTHERAPY AND PHARMACOTHERAPY	3	Chemoinfusion
5	462	CLASS X COMBINED CHEMOTHERAPY AND PHARMACOTHERAPY	3	Chemoinfusion
5	463	CLASS XI COMBINED CHEMOTHERAPY AND PHARMACOTHERAPY	3	Chemoinfusion
5	464	CLASS XII COMBINED CHEMOTHERAPY AND PHARMACOTHERAPY	3	Chemoinfusion
5	465	CLASS XIII COMBINED CHEMOTHERAPY AND PHARMACOTHERAPY	3	Chemoinfusion
1	350	LEVEL I ADJUNCTIVE GENERAL DENTAL SERVICES	4	Dental
1	351	LEVEL II ADJUNCTIVE GENERAL DENTAL SERVICES	4	Dental
1	371	LEVEL I ORTHODONTICS	4	Dental
1	372	SEALANT	4	Dental
1	373	LEVEL I DENTAL FILM	4	Dental
1	376	DIAGNOSTIC DENTAL PROCEDURES	4	Dental
1	377	PREVENTIVE DENTAL PROCEDURES	4	Dental
2	352	LEVEL I PERIODONTICS	4	Dental

Severity	EAPG	EAPG Description	Service	Service Description
2	374	LEVEL II DENTAL FILM	4	Dental
2	379	LEVEL II ORTHODONTICS	4	Dental
2	353	LEVEL I PROSTHODONTICS, FIXED	4	Dental
2	356	LEVEL I PROSTHODONTICS, REMOVABLE	4	Dental
3	359	LEVEL I MAXILLOFACIAL PROSTHETICS	4	Dental
3	361	LEVEL I DENTAL RESTORATIONS	4	Dental
3	364	LEVEL I ENDODONTICS	4	Dental
3	375	DENTAL ANESTHESIA	4	Dental
3	378	LEVEL II PERIODONTICS	4	Dental
3	354	LEVEL II PROSTHODONTICS, FIXED	4	Dental
3	357	LEVEL II PROSTHODONTICS, REMOVABLE	4	Dental
4	360	LEVEL II MAXILLOFACIAL PROSTHETICS	4	Dental
4	362	LEVEL II DENTAL RESTORATIONS	4	Dental
4	365	LEVEL II ENDODONTICS	4	Dental
4	366	LEVEL III ENDODONTICS	4	Dental
4	367	LEVEL I ORAL AND MAXILLOFACIAL SURGERY	4	Dental
4	368	LEVEL II ORAL AND MAXILLOFACIAL SURGERY	4	Dental
4	381	LEVEL I DENTAL IMPLANTS	4	Dental
4	382	LEVEL II DENTAL IMPLANTS	4	Dental
4	355	LEVEL III PROSTHODONTICS, FIXED	4	Dental
4	358	LEVEL III PROSTHODONTICS, REMOVABLE	4	Dental
5	363	LEVEL III DENTAL RESTORATION	4	Dental
5	369	LEVEL III ORAL AND MAXILLOFACIAL SURGERY	4	Dental
5	370	LEVEL IV ORAL AND MAXILLOFACIAL SURGERY	4	Dental
1	674	CONTUSION, OPEN WOUND & OTHER TRAUMA TO SKIN & SUBCUTANEOUS TISSUE	5	Dermatology
2	1	PHOTOCHEMOTHERAPY	5	Dermatology
3	670	SKIN ULCERS	5	Dermatology
4	671	MAJOR SKIN DIAGNOSES	5	Dermatology
4	861	PARTIAL THICKNESS BURNS W OR W/O SKIN GRAFT	5	Dermatology
5	676	DECUBITUS ULCER	5	Dermatology
5	860	EXTENSIVE 3RD DEGREE OR FULL THICKNESS BURNS W/O SKIN GRAFT	5	Dermatology
1	452	DIABETES SUPPLIES	6	DME
1	453	MOTORIZED WHEELCHAIR	6	DME
1	456	MOTORIZED WHEELCHAIR ACCESSORIES	6	DME
1	1001	DURABLE MEDICAL EQUIPMENT AND SUPPLIES - LEVEL 1	6	DME
1	1002	DURABLE MEDICAL EQUIPMENT AND SUPPLIES - LEVEL 2	6	DME
1	1003	DURABLE MEDICAL EQUIPMENT AND SUPPLIES - LEVEL 3	6	DME
1	1004	DURABLE MEDICAL EQUIPMENT - LEVEL 4	6	DME
1	1005	DURABLE MEDICAL EQUIPMENT - LEVEL 5	6	DME
1	1006	DURABLE MEDICAL EQUIPMENT - LEVEL 6	6	DME
1	1007	DURABLE MEDICAL EQUIPMENT - LEVEL 7	6	DME
1	1008	DURABLE MEDICAL EQUIPMENT - LEVEL 8	6	DME
1	1009	DURABLE MEDICAL EQUIPMENT - LEVEL 9	6	DME
2	1010	DURABLE MEDICAL EQUIPMENT - LEVEL 10	6	DME
2	1011	DURABLE MEDICAL EQUIPMENT - LEVEL 11	6	DME
2	1012	DURABLE MEDICAL EQUIPMENT - LEVEL 12	6	DME
2	1013	DURABLE MEDICAL EQUIPMENT - LEVEL 13	6	DME
2	1014	DURABLE MEDICAL EQUIPMENT - LEVEL 14	6	DME
2	1015	DURABLE MEDICAL EQUIPMENT - LEVEL 15	6	DME
2	1016	DURABLE MEDICAL EQUIPMENT - LEVEL 16	6	DME
2	1017	DURABLE MEDICAL EQUIPMENT - LEVEL 17	6	DME
2	1018	DURABLE MEDICAL EQUIPMENT - LEVEL 18	6	DME
2	1019	DURABLE MEDICAL EQUIPMENT - LEVEL 19	6	DME

Severity	EAPG	EAPG Description	Service	Service Description
2	1020	DURABLE MEDICAL EQUIPMENT - LEVEL 20	6	DME
3	454	TPN FORMULAE	6	DME
3	498	PEN FORMULAE	6	DME
1	560	EAR, NOSE, MOUTH, THROAT, CRANIAL/FACIAL MALIGNANCIES	7	Otolaryngology
1	562	INFECTIONS OF UPPER RESPIRATORY TRACT & OTITIS MEDIA	7	Otolaryngology
1	563	DENTAL & ORAL DIAGNOSES & INJURIES	7	Otolaryngology
1	564	LEVEL I OTHER EAR, NOSE, MOUTH, THROAT & CRANIAL/FACIAL DIAGNOSES	7	Otolaryngology
2	561	VERTIGINOUS DIAGNOSES EXCEPT FOR BENIGN VERTIGO	7	Otolaryngology
2	251	OTORHINOLARYNGOLOGIC FUNCTION TESTS	7	Otolaryngology
2	565	LEVEL II OTHER EAR, NOSE, MOUTH, THROAT & CRANIAL/FACIAL DIAGNOSES	7	Otolaryngology
2	252	LEVEL I FACIAL AND ENT PROCEDURES	7	Otolaryngology
2	257	AUDIOMETRY	7	Otolaryngology
3	62	LEVEL I ENDOSCOPY OF THE UPPER AIRWAY	7	Otolaryngology
3	253	LEVEL II FACIAL AND ENT PROCEDURES	7	Otolaryngology
3	256	TONSIL AND ADENOID PROCEDURES	7	Otolaryngology
4	63	LEVEL II ENDOSCOPY OF THE UPPER AIRWAY	7	Otolaryngology
4	254	LEVEL III FACIAL AND ENT PROCEDURES	7	Otolaryngology
5	255	LEVEL IV FACIAL AND ENT PROCEDURES	7	Otolaryngology
5	250	COCHLEAR DEVICE IMPLANTATION	7	Otolaryngology
1	624	LEVEL I GASTROINTESTINAL DIAGNOSES	8	Gastroenterology
1	639	LEVEL I HEPATOBILIARY DIAGNOSES	8	Gastroenterology
2	621	PEPTIC ULCER & GASTRITIS	8	Gastroenterology
2	623	ESOPHAGITIS	8	Gastroenterology
2	625	LEVEL II GASTROINTESTINAL DIAGNOSES	8	Gastroenterology
2	630	CONSTIPATION	8	Gastroenterology
2	631	HERNIA	8	Gastroenterology
2	627	NON-BACTERIAL GASTROENTERITIS, NAUSEA & VOMITING	8	Gastroenterology
3	637	GALLBLADDER & BILIARY TRACT DIAGNOSES	8	Gastroenterology
3	640	LEVEL II HEPATOBILIARY DIAGNOSES	8	Gastroenterology
3	632	IRRITABLE BOWEL SYNDROME	8	Gastroenterology
3	628	ABDOMINAL PAIN	8	Gastroenterology
3	633	ALCOHOLIC LIVER DISEASE	8	Gastroenterology
3	130	ALIMENTARY TESTS AND SIMPLE TUBE PLACEMENT	8	Gastroenterology
3	131	ESOPHAGEAL DILATION WITHOUT ENDOSCOPY	8	Gastroenterology
3	132	ANOSCOPY WITH BIOPSY AND DIAGNOSTIC PROCTOSIGMOIDOSCOPY	8	Gastroenterology
3	133	PROCTOSIGMOIDOSCOPY WITH EXCISION OR BIOPSY	8	Gastroenterology
3	626	INFLAMMATORY BOWEL DISEASE	8	Gastroenterology
3	629	MALFUNCTION, REACTION & COMPLICATION OF GI DEVICE OR PROCEDURE	8	Gastroenterology
3	638	CHOLECYSTITIS	8	Gastroenterology
4	134	DIAGNOSTIC UPPER GI ENDOSCOPY OR INTUBATION	8	Gastroenterology
4	136	DIAGNOSTIC LOWER GASTROINTESTINAL ENDOSCOPY	8	Gastroenterology
4	620	DIGESTIVE MALIGNANCY	8	Gastroenterology
4	635	PANCREAS DIAGNOSES EXCEPT MALIGNANCY	8	Gastroenterology
4	636	HEPATITIS WITHOUT COMA	8	Gastroenterology
5	149	SCREENING COLORECTAL SERVICES	8	Gastroenterology
5	135	THERAPEUTIC UPPER GI ENDOSCOPY OR INTUBATION	8	Gastroenterology

Severity	EAPG	EAPG Description	Service	Service Description
5	137	THERAPEUTIC COLONOSCOPY	8	Gastroenterology
5	138	ERCP AND MISCELLANEOUS GI ENDOSCOPY PROCEDURES	8	Gastroenterology
5	634	MALIGNANCY OF HEPATOBILIARY SYSTEM & PANCREAS	8	Gastroenterology
1	695	OBESITY	9	Endocrinology
2	713	DIABETES WITHOUT COMPLICATIONS	9	Endocrinology
2	692	LEVEL I ENDOCRINE DIAGNOSES	9	Endocrinology
3	693	LEVEL II ENDOCRINE DIAGNOSES	9	Endocrinology
3	691	INBORN ERRORS OF METABOLISM	9	Endocrinology
4	711	DIABETES WITH OTHER MANIFESTATIONS & COMPLICATIONS	9	Endocrinology
4	710	DIABETES WITH OPHTHALMIC MANIFESTATIONS	9	Endocrinology
4	712	DIABETES WITH NEUROLOGIC MANIFESTATIONS	9	Endocrinology
4	714	DIABETES WITH RENAL MANIFESTATIONS	9	Endocrinology
5	690	MALNUTRITION, FAILURE TO THRIVE & OTHER NUTRITIONAL DIAGNOSES	9	Endocrinology
5	694	ELECTROLYTE DISORDERS	9	Endocrinology
1	425	LEVEL I OTHER MISCELLANEOUS ANCILLARY PROCEDURES	10	General Medicine
1	427	BIOFEEDBACK AND OTHER TRAINING	10	General Medicine
1	449	ADDITIONAL UNDIFFERENTIATED MEDICAL VISIT/SERVICES	10	General Medicine
1	457	VENIPUNCTURE	10	General Medicine
1	458	ALLERGY THERAPY	10	General Medicine
1	459	VACCINE ADMINISTRATION	10	General Medicine
1	490	INCIDENTAL TO MEDICAL VISIT OR SIGNIFICANT PROCEDURE	10	General Medicine
1	491	MEDICAL VISIT INDICATOR	10	General Medicine
1	497	TELEHEALTH FACILITATION	10	General Medicine
1	663	PAIN	10	General Medicine
1	411	BLOOD AND URINE DIPSTICK TESTS	10	General Medicine
1	414	LEVEL I IMMUNIZATION	10	General Medicine
1	415	LEVEL II IMMUNIZATION	10	General Medicine
1	429	PATIENT EDUCATION, GROUP	10	General Medicine
1	809	OTHER INFECTIOUS & PARASITIC DISEASES	10	General Medicine
1	810	H. PYLORI INFECTION	10	General Medicine
2	808	VIRAL ILLNESS	10	General Medicine
2	488	MINOR DEVICE EVALUATION & ELECTRONIC ANALYSIS	10	General Medicine
2	116	ALLERGY TESTS	10	General Medicine
2	424	DRESSINGS AND OTHER MINOR PROCEDURES	10	General Medicine
4	489	LEVEL II OTHER MISCELLANEOUS ANCILLARY PROCEDURES	10	General Medicine
2	675	OTHER SKIN, SUBCUTANEOUS TISSUE & BREAST DIAGNOSES	10	General Medicine
2	392	PAP SMEARS	10	General Medicine
2	416	LEVEL III IMMUNIZATION	10	General Medicine
2	428	PATIENT EDUCATION, INDIVIDUAL	10	General Medicine
2	451	SMOKING CESSATION TREATMENT	10	General Medicine
3	807	FEVER	10	General Medicine
3	417	MINOR REPRODUCTIVE PROCEDURES	10	General Medicine
3	421	TUBE CHANGE	10	General Medicine
3	118	NUTRITION THERAPY	10	General Medicine
3	673	CELLULITIS & OTHER BACTERIAL SKIN INFECTIONS	10	General Medicine
3	875	CONTRACEPTIVE MANAGEMENT	10	General Medicine
3	806	POST-OPERATIVE, POST-TRAUMATIC, OTHER DEVICE INFECTIONS	10	General Medicine
3	852	OTHER COMPLICATIONS OF TREATMENT	10	General Medicine

Severity	EAPG	EAPG Description	Service	Service Description
4	510	MAJOR SIGNS, SYMPTOMS AND FINDINGS	10	General Medicine
4	423	INTRODUCTION OF NEEDLE AND CATHETER	10	General Medicine
4	448	EXPANDED HOURS ACCESS	10	General Medicine
4	450	OBSERVATION	10	General Medicine
4	853	OTHER INJURY, POISONING & TOXIC EFFECT DIAGNOSES	10	General Medicine
4	854	TOXIC EFFECTS OF NON-MEDICINAL SUBSTANCES	10	General Medicine
4	876	ADULT PREVENTIVE MEDICINE	10	General Medicine
4	877	CHILD PREVENTIVE MEDICINE	10	General Medicine
4	878	GYNECOLOGICAL PREVENTIVE MEDICINE	10	General Medicine
4	879	PREVENTIVE OR SCREENING ENCOUNTERS	10	General Medicine
4	882	GENETIC COUNSELING	10	General Medicine
4	880	HIV INFECTION	10	General Medicine
5	850	ALLERGIC REACTIONS	10	General Medicine
5	92	RESUSCITATION	10	General Medicine
5	672	MALIGNANT BREAST DIAGNOSES	10	General Medicine
5	851	POISONING OF MEDICINAL AGENTS	10	General Medicine
5	805	SEPTICEMIA & DISSEMINATED INFECTIONS	10	General Medicine
5	881	AIDS	10	General Medicine
1	3	LEVEL I SKIN INCISION AND DRAINAGE	11	General Surgery
1	5	NAIL PROCEDURES	11	General Surgery
1	6	LEVEL I SKIN DEBRIDEMENT AND DESTRUCTION	11	General Surgery
1	9	LEVEL I EXCISION AND BIOPSY OF SKIN AND SOFT TISSUE	11	General Surgery
1	12	LEVEL I SKIN REPAIR	11	General Surgery
1	90	SECONDARY VARICOSE VEINS AND VASCULAR INJECTION	11	General Surgery
1	455	IMPLANTED TISSUE OF ANY TYPE	11	General Surgery
2	61	NEEDLE AND CATHETER BIOPSY, ASPIRATION, LAVAGE AND INTUBATION	11	General Surgery
2	2	SUPERFICIAL NEEDLE BIOPSY AND ASPIRATION	11	General Surgery
2	4	LEVEL II SKIN INCISION AND DRAINAGE	11	General Surgery
2	7	LEVEL II SKIN DEBRIDEMENT AND DESTRUCTION	11	General Surgery
2	13	LEVEL II SKIN REPAIR	11	General Surgery
2	30	LEVEL I MUSCULOSKELETAL PROCEDURES EXCLUDING HAND AND FOOT	11	General Surgery
3	380	ANESTHESIA	11	General Surgery
3	10	LEVEL II EXCISION AND BIOPSY OF SKIN AND SOFT TISSUE	11	General Surgery
3	145	LEVEL I LAPAROSCOPY	11	General Surgery
3	20	LEVEL I BREAST PROCEDURES	11	General Surgery
3	8	LEVEL III SKIN DEBRIDEMENT AND DESTRUCTION	11	General Surgery
3	11	LEVEL III EXCISION AND BIOPSY OF SKIN AND SOFT TISSUE	11	General Surgery
3	14	LEVEL III SKIN REPAIR	11	General Surgery
3	91	VASCULAR LIGATION AND RECONSTRUCTION	11	General Surgery
3	141	LEVEL I ANAL AND RECTAL PROCEDURES	11	General Surgery
4	15	LEVEL IV SKIN REPAIR	11	General Surgery
4	21	LEVEL II BREAST PROCEDURES	11	General Surgery
4	115	DEEP LYMPH STRUCTURE AND THYROID PROCEDURES	11	General Surgery
4	139	LEVEL I HERNIA REPAIR	11	General Surgery
4	142	LEVEL II ANAL AND RECTAL PROCEDURES	11	General Surgery
4	143	LEVEL I GASTROINTESTINAL PROCEDURES	11	General Surgery
4	146	LEVEL II LAPAROSCOPY	11	General Surgery
5	147	LEVEL III LAPAROSCOPY	11	General Surgery
5	22	LEVEL III BREAST PROCEDURES	11	General Surgery
5	140	LEVEL II HERNIA REPAIR	11	General Surgery
5	144	LEVEL II GASTROINTESTINAL PROCEDURES	11	General Surgery

Severity	EAPG	EAPG Description	Service	Service Description
5	148	LEVEL IV LAPAROSCOPY	11	General Surgery
1	780	OTHER HEMATOLOGICAL DIAGNOSES	12	Hematology
1	785	ANEMIA EXCEPT FOR IRON DEFICIENCY ANEMIA AND SICKLE CELL ANEMIA	12	Hematology
1	786	IRON DEFICIENCY ANEMIA	12	Hematology
2	781	COAGULATION & PLATELET DIAGNOSES	12	Hematology
2	782	CONGENITAL FACTOR DEFICIENCIES	12	Hematology
2	784	SICKLE CELL ANEMIA	12	Hematology
3	112	PHLEBOTOMY	12	Hematology
4	113	LEVEL I BLOOD AND BLOOD PRODUCT EXCHANGE	12	Hematology
4	783	SICKLE CELL ANEMIA CRISIS	12	Hematology
5	114	LEVEL II BLOOD AND BLOOD PRODUCT EXCHANGE	12	Hematology
1	83	PLACEMENT OF TRANSVENOUS CATHETERS	13	Interventional Cardiology
1	95	THROMBOLYSIS	13	Interventional Cardiology
2	88	LEVEL I CARDIOTHORACIC PROCEDURES	13	Interventional Cardiology
3	89	LEVEL II CARDIOTHORACIC PROCEDURES	13	Interventional Cardiology
3	84	DIAGNOSTIC CARDIAC CATHETERIZATION	13	Interventional Cardiology
4	86	PACEMAKER INSERTION AND REPLACEMENT	13	Interventional Cardiology
4	87	REMOVAL AND REVISION OF PACEMAKER AND VASCULAR DEVICE	13	Interventional Cardiology
4	85	PERIPHERAL TRANSCATHETER AND REVASCULARIZATION PROCEDURES	13	Interventional Cardiology
4	96	ATRIAL AND VENTRICULAR RECORDING AND PACING	13	Interventional Cardiology
4	99	CORONARY ANGIOPLASTY	13	Interventional Cardiology
5	97	AICD IMPLANT	13	Interventional Cardiology
1	394	LEVEL I IMMUNOLOGY TESTS	14	Laboratory
1	396	LEVEL I MICROBIOLOGY TESTS	14	Laboratory
1	398	LEVEL I ENDOCRINOLOGY TESTS	14	Laboratory
1	400	LEVEL I CHEMISTRY TESTS	14	Laboratory
1	402	BASIC CHEMISTRY TESTS	14	Laboratory
1	404	TOXICOLOGY TESTS	14	Laboratory
1	406	LEVEL I CLOTTING TESTS	14	Laboratory
1	408	LEVEL I HEMATOLOGY TESTS	14	Laboratory
1	410	URINALYSIS	14	Laboratory
1	390	LEVEL I PATHOLOGY	14	Laboratory
2	385	LEVEL I MOLECULAR PATHOLOGY AND GENETIC TESTS	14	Laboratory
2	395	LEVEL II IMMUNOLOGY TESTS	14	Laboratory
2	397	LEVEL II MICROBIOLOGY TESTS	14	Laboratory
2	399	LEVEL II ENDOCRINOLOGY TESTS	14	Laboratory
2	401	LEVEL II CHEMISTRY TESTS	14	Laboratory
2	403	ORGAN OR DISEASE ORIENTED PANELS	14	Laboratory
2	405	THERAPEUTIC DRUG MONITORING	14	Laboratory
2	407	LEVEL II CLOTTING TESTS	14	Laboratory
2	409	LEVEL II HEMATOLOGY TESTS	14	Laboratory
2	486	BASIC BLOOD TYPING	14	Laboratory
2	393	BLOOD AND TISSUE TYPING	14	Laboratory
3	386	LEVEL II MOLECULAR PATHOLOGY AND GENETIC TESTS	14	Laboratory
3	391	LEVEL II PATHOLOGY	14	Laboratory

Severity	EAPG	EAPG Description	Service	Service Description
4	387	LEVEL III MOLECULAR PATHOLOGY AND GENETIC TESTS	14	Laboratory
1	770	NORMAL NEONATE	15	Neonatology
2	771	LEVEL I NEONATAL DIAGNOSES	15	Neonatology
2	873	NEONATAL AFTERCARE	15	Neonatology
3	772	LEVEL II NEONATAL DIAGNOSES	15	Neonatology
1	520	SPINAL DIAGNOSES & INJURIES	16	Neurology
1	524	LEVEL I CNS DIAGNOSES	16	Neurology
1	526	TRANSIENT ISCHEMIA	16	Neurology
1	527	PERIPHERAL NERVE DIAGNOSES	16	Neurology
1	530	HEADACHES OTHER THAN MIGRAINE	16	Neurology
1	531	MIGRAINE	16	Neurology
1	533	AFTEREFFECTS OF CEREBROVASCULAR ACCIDENT	16	Neurology
1	534	NONSPECIFIC CVA & PRECEREBRAL OCCLUSION W/O INFARC	16	Neurology
1	522	DEGENERATIVE NERVOUS SYSTEM DIAGNOSES EXC MULT SCLEROSIS	16	Neurology
2	525	LEVEL II CNS DIAGNOSES	16	Neurology
2	211	ELECTROENCEPHALOGRAM	16	Neurology
2	212	ELECTROCONVULSIVE THERAPY	16	Neurology
2	213	NERVE AND MUSCLE TESTS	16	Neurology
2	214	LEVEL I NERVOUS SYSTEM INJECTIONS, STIMULATIONS OR CRANIAL TAP	16	Neurology
2	521	NERVOUS SYSTEM MALIGNANCY	16	Neurology
2	529	SEIZURE	16	Neurology
2	532	HEAD TRAUMA	16	Neurology
2	536	CEREBRAL PALSY	16	Neurology
3	523	MULTIPLE SCLEROSIS & OTHER DEMYELINATING DISEASES	16	Neurology
3	219	SPINAL TAP	16	Neurology
3	210	EXTENDED EEG STUDIES	16	Neurology
3	222	SLEEP STUDIES	16	Neurology
3	220	LEVEL II NERVOUS SYSTEM INJECTIONS, STIMULATIONS OR CRANIAL TAP	16	Neurology
3	215	LEVEL I REVISION OR REMOVAL OF NEUROLOGICAL DEVICE	16	Neurology
3	216	LEVEL II REVISION OR REMOVAL OF NEUROLOGICAL DEVICE	16	Neurology
4	528	NONTRAUMATIC STUPOR & COMA	16	Neurology
4	535	CVA & PRECEREBRAL OCCLUSION W INFARCT	16	Neurology
4	217	LEVEL I NERVE PROCEDURES	16	Neurology
4	218	LEVEL II NERVE PROCEDURES	16	Neurology
5	221	LAMINOTOMY AND LAMINECTOMY	16	Neurology
5	223	LEVEL III NERVE PROCEDURES	16	Neurology
5	224	LEVEL IV NERVE PROCEDURES	16	Neurology
1	761	POSTPARTUM & POST ABORTION DIAGNOSES W/O PROCEDURE	17	Obstetrics and Gynecology
1	764	FALSE LABOR	17	Obstetrics and Gynecology
1	765	OTHER ANTEPARTUM DIAGNOSES	17	Obstetrics and Gynecology
1	766	ROUTINE PRENATAL CARE	17	Obstetrics and Gynecology
1	752	LEVEL I MENSTRUAL AND OTHER FEMALE DIAGNOSES	17	Obstetrics and Gynecology
2	191	LEVEL I FETAL PROCEDURES	17	Obstetrics and Gynecology
2	762	THREATENED ABORTION	17	Obstetrics and Gynecology

Severity	EAPG	EAPG Description	Service	Service Description
				Gynecology
2	763	ABORTION W/O D&C, ASPIRATION CURETTAGE OR HYSTEROTOMY	17	Obstetrics and Gynecology
2	751		17	Obstetrics and Gynecology
		FEMALE REPRODUCTIVE SYSTEM INFECTIONS		
2	753	LEVEL II MENSTRUAL AND OTHER FEMALE DIAGNOSES	17	Obstetrics and Gynecology
3	190		17	Obstetrics and Gynecology
		ARTIFICIAL FERTILIZATION		
3	192		17	Obstetrics and Gynecology
		LEVEL II FETAL PROCEDURES		
3	750		17	Obstetrics and Gynecology
		FEMALE REPRODUCTIVE SYSTEM MALIGNANCY		
3	196		17	Obstetrics and Gynecology
		LEVEL I FEMALE REPRODUCTIVE PROCEDURES		
3	201		17	Obstetrics and Gynecology
		COLPOSCOPY		
3	760		17	Obstetrics and Gynecology
		VAGINAL DELIVERY		
4	193		17	Obstetrics and Gynecology
		TREATMENT OF INCOMPLETE ABORTION		
4	194		17	Obstetrics and Gynecology
		THERAPEUTIC ABORTION		
4	197		17	Obstetrics and Gynecology
		LEVEL II FEMALE REPRODUCTIVE PROCEDURES		
4	199		17	Obstetrics and Gynecology
		DILATION AND CURETTAGE		
4	200		17	Obstetrics and Gynecology
		HYSTEROSCOPY		
5	195		17	Obstetrics and Gynecology
		VAGINAL DELIVERY		
5	198		17	Obstetrics and Gynecology
		LEVEL III FEMALE REPRODUCTIVE PROCEDURES		
1	483	RADIATION THERAPY MANAGEMENT	18	Oncology
1	484	THERAPEUTIC RADIOLOGY TREATMENT PLANNING	18	Oncology
1	800	ACUTE LEUKEMIA	18	Oncology
1	801	LYMPHOMA, MYELOMA & NON-ACUTE LEUKEMIA	18	Oncology
1	804	LYMPHATIC & OTHER MALIGNANCIES & NEOPLASMS OF UNCERTAIN BEHAVIOR	18	Oncology
2	347	HIGH ENERGY NEUTRON RADIATION TREATMENT DELIVERY	18	Oncology
2	476	LEVEL I THERAPEUTIC RADIATION TREATMENT PREPARATION	18	Oncology
2	478	MEDICAL RADIATION PHYSICS	18	Oncology
2	480	TELETHERAPY/BRACHYTHERAPY CALCULATION	18	Oncology
3	343	RADIATION TREATMENT DELIVERY	18	Oncology
3	344	INSTILLATION OF RADIOELEMENT SOLUTIONS	18	Oncology
3	341	RADIATION THERAPY AND HYPERTHERMIA	18	Oncology
3	477	LEVEL II THERAPEUTIC RADIATION TREATMENT PREPARATION	18	Oncology
3	479	TREATMENT DEVICE DESIGN AND CONSTRUCTION	18	Oncology
3	481	THERAPEUTIC RADIOLOGY SIMULATION FIELD SETTING	18	Oncology
3	802	RADIOTHERAPY	18	Oncology
3	803	CHEMOTHERAPY	18	Oncology
4	342	AFTERLOADING BRACHYTHERAPY	18	Oncology
4	345	HYPERTHERMIC THERAPIES	18	Oncology
5	346	RADIOSURGERY	18	Oncology
5	348	PROTON TREATMENT DELIVERY	18	Oncology

Severity	EAPG	EAPG Description	Service	Service Description
5	349	LEVEL II AFTERLOADING BRACHYTHERAPY	18	Oncology
5	482	RADIOELEMENT APPLICATION	18	Oncology
1	231	FITTING OF CONTACT LENSES	19	Ophthalmology
1	422	PROVISION OF VISION AIDS	19	Ophthalmology
1	550	ACUTE MAJOR EYE INFECTIONS	19	Ophthalmology
1	551	CATARACTS	19	Ophthalmology
1	552	GLAUCOMA	19	Ophthalmology
1	553	LEVEL I OTHER OPHTHALMIC DIAGNOSES	19	Ophthalmology
1	555	CONJUNCTIVITIS	19	Ophthalmology
2	230	MINOR OPHTHALMOLOGICAL TESTS AND PROCEDURES	19	Ophthalmology
2	419	MINOR OPHTHALMOLOGICAL INJECTION, SCRAPING AND TESTS	19	Ophthalmology
2	554	LEVEL II OTHER OPHTHALMIC DIAGNOSES	19	Ophthalmology
3	485	CORNEAL TISSUE PROCESSING	19	Ophthalmology
3	232	LASER EYE PROCEDURES	19	Ophthalmology
4	233	CATARACT PROCEDURES	19	Ophthalmology
4	234	LEVEL I ANTERIOR SEGMENT EYE PROCEDURES	19	Ophthalmology
4	237	LEVEL I POSTERIOR SEGMENT EYE PROCEDURES	19	Ophthalmology
4	240	LEVEL I REPAIR AND PLASTIC PROCEDURES OF EYE	19	Ophthalmology
5	235	LEVEL II ANTERIOR SEGMENT EYE PROCEDURES	19	Ophthalmology
5	236	LEVEL III ANTERIOR SEGMENT EYE PROCEDURES	19	Ophthalmology
5	238	LEVEL II POSTERIOR SEGMENT EYE PROCEDURES	19	Ophthalmology
5	239	STRABISMUS AND MUSCLE EYE PROCEDURES	19	Ophthalmology
5	241	LEVEL II REPAIR AND PLASTIC PROCEDURES OF EYE	19	Ophthalmology
1	650	FRACTURE OF FEMUR	20	Orthopedics
1	652	FRACTURES & DISLOCATIONS EXCEPT FEMUR, PELVIS & BACK	20	Orthopedics
1	655	CONNECTIVE TISSUE DIAGNOSES	20	Orthopedics
1	656	BACK & NECK DIAGNOSES EXCEPT LUMBAR DISC DIAGNOSES	20	Orthopedics
1	657	LUMBAR DISC DIAGNOSES	20	Orthopedics
1	660	LEVEL I OTHER MUSCULOSKELETAL SYSTEM & CONNECTIVE TISSUE DIAGNOSES	20	Orthopedics
1	662	OSTEOPOROSIS	20	Orthopedics
1	658	LUMBAR DISC DIAGNOSES WITH SCIATICA	20	Orthopedics
1	39	REPLACEMENT OF CAST	20	Orthopedics
1	40	SPLINT, STRAPPING AND CAST REMOVAL	20	Orthopedics
2	49	ARTHROCENTESIS AND LIGAMENT OR TENDON INJECTION	20	Orthopedics
2	651	FRACTURE OF PELVIS OR DISLOCATION OF HIP	20	Orthopedics
2	653	MUSCULOSKELETAL MALIGNANCY & PATHOLOGICAL FRACTURES	20	Orthopedics
2	654	OSTEOMYELITIS, SEPTIC ARTHRITIS & OTHER MUSCULOSKELETAL INFECTIONS	20	Orthopedics
2	659	MALFUNCTION, REACTION, COMPLIC OF ORTHOPEDIC DEVICE OR PROCEDURE	20	Orthopedics
2	661	LEVEL II OTHER MUSCULOSKELETAL SYSTEM & CONNECTIVE TISSUE DIAGNOSES	20	Orthopedics
3	41	CLOSED TREATMENT FX & DISLOCATION OF FINGER, TOE & TRUNK	20	Orthopedics
3	42	CLOSED TREATMENT FX & DISLOCATION EXC FINGER, TOE & TRUNK	20	Orthopedics
3	33	LEVEL I HAND PROCEDURES	20	Orthopedics
3	35	LEVEL I FOOT PROCEDURES	20	Orthopedics
3	37	LEVEL I ARTHROSCOPY	20	Orthopedics
4	48	HAND AND FOOT TENOTOMY	20	Orthopedics

Severity	EAPG	EAPG Description	Service	Service Description
4	32	LEVEL III MUSCULOSKELETAL PROCEDURES EXCLUDING HAND AND FOOT	20	Orthopedics
4	34	LEVEL II HAND PROCEDURES	20	Orthopedics
4	36	LEVEL II FOOT PROCEDURES	20	Orthopedics
4	38	LEVEL II ARTHROSCOPY	20	Orthopedics
4	45	BUNION PROCEDURES	20	Orthopedics
4	46	LEVEL I ARTHROPLASTY	20	Orthopedics
5	31	LEVEL II MUSCULOSKELETAL PROCEDURES EXCLUDING HAND AND FOOT	20	Orthopedics
5	43	OPEN OR PERCUTANEOUS TREATMENT OF FRACTURES	20	Orthopedics
5	44	BONE OR JOINT MANIPULATION UNDER ANESTHESIA	20	Orthopedics
5	47	LEVEL II ARTHROPLASTY	20	Orthopedics
1	575	ASTHMA	21	Pulmonary
1	578	PNEUMONIA EXCEPT FOR COMMUNITY ACQUIRED PNEUMONIA	21	Pulmonary
1	412	SIMPLE PULMONARY FUNCTION TESTS	21	Pulmonary
1	576	LEVEL I OTHER RESPIRATORY DIAGNOSES	21	Pulmonary
2	572	BRONCHIOLITIS & RSV PNEUMONIA	21	Pulmonary
2	573	COMMUNITY ACQUIRED PNEUMONIA	21	Pulmonary
2	574	CHRONIC OBSTRUCTIVE PULMONARY DISEASE	21	Pulmonary
2	571	RESPIRATORY MALIGNANCY	21	Pulmonary
2	570	CYSTIC FIBROSIS - PULMONARY DISEASE	21	Pulmonary
2	577	LEVEL II OTHER RESPIRATORY DIAGNOSES	21	Pulmonary
3	60	PULMONARY TESTS	21	Pulmonary
3	65	RESPIRATORY THERAPY	21	Pulmonary
4	64	ENDOSCOPY OF THE LOWER AIRWAY	21	Pulmonary
5	579	STATUS ASTHMATICUS	21	Pulmonary
5	67	VENTILATION ASSISTANCE AND MANAGEMENT	21	Pulmonary
1	470	OBSTETRICAL ULTRASOUND	22	Radiology and Nuclear Medicine
1	471	PLAIN FILM	22	Radiology and Nuclear Medicine
1	472	ULTRASOUND GUIDANCE	22	Radiology and Nuclear Medicine
1	473	CT GUIDANCE	22	Radiology and Nuclear Medicine
1	286	MAMMOGRAPHY & OTHER RELATED PROCEDURES	22	Radiology and Nuclear Medicine
2	475	MRI GUIDANCE	22	Radiology and Nuclear Medicine
2	283	MAGNETIC RESONANCE ANGIOGRAPHY - OTHER SITES	22	Radiology and Nuclear Medicine
2	285	MISCELLANEOUS RADIOLOGICAL PROCEDURES WITH CONTRAST	22	Radiology and Nuclear Medicine
2	287	DIGESTIVE RADIOLOGY	22	Radiology and Nuclear Medicine
2	288	DIAGNOSTIC ULTRASOUND EXCEPT OBSTETRICAL AND VASCULAR OF LOWER EXTREMITIES	22	Radiology and Nuclear Medicine
2	289	VASCULAR DIAGNOSTIC ULTRASOUND OF LOWER EXTREMITIES	22	Radiology and Nuclear Medicine
2	291	BONE DENSITOMETRY	22	Radiology and Nuclear Medicine
2	293	MRI- JOINTS	22	Radiology and Nuclear Medicine
2	296	MRI- OTHER	22	Radiology and Nuclear Medicine
2	298	CAT SCAN BACK	22	Radiology and

Severity	EAPG	EAPG Description	Service	Service Description
				Nuclear Medicine
2	301	CAT SCAN - OTHER	22	Radiology and Nuclear Medicine
3	281	MAGNETIC RESONANCE ANGIOGRAPHY - HEAD AND/OR NECK	22	Radiology and Nuclear Medicine
3	282	MAGNETIC RESONANCE ANGIOGRAPHY - CHEST	22	Radiology and Nuclear Medicine
3	292	MRI- ABDOMEN	22	Radiology and Nuclear Medicine
3	294	MRI- BACK	22	Radiology and Nuclear Medicine
3	295	MRI- CHEST	22	Radiology and Nuclear Medicine
3	297	MRI BRAIN AND MAGNETOENCEPHALOGRAPHY	22	Radiology and Nuclear Medicine
3	299	CAT SCAN - BRAIN	22	Radiology and Nuclear Medicine
3	300	CAT SCAN - ABDOMEN	22	Radiology and Nuclear Medicine
3	330	LEVEL I DIAGNOSTIC NUCLEAR MEDICINE	22	Radiology and Nuclear Medicine
4	474	RADIOLOGICAL GUIDANCE FOR THERAPEUTIC OR DIAGNOSTIC PROCEDURES	22	Radiology and Nuclear Medicine
4	302	ANGIOGRAPHY, OTHER	22	Radiology and Nuclear Medicine
4	303	ANGIOGRAPHY, CEREBRAL	22	Radiology and Nuclear Medicine
4	331	LEVEL II DIAGNOSTIC NUCLEAR MEDICINE	22	Radiology and Nuclear Medicine
4	340	THERAPEUTIC NUCLEAR MEDICINE	22	Radiology and Nuclear Medicine
4	290	PET SCANS	22	Radiology and Nuclear Medicine
5	284	MYELOGRAPHY	22	Radiology and Nuclear Medicine
5	280	VASCULAR RADIOLOGY EXCEPT VENOGRAPHY OF EXTREMITY	22	Radiology and Nuclear Medicine
5	332	LEVEL III DIAGNOSTIC NUCLEAR MEDICINE	22	Radiology and Nuclear Medicine
1	871	SIGNS, SYMPTOMS & OTHER FACTORS INFLUENCING HEALTH STATUS	23	Rehabilitation
1	874	JOINT REPLACEMENT	23	Rehabilitation
2	275	SPEECH THERAPY & EVALUATION, GROUP	23	Rehabilitation
2	274	OCCUPATIONAL/PHYSICAL THERAPY, GROUP	23	Rehabilitation
3	872	OTHER AFTERCARE & CONVALESCENCE	23	Rehabilitation
3	273	MANIPULATION THERAPY	23	Rehabilitation
3	870	REHABILITATION	23	Rehabilitation
4	270	OCCUPATIONAL THERAPY	23	Rehabilitation
4	271	PHYSICAL THERAPY	23	Rehabilitation
4	272	SPEECH THERAPY AND EVALUATION	23	Rehabilitation
5	66	PULMONARY REHABILITATION	23	Rehabilitation
5	94	CARDIAC REHABILITATION	23	Rehabilitation
5	993	INPATIENT ONLY PROCEDURES	24	Unassigned
5	994	USER CUSTOMIZABLE INPATIENT PROCEDURES	24	Unassigned
1	999	UNASSIGNED	24	Unassigned
1	727		25	Urology and Nephrology
1	741	ACUTE LOWER URINARY TRACT INFECTIONS MALE REPRODUCTIVE SYSTEM DIAGNOSES EXCEPT MALIGNANCY	25	Urology and Nephrology

Severity	EAPG	EAPG Description	Service	Service Description
1	743	PROSTATITIS	25	Urology and Nephrology
1	744	MALE REPRODUCTIVE INFECTIONS	25	Urology and Nephrology
1	726	OTHER KIDNEY & URINARY TRACT DIAGNOSES, SIGNS & SYMPTOMS	25	Urology and Nephrology
2	181	CIRCUMCISION	25	Urology and Nephrology
2	161	URINARY STUDIES AND PROCEDURES	25	Urology and Nephrology
2	742	NEOPLASMS OF THE MALE REPRODUCTIVE SYSTEM	25	Urology and Nephrology
2	724	URINARY STONES & ACQUIRED UPPER URINARY TRACT OBSTRUCTION	25	Urology and Nephrology
2	166	LEVEL I URETHRA AND PROSTATE PROCEDURES	25	Urology and Nephrology
3	180	TESTICULAR AND EPIDIDYMAL PROCEDURES	25	Urology and Nephrology
3	164	LEVEL II BLADDER AND KIDNEY PROCEDURES	25	Urology and Nephrology
3	185	PROSTATE NEEDLE AND PUNCH BIOPSY	25	Urology and Nephrology
3	162	URINARY DILATATION	25	Urology and Nephrology
3	163	LEVEL I BLADDER AND KIDNEY PROCEDURES	25	Urology and Nephrology
3	740	MALIGNANCY, MALE REPRODUCTIVE SYSTEM	25	Urology and Nephrology
3	723	KIDNEY AND CHRONIC URINARY TRACT INFECTIONS	25	Urology and Nephrology
3	725	MALFUNCTION, REACTION, COMPLIC OF GENITOURINARY DEVICE OR PROC	25	Urology and Nephrology
3	720	RENAL FAILURE	25	Urology and Nephrology
3	721	KIDNEY & URINARY TRACT MALIGNANCY	25	Urology and Nephrology
3	722	NEPHRITIS & NEPHROSIS	25	Urology and Nephrology
3	167	LEVEL II URETHRA AND PROSTATE PROCEDURES	25	Urology and Nephrology
4	165	LEVEL III BLADDER AND KIDNEY PROCEDURES	25	Urology and Nephrology
4	160	EXTRACORPOREAL SHOCK WAVE LITHOTRIPSY	25	Urology and Nephrology
4	183	OTHER PENILE PROCEDURES	25	Urology and Nephrology
4	184	DESTRUCTION OR RESECTION OF PROSTATE	25	Urology and Nephrology
4	168	HEMODIALYSIS	25	Urology and Nephrology
4	169	PERITONEAL DIALYSIS	25	Urology and Nephrology
5	182	INSERTION OF PENILE PROSTHESIS	25	Urology and Nephrology

Appendix 4. ICC and Geographic TCOC Growth Rankings

Hospital Name	ICC Result	ICC Rank	2013-2018 TCOC per Capita Growth Rate	TCOC Rank	Total Rank Points (Low Score is Better)
Anne Arundel Medical Center	-5.72%	7	3.53%	3	10
Atlantic General Hospital	-4.05%	3	5.01%	9	12
Johns Hopkins Hospital	-9.46%	10	3.81%	5	15
University of Maryland Baltimore Washington Medical Center					
St. Agnes Hospital	-9.92%	11	5.98%	12	23
St. Agnes Hospital	-11.84%	17	4.10%	6	23
Johns Hopkins Bayview Medical Center	-10.48%	12	6.09%	14	26
Mercy Medical Center	-1.66%	1	9.23%	29	30
Holy Cross Hospitals	-8.22%	9	7.69%	21	30
Meritus Medical Center	-11.00%	15	6.18%	15	30
Harford Memorial Hospital	-17.64%	28	3.44%	2	30
Washington Adventist Hospital	-15.29%	25	4.35%	7	32
MedStar Union Memorial Hospital	-5.06%	5	9.53%	30	35
Fort Washington Medical Center	-5.18%	6	10.42%	33	39
Howard County General Hospital	-10.61%	14	7.92%	25	39
Doctors Community Hospital	-21.46%	33	4.52%	8	41
University of Maryland Shore Medical Center at Dorchester	-20.11%	31	5.67%	11	42
Laurel Regional Hospital	-25.46%	41	3.09%	1	42
Suburban Hospital	-3.21%	2	12.37%	41	43
Frederick Memorial Hospital	-17.00%	27	6.88%	16	43
MedStar Southern Maryland Hospital Center	-23.81%	40	3.79%	4	44
Peninsula Regional Medical Center	-13.11%	19	8.48%	26	45
MedStar Franklin Square Hospital Center	-14.01%	21	7.88%	24	45
University of Maryland Shore Medical Center at Easton	-21.64%	36	5.67%	10	46
MedStar St. Mary's Hospital	-13.43%	20	8.89%	27	47
MedStar Harbor Hospital Center	-4.58%	4	18.04%	45	49
Sinai Hospital	-19.78%	30	7.15%	19	49
Western Maryland Regional Medical Center	-21.18%	32	7.00%	17	49
Shady Grove Adventist Hospital	-12.70%	18	10.71%	34	52
University of Maryland Charles Regional Medical Center	-10.58%	13	11.72%	40	53
Garrett County Memorial Hospital	-7.56%	8	19.96%	46	54
Greater Baltimore Medical Center	-11.74%	16	11.15%	38	54
Upper Chesapeake Medical Center	-16.72%	26	9.01%	28	54
Prince Georges Hospital Center	-14.08%	23	10.40%	32	55
Northwest Hospital Center	-23.72%	38	7.01%	18	56
Carroll Hospital Center	-21.51%	34	7.85%	23	57
Calvert Memorial Hospital	-21.55%	35	7.84%	22	57
McCready Memorial Hospital	-26.98%	45	6.03%	13	58

University of Maryland Shore Medical Center at Chestertown	-23.79%	39	7.16%	20	59
University of Maryland Medical Center	-14.16%	24	11.03%	36	60
University of Maryland St. Joseph Medical Center	-14.06%	22	11.16%	39	61
MedStar Good Samaritan Hospital	-18.94%	29	12.93%	44	73
Bon Secours Hospital	-25.54%	42	10.31%	31	73
MedStar Montgomery Medical Center	-23.14%	37	12.57%	42	79
University of Maryland Rehabilitation & Orthopaedic Institute	-26.31%	43	11.03%	36	79
Union Hospital of Cecil County	-31.05%	46	10.94%	35	81
University of Maryland Medical Center Midtown Campus	-26.32%	44	12.64%	43	87

Appendix 5: Preliminary Overview of Total Cost of Care Benchmark Calculations

Staff is proposing to calculate a hospital's Benchmark Score as the ratio of the Medicare FFS average per capita cost of care for their attributed beneficiaries for CY2018 to that of a benchmark group. A score above 1 will indicate total cost of care above the benchmark, a score below 1 will indicate cost below the benchmark. For this purpose total cost of care for each Maryland hospital will be calculated leveraging the MPA policies with the only revision being that the categorical exclusions and the elimination of beneficiary costs above the 99th percentile will not be applied.¹⁸

Benchmark Overview

The benchmark for a hospital will be developed in a three step process. Step 1 is to identify benchmark groups for each Maryland County. Step 2 is to translate the county benchmarks into a benchmark for each hospital. Step 3 is to complete the cost comparison.

Step 1 Establish Benchmark Counties

Staff has established and shared a list of benchmark counties for each Maryland County (collectively for each Maryland County the Benchmark Cohort). The Benchmark Cohort was identified in two steps (1) narrowing possible benchmark counties for each Maryland County to those of a similar population size and density and (2) from the narrowed list selecting the counties with the closest match to the Maryland County in terms of four demographic characteristics.

A. Step 1, Part 1 – Narrowing the Potential Benchmark Cohort

Initially the Benchmark Cohort for a county was limited to counties with the same Rural-Urban Continuum code (RU Code) as the Maryland County. RU Codes are assigned to each US County by the Department of Agriculture and reflect factors such as population, degree of urbanization and adjacency to a metro area.¹⁹

The potential Benchmark Cohort was further narrowed based on the population size and density. Under this approach the most urban counties were subdivided into a 4x4 matrix based on the population size and density quartiles. The potential Benchmark Cohort was then narrowed to only those national counties in the same cell as the Maryland County. In this process, some cells were combined due to small size.

¹⁸ These adjustments are removed due to the technical complexity of applying them to the national benchmark data. Staff believes that given that the outcomes of the benchmarking are being used to broadly group hospitals rather than measure at a detail level, the removal of the exclusions is not material.

¹⁹ The codes range from 1 (most urban) to 9 (least urban). For Maryland counties with RU Codes 2-8 all national counties with the same RU Code were included in the potential Benchmark Cohort. However, RU Code 1 reflects a large variation in county size, in order to better match Maryland's five large urban counties to an appropriate peer group (Baltimore City and County, Anne Arundel, Prince George's and Montgomery) a refinement was added for all RU 1 Maryland counties.

B. Step 1, Part 2 – Selecting the Benchmark Cohort

The specific members of the Benchmark Cohort for each Maryland County were selected as the most “similar” to the Maryland County across four dimensions:

Income – **Median Income** (Source: American Community Survey 2013 to 2017)

Cost – **Regional Price Parities (RPP)**, price levels across the US (Source: Bureau of Economic Analysis, 2018)

Socio-Economic Status – **% Deep Poverty**, % of individuals below 50% of the poverty level (Source: American Community Survey, 2013 to 2017)

Disease Burden – **Hierarchical Condition Category (HCC)**, measure of healthcare cost risk in a population (Source: CMS, 2017)

Staff considered an extensive list of metrics on which to define similarity. Staff settled on a short list of metrics in order to simplify the process and maximize data availability. These specific metrics that were selected represent various factors that drive healthcare need in a community. Staff specifically avoided metrics that reflect the historic nature of the healthcare system in a community like academic presence, physician supply or payor mix.

The values from each metric for each county were then converted to standard deviations from the mean to create a common scale and then blended together with equal weight given to each metric.²⁰ Each national county’s similarity to each Maryland County was then calculated based on comparing the blended score of the Maryland County with that of the national county. The Benchmark Cohort for a Maryland County is made up of the national counties with the smallest difference from the Maryland County (from within the pools determined in Step 1 Part 1).

For the five large urban counties the Benchmark Cohort consists of the 20 most similar national counties. For the remaining counties the 50 most similar were used. The number of counties in the Benchmark Cohort was selected to balance a number of factors. The need to evaluate the Maryland County against a range of peers for this and other policies and the greater stability of larger samples indicated a larger cohort size. However, increasing the sample size reduces the average similarity and tends towards the maximum potential matches for the largest counties. The cohort sizes were selected to balance these factors, with a larger cohort used for smaller counties with more potential matches and greater risk of data instability (see discussion of 5% sample below).

Step 2 – Translate County Benchmarks into Hospital Benchmarks

Once a Benchmark Cohort was selected average total cost of care was calculated for each member and a cohort average was calculated based on a straight average (Benchmark TCOC). A straight average was used as staff did not feel that different county sizes were relevant once a county was placed in the Benchmark Cohort.

²⁰ Data for all the metrics except RPP are available at a county level. RPP is available at an MSA level. Staff felt it was appropriate to map from an MSA level to a county level for this metric due to the regional nature of prices.

Data for national costs was pulled from the Medicare 5% sample provided by CMS in its data warehouse referred to as the Chronic Condition Warehouse or CCW.²¹ The 100% sample was used for Maryland because of the greater stability. Testing showed that for smaller counties the 5% sample can be unstable, at a county level, from year to year. However, given the size of the cohort used for small counties (50 counties), staff believes using the 5% sample for the Benchmark Cohorts is a reliable approach.

Once benchmark costs had been established at a county level they were translated to a hospital level based on the residence of a hospital’s MPA attributed beneficiaries, which was calculated for each hospital in each county. Counties with less than 2% of the hospital’s total population were then dropped as reflecting noise in the data. A percentage of total MPA attributed beneficiaries reflected in the benchmark was then calculated as 1 – Sum of the percentage reflected by the dropped counties to ensure that the sum of the weights equals 100. For most hospitals, the percent of MPA beneficiaries in dropped counties is less than 10%.

Each Hospital’s Unadjusted Benchmark was then calculated as

$$\frac{\sum \text{MD County \% of Hospital attributed beneficiaries} \times \text{MD County Benchmark TCOC}}{\% \text{ of Hospital's total MPA attributed beneficiaries reflected}}$$

To better match on healthcare risk the Unadjusted Benchmark was then converted to an Adjusted Benchmark by dividing the Unadjusted Benchmark by the average HCC score for the Benchmark Cohort and multiplying it by the HCC score for the Hospital MPA attributed beneficiaries.

Staff is continuing to evaluate methods that will further normalize the Adjusted Benchmark for differences between the demographics of the Hospital’s attributed population and the benchmark demographics that are not accounted for in the HCC score.

Step 3 – Complete the cost comparison

Each hospital’s Benchmark Score is calculated as the ratio of the average total cost per capita of the Hospital’s attributed beneficiaries to the Adjusted Benchmark. Hospitals below their Adjusted Benchmark will have scores below 1.0, those above their adjusted benchmark will have scores above 1.0.

The Benchmark Scores are then ranked from lowest to highest and the bottom quartile flagged for potential adjustment under this efficiency approach.

²¹ Whereas under the MPA attribution costs for Maryland counties are pulled from the 100% sample for Maryland provided by CMS in CCW. Staff compared results for Maryland between the two samples and determined they were comparable.

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

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Health Services Cost Review Commission

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TO: Commissioners

FROM: HSCRC Staff

DATE: July 10, 2019

RE: Hearing and Meeting Schedule

September 11, 2019 To be determined - 4160 Patterson Avenue
HSCRC/MHCC Conference Room

October 9, 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.