AHEAD Model

Financial Specifications for the CMS-Designed Medicare FFS Hospital Global Budget Methodology

Version 3.0

Disclaimer: *The content in this resource does not reflect updates to the AHEAD Model, effective as of August 2025. These updates include model timeline changes, the addition of a geographic-based component (Geo AHEAD) that overlays hospital global budgets, and a requirement to implement state-level choice and competition policies that may impact hospitals. For the most up-to-date information about the AHEAD model and these updates, please see the AHEAD Model Webpage.*

Centers for Medicare & Medicaid Services
Center for Medicare & Medicaid Innovation
State and Population Health Group
7500 Security Boulevard,
Baltimore, Maryland 21244

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1. Introduction

This document describes the financial methodology and operational payment features of Medicare Fee-For-Service (FFS) Hospital Global Budget (HGB) under the AHEAD model. It aims to provide eligible applicants, providers, and interested parties with the specifications necessary to understand the way prospective, Medicare FFS HGB payments to Participant Hospitals for select services are designed in the AHEAD Model to incentivize and reward care delivery transformation that drives value-based care. As designed, Medicare FFS HGBs are fixed, annual prospective budgets based on a historical net patient revenue (NPR) baseline that is trended forward to account for annual changes and performance incentives.

1.1 Updates to Technical Specifications

This document is the third version of the HGB specifications and includes the following updates to the methodology in response to feedback from key audiences. These updates improve predictability of HGB payments to reduce risk for interested Participant Hospitals. The Centers for Medicare & Medicaid Services (CMS) does not anticipate further major updates to the HGB specifications. However, CMS encourages interested parties to continue to offer recommendations to refine the methodology. Suggestions or other questions about the AHEAD Model can be submitted to AHEAD@cms.hhs.gov. Specifications are updated annually, prior to each model performance year (PY), to account for changes to CMS policy or other circumstances.

Below is a summary of major changes from the second to third versions:

- **Baseline Calculation:** To better account for the time needed to calculate HGBs, the baseline calculation has been clarified to use four months of Claims Runout rather than six months. Additionally, the baseline amounts are optimized using logistic regression to be comparable to what Medicare FFS payments to the Participant Hospital would have been in the absence of HGB payments during the first PY.
- **Disproportionate Share Hospital (DSH), Indirect Medical Education (IME), Direct Graduate Medical Education (DGME) and Nursing and Allied Health (N&AH) Payments:** To ensure Participant Hospitals are compensated for costs related to DSH, IME, DGME, and N&AH for Medicare Advantage beneficiaries, CMS now applies a floor to these payments so that they are not lower than what would have been paid under Medicare rules applicable during each PY, including settlements performed by the Medicare Administrative Contractor (MAC).
- **Annual Payment Adjustment (APA):** The APA is now separated into two components so that the uncompensated care payment adjustment, which is unrelated to case mix is no longer adjusted by the Participant Hospital's case mix. This allows for better parity with Medicare FFS.
- **Outlier Adjustment:** The Outlier Adjustment is a new adjustment that uses actual outlier payment amounts from No-Pay Claims to calculate the change in the share of a Participant Hospital's outlier payments year-to-year. Previously, adjustment for outliers was included in the APA using estimated amounts sourced from the Inpatient Prospective Payment System (IPPS) Impact File.
- **Market Shift Adjustment (MSA):** The MSA is adjusted to better account for shifts between hospital markets. First, the geographic area is now based on zip code instead of

county. Zip-codes are identified by the contribution to the Participant Hospital's total Medicare FFS Payments or the Participant Hospital's rank within the zip based on Medicare FFS payments relative to other hospitals that also serve the zip. This results in smaller geographic areas that better reflect the market area served by a Participant Hospital. Second, the MSA is now calculated using the Participant Hospital's year-over-year change in the share of FFS payments and case weights within its geographic market area. To protect small hospitals from high year-over-year variation, CMS applied a floor limiting reductions in HGB payments from the MSA for Participant Hospitals defined as small hospitals in the methodology. Finally, the MSA no longer includes the lesser of rule or the Unplanned Volume Adjustment. These changes combine to provide higher face validity by better aligning the MSA with changes in volume.

- **Average Sales Price (ASP)/Average Wholesale Price (AWP) Drugs Weighting:** For purposes of including ASP/AWP drugs in the MSA, CMS now creates a scale factor that converts ASP/AWP prices to Ambulatory Payment Classifications (APC) weights. The scale factor represents the average payment made by CMS in dollars per unit of APC weight for outpatient services paid via APC.
- **Social Risk Adjustment (SRA):** The SRA now utilizes the CMS-developed Community Deprivation Index (CDI) in lieu of the Area Deprivation Index (ADI) to align more closely to other validated health measures. The scaling for the SRA is now based on the percentile of the Participant Hospital's Social Risk Score (SRS) relative to hospitals within each AHEAD state or sub-state region rather than the state median. This allows for a less concentrated distribution of SRA rewards. In addition, the CDI value used to calculate a hospital's SRS cannot be lower than the CDI used in the SRA for Performance Year 1 (PY1), to avoid penalizing hospitals that positively influence social health needs of local areas.
- **Total Cost of Care (TCOC) Adjustment:** The TCOC Adjustment has been revised to use risk corridors and a trend factor that better aligns with statewide TCOC targets. Instead of using the case-matched trend described in Version 2.0, risk adjusted attributed Per Beneficiary Per Month (PBPM) TCOC for each Participant Hospital is trended forward using the same annual growth factor as used in AHEAD State TCOC calculations to set the Participant Hospital's Target PBPM TCOC. A performance corridor of +/- two percent is then applied to protect providers that have small changes in their TCOC from natural fluctuations and only rewards or penalizes providers that have outperformed or underperformed their target by a meaningful amount.
- **Effectiveness Adjustment:** The New York University Emergency Department measure is replaced with NCQA's Emergency Department Utilization measure. The Low Value Care measure is also removed. The effectiveness adjustment was also updated to adjust Participant Hospital's overall PAU percent by their SRS.
- **Community Improvement Bonus (CIB):** The CIB is revised to replace the PQI-92 measure with PQI-90 and to update the readmissions measure to use the Hybrid eHWR measure. The CIB is also modified to calculate performance improvement for all beneficiaries in each measure as opposed to only the high acuity cohort. The high acuity cohort was replaced due to small data sizes that resulted in high variability in HGB calculations. The targets are also revised for each measure and performance year. Finally,

the CIB now multiplies the improvement score for each measure by the Participant Hospital's SRS percentile.

- **Critical Access Hospital (CAH) Quality Incentive Program:** The Safe Use of Opioids measure was moved from the Quality and Utilization domain to the Patient Safety Domain because it more closely aligns with the other Patient Safety measures. The pay-for-reporting threshold was increased from at least one measure in two domains to at least one measure in all three domains.
- **Site Specific HGBs:** Hospitals may elect to participate in HGBs at either the CMS Certification Number (CCN) or Organizational National Provider Identifier (ONPI) level. If a hospital participates at the ONPI level, the baseline and all other adjustments except the Annual Payment Adjustment (APA) are calculated specific to the ONPI. This allows hospitals within systems to gain experience with HGBs.

1.2 Model Overview

The AHEAD Model is a voluntary, state-based alternative payment and service delivery model designed to curb health care cost growth, improve population health, and advance community health outcomes. The AHEAD Model tests a flexible framework that includes statewide or sub-state[1] accountability targets for all-payer, Medicare FFS cost growth, primary care investment, and population health outcomes. The model includes specific components to help each award recipient achieve these goals, including Medicare HGB and Medicaid HGB for Participant Hospitals and a primary care program for Participant Primary Care Practices.

Current statewide and regional care transformation and payment reforms, along with early implementation of transformation activities, are key to building a sustainable approach to care transformation under the AHEAD Model. The Model is intended to integrate seamlessly into ongoing state health reform work—especially in those states that have already invested considerable time and resources in restructuring local delivery systems—to galvanize participating states to enhance innovation while meeting Model goals. With Medicare serving as an invested payer in these innovations, AHEAD provides a framework to use Medicare FFS, Medicaid, and commercial payer alignment to catalyze greater transformation within states and across regions. The model relies on a state-led, all-payer strategy to increase investments in primary care and integrate behavioral health and health-related social needs across the delivery system, while constraining TCOC growth through improved preventive care and population health, HGBs, and all-payer and Medicare FFS growth targets.

1.3 Hospital Global Budgets

HGBs are a method of financing health care services that shift economic incentives away from volume and toward value. This key component of the AHEAD Model aims to change care delivery, improve care quality, reduce unnecessary services, and generate revenue to invest in population health priorities. HGBs are a prospectively set fixed amount of revenue a hospital receives for the treatment of a specific patient population or program. Hospital FFS payments encourage providers to increase the volume of services to generate revenue, which may incentivize

[1] A sub-state region is defined as a group or groups of zip codes within a state that do not encompass an entire state and may or may not be close in location (i.e., do not need to share a common border). If a state elects and is accepted to participate in the AHEAD Model via a sub-state region, assessment of the state's performance is based on its participation at the sub-state region-level. States may not apply to participate in the AHEAD Model through multiple, separate sub-state regions.

the overuse of services, duplication of complex services, or over-investment in sophisticated capital and technology. In comparison, global budgets provide hospitals, including rural and urban safety net hospitals, with financial stability and flexibility, and incentivize reductions in unnecessary utilization. Unlike FFS, hospitals participating in global budgets can retain revenue that would otherwise be lost from eliminating unnecessary utilization like readmissions or avoidable emergency department visits. Global budgets also provide hospitals with the incentives for and flexibility to work with other health care providers and public health agencies to improve the health of the mutual populations they serve.

In the AHEAD Model[2], Medicare HGB payment amounts are calculated based on Medicare payments in previous years and updates to reflect inflation as well as changes in populations served and services provided. Because revenue is separated from volume in an HGB, hospitals are disincentivized to increase volume and rewarded for population health improvements that reduce costs. Through global budgets, hospitals can reduce the costs of care, improve their financial performance, and refocus investments to improve the care of their patient population.

Under AHEAD, HGBs replace payments for inpatient and outpatient facility services, but not for professional services. However, hospitals must engage and work with these professional services providers furnishing care to hospital patients, as well as non-hospital providers and facilities furnishing care to Medicare beneficiaries who may or may not seek hospital care, to succeed in this type of arrangement. Additionally, CMS makes certain waivers available to allow Participant Hospitals to formalize arrangements with these non-hospital providers and to provide additional flexibilities to Participant Hospitals. These waivers are described in greater detail in the State and Hospital Participation Agreements.

By participating in HGBs and shifting away from FFS incentives, hospitals can realize financial savings from reduced avoidable utilization (e.g., avoidable admissions and emergency visits) and moving care to lower acuity settings, when appropriate. Hospitals also derive value from stable and predictable funding, the ability to reorient activities to population health management, and the opportunity to deploy innovative strategies that improve beneficiary care quality and reinvigorate clinician engagement.

1.4 Timeline

The AHEAD Model operates for 11 years (2024 – 2034), and includes a Pre-Implementation Period and an Implementation Period, followed by up to two Transition Years. There are three cohorts of states in the AHEAD Model, each of which have their own timeline. States apply to a specific cohort when applying to the model, and CMS selects states for participation in that cohort in which they applied. Cohort participation impacts the length of the Pre-Implementation Period (which can range between 18 – 30 months) and the number of Performance Years (PYs) in the Implementation Period (eight or nine years). During the Pre-Implementation Period, AHEAD States recruit Participant Hospitals, recruit Primary Care Practices for Primary Care AHEAD, initiate Medicaid alignment, develop a Model Governance Structure, and engage private payers. **Exhibit 1** provides a visual representation of the model implementation timeline for Cohorts one to three. Medicare HGB payments and Primary Care AHEAD do not begin until the Implementation Period (PY1 and beyond) for AHEAD States.

[2] AHEAD Model Hospital Global Budget Factsheet, https://www.cms.gov/files/document/ahead-hgb-fs.pdf

Exhibit 1: Cohort Implementation Timeline

Cohort	2024 Q3	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
1	Pre-Imp.	Pre-Imp.	PY1	PY2	PY3	PY4	PY5	PY6	PY7	PY8	PY9
2	Pre-Imp.	Pre-Imp.	Pre-Imp.	PY1	PY2	PY3	PY4	PY5	PY6	PY7	PY8
3	NOFO	Pre-Imp.	Pre-Imp.	PY1	PY2	PY3	PY4	PY5	PY6	PY7	PY8

Abbreviations: NOFO = Notice of Funding Opportunity, Pre-Imp. = Pre-Implementation Period

1.5 Eligible Hospitals

Acute Care Hospitals (ACHs) and Critical Access Hospitals (CAHs) are eligible to participate in Medicare HGBs under the model. Eligible Hospitals also include Rural Emergency Hospitals (REHs)—a new Medicare provider type offering outpatient, observation, emergency, and certain other services that AHEAD States allow to operate by enacting legislation prior to or during the Model Implementation Period. Eligible Hospitals must be a Medicare-enrolled facility in good standing[3] with CMS and located in a participating AHEAD State or sub-state region to be eligible to participate. Hospital participation in AHEAD is voluntary and is subject to state-level coordination and oversight. Eligible Hospitals that meet these qualifications and sign a Hospital Participation Agreement for the AHEAD Model are termed Participant Hospitals. **Exhibit 2** outlines the hospital types eligible and ineligible for participation in the AHEAD Medicare FFS HGB.[4]

Exhibit 2: Provider Types Eligible and Ineligible from Participation in Medicare HGBs

Hospital Type	Eligible/Ineligible
Acute Care Hospitals	Eligible
Critical Access Hospital	Eligible
Medicare-Dependent Hospital	Eligible
REH	Eligible
Rural Referral Center (RRC) Program	Eligible
Sole Community Hospital (SCH)	Eligible
Tribal Hospital	Eligible
Indian Health Service (IHS) Hospitals	Eligible
Cancer Hospitals	Ineligible
Children's Hospitals	Ineligible
Long-Term Care Facilities	Ineligible
Skilled Nursing Facilities	Ineligible

[3] Medicare-enrolled providers must meet all requirements set forth by CMS to be considered in good standing. More information on Medicare enrollment and requirements for provider is available at: https://www.cms.gov/medicare/enrollment-renewal/providers-suppliers.

[4] While Tribal and Indian Health Services hospitals are eligible for the AHEAD Model, the states currently considering the model do not have Tribal and Indian Health Services hospitals. Therefore, the HGB methodology does not specify an application for these hospitals.

Hospital Type	Eligible/Ineligible
Psychiatric Hospitals (free standing and distinct part units)	Ineligible
Rehabilitation Hospitals (free standing and distinct part units)	Ineligible
Transplant Hospitals	Ineligible
Veterans' Hospitals	Ineligible

Exhibit 3 lists payment policies by type of hospital that precede participation in AHEAD and details how they are addressed in the baseline and subsequent HGBs for each Participant Hospital. Hospitals that voluntarily agree to participate under a HGB sign Hospital Participation Agreements with CMS that enumerate their participation requirements and expectations. Hospital Participation Agreements are provided to interested hospitals during the Pre-Implementation Period and need to be signed in advance of a hospital participating in HGBs for the upcoming PY.

Exhibit 3: Hospital Types Included Under the AHEAD Hospital Global Budget Methodology

Hospital Type	Payments & Policies Prior to AHEAD Model	Basis for HGB Development
Critical Access Hospital (CAH)	CAHs are paid for most inpatient and outpatient services to patients at 101 percent of reasonable costs.	Medicare FFS payments and cost report settlements including swing beds that reflect total payments are used to construct a CAH's baseline HGB. Under the AHEAD Model, CAHs are no longer reconciled back to 101 percent of reasonable costs as part of their cost reporting. A payment floor is also applied to CAHs participating in AHEAD (**Section 2.1.6**).
Medicare-Dependent Hospital (MDH)	MDHs receive operating payments based on the higher of the federal rate or the federal rate plus 75 percent of the difference between the federal rate and the hospital-specific rate. An MDH's capital payments are solely based on the capital base rate. MDHs may also qualify for a payment adjustment if the hospital experiences a significant volume decrease. The MDH program expires on March 31, 2025. All hospitals that previously qualified for MDH status will be paid under IPPS and will no longer receive the additional payment based on the hospital-specific rate. The MDHs do have the option to apply for SCH status and will be paid as such under certain conditions following the program expiration.	Given the MDH program expiration, the Medicare FFS payments methodology for acute care hospitals or SCHs will be applied.

Hospital Type	Payments & Policies Prior to AHEAD Model	Basis for HGB Development
Rural Emergency Hospital (REH)	Medicare provider type effective 01/01/23. CAHs can voluntarily convert to an emergency hospital that does not maintain inpatient beds. REHs receive the same Medicare payment rates as other Emergency Departments (ED) paid under Outpatient Prospective Payment System (OPPS), plus an additional payment to assist with capital costs. Note that methodology may be updated depending on final Inpatient Prospective Payment System (IPPS)/OPPS rule.	Medicare FFS payments that reflect unique payment methodologies for REH are used to construct the baseline. Participating Hospitals that convert to REHs during Model PYs have the HGB reconstructed on a case-by-case basis. CMS continues to develop a REH-specific HGB methodology for inclusions of additional considerations.
Rural Referral Center (RRC) Program	RRCs support high-volume rural hospitals and are paid based upon the urban, rather than rural, prospective payment rates as adjusted by the applicable Diagnosis Related Group (DRG) weighting factor and the rural area index. In addition, RRCs have distinct considerations regarding the calculation of DSH adjustment factors. They are not subjected to the 12% rural cap on traditional DSH payments. As for the wage index reclassification for Medicare reimbursement purposes, the RRCs are exempt from the proximity requirement and the 106% average hourly wage criterion.	The DSH capital and operating adjustment factors used for calculating the Policy & Quality Adjustments in the APA and the hospital-specific wage index used for adjusting geographic area differences in hospital wages include the distinct DSH adjustment provisions and reclassified wage index for RRCs.
Sole Community Hospital (SCH)	SCHs can receive operating payments based on the higher of their hospital-specific payment rate or the federal rate, while capital payments are solely based on the capital base rate (like all other Acute Care Hospitals). SCHs are also subject to special considerations regarding the calculation of the DSH adjustment factor. They are exempt from the proximity requirement for wage index reclassification. For outpatient services, SCHs receive a 7.1% increase above the standard OPPS rates, excluding drugs and biologics.	The APA adjusts prices by leveraging the changes in the SCHs' Hospital Specific Payment, the reclassified wage index, and the appropriate DSH adjustment factors, all of which reflect the unique payment structure of the SCHs. Their increased OPPS reimbursement is included in standard CMS outlier payment policy and is included in the AHEAD Outlier Adjustment like ACHs.
Indian Health Service (IHS) Hospitals	The IHS is the principal federal health care provider and health advocate for American Indian/Alaska Native (AI/AN) peoples, and its goal is to raise their health status to the highest possible level. The IHS provides a comprehensive health service delivery system for AI/AN peoples.[5]	Medicare FFS payments that reflect unique payment methodologies for IHS Hospitals are used to construct the baseline.

[5] See *Indian Health Service Agency Overview*, https://www.ihs.gov/aboutihs/overview.

Hospital Type	Payments & Policies Prior to AHEAD Model	Basis for HGB Development
Tribal Hospitals	Hospitals that are owned and/or operated by Tribes or Tribal organizations that contract with IHS to plan, conduct, or administer one or more individual programs, functions, services or activities under Public Law (P.L.) 93-638, or portions thereof, including construction programs that the IHS would otherwise provide for AI/ANs because of their status as AI/ANs.[6]	Medicare FFS payment that reflect the unique payment methodology paid to Tribal Hospitals in lieu of IHS Hospitals are used to construct the baseline.

1.6 Key Terms

Exhibit 4 and **Exhibit 5** introduce key terms and explanations for current programs and payments administered by CMS that intersect with HGBs, as well as new AHEAD terms for elements of the HGB methodology.[7]

Exhibit 4: Overview of CMS Programs and Payments

Term	Description
Acute Care Hospital	A hospital that provides inpatient medical care and other related services for surgery, acute medical conditions, or injuries (usually for a short-term illness or condition) (defined as a "subsection (d) hospital" in Section 1886(d)(1)(B) of the Social Security Act) and traditionally paid through the IPPS and OPPS.
AHEAD Accountable Care Prospective Trend (ACPT)	A model-developed prospective growth rate based on the (United States Per Capita Cost) USPCC rate, prospectively set for a five-year period, similar to the ACPT used in the Medicare Shared Savings Program. The AHEAD ACPT is prospectively set to avoid incorporating the effect of the AHEAD model on healthcare spending.
Alternative Payment Model (APM)	A payment approach that provides added incentive payments for high quality and cost-efficient care. APMs can apply to a specific clinical condition, a care episode, or a population. For purposes of the Quality Payment Program, APM is codified in 42 CFR 414.1305.
Completion Factor	To account for the time between when a claim is incurred and when it is paid, a completion factor is used to adjust paid amounts to estimate actual spending during a specific time period. It represents the percentage of estimated incurred claims already paid through a particular point in time, allowing the model to create a multiplier based on historic Claims Runout patterns, that allows the model to project final payments before the claims cycle is completed.
Critical Access Hospital (CAH)	A state that has established a Medicare Rural Hospital Flexibility Program (Flex) may designate certain facilities as CAHs. CMS certifies a state-designated facility as a CAH if the facility meets certain requirements. CAHs receive cost-based reimbursement for most Medicare Part A and Part B services. Eligible Hospitals must, among other requirements, meet the following conditions to obtain CAH designation: 1) Have 25 or fewer acute care inpatient beds. 2) Be located more than 35 miles from another hospital or CAH, or 15 miles if mountainous terrain with only secondary roads (some exceptions apply). 3) Maintain an annual average length of stay of 96 hours or less for acute care patients. 4) Provide 24/7 emergency care services. Conditions of Participation for CAHs are defined in 42 CFR 485 subpart F.8

[6] See *Title 1, Indian Health Service*, https://www.ihs.gov/odsct/title1.

[7] Key terms are always capitalized to indicate the term's defined purpose in the payment calculation. In some cases, the same or similar words appear in lower case for the purpose of introducing a concept.

[8] See Critical Access Hospitals, https://www.cms.gov/files/document/ahead-hgb-fs.pdf and https://www.cms.gov/medicare/health-safety-standards/certification-compliance/critical-access-hospitals.

Term	Description
Hierarchical Condition Categories (HCC)	HCC scores use International Classification of Diseases (ICD)-10 codes to assign risk scores to patients. Within the AHEAD Model, CMS HCC risk scores are used to account for differences in beneficiary demographics and health conditions. HCC is incorporated in both the Demographic and TCOC Adjustments.
Hospital-Acquired Condition Reduction Program (HACRP)	HACRP is an IPPS Value-Based Purchasing (VBP) program that ties Medicare payments for hospitals based on their performance on measures of hospital-acquired conditions (HAC). Hospitals ranked in the lowest-performing quartile (highest frequency of conditions) among all hospitals nationwide are subject to a one percent reduction in payment rates. This one percent HACRP reduction adjustment is expressed as a 0.99 factor that is applied to the hospital's payment rate after adjustments are made under the Hospital VBP program and the Hospital. Hospitals that rank above the lowest quartile are assigned a HACRP payment factor of 1.0 to be applied to their payment rates.
Hospital Readmissions Reduction Program (HRRP)	HRRP is another IPPS Medicare VBP. HRRP incentivizes improved communication and care coordination for patients receiving hospital care. Hospital payments are adjusted based on a measure of excess readmissions. The reduction is based on the dollar value of each hospital's percentage of potentially preventable Medicare readmissions for specific designated conditions. The penalty is collected from the hospitals through a percentage reduction in their base Medicare inpatient claims payments, up to a cap of three percent.
Hospital Specific Market Area	A geographic region specific to a Participant Hospital. It is zip code based and identified by a zip code's contribution to the Participant Hospital's total Medicare FFS payments or the Participant Hospital's rank within the zip-code based on Medicare FFS payments. For more information, refer to section 2.2.3.1.
Hospital Value-Based Purchasing Program (VBP)	The Hospital VBP adjusts ACH payments based on the quality of care delivered to hospital patients and patient experiences. The program adjusts payments to hospitals under IPPS.
Indirect Medical Education (IME)	Medicare ACHs that have licensed medical staff enrolled in an approved Graduate Medical Education (GME) program receive an additional payment from Medicare, known as the IME adjustment, to reflect the higher patient care costs of teaching hospitals relative to non-teaching hospitals. The hospital receives a percentage add-on payment. This percentage varies and is calculated using a hospital's ratio of staff enrolled in GME to beds and a multiplier, which is set by the United States Congress.
Graduate Medical Education (GME)	Payments to hospitals for the costs of approved GME programs. The GME methodology includes a hospital-specific, base-period per resident amount (PRA) that is calculated by dividing a hospital's allowable costs of GME for a base period by its number of residents during the base period. Medicare-direct GME payments are calculated by multiplying the PRA by the weighted number of full-time equivalent (FTE) residents working in all areas of the hospital (and non-hospital sites, when applicable), and the hospital's Medicare share of total inpatient days. In contrast to IME, teaching hospitals' Medicare-direct GME costs are excluded from the IPPS and continue to be paid separately.
Healthcare Provider Cost Reporting Information System (HCRIS)	Facility based Medicare providers are required to submit annual cost reports to the Medicare Administrative Contractor (MAC) containing utilization data, costs and charges by cost center and financial data. In the AHEAD model, cost report data is used to collect settlement payments made to CAHs that reconcile interim payments to 101 percent of cost.

Term	Description
Integrated Data Repository (IDR)	All data used for the AHEAD Model financial calculations are housed within the IDR. The IDR contains the following data sources: • Claims Data: Contains person-level Medicare FFS Claims data submitted by Medicare providers for payment for services provided to Medicare beneficiaries. This data is sourced from the National Claims History (NCH) and is updated on a weekly basis. • Eligibility Data: Contains beneficiary eligibility data, including Medicare Advantage (Medicare Part C) and Prescription Drug Program (Medicare Part D) plan enrollment data. This data is sourced from the CMS Common Medicare Environment (CME) and is updated daily. • Provider Data: Contains information about providers that is sourced from both the Provider Enrollment, Chain, and Ownership System (PECOS) and the National Plan and Provider Enumeration System (NPPES).
Low-Volume Adjustment	CMS provides an additional payment to a qualifying hospital for the higher incremental costs associated with a low volume of discharges.
Master Data Management (MDM) System	The MDM contains APM program overlap data, including beneficiary and provider-level data.
Medicare Administrative Contractor (MAC)	The MAC is a CMS contractor awarded a geographic jurisdiction to process Medicare Part A and Part B (A/B) medical claims or Durable Medical Equipment (DME) claims for Medicare FFS beneficiaries.
Medicare Disproportionate Share Hospital (DSH)	DSHs serve a significantly disproportionate number of low-income patients and receive payments from CMS to cover the cost of providing care to uninsured patients. This adjustment is authorized under Section 1886(d)(5)(F) of the Consolidated Omnibus Budget Reconciliation Act (COBRA) of 1985. The primary method for determining payments is for a hospital to qualify based on a statutory formula that results in the DSH patient percentage. The DSH patient percentage is equal to the sum of the percentage of Medicare inpatient days attributed to patients eligible for both Medicare Part A and Supplemental Security Income (SSI), and the percentage of total impatient days attributed to patients eligible for Medicaid but not Medicare Part A. The alternate special exception method is for large urban hospitals that can demonstrate that more than 30 percent of their total net inpatient care revenues come from State and local governments for indigent care (other than Medicare or Medicaid).
Medicare Fee-For-Service (FFS) Claims	Medicare FFS claims are requests submitted by medical providers for FFS payment by Medicare for services rendered to Medicare Part A or Part B eligible beneficiaries. These claims are processed by specific MACs. Throughout this document Medicare FFS claim payments refer to the dollars paid by Medicare for the rendered services and not utilization.
Medicare Hospital Inpatient Quality Reporting Program (IQR)	IQR is a pay-for-reporting program for Acute Care Hospitals. Acute Care Hospital payments are adjusted based on whether hospitals do or do not successfully report the designated quality measures. Data collected under IQR informs HACRP, HRRP, and VBP.
Medicare Hospital Outpatient Quality Reporting Program (OQR)	OQR is a pay for reporting program which collects quality measure data for Acute Care Hospitals. OPPS payments for hospitals that do, or do not, meet administrative, data collection and submission, validation, and publication requirements.
Medicare Promoting Interoperability Program	CMS program that provides financial incentives to providers to demonstrate meaningful use of Electronic Health Record (EHR) systems and meeting certain interoperability and functionality criteria and improving patient access to health care information.
Outlier Payments	In Medicare FFS, in some cases, individual payments on claims are adjusted for the excess costs related to a specific patient's condition (so called "outlier" costs). This additional payment known as an "Outlier" is designed to protect the hospital from large financial losses due to unusually expensive cases.

Term	Description
Rural Emergency Hospital (REH)	REHs are facilities converted from either a CAH or a rural hospital (or one treated as such under Section 1886(d)(8)(E) of the Social Security Act) with less than 50 beds, and that do not provide acute care inpatient services with the exception of skilled nursing facility services furnished in a distinct part unit.
Swing Beds	Section 1861(e) of the Social Security Act allows critical access hospitals (CAHs) approved to provide swing bed services to use their beds for acute care or post-hospital skilled nursing facility (SNF) care. A CAH with Medicare swing bed approval may use any of its inpatient beds for either inpatient or SNF-level services.
Uncompensated Care (UCC)	In Medicare FFS, DSH hospitals are also eligible to receive a new additional payment for UCC that is a pro rata share of dollars in a UCC pool. This pool is distributed to qualifying hospitals in proportion to their share of bed days attributed to low-income, uninsured patients. Hospitals receive interim payments per discharge which is then reconciled and settled in the cost report.
United States Per Capita Cost (USPCC)	Medicare spending forecast produced by the CMS Office of the Actuary.
Wage Index	As part of the methodology for determining IPPS payments to hospitals, CMS adjusts the standardized amounts for geographic differences in cost of labor for hospitals in different labor markets by a factor reflecting the relative hospital wage level in the market compared to the national average hospital wage level. This ratio is the Wage Index.

Exhibit 5: Overview of AHEAD Model Financial Terms

Term	Description
AHEAD State or Sub-state region	States that voluntarily apply and accept to participate in the AHEAD Model either statewide or in a specified sub-state region. CMS executes a Cooperative Agreement and a State Agreement with each AHEAD State.
Annual Payment Adjustment (APA)	The baseline and subsequent HGBs is trended forward using an APA based on various factors. See **Section 2.2.1** for more information.
Baseline	The 3-year time period used to develop HGBs, based on Eligible Hospital Services. Given the need for Claims Runout, there is a 6-month Gap Period between the Baseline and the Participant Hospital's first PY.
Claims Runout	The time between the provision of medical services and the processing of claims by the MACs and the availability of claims data in Medicare databases such as the IDR.
Demographic Adjustment (DA)	Adjustment to HGBs on an annual basis to reflect changes in the status of the population (population size, age, Medicare status, medical risk, etc.) served by the hospitals in a specific geographic region. See **Section 2.2.2.3** for more information.
Effectiveness Adjustment (EA)	Adjustment to HGBs based on a portion of a Participant Hospital's calculated Potentially Avoidable Utilization (PAU). See **Section 2.3.3** for more information.
Eligible Beneficiaries	All Medicare FFS beneficiaries enrolled in Medicare Part A and/or B receiving services at a Participant Hospital used to develop the HGB.
Eligible Hospital	Hospitals eligible to participate in HGBs under the AHEAD Model include ACHs, CAHs, and REHs (pending state-enabling legislation) located within a participating state or sub-state region.
Eligible Hospital Services	Medicare Part A and outpatient facility services covered under Part B furnished by Participant Hospitals that are included in HGBs are those with type of bill 11X, 12X, 13X, 14X, 85X, or 18X and where Medicare is the primary payer. Outpatient cancer drugs, professional services rendered in a hospital setting, and payments listed in **Appendix D** are excluded. See **Section 2.1** for more information.

Term	Description
Gap Period	The six-month period between the end of the three-year Baseline and PY1. The Gap Period provides the necessary time for Claims Runout and HGB calculations.
Community Improvement Bonus (CIB)	HGBs may receive an annual upward adjustment based on hospital performance on select quality measures.
Hospital Global Budgets (HGBs)	A fixed, prospectively set amount of annual revenue to a hospital for selected Medicare Part A and outpatient facility services covered under Part B. Under AHEAD, HGB amounts are paid by Medicare to Participant Hospitals in the form of prospective, bi-weekly payments in place of traditional Medicare FFS claims. Professional services rendered in a hospital setting are excluded.
Population Health Accountability Plan	Participant Hospitals are required to develop and implement specific initiatives documented in a Population Health Accountability Plan that further the goals of the State Population Health Accountability Plan and address the needs in their specific communities.
Hospital Participation Agreement	The agreement between the Participant Hospital, the AHEAD State, and CMS outlining key terms for hospital participation in the AHEAD Model. Each Participant Hospital is required to execute a Hospital Participation Agreement.
Market Shift Adjustment (MSA)	Adjustments to HGBs based on material shifts in volume for services between hospitals in such a way that covers hospitals' costs.
Model Governance Structure	A multi-sector stakeholder workgroup convened by an AHEAD State to develop and oversee the implementation of the State Population Health Accountability Plan, assist with the review of Population Health Accountability Plan, and potentially assist with the development or implementation of other elements of the Model.
Non-Participant Hospital	A hospital that does not have a signed Hospital Participation Agreement with CMS to participate in AHEAD. A Non-Participant Hospital continues to be reimbursed as normal. These may be located inside or outside of the state or sub-state region.
No-Pay Claims	Medicare claims for providers participating in APMs that are processed by the MAC, but not paid because the provider is paid using a method specific to the APM. All standard data elements that are found on Medicare claims are populated on these claims, including the paid amount field, which displays what the claim would have paid under FFS. Claim value codes are used to identify that the claim was not paid FFS because it was submitted by a Participant Hospital for Eligible Hospital Services.
Outlier Adjustment	An adjustment to update the HGBs based on changes in Outlier Payments calculated from Medicare FFS claims or No-Pay Claims is now included in the HGB methodology (**Section 2.2.2.4**). In addition, carveouts applied to the baseline for cancer drugs (**Sections 2.1.4 and 2.1.5**) protect the hospital from large financial losses due to unusually expensive cases.
Participant Hospital	An Eligible Hospital, (**Exhibit 2**) as identified by its CMS Certification Number (CCN), that: 1) Is physically located within the AHEAD State or sub-state region; and 2) Has signed a Hospital Participation Agreement with CMS to participate in AHEAD.
Hospital Performance Year (Hospital PY)	For the AHEAD Model, each Hospital PY is the 12-month period when HGBs for Participant Hospitals replace Medicare FFS payments for included services or CAH cost-based reimbursement. Hospitals may sign up to participate throughout the AHEAD Implementation Period by signing a Hospital Participation Agreement in advance of their first PY.

Term	Description
Performance Year of the Applicable Cohort (PY)	AHEAD States elect to participate in one of three cohorts. The first year in which HGBs are available to Eligible Hospitals in that state determines the first PY of the Applicable Cohort: • Cohort one includes nine PYs, beginning January 1, 2026, through December 31, 2034. • Cohorts two and three include eight PYs, beginning January 1, 2027, through December 31, 2034.
Potentially Avoidable Utilization (PAU)	PAU is calculated for each Participant Hospital as part of the Effectiveness Adjustment. PAU includes readmissions, avoidable admissions (calculated by the AHRQ Prevention Quality Indicators [PQI]-90. There may be other sources of PAU in which hospitals can reduce and see savings under HGBs, however this definition is used for the Effectiveness Adjustment.
Quality Adjustment – Prospective Payment System (PPS) Hospitals	Quality adjustments to HGBs allow quality measures to align with existing CMS programs for PPS hospitals. Including HRRP, VBP, HACRP, IQR, Medicare Promoting Interoperability, and OQR. Participant Hospitals continue to report to these programs under the AHEAD Model.
Quality Adjustment – Critical Access Hospitals (CAHs)	CAHs have an upside-only Quality Adjustment designed under AHEAD that incentivizes performance on specific, rural-relevant quality measures.
Primary Care AHEAD	Primary Care AHEAD is a voluntary program within the Model for Participant Primary Care Practices. Participant Primary Care Practices may include Federally Qualified Health Centers (FQHCs) including Health Centers and Health Center Look-Alikes[9], Rural Health Clinics (RHCs), and practices with primary care specialties as defined by CMS.
Safety Net Hospital (SNH)	Safety Net Hospitals include: 1) Short-term hospitals that serve above a baseline threshold of beneficiaries with dual eligibility for Medicare and Medicaid or Part D Low-Income Subsidy (LIS). Facilities are identified as a safety net hospital when their patient-mix of beneficiaries with dual eligibility or Part D LIS exceeds the 75th percentile threshold for all congruent facilities who bill Medicare within their state. 2) Critical Access Hospitals. 3) Short-term hospitals with Medicare DSH Patient Percent (DPP) exceeding the 75th percentile threshold for all congruent facilities who bill Medicare within their state, where DPP is defined as the sum of the percentage of Medicare inpatient days attributable to patients eligible for both Medicare Part A and Supplemental Security Income (SSI), and the percentage of total inpatient days attributable to patients eligible for Medicaid by not Medicare Part A. A hospital identified as an SNH in the base year will retain its SNH status for the model's duration. **Sections 2.3.3 and 2.3.4** in the methodology described below include adjustments that account for the unique context of SNHs. Often, the policies for CAHs and other SNHs align; however, there are areas where these policies may differ (as indicated within this document).
Service Line Adjustment (SLA)	SLAs made to HGBs account for service line additions, expansions, eliminations, or contractions. SLAs reflect a hospital's pre-planned and approved intent to add or expand a new service, or to eliminate or contract out an existing service.

[9] For more information on Health Center Look-Alikes, see https://bphc.hrsa.gov/funding/funding-opportunities/health-center-program-look-alikes.

Term	Description
Social Risk Adjustment (SRA)	Adjustments to HGBs based on a combination of the CMS-developed Community Deprivation Index (CDI) and proportion of Medicare-Medicaid dually eligible and/or Part D LIS beneficiaries in the Participant Hospital's service area.
State Agreement	The legal agreement executed between the AHEAD State Medicaid Agency and CMS during the Pre-Implementation Period and prior to the start of the first PY. This is a requirement for the state to participate in AHEAD and for CMS to allow the Implementation Period/PYs to begin.
Total Cost of Care (TCOC) Performance Adjustment	An upward or downward adjustment to the HGB based on hospital performance relative to a TCOC target for the hospital's attributed population.
Transformation Incentive Adjustment (TIA)	An upward adjustment applied to each Participant Hospital's HGB in the first two PYs of the Applicable Cohort to facilitate investment by hospitals in care management and transformation activities. The TIA needs to be repaid if a Participant Hospital exits the Model before the sixth PY for its respective cohort, or before the seventh PY for Participant Hospitals in Rhode Island.
Transition Year	After the final PY of the AHEAD Model, CMS offers two Transition Years to Participant Hospitals to allow for transition to another value-based care model, back to FFS, or to a cost-based reimbursement depending on the type of hospital.
Waivers	CMS may waive certain Medicare program rules and fraud and abuse laws for the purposes of testing payment and service delivery models developed by the CMS Center for Medicare and Medicaid Innovation (the Innovation Center). CMS includes these waiver offerings and any potential beneficiary engagement incentives as part of the Hospital Participation Agreement.

2. Hospital Global Budget Construction

Eligible Hospitals that voluntarily sign Hospital Participation Agreements with CMS receive a fixed HGB payment for Medicare FFS inpatient and outpatient hospital services in the form of prospective, bi-weekly payments from Medicare, replacing payments for FFS claims.

To construct the Medicare HGBs for Participant Hospitals, CMS first calculates a Participant Hospital's global budget baseline by combining the hospital's historical revenue from FFS payments from the three most recent years preceding the year in which the hospital joins the model. CMS weights historical revenue, with the most recent years weighted more heavily (i.e., Base Year [BY] 1: 10 percent; BY2: 30 percent and BY3: 60 percent). Historical revenue paid by CMS outside the FFS framework is excluded from the baseline. Similarly, Medicare payments to hospitals currently paid outside the FFS framework continues to be paid as they are currently and outside of the HGB. See **Appendix D** for a detailed list of payments excluded from HGBs. Professional services rendered in a hospital setting are not included in the HGB and continues to be paid FFS.

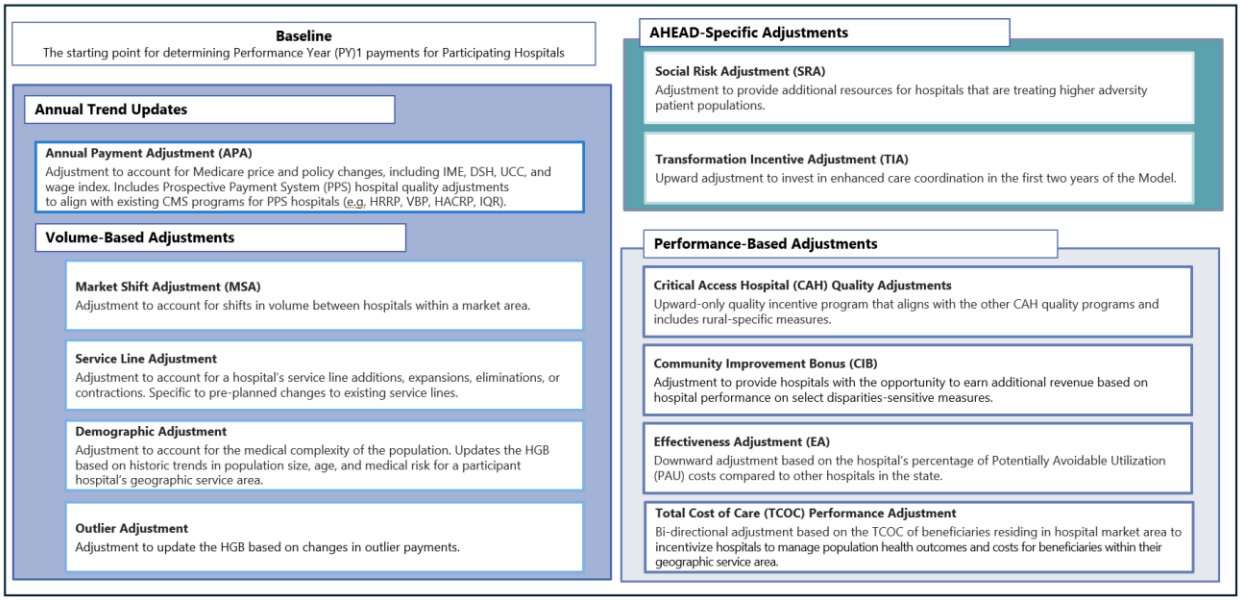
CMS then applies annual trend updates to the HGB baseline to reflect changes in inflation, demographic changes, market shifts and service line changes. CMS also applies AHEAD-specific adjustments, including the TIA and the SRA. See **Section 2.2** for additional information on annual trend updates and AHEAD-specific adjustments.

CMS also applies performance-based adjustments to HGBs based on financial and quality performance standards. Performance-based adjustments to HGBs includes adjustments for performance on CMS national quality programs, community improvement, effectiveness on PAU targets, and performance on TCOC targets. See **Section 2.3** for more information on performance-based adjustments. CAHs (**Sections 2.3.1**) have separate quality and TCOC (**Section 2.3.4**) performance adjustments.

After adjusting each Participant Hospital's global budget, each hospital receives a prospective, bi-weekly HGB payment for Eligible Hospital Services in lieu of traditional FFS claims or cost-based reimbursement. Hospitals continue to submit Medicare FFS inpatient and outpatient claims and Medicare Hospital Cost Reports to CMS, however these claims will be No-Pay Claims.

Exhibit 6 is a visual representation of the elements of the Medicare FFS HGB calculation.

Exhibit 6: General Steps for Calculating the AHEAD Medicare FFS HGB



2.1 Baseline Calculation

The HGB Baseline Amount is the starting point for determining PY1 HGB payments for a Participant Hospital. For subsequent PYs the baseline is the prior PYs HGB with volume, demographic and price adjustments (**Exhibit 43**). To increase the predictability of HGB payments, the methodology does not apply retrospective reconciliation to prior PY HGBs. To calculate the Inpatient and Outpatient Baseline Paid Amount, CMS utilizes historical Medicare FFS revenue data from three baseline years (BYs). The BYs are described and weighted as illustrated in **Exhibit 7**.

CMS calculates historical Medicare FFS revenue by summing the Medicare FFS claim payments for Eligible Hospital Services during the BYs. All factors used in Medicare FFS claim payment are incorporated to ensure the HGB Baseline Amount fully accounts for Medicare FFS revenue that is replaced by the HGB. This includes all the same pricing components used to calculate the paid amount on a claim, including DRG base payment rates, adjustments for market conditions, complexity of service (DRG-Weights), policy adjustments, and quality adjustments.

Beneficiary out-of-pocket payments are excluded from the HGB Baseline Amount calculation because beneficiary cost-sharing (e.g., deductibles, coinsurance, or copayments) is unaffected by HGBs. Payment reductions from sequestration during the BYs are added back to historical Medicare FFS revenue so that sequestration can be appropriately re-applied to PY HGB payments.

Rationale

Beneficiary Cost-Sharing is based on the Allowed Amount calculated on No-Pay Claims and is unchanged from current Medicare FFS.

Payments that are excluded from the HGB and continue to be paid separately under existing methodologies include:

- Payments made outside the Medicare FFS claims payment mechanisms (e.g., Payments for Medicare Advantage DGME).

- Payments made to specialty hospitals and distinct part units (e.g., rehab units inside acute care hospitals).
- Inpatient services paid separately from the Medicare Severity Diagnosis Related Groups (MS-DRG) including new technology and organ acquisition costs.
- Antineoplastics or cancer drugs.
- New technology add-on payments (NTAP).
- Payments made to CAHs for professional services.

More information on HGB payment exclusions can be found in **Appendix D: Payment Exclusions.**

For CAHs, settlements made through cost reports to reconcile to 101 percent of costs are incorporated in historical Medicare FFS revenue to ensure that HGBs fully account for Medicare revenue that is replaced by HGBs. For hospitals paid through other special status designations, (e.g., SCHs), these payment methodologies are also incorporated into the baseline (**Exhibit 3**). In these methodologies, the paid amount incorporates additional payments such as the hospital specific rate used to pay SCHs.

Services provided to beneficiaries covered by Medicare Advantage are excluded from the Medicare FFS HGB. Claims for these beneficiaries continues to be paid by Medicare Advantage plans. Changes in Medicare FFS enrollment, including those due to Medicare Advantage dis/enrollment are captured through the Demographic Adjustment (DA).

2.1.1 Hospital Global Budget: Performance Year 1 Baseline Calculation

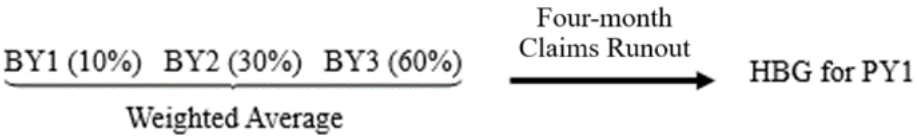
Inpatient and outpatient Medicare FFS Revenue for each BY is combined to obtain weighted inpatient and outpatient baseline paid amounts. BY1 and BY2 revenue is adjusted to account for changes in Medicare FFS prices between baseline years. The methodology for adjusting inpatient and outpatient revenue is further described in **Section 2.2.1** and is aligned with that used for the Annual Payment Adjustment. Each BY is assigned a different weight, with the oldest BY (BY1) assigned a 10 percent weight, the middle (BY2) a 30 percent weight, and the most recent (BY3) a 60 percent weight. Each BY is based on a historical 12-month period, starting July 1 and ending June 30. This allows for 4 months of runout (through October) to deliver the final PY calculation in November for the subsequent calendar year. The most recent BY begins 18 months prior to the first PY and ends six months prior to the first PY. CMS applies Completion Factors to account for any claims that have been incurred but not yet paid by CMS. Using more recent claims data with completion factors helps to ensure that the baseline is more representative of anticipated PY1 claims, which helps to reduce risk for hospitals. **Exhibit 7** below describes each of the three BY and illustrates the weighting applied to its respective historical Medicare FFS revenue.

Exhibit 7: Baseline Weighting Applied to Historical Medicare FFS Revenue (PY1 only)

Year	Description	Percentage Weighting
BY1	Begins 3.5 years prior to Hospital PY1 begin date.	10%
BY2	Begins 2.5 years prior to Hospital PY1 begin date.	30%
BY3	Begins 1.5 years prior to Hospital PY1 begin date.	60%

As an example, for a Participant Hospital that begins participating in AHEAD in calendar year 2026 (PY1), BY1 includes Medicare FFS claims with dates of service between July 1, 2022 to June 30, 2023, while BY2 and BY3 includes dates of service between July 1, 2023 to June 30, 2024 and July 1, 2024 to June 30, 2025, respectively. The gap between the most recent baseline year (BY3) and PY1 is due to the time needed for Claims Runout (i.e., 2024 data is not available until mid-2025).[10] **Sections 2.1.2** through **2.1.7** describe the baseline calculation for PY1 HGB payment. **Section 2.1.8** describes an estimated HGB calculation that is provided to interested, Eligible Hospitals in advance of PY1 to support participation decision. The estimated HGB calculation is the same as the PY1 HGB payment calculation, except that it is performed earlier in the year prior to PY1 to preview HGB payment amounts. **Exhibit 8** below illustrates the BY weighting for PY1.

Exhibit 8: PY1 Weighted Baseline Calculation



$$(\boldsymbol{Eq.1.a})\ \boldsymbol{Weighted\ Inpatient\ Baseline}$$
$$= \Big(\big(0.1 * (Inpatient\ Baseline\ Paid\ Amounts\ for\ BY1 * (1 + BY1\ to\ BY3\ APA)\big)\Big)$$
$$+ \big(0.3 * (Inpatient\ Baseline\ Paid\ Amounts\ for\ BY2) * (1 + BY2\ to\ BY3\ APA)\big)$$
$$+ \big(0.6 * (Inpatient\ Baseline\ Paid\ Amounts\ for\ BY\ 3)\big)\Big)$$
$$* Baseline\ Adjustment\ Factor$$

$$(\boldsymbol{Eq.1.b})\ \boldsymbol{Weighted\ Outpatient\ Baseline}$$
$$= \Big(\big(0.1 * (Outpatient\ Baseline\ Paid\ Amounts\ for\ BY\ 1 * (1 + BY1\ to\ BY3\ APA)\big)\Big)$$
$$+ \Big(0.3 * \big(Outpatient\ Baseline\ Paid\ Amounts\ for\ BY\ 2 * (1 + BY2\ to\ BY3\ APA)\big)\Big)$$
$$+ \big(0.6 * (Outpatient\ Baseline\ Paid\ Amounts\ for\ BY\ 3)\big)\Big)$$
$$* Baseline\ Adjustment\ Factor$$

[10] Gap period data is used in the APA calculation that adjusts the HGB Baseline Amount to obtain the Final Adjusted HGB Baseline Amount for PY1.

Calculation of the inpatient and outpatient Baseline paid amounts in Equation 1 is described in Sections 2.1.4 and 2.1.5.

2.1.2 Optimizing Performance Year 1 Baseline

For PY1 only, after the baseline calculation described in **Equation 1.a and 1.b**, CMS uses logistic regression to adjust the weighted baseline (**Appendix F**), and ensure it appropriately represents what Medicare FFS payments to the hospital would have been in the absence of HGB payments. The logistic regression uses historical claims data to estimate a probability that is multiplied by a scaling factor to calculate a Baseline Adjustment Factor. The Baseline Adjustment Factor is multiplied by the Weighted Inpatient Baseline and Weighted Outpatient Baseline to set the baseline for PY1 (**Eq 1.a and Eq. 1.b**).

$$(\boldsymbol{Eq.2})\boldsymbol{Baseline\ Adjustment\ Factor} = 1 + \big(P(H)\big) * Scaling\ Factor$$

Where,

P(H) = Probability from logistic regression estimated using a principal components analysis of 36 months of historical claims data (H) minus .5 to center the probability around 0. P(H) indicates the statistical probability that the 60/30/10 baseline is underestimated or overestimated relative to Medicare FFS payments to the hospital in PY1. The logistic regression equation is currently specified as,

$$(\boldsymbol{Eq\ 2.b})\boldsymbol{P(H)} = \frac{1}{1 + e^{-(b_1 * x_1 + \ldots + b_k * x_k + b_h * h + a)}}$$

Where,

x = Medicare FFS claims incurred and paid in month *k* prior to a 12-month period (to represent a performance year) plus Medicare FFS claims incurred in *k*-1 prior months divided by the weighted sum of the Inpatient Baseline Paid Amounts plus Outpatient Baseline Paid Amounts. *k* is specified from one to 36 prior months.

h = log of BY3 Inpatient Baseline Paid Amounts plus Outpatient Baseline Paid Amounts.

Scaling Factor = Multiplier developed from historical data that minimizes the distribution of differences between weighted Inpatient Baseline Paid Amounts plus Outpatient Baseline Paid Amounts and 12 months of Medicare FFS claims beginning six months after the baseline period across all hospitals within the state or sub-state region. This factor serves to reduce the variation between the weighted baselines and Medicare FFS payments during an upcoming calendar year that is analogous to the first PY. The multiplier can have one of two values. If P(H) is less than zero, a multiplier is used to increase global budgets and a separate multiplier is applied if P(H) is greater than zero.

Simulation of the Baseline Adjustment Factor using historical data improved the representativeness of baseline Medicare FFS spending relative to an upcoming performance year. CMS re-estimates probabilities and Scaling Factors using more recent data prior to PY1 and provides these to hospitals along with HGB payment amounts prior to making participation decisions.

2.1.3 Hospital Global Budget: Inpatient and Outpatient Baseline Paid Amounts

For each BY, Medicare FFS claim payments for Eligible Hospital Services are summed to calculate a total Inpatient Baseline Paid Amounts and Outpatient Baseline Paid Amount. Claim payments incorporate all factors included in the calculation of FFS payments made on claims,

including applicable Medicare pricing adjustments. In Medicare FFS, interim payments on claims for pricing adjustments such as Disproportionate Share Hospital (DSH) and Indirect Medical Education (IME) are paid on claims then subsequently reconciled via hospital cost reports. HGB baseline amounts are adjusted as needed using amounts from the cost reports, pro-rated to align with the baseline time periods described in **Exhibit 7**. In the event that a cost report is not available due to timing, CMS uses a placeholder value from the most recent cost report, then subsequently adjusts HGB payments in the next payment cycle. Dollars removed from claims payments due to sequestration are added back in so that sequestration can be appropriately re-applied to PY HGB payments.

For CAHs, interim payments made via claims and settlements made through cost reports are incorporated into Inpatient Baseline Paid Amounts and Outpatient Baseline Paid Amounts. Medicare Swing Bed payments are also included for CAHs. Payments made for professional services are excluded.

Payments that are made outside the Medicare FFS claims payment mechanisms continue to be paid separately under existing methodologies and are not included in the HGB. Examples include Medicare bad debt, Direct Graduate Medical Education (DGME), nurse and allied health education, and organ acquisition costs. Currently Medicare FFS provides payment to hospitals for IME and DGME costs for Medicare Advantage (MA) beneficiaries. These payments continue to be paid through Medicare FFS and excluded from HGB payments for either MA plans or in the CMS-Designed global budget. Participant Hospitals continue to submit shadow claims as they do today. CMS also applies a floor for IME and DGME so that if volume is reduced as a result of HGB payments, IME and DGME payments cannot be any lower than in BY3.

Medicare expenditures in specialty hospitals and distinct part units are also excluded from HGB payments. This exclusion is because one of the goals of HGBs is to reduce potentially avoidable utilization and may not be appropriate for specialized services provided in hospital-distinct part units or specialty hospitals, such as psychiatric, rehabilitation, cancer, and long-term care services. See **Section 1.5** for a complete list of hospital types that are ineligible to participate in HGBs through the AHEAD Model.

Exclusions specific to IPPS and OPPS FFS payments are included in **Sections 2.1.4 and 2.1.5.**

2.1.4 Inpatient Baseline Paid Amount

For ACHs, the inpatient Baseline paid amount includes all hospital Medicare FFS payments for Eligible Hospital Services paid under the IPPS. Eligible Hospital Services in the baseline include inpatient hospitalizations covered under Part A with bill type 11X or 12X. Inpatient services paid separately from the MS-DRG payment, such as new technology and organ acquisition costs, continue to be paid separately under existing methodologies and are not included in the HGB.

Medicare FFS payments for services under the IPPS are based on the factors described in **Exhibit 9** and **Appendix C: IPPS and OPPS Payment Components**.

Exhibit 9: FFS Payment Factors Under IPPS Included in Baseline Calculation

Factor	Description
Base IPPS Payments Rates	• Labor & Non-Labor Standardized Base Operating Payment Rates • Capital Base Payment Rate

Location Specific Market Condition Adjustments	• Wage Index • Cost of Living Adjustment (COLA)
Complexity of Service/Case Mix	• DRG Weight
Claims Based Policy Adjustments	• IME Adjustments for Operating & Capital • DSH Adjustments for Operating & Capital • Low Volume Adjustment • UCC Adjustment • Outlier Adjustment
Quality Adjustments	• HRRP • VBP Program • HACRP • Medicare Hospital IQR • Meaningful EHR User

The inpatient Baseline paid amount only includes claims for which Medicare is the primary payer. The CMS IDR is used to pull all relevant claims and claim paid amounts. The inpatient Baseline paid amount is adjusted for the reduction in FFS payment amounts due to sequestration by adding back in the reduction applicable as of the date of service.

For CAHs, the inpatient Baseline payment amount is the sum of interim payments made through claims, cost report settlements, Skilled Nursing Facility swing bed (swing bed) interim payments made through claims, and swing bed settlements made through cost reports. Settlement amounts (CAH and CAH Swing Bed) are obtained from cost report data in the Healthcare Provider Cost Reporting Information System (HCRIS), and swing bed interim claim payment amounts are obtained through the CMS IDR.

For hospitals paid using special status designations, (e.g., Medicare Dependent Hospitals, **Exhibit 3**), the baseline paid amount includes payments specific to these unique payment methodologies. For these hospitals and ACHs, the inpatient Baseline paid amounts are calculated as,

$$(\boldsymbol{Eq.3})\ \boldsymbol{Inpatient\ Baseline\ Paid\ Amount\ for\ Non\ CAH\ Hospitals} = Paid\ Amounts\ on\ FFS\ Claims + Medicare\ Settlement\ on\ Cost\ Reports + Sequestration$$

For CAHs, Inpatient Baseline Paid Amounts are calculated as,

$$(\boldsymbol{Eq.4})\ \boldsymbol{Inpatient\ Baseline\ Paid\ Amount\ for\ CAH\ Hospitals} = Paid\ Amount\ on\ Interim\ Inpatient\ Claims + Paid\ Amount\ on\ Interim\ Swing\ Bed\ Claims + Settlement\ to\ 101\%\ on\ Cost\ Reports + Sequestration$$

Where,

Paid Amounts on FFS or Interim Claims: The sum of the total Medicare paid amount on claims for all Eligible Hospital Services from the CMS IDR.

Medicare Settlement on Cost Reports: Pro-rated settlement amounts from cost reports for payments such as IME that are settled via costs reports. Amounts are exclusive of interim payments made on claims.

Sequestration Amounts: Statutorily required reduction to Medicare payments.

Settlement to 101 percent on Cost Reports: For CAHs only Part A settlement payments from Worksheet E-1. If more than one cost report overlaps a baseline year, settlement payments from both cost reports are weighted proportional to the number of months that the cost report overlaps the baseline year. See **Section 2.1.6** for more detail.

Exhibit 10 includes specific parameters for claim inclusion.

Exhibit 10: Parameters for Claim Inclusion Under IPPS

Parameter	Description
Medicare as a Primary Payer	Only claims for which Medicare is the primary payer are included.
Type of Bill	Eligible Hospital Services include claims with bill types 11X or 12X.
Claim Date	Claims for Eligible Hospital Services are included if the inpatient date of service 'from date' is within the applicable BY.

2.1.5 Outpatient Baseline Paid Amount

For ACHs, the outpatient Baseline amount includes all Medicare FFS payments for Eligible Hospital Services. For CAHs, the outpatient Baseline paid amount includes interim payments and settlement data from cost reports for outpatient services. Eligible Hospital Services in the baseline include outpatient services covered under Part B that are billed on facility claims (e.g., bill types, 13X, 14X, 85X, or 18X).

Cancer drugs[11] are excluded from HGBs and continue to be paid through the normal claims process. This approach is designed to explicitly recognize the volatility of high-cost drugs, which can pose substantial risks to Participant Hospitals under HGBs. In addition, APC new technology payments are excluded from the HGB calculation. More information can be found on outpatient exclusions in **Appendix D: Payment Exclusions.**

Medicare FFS payments for services under the OPPS are based factors described in **Exhibit 11** and in **Appendix C: IPPS and OPPS Payment Components**.

Exhibit 11: FFS Payment Factors Under OPPS included in Baseline Calculation

Parameter	Description
Base OPPS Payment Rates	• OPPS Conversion Factor
Geographic Factors	• Hospital Wage Index (Labor Portion of Conversion Factor is Adjusted – 60%) • Non-Labor Portion of Conversion Factor is Not Adjusted
Complexity of Services	• APC Relative Weight
Claims Based Policy Adjustments	• Sole-Community Hospitals (SCH) Add-On • High-Cost Outlier Adjustment

These components, and all pass-through payments, continue to be calculated based on current payment policies.

The outpatient Baseline payment amount is calculated by summing the total OPPS FFS payment amounts across all claims for which Medicare is the primary payer. The CMS IDR is used to

[11] Identified by therapeutic class of antineoplastics, less vaccines and saline. Version 3.0 includes more information about how these services are incorporated into the APA and MSA.

pull all relevant claims and claim payment amounts. The outpatient Baseline payment amount adds back in the reduction in FFS payment amounts due to sequestration so that sequestration can be appropriately reapplied to the HGB payment made during the PY. For CAHs, the outpatient Baseline paid amount includes interim payments made on claims and settlement payments paid via cost reports and excludes payments for professional services (CAH Method II billing revenue codes 0960-0989).

For other hospitals paid using specials status designations, (e.g., SCHs, **Exhibit 3**), the outpatient Baseline paid amount includes payments made under these unique payment methodologies. For these hospitals and ACHs, outpatient Baseline paid amounts are calculated as,

$$(\boldsymbol{Eq.5})\ \boldsymbol{Outpatient\ Baseline\ Paid\ Amount\ for\ Non\ CAH\ Hospitals} = Paid\ Amounts\ on\ FFS\ Claims + Sequestration$$

For CAHs, Outpatient Baseline Paid Amounts are calculated as,

$$(\boldsymbol{Eq.6})\ \boldsymbol{Outpatient\ Baseline\ Paid\ Amount\ for\ CAH\ Hospitals} = Paid\ Amount\ on\ Interim\ Outpatient\ Claims + Settlement\ to\ 101\%\ on\ Cost\ Reports + Sequestration$$

Where,

Paid Amounts on FFS or Interim Claims: A sum of the total Medicare paid amount for all hospital claims using the CMS IDR.

Sequestration Amounts: An additional payment to account for the two percent sequestration reduction made to Medicare claims payments.

Settlement to 101 percent on Cost Reports: For CAHs only Part A settlement payments from Worksheet E-1. If more than one cost report overlaps a baseline year, settlement payments from both cost reports are weighted proportional to the number of months that the cost report overlaps the baseline year. See **Section 2.1.6** for more detail.

Exhibit 12 provides details on the parameters for claim inclusion and exclusion.

Exhibit 12: Parameters for Claim Inclusion and Exclusion Under OPPS

	Parameter	Description
Parameters for Claim Inclusion	**Medicare as Primary Payer**	Only claims for which Medicare is the primary payer are included.
	Type of Bill	Eligible Hospital Services include claims with bill types 13X, 14X, 85X, or 18X.
	Claim Date	Claims are included if the claim from date is within the BY.
Parameters for Claim Exclusion	**Outpatient Cancer Drug Carve Out Amounts**	Drugs in the Antineoplastic Therapeutic class, except for saline and vaccines.
	Outpatient New Technology Carve Out Amounts	A sum of the line-level claim payments with an APC designation as "New Technology" using the CMS published annual Addendum A files.
	Professional Payments on CAH Hospital Claims	The sum of all professional payments as reported in the CMS IDR where the Revenue Center Code on the claim line has a code of 096, 097, or 098.

2.1.6 Payment Floor for Critical Access Hospitals

The AHEAD Model includes a payment floor to ensure HGB payments for CAHs are no lower than current Medicare FFS reimbursement at 101 percent of costs (before sequestration). The floor is calculated such that if prospective HGB payments for the PY are less than what would have been paid by Medicare FFS had the CAH not participated in HGBs, CMS makes an additional payment to the CAH equal to the difference.

The difference is incorporated into subsequent HGB payments. Due to the time needed to process hospital cost reports, this payment occurs after the PY once cost report or reports that overlap the PY are available in HCRIS. If more than one cost report overlaps the PY, Medicare revenue is weighted using the number of months that overlap the PY. For example, if a hospital files a cost report that corresponds to the first three months of the PY and a subsequent report that corresponds to the remaining nine months, revenue from the first cost report is weighted at 25 percent and 75 percent from the subsequent cost report. This calculation is made only after both cost reports are available.

2.1.7 Baseline Adjustments

The Weighted Baseline calculation uses historical Medicare FFS payment data to determine the hospital's global budget, however changes can occur over time that might cause the baseline to not be representative of PY1. The CMS-Designed global budget includes several mechanisms to account for these types of changes.

Service Line Adjustment (SLA) (see **Section 2.2.2.2**) can be used to prospectively adjust funding to better align HGB payments with operational and service line changes. For example, if a hospital is expanding into a needed service or closing an underutilized service, the SLA allows the hospital to adjust its HGB such that it is not tied to historical data that no longer reflects this new reality. Service Line Adjustments can also be used account for changes in CMS payment rules, such when new technology services shift from separately payable to be included in APCs.

The hospital Participation Agreement (PA) includes provisions for Exogenous Factors, Changes in Control, Changes in Status that can be used to account for exceptional circumstances such as mergers, operational disruptions, or changes in hospital status. CMS works with hospitals on a

case-by-case basis for situations that might warrant considerations of such one-time adjustments using processes outlined in the PA. The PA is distributed to interested hospitals prior to PY1.

CMS encourages hospitals to proactively report historical or forward-looking information that could cause the baseline to not represent PY1. Prior to calculating PY1 baselines, CMS distributes a survey to hospitals to gather relevant information on factors that could affect the baseline. The data is used to identify where Service Line Adjustment or provisions in the PA such as Exogenous Factor could necessitate one-time adjustments. Any one-time adjustments are evaluated on a case-by-case basis. CMS reviews each request, considering supporting rationale and documentation, before deciding to approve, modify, or deny the adjustment.

2.1.8 Baseline Estimates

Hospitals interested in the CMS-Designed HGB receive an estimated global budget amount in the beginning of July of the year prior to PY1 for the purposes of making participation decisions. Final global budgets for PY1 are calculated in November prior to PY1 using the time periods described in **Section 2.2.1.** The purpose of calculating the final global budgets in November prior to PY1 is to use the most recently available data in the baseline.

The estimated global budget provided in July prior to PY1 uses the same time intervals and weighting as described in **Exhibit 7** in **Section 2.2.1** above but shifted four months earlier in the BY year to allow for adequate Claims Runout. For the July estimated global budget, the three BYs uses 12 months of FFS claims from March to February allowing for same four months of runout used in the calculation of final global budgets.

Exhibit 13: Weighting Applied to Historical Revenue for Estimated Global Budgets

Year	Description	Percentage Weighting
Estimated HGB BY1	Begins 3 years and 10 months prior to Hospital PY1 begin date.	10%
Estimated HGB BY2	Begins 2 years and 10 months prior to Hospital PY1 begin date.	30%
Estimated HGB BY3	Begins 1 year and 10 months prior to Hospital PY1 begin date.	60%

2.2 Annual Trend Updates

2.2.1 Annual Payment Adjustment

The Annual Payment Adjustment (APA) adjusts the HGB Baseline Inpatient and Outpatient Amounts and annually adjusts PY HGB payments to account for changes in Medicare FFS prices between baseline years or from one PY to the next. These changes include updates to hospital payments per legislative or administrative policy changes. The APA differs from other adjustments in the global budget that account for acuity (e.g., demographic) and volume (e.g., market shift). The APA instead reflects the specific FFS payment factors (e.g., wage indexes) for each Participant Hospital and adjusts baseline and PY amounts accordingly. The APA is calculated at the Medicare CCN level because input data sources (e.g., IPPS Final Rule Impact File) are only published by Medicare at the CCN level. If a hospital elects an HGB calculated at the Organizational National Provider Identifier (ONPI) level, the APA corresponding to the CCN is applied to the HGB.

The Inpatient APA is based on the change in the hospital specific IPPS payment factors published annually in the IPPS Final Rule. To calculate the Inpatient APA, an annual Case Adjusted Rate (CAR) is calculated for each Participant Hospital. The CAR is equivalent to total Medicare Payments divided by the Case Mix Index (average MS-DRG weight) divided by volume. It can be interpreted as the average Inpatient Medicare payment per unit at a Participant Hospital adjusted by the hospital's average MS-DRG weight. The Inpatient APA is designed to adjust for price and policy changes only, and therefore the CAR controls for changes made due to DRG-weights and volume. The CAR calculation accounts for the same location specific price adjustments (e.g., wage index, COLA) and Policy & Quality Adjustments (e.g., IME, DSH, UCC, HRRP) made in IPPS and OPPS payment rates. Unlike the baseline payment, the Inpatient APA is calculated using summary data that CMS utilizes for payments in the upcoming fiscal year (e.g., IPPS and OPPSS Final Rule).

The Outpatient APA is adjusted based on the change in the hospital-specific Ambulatory Payment Classifications (APC) payment amounts. This calculation creates the Wage Adjusted APC Conversion Factor (WAACF), which is the basis for the Outpatient APA. Like the Inpatient APA, the Outpatient APA incorporates geographic area differences in hospital wages (e.g., Wage Index) and updates for policy shifts and price changes (e.g., OPPS APC conversion factor).

The APA is the percentage change in the Participant Hospital's CAR and WAACF between two years. The APA is used to adjust BY1 and BY2 Inpatient and Outpatient Baseline Paid Amounts to BY3 price and policy changes when calculating the Baseline. **See Eq.1(a) and Eq.1b in Section 2.1 Baseline Calculation.** The APA is also used to adjust the Baseline to reflect PY1 price and policy changes when calculating the PY1 HGB. For more information, please refer to Eq. 1, Eq. 8, Eq. 11, and **Exhibit 16**).

Reimbursement for CAHs is based on reasonable costs instead of IPPS and OPPS, therefore the IPPS Hospital Market Basket serves as the basis to price adjust baseline payments to PY1 dollars.[12] CMS uses the IPPS Hospital Market Basket to update payment rates for IPPS hospitals annually and to account for changes in the prices of goods and services used by these hospitals in treating Medicare patients, as well as for other factors.

Other special designation hospitals include those detailed in **Exhibit 3** (e.g., SCHs, REHs). These hospitals are paid using methods that differ from standard IPPS/OPPS. For example, SCHs are paid a Hospital Specific Payment (HSP) Rate that does not use the same IPPS and OPPS payment factors. For these hospitals, the change in HSP is used to adjust prices in AHEAD. The wage index and DSH adjustment used by the APA calculation includes policies and adjustment factors applicable to these hospitals.

2.2.1.1 Inpatient Annual Payment Adjustment: Overview

Payment Factors Included: The inpatient portion of the HGB is adjusted based on the change in the hospital specific IPPS payment factors listed below and published annually in the IPPS Final Rule. Please see **Exhibit 14** and **Appendix B: Data Sources** for more information about where each data source can be found.

[12]The IPPS Hospital Market Basket refers to the input price index used to measure changes in the costs of providing hospital services under IPPS. See CMS' website on Market Basket Data for more information on updates to and forecasts regarding the Market Basket.

Exhibit 14: FFS Payment Factors Under IPPS Included in Annual Payment Adjustment

Factor	Description
Base IPPS Payments Rates	• Labor & Non-Labor Standardized Base Operating Payment Rates • Capital Base Payment Rate
Location Specific Market Condition Adjustments	• Wage Index • Cost of Living Adjustment (COLA)
Complexity of Service/Case Mix	• MS-DRG weight
Claims Based Policy Adjustments	• IME Adjustments for Operating & Capital • DSH Adjustments for Operating & Capital • Low Volume Adjustment • UCC Adjustment
Quality Adjustments	• HRRP • VBP Program • HACRP • Medicare Hospital IQR • Meaningful EHR User

APA Calculation: For the APA, the AHEAD CAR is calculated for each Participant Hospital's BY or PY. The percentage change in the CAR between years is multiplied by either baseline payments or prior global budget amounts to adjust for changes in prices over time.

To determine the APA factor for the inpatient portion of the HGB, calculate the percentage change in the CAR between two years (see **Eq.1)**. To trend the baseline amount forward (see **Section 2.1**) the two years included in the calculation are BY1 to BY3 and BY2 to BY3. Subsequently, the two years included in the calculation are BY3 to PY1 and then each PY to the next.

$$(\boldsymbol{Eq.1})\ \boldsymbol{Inpatient\ APA} = \frac{Year\ 2\ CAR - Year\ 1\ CAR}{Year\ 1\ CAR}$$

a. AHEAD Case Adjusted Rate

The CAR represents a Participant Hospital's average case mix adjusted payment per discharge and is calculated by estimating total Medicare payments for a hospital (Medicare allowed amounts for a hospital minus sequestrations and deductibles), including all operating and capital amounts and policy adjustments. Total Medicare payments and policy and quality payments are then normalized for patient mix by dividing by the Case Mix Index, which is the Participant Hospital's average MS-DRG weight per inpatient discharge. The average case mix adjusted payment is calculated by dividing by total Medicare discharges to normalize for volume differences between years. The payment adjustment for uncompensated care is unrelated to case mix and is calculated separately then added to payments that are adjusted for case mix to maintain parity with Medicare FFS. An example of the calculation of the CAR can be found in **Exhibit 15**.

$$(\boldsymbol{Eq.2})\ \boldsymbol{AHEAD\ Case\ Adjusted\ Rate}\ (\boldsymbol{CAR}) = \frac{\frac{(Est\ Medicare\ Payments + Policy\ \&\ Qual\ Adj)}{Case\ Mix\ Index}}{Medicare\ Discharges} + \frac{UCC\ Oper.Adj}{Medicare\ Discharges}$$

The data elements required to calculate the CAR; (1) Estimated Medicare Payments (**Eq .3)**, (2) Case Mix Index, (3) Total Medicare Discharges, and (4) Policy & Quality Adjustments (**Eq. 7)**, are

defined in **Sections 2.2.1.b, 2.2.1.c, 2.2.1.d, and 2.2.1.e**. The UCC Operating Adjustment is defined in Appendix A: Formulas and Calculations.

b. Estimated Medicare Payments

For the CAR, Estimated Medicare Payments are calculated by multiplying operating and capital rates by the number of discharges reported in the CMS Impact File for a Participant Hospital minus deductibles and sequestration. Total Medicare Payments are estimated by first calculating the total operating and capital payment amounts and then adjusting that total by the Low Volume Adjustment factor and the Hospital-Acquired Condition Reduction Program (HACRP) Adjustment factor.

$$(\boldsymbol{Eq.3})\ \boldsymbol{Estimated\ Medicare\ Payments} = (Operating\ Amount + Capital\ Amount) * (1 + Low\ Volume\ Adjustment\ Factor) * (HACRP\ Adjustment\ Factor) - Estimated\ Deductibles * (1 - Sequestration\ Percentage)$$

Where,

Operating Amount: The operating amount is calculated by following the same steps used to price FFS claims, but at an aggregate level. A location adjusted operating rate is first calculated by multiplying the Medicare Wage Index and COLA by the base labor and non-labor operating base rates respectively. The location adjusted operating rate is then multiplied by the Participant Hospital's total number of Medicare discharges and case mix index (average DRG-weights) to obtain total base estimated operating payments. An example of the specific adjustments applied is provided in **Exhibit 15**, the calculated amounts are detailed in **Appendix A: Formulas and Calculations**, and data sources for each component such as the COLA are detailed in **Appendix B**.

$$(\boldsymbol{Eq.4})\ \boldsymbol{Operating\ Amount} = (((National\ Operating\ Labor\ Base\ Rate * Medicare\ Wage\ Index) + (National\ Operating\ Non\ Labor\ Base\ Rate * Operating\ COLA)) * Medicare\ Discharges * Case\ Mix\ Index)$$

For SCHs the Operating Amount is equal to the higher of their hospital-specific payment rate multiplied by total discharges and the case mix index or the operating amount calculated in Eq. 4 that uses the national operating base rates. If the hospital-specific payment rate is utilized, policy and quality adjustments are excluded.

$$(\boldsymbol{Eq.4a})\ \boldsymbol{Operating\ Amount\ For\ SCH} = (Hospital\ Specific\ Operating\ Labor\ Base\ Rate * Medicare\ Discharges * Case\ Mix\ Index)\ IF\ greater\ than\ Operating\ Amount\ calculated\ in\ Eq.4$$

Capital Amount: Similar to the Operating Amount, the Capital Amount is estimated by following the same steps as would be for FFS claims, but at an aggregate level.

$$(\boldsymbol{Eq.5})\ \boldsymbol{Capital\ Amount} = \big((National\ Capital\ Base\ Rate * Geographic\ Adjustment\ Factor\ for\ Capital * Capital\ COLA) * Medicare\ Discharges * Case\ Mix\ Index\big)$$

Low Volume Adjustment Factor: The Low Volume Adjustment Factor provides an additional payment to qualifying hospitals with a low volume of discharges and is applied to the sum of the operating and capital amount.

HACRP: The HACRP reduces overall payments by up to one percent for Participant Hospitals with the worst-performing quartile of risk-adjusted quality measures for reasonably preventable HACs. To account for this adjustment, reduction to the summed operating and capital payments amount (adjusted for the Low Volume Adjustment Factor) is applied for Participant Hospitals.

Estimated Deductibles: Estimated deductibles are removed in the estimation of total Medicare payments (adjusted for the Low Volume Adjustment Factor and HACRP). These costs are paid by beneficiaries and not Medicare and are unaffected by participation in Medicare FFS HGBs. As a result, they are excluded from both baseline and the APA. The estimated total annual deductible amount for a Participant Hospital is calculated by multiplying the Medicare Annual Inpatient Deductible Amount by the total number of Medicare Discharges.

$$(\boldsymbol{Eq.6})\ \boldsymbol{Estimated\ Deductibles} = Medicare\ Annual\ Inpatient\ Deductible\ Amount * Total\ Number\ of\ Medicare\ Discharges$$

Sequestration Percentage: "Sequestration is the automatic reduction (i.e., cancellation) of certain federal spending, generally by a uniform percentage."[13] The sequestration reduction percentage is applied to the total operating and capital payments amount after accounting for the Low Volume Factor, HAC Adjustment, and Estimated Deductibles.

c. Policy and Quality Adjustments

$$(\boldsymbol{Eq.7})\ \boldsymbol{Policy\ and\ Quality\ Adjustments} = (Operating\ Policy\ \&\ Quality\ Adj + Capital\ Policy\ \&\ Quality\ Adj) * (1 + Low\ Volume\ Adjustment\ Factor) * (HACRP\ Adjustment\ Factor) * (1 - Sequetration\ Percentage)$$

Operating Policy & Quality Adjustments: Includes IME, DSH, Low Volume, HRRP, VBP, HACRP and IQR adjustments (see **Appendix C: IPPS and OPPS Payment Components**). These adjustments are applied in IPPS as percentage add-ons to geographic and case-mix adjusted base rate. UCC payments are considered separately as they are not calculated as percentage add-ons and are applied on a per-claim basis.

In the APA, two years of IPPS Impact File data are reviewed (the PY and one year prior), and the higher values for the DSH Operating Adjustment Factor and UCC Per Claim Amount are used. This helps to create payment stability and reduce year-to-year variability.

Capital Policy & Quality Adjustments: Includes IME, DSH, and Low Volume adjustments. (See **Appendix C: IPPS and OPPS Payment Components**)

Similar to the DSH Operating Adjustment the higher of value is use for the DSH Capital Adjustment. For the APA, two years of IPPS Impact File data are reviewed (the PY and one year prior), and the higher value for the DSH Capital Adjustment Factor is utilized.

d. Case Mix Index

The Case Mix Index is the average DRG weight for a hospital inpatient discharge. Dividing the total Estimated Medicare Payments by the Case Mix Index for a Participant Hospital, normalizes for changes in patient mix allowing the CAR and thus the APA to measure only price and policy

[13] Congressional Research Service: Medicare and Budget Sequestration

changes. Changes in the complexity of the population served are accounted for in the Demographic Adjustment.

e. Total Number of Medicare Discharges

The total number of Medicare Discharges is the sum of all Medicare cases for a Participant Hospital in a given Fiscal Year, from the Medicare Provider Analysis and Review (MEDPAR) claims file, as reported in the Impact File. It does not account for transfer adjustments. Dividing the case mix adjusted Estimated Medicare Payments by the total number of Medicare Discharges removes the impact of volume on the CAR and thus allows the APA to account for changes in price and policy alone.

Exhibit 15 provides an example for how to calculate the Inpatient APA CAR.

Exhibit 15: Inpatient Annual Payment Adjustment: Case Adjusted Rate Example Calculation

Item	Factor	Operating Labor Related (1)	Operating Non-Labor Related (2)	Operating Base (3)	Capital Base (4)	BY Total (5)
A	National Base Rate	$3856.27	$1789.81		$459.41	
B	Wage Index / Geographic Adjustment	1.0634			1.043	
C	Wage Adjusted Base Rate	= (A1 x B1) $4,101				
D	Operating COLA		1		1	
E	COLA Adjusted Base Rate		= (A2 x D2) $1,790			
F	Medicare Discharges			2245	2245	2245
G	Case Mix Index			1.6642	1.6642	1.6642
H	Location & Case Mix Adjusted Operating/Capital Amount			= (C1 + E2) * F3 * G3 $22,009,536	= (A4 * B4 * D4) * F4 * G4 $1,790,221	
I	Total Operating/ Capital Amount					= H3 + H4 $23,799,757
J	Readmission Adjustment			= H3 * (0.9992-1) -$17,608		
K	VBP Adjustment Factor			1.0108		
L	VBP Amount Redistributed (with 2%)			= ((K3 – 1) + 0.02) * H3 $677,894		
M	VBP 2% Withhold			= H3 * -2% ($440,191)		
N	VBP Adjustment			= L3 + M3 $237,703		

Item	Factor	Operating Labor Related (1)	Operating Non-Labor Related (2)	Operating Base (3)	Capital Base (4)	BY Total (5)
O	IME Adjustment			= (H3 * 0.0925) $2,035,883	= (H4 * 0.1194) $213,752	
P	DSH Adjustment			= (H3 * 0.0429) $944,209	= (H4 * 0.3389) $606,706	
Q	Policy & Quality Adjustment Total			=J3 + N3 + O3 + P3 $3,200,187	=O4 + P4 $820,458	=Q3 + Q4 $4,020,645
R	UCC Per Claim Amount			250		
S	UCC Adjustment			= R3 * F3 $561,250		
T	Low Volume Adjustment Factor					1
U	HACRP Adjustment					0
V	Sequestration Percentage					-0.02
W	Medicare Annual Inpatient Deductible Amount					1364
X	Estimated Total Deductibles					=W5 * F5 $3,062,180
Y	Estimated Medicare Payments (With Sequestration & Deductibles Removed)					= ((I5 * T5 * (1+U5)) – X5) * (1 + V5) $20,322,825
Z	Estimated Policy & Quality Adjustments (With Sequestration Removed)					=Q5 * T5 * (1+U5) * (1 + V5) $3,940,232
AA	UCC Adjustment (With Sequestration Removed)					=S3 * T5 * (1+U5) * (1 + V5) $550,025
AB	Case Adjusted Rate (CAR)					= (Y5 / G5 / F5) + (Z5 / G5 / F5) + (AA5 / F5) $6,739

f. Applying the Inpatient Annual Payment Adjustment for PY1

When calculating the Inpatient Baseline Paid Amount, total paid amounts from eligible claims (See **Section 2.1.1)** for BY1 and BY2 are adjusted to reflect price and policy changes between each BY. **(See Eq.1(a) and Eq.1(b) in Section 2.1 Baseline)** The final Inpatient Weighted Baseline Paid Amount, is multiplied by the Baseline Adjustment Factor, is then adjusted to reflect price and policy changes between BY3 and PY1.

$$(\boldsymbol{Eq.8})\ \boldsymbol{Inpatient\ PY1\ APA\ Adjusted\ Amount} = Inpatient\ Baseline\ Amount * (1 + Annual\ Inpatient\ Adjustment\ for\ BY3\ to\ PY1)$$

The HGB is calculated on an annual basis, using the IPPS Hospital Market Basket update effective on October 1 to update the inpatient portion of the HGB effective January 1 of PY. In approximately August of the PY, CMS publishes the next IPPS Hospital Market Basket update. This update is used to calculate the next PY's HGB and to calculate an adjustment to the current PY's HGB to account for updated prices applicable between October and January of the current PY. CMS makes a one-time payment at the beginning of the next PY to account for updated prices.

Exhibit 16: Example of Baseline & PY 1 Inpatient Annual Payment Adjustment Application

Item	Factor	BY1 (1)	BY 2 (2)	BY3 (3)	PY1 (4)
A	Case Adjusted Rate	$6500	$6700	$6900	$7000
B	Inpatient APA Percent	= (A3 – A1) / A1 = 6.2%	= (A3 – A2) / A2 = 3.0%	= (A4 – A3) / A3 = 1.4%	-
C	Baseline Amount (Adjusted for Sequestration)	$1,000,000	$1,200,000	$1,300,000	-
D	Adjusted Baseline Amount	C1 x (1+ B1) $1,062,000	C2 x (1+ B2) $1,236,000	C3 $1,300,000	
E	Percent Contribution to PY 1 Baseline	10%	30%	60%	-
F	Weighted Baseline Amount	C1 x E1 $100,000	C2 x E2 $370,800	C3 x E3 $780,000	F1 + F2 + F3 $1,250,800
G	APA Adjusted Baseline				F4 x (1+B3) $1,268,311

2.2.1.2 Outpatient Annual Payment Adjustment: Overview

The outpatient portion of the HGB is adjusted based on the change in the hospital-specific APC payment amounts, which is effective January 1 of each year as part of the OPPS Final Rule. Similar to the inpatient calculation, the Outpatient APA incorporates geographic area differences in hospital wages (e.g., Wage Index) and updates for factors such as policy shifts and price changes (e.g., OPPS APC conversion factor). This creates the Wage Adjusted APC Conversion Factor (WAACF), which is the basis for the Outpatient APA. The OPPS APC conversation factor is calculated by CMS and made publicly available through the Impact file (see **Appendix B: Data Sources**).

To determine the Outpatient APA, calculate the percentage change in the WAACF between two years (see **Eq.9)**. To trend the baseline amount forward (see **Section 2.1**) the two years included in the calculation are BY1 to BY3 and BY2 to BY3. Subsequently, the two years included in the calculation are BY3 to PY1 and then each PY to the next.

$$(\boldsymbol{Eq.9})\ \boldsymbol{Annual\ Outpatient\ Adjustment} = \frac{Year\ 2\ \text{WAACF} - Year\ 1\ \text{WAACF}}{Year\ 1\ \text{WAACF}}$$

a. Wage Adjusted APC Conversion Factor (WAACF)

The WAACF is calculated in two steps. First, the OPPS APC Conversion Factor is multiplied by the hospital specific wage index. This total accounts for 60 percent of the WAACF. The other 40 percent is determined by multiplying the OPPS APC Conversation Factor by 40 percent. The sum total is equivalent to the WAACF.

$$(\boldsymbol{Eq.10})\ \boldsymbol{WAACF} = ((OPPS\ APC\ Conversion\ Factor * 0.6 * Hospital\ Specific\ Wage\ Index) + (OPPS\ APC\ Conversion\ Factor * 0.4)$$

b. Applying the Outpatient Annual Payment Adjustment for PY1

To apply the Outpatient APA to the PY1 HGB, the Outpatient APA for each BY is applied on a weighted basis. The three BY budgets are multiplied by the Outpatient APA (Equation 10) and the weighted amount; 10 percent for BY1, 30 percent for BY2, and 60 percent for BY3.

$$(\boldsymbol{Eq.11})\ \boldsymbol{Outpatient\ PY1\ APA\ Adjusted\ Amount} = Outpatient\ Baseline\ Amount * (1 + Annual\ Outpatient\ Adjustment\ for\ BY3\ to\ PY1)$$

For the outpatient services, the OPPS Final Rule and Market Basket Update are released in November prior to becoming effective January 1 for FFS payments. These updates are incorporated into HGBs effective January 1.

c. Applying the Annual Payment Adjustment: Basis and Timing

The APA is applied to calculate the initial HGB for PY1 (see **Eq. 8** and **Eq. 11**). The APA is applied to subsequent PYs based on the same approach; however, each subsequent PY is compared to the previous PY, as outlined below in **Exhibit 17.**

Exhibit 17: Basis for Annual Payment Adjustments

Performance Year	Inpatient	Outpatient
PY2 = HGB PY1 * (1 + PY2 APA)	(PY2 IP CAR – PY1 IP CAR) ÷ PY1 IP CAR	(PY2 OP WAACF – PY1 OP WAACF) ÷ PY1 OP WAACF
PY3 = HGB PY2 * (1 + PY3 APA)	(PY3 IP CAR – PY2 IP CAR) ÷ PY2 IP CAR	(PY3 OP WAACF – PY2 OP WAACF) ÷ PY2 OP WAACF
PY4 = HGB PY3 * (1 + PY4 APA)	(PY4 IP CAR – PY3 IP CAR) ÷ PY3 IP CAR	(PY4 OP WAACF – PY3 OP WAACF) ÷ PY3 OP WAACF
PY5 = HGB PY4 * (1 + PY5 APA)	(PY5 IP CAR – PY4 IP CAR) ÷ PY4 IP CAR	(PY5 OP WAACF – PY4 OP WAACF) ÷ PY4 OP WAACF
PY6 = HGB PY5 * (1 + PY6 APA)	(PY6 IP CAR – PY5 IP CAR) ÷ PY5 IP CAR	(PY6 OP WAACF – PY5 OP WAACF) ÷ PY5 OP WAACF
PY7 = HGB PY6 * (1 + PY7 APA)	(PY7 IP CAR – PY6 IP CAR) ÷ PY6 IP CAR	(PY7 OP WAACF – PY6 OP WAACF) ÷ PY6 OP WAACF
PY8 = HGB PY7 * (1 + PY8 APA)	(PY8 IP CAR – PY7 IP CAR) ÷ PY7 IP CAR	(PY8 OP WAACF – PY7 OP WAACF) ÷ PY7 OP WAACF

Exhibit 17a: Sample calculation of the Inpatient HGB component with IPPS update from 2025-2026

Item	Factor	Calculation
A	Inpatient component of the 2026 HGB calculated prior to PY1 using the APA based on the 2026 IPPS Final Rule.	$101,536,420
B	25% Weight to represent Oct-Dec	25%
C	Inpatient component of the 2026 HGB re-calculated during November of PY1 using the APA based on the 2027 IPPS Final Rule. All other inputs to the calculation are the same as those used to calculate the 2026 prior to the PY.	$105,428,566
D	25% Weight to represent Oct-Dec	25%
E	One-time payment to adjust Inpatient component of the 2026 HGB made during the beginning of 2027 to account for updated CMS prices applicable in the 4th quarter of 2026.	= (C * D) - (A * B) = ($105,428,566 * 25%) - ($101,536,420 * 25%) = $973,037

Exhibit 18 below details the timing of the PY Market Basket update based on CMS' updates to the DRG and APC base rates based on IPPS and OPPS Final rules.

Exhibit 18: Timing of the Inpatient Prospective Payment System and Outpatient Prospective Payment System Updates for Inpatient and Outpatient Services During the AHEAD Model

	Pre-AHEAD	AHEAD							
	Oct 2025 – Dec 2025	PY1	PY2	PY3	PY4	PY5	PY6	PY7	PY8

IPPS	Oct 2025	Oct 2025	Oct 2026	Oct 2027	Oct 2028	Oct 2029	Oct 2030	Oct 2031	Oct 2032
OPPS	Jan 2025	Jan 2026	Jan 2027	Jan 2028	Jan 2029	Jan 2030	Jan 2031	Jan 2032	Jan 2033

The APA is applied to calculate the initial HGB for PY1, as well as each subsequent PY. It is subject to changes in the IPPS Hospital Market Basket and other payment adjustments as detailed earlier in this section.

2.2.2 Volume-Based Adjustments

Volume-Based Adjustments update the Baseline Amount (adjusted by the APA) to reflect changes in demographics and volume. Because annual revenues from the HGB are fixed, Participant Hospitals are incentivized to reduce potentially avoidable utilization, improve beneficiaries' health, and shift care to appropriate lower-acuity settings to maximize net income. Volume-based adjustments facilitate predictable HGB payments and provide incentives for growth in retained revenue or savings that accrue to hospitals from the difference between fixed historical revenue and costs from lower utilization during the PYs[14]. Calculation of these adjustments consider Medicare FFS payments for all Eligible Hospital Services in the state or sub-state region, regardless of individual hospital participation in the AHEAD Model. Medicare payments to ineligible hospital types (as defined in **Section 1.5**) or for excluded hospital services (as defined in **Appendix D**) are not included in the calculation of volume-based adjustments. HGBs provide market shift and service line adjustments to account for service volume change year-over-year.

1. **Market Shift Adjustment**: Adjusts for upward and downward changes in revenue when patient volume and complexity realigns or shifts between Eligible Hospitals within a Hospital-Specific Market Area.
2. **Service Line Adjustment**: Adjusts funding to account for service line modifications, including additions, expansions, reductions, or elimination of specific service lines. Of note, Participant Hospitals can retain a portion of the revenue associated with the volume of a removed service line to invest in population health activities.
3. **Demographic Adjustment**: Adjusts HGBs for changes in the size and acuity of Medicare FFS beneficiaries served by the hospital.
4. **Outlier Adjustment**: Alters HGBs for changes in the portion of outlier payments between the baseline and PY.

2.2.2.1 Market Shift Adjustment

The MSA is designed to account for upward and downward changes in revenue when patient volume and complexity realigns or shifts between Eligible Hospitals within a Hospital-Specific Market Area. The MSA provides an adjustment to HGBs to cover the costs associated with shifts in FFS dollars (as measured by No-Pay Claims or FFS claims) and patient resource needs (measured using DRG and APC weights) from one hospital to another within a Hospital-Specific Market Area. The adjustment includes both participating Hospitals and non-participating Hospitals to account for revenue shifts in and out of the HGB. The MSA functions to re-distribute

[14] See Evaluation of the Maryland Total Cost of Care Model: Progress Report, April 2024

volume between hospitals, while the Demographic Adjustment (**Section 2.2.2.3**) updates global budgets in response to changes in the population served by each hospital.

The MSA is not applied to planned service line contractions or eliminations and is not applied to new service line additions until two years of experience have occurred (**Section 2.2.2.2**). The Service Line Adjustment (SLA) adjusts HGBs for anticipated revenue changes due to planned service line modifications. Conversely, the MSA accounts for historical volume shifts between hospitals. To ensure SLAs are funded at the full amount approved by CMS, SLAs are removed from the MSA.

To support small hospitals and provide additional protection from year-to-year volume variations, an MSA small provider floor will be implemented. The floor will be set at 0%, ensuring no eligible hospital receives a downward adjustment from the MSA. Eligible small providers are any hospitals whose Year 2 FFS payments represent 2% or less of the AHEAD state's or sub-state region's total Year 2 FFS payments. This approach protects the greatest number of hospitals with minimal additional cost and helps maintain stability in hospital funding without significantly increasing model spending.

The MSA is calculated as the change in the share of FFS dollars and weights for a hospital within its Hospital-Specific Market Area. In Medicare payment methodologies, weights are a measure of resource use and are typically multiplied by a conversion factor or base rate to produce a payment amount in dollars. This shift in weights and FFS dollars for each hospital is multiplied by a MSA Shift Allowance allocated to the MSA to convert the change in market share to dollars.

Calculating a Participant Hospital's MSA involves four primary steps:

1. Determine the Hospital-Specific Market Area and overlapping market areas
2. Calculate the MSA Shift Allowance available for the Hospital-Specific Market Area
3. Calculate the proportional shift in FFS dollars and weights for the hospital within its Hospital-Specific Market Area
4. Convert proportional shift in weights and FFS dollars to MSA adjustment amount in dollars that can be applied to global budgets.

The MSA is a bi-directional adjustment for all Participant Hospitals except those defined as Small Hospitals under the MSA methodology for which a MSA Floor would apply. Participant Hospitals that gain proportional market share receive a positive MSA. Participant Hospitals that lose proportional market share receive a negative MSA, with the exception of Small Hospitals as detailed below. The methodology is designed to ensure that increases due to changes in utilization are offset by reductions in utilization elsewhere.

The MSA is applied to prospective HGB payments beginning in PY2 using historical data. For the PY2 MSA, data from BY3 and the Gap Period gap period is used. For PY3 data from the Gap Period and PY1 is used in the MSA. Subsequently, the MSA is calculated using claims data from the prior two years (e.g., PY1 and PY2). See **Exhibit 43** for more information. The MSA amount is calculated separately for inpatient and outpatient services and then summed into a single adjustment to HGB payments.

a. Determine the Hospital Specific Market Area and Overlapping Market Areas

The Hospital-Specific Market Area for each Eligible Hospital (**Section 1.5**) is a collection of zip codes identified by contribution to the hospital's total Medicare FFS dollars or the hospital's rank within the zip based on Medicare FFS dollars. All Eligible Hospitals in the HGB State or Substate region and Border States are assessed to determine hospital specific market areas and overlapping market areas. A Border State is defined as a state that shares a boundary with the HGB State (or Substate). Any Border State Hospitals whose market area zip codes overlap with a HGB State (or substate) Hospital are included in assessing the HGB State (or Substate) market shift. Hospital-Specific Market Areas are reassessed annually and shared with each Participating Hospital prior to the PY. To be included in a Hospital-Specific Market Area, a zip code must be located within 120 miles of the Eligible Hospital. In addition, the zip code must meet at least one of the following criteria:

1. The zip code contributes at least 0.75 percent of the Eligible Hospital's total FFS dollars
2. Within the zip code, the Eligible Hospital is the first or second hospital ranked by FFS dollars
3. When zip codes are sorted descending by total FFS dollars, the zip code contributes to the top 75 percent cumulative FFS dollars to the hospital

The MSA measures shifts in services between hospitals within this Hospital-Specific Market Area. The MSA is calculated by including zip codes identified for each hospital using the three steps above, plus those zip codes that overlap from other Hospital-Specific Market Areas. This set of zip codes are Overlapping Market Area Zips. Overlapping zip codes are included because Medicare beneficiaries residing in zip codes that are in more than one hospital's market area are more apt to receive services from either hospital.

b. Calculate the MSA Shift Allowance Available for the Hospital Specific Market Area

The MSA Shift Allowance is the maximum amount of dollars that can shift between Eligible Hospitals in the Hospital-Specific Market Area. For each hospital, it is equal to the sum of FFS dollars across each hospital market area zip codes, plus FFS dollars in Overlapping Market Area Zip codes, adjusted by the State Growth Benchmark (inpatient and/or outpatient trend) and a funding factor of 80 percent.

$$(\boldsymbol{Eq.1})\ \boldsymbol{MSA\ Shift\ Allowance_i} = \sum_{j=1}^{j=n} s_j * State\ Growth\ Benchmark * Funding\ Factor$$

Where,

n = Number of Hospitals with Overlapping Market Area Zip Codes is the total number of hospitals with at least one Overlapping Market Area zip code with the primary hospital.

s = Sum of FFS Dollars from Overlapping Market Area Zip Codes is the sum of Hospital FFS dollar No-Pay Claims and FFS equivalent payment amounts in Year 2 to all hospitals for beneficiaries residing in Overlapping Market Area Zips (**Section 2.2.2.1a**).

State Growth Benchmark is the AHEAD state or region wide trend factor applied to the MSA Shift Allowance to recognize growth from one year to the next. The selected State Growth

Benchmark is used for the second of two years included in the MSA. For more information, refer to the Total Cost of Care Adjustment (**Section 2.3.4**).

Funding Factor is a multiplier applied to the MSA Shift Allowance to recognize the costs for moving volume from one location to another. The higher the funding factor the higher the MSA Shift Allowance. The MSA's funding factor is set at 80 percent to cover the incremental cost of the volume shift between hospitals. CMS may revisit the value of the funding factor to balance payment stability against the need to recognize changes in volume.

Inpatient and outpatient FFS dollars and weights are based on the same methodology as the Baseline, utilizing the same inclusion and exclusion criteria.

c. Calculate the Proportional shift in FFS and Weights for the hospital within its Market Area

The MSA is determined based on the hospital's year-over-year change in share or proportional shift in FFS dollars and weights within its Hospital-Specific Market Area. The proportional shift is calculated for FFS dollars and weights separately and is then combined as a 50/50 weighted average between the change in the two proportions. Incorporating FFS dollars in the MSA is new to version 3.0 of the HGB Financial Specifications. The MSA recognizes outliers and other payments that are important to hospitals along with weights, which measure the resources used by the hospital to provide certain services.

The FFS Payment Proportional Shift is the change in the hospital's FFS dollars, as a proportion of the total overlapping market area's FFS dollars between the two time periods included in the MSA. See **Exhibit 43** for a complete schedule of years included in the MSA.

$$(\boldsymbol{Eq.2})\ \boldsymbol{FFS\ Payment\ Proportional\ Shift} = \frac{Hospital\ FFS\ Payment_{\ Year2}}{Market\ Area\ FFS\ Payment_{\ Year2}} - \frac{Hospital\ FFS\ Payment_{\ Year1}}{Market\ Area\ FFS\ Payment_{\ Year1}}$$

Where,

Hospital FFS Payment = The paid amount to the hospital for Medicare FFS dollars for beneficiaries residing in Hospital Market Area Zips plus Overlapping Market Area Zips.

Market Area FFS Payment = The sum of FFS dollars to all Eligible Hospitals for beneficiaries residing in in Hospital Market Area Zips plus Overlapping Market Area Zips.

The weights proportional shift is the change in the hospital's APC or MS-DRG weights, as a proportion of the total market area's weights between the two time periods included in the MSA (**Exhibit 43**).

$$(\boldsymbol{Eq.3})\ \boldsymbol{FFS\ Weights\ Proportional\ Shift} = \frac{Hospital\ Weights_{\ Year2}}{Total\ Market\ Area\ Weights_{\ Year2}} - \frac{Hospital\ Weights_{\ Year1}}{Total\ Market\ Area\ Weights_{\ Year1}}$$

Where,

Hospital Weights = The total weights for Medicare No-Pay or Medicare FFS claims for beneficiaries residing in Hospital Market Areas plus Overlapping Market Area Zips. In Medicare payment methodologies, weights are a measure of resource use and are typically multiplied by a

conversion factor or base rate to produce a payment amount in dollars. For the global budget, all services including those not normally paid using MS-DRGs or APCs are weighted using MS-DRGs or APCs as described below. As noted above, the MSA is calculated separately for inpatient and outpatient services so to not combine weighting systems.

Inpatient services are weighted using,

- **MS-DRG Weights:** The MS-DRG system is used to classify inpatient services based on the patient's diagnosis, the severity of the illness, and the procedures performed. Each MS-DRG is assigned a weight that reflects the relative resource use required to treat patients in that group. These are updated annually using historical cost data and adjusted for geographic factors. Although CAHs are not paid using MS-DRGs, CMS assigns MS-DRG weights to these claims that can be used in the MSA. DRG weights are not provided for CAH swing beds services, however these are grouped using IPPS pricing software to assign MS-DRG weights.

Outpatient services are weighted using,

- **APC Weights:** APCs are used to group outpatient services into clinically coherent categories with similar resource utilization. Each APC is assigned a weight, which reflects the relative cost of providing a service within that classification. The weight is calculated based on the average cost of all procedures within the APC group, adjusted for geographic cost differences.
- **Weighting for ASP/SWP Drugs:** Part B drug claims paid via Average Sale Price (ASP) or Average Wholesale Price (AWP) are outside of the OPPS APC payment mechanism and these claims are not normally assigned APC weights. ASP/AWP drugs are assigned an APC weight by dividing all APC claim weights by all APC HOPD payments to calculate a scale factor that represents the average Medicare payment per unit of APC weight. ASP/AWP payments on No-Pay or Medicare FFS claims are then multiplied by that scale factor to convert ASP/AWP prices to APC relative values. Drugs paid through ASP/AWP are included except for certain oncology drugs that are carved out of HGBs.

See **Appendix E** for more information about weighting.

Market Area Weights = The sum of hospital weights for all hospitals with beneficiaries residing in Hospital Market Area Zips plus Overlapping Market Area Zips. After calculating the FFS Payments Proportional Shift and the Weights Proportional Shift, an overall weighted proportional shift is calculated. The weighting is evenly split 50 percent toward FFS payments and 50 percent toward weights.

$$(\boldsymbol{Eq.4})\ \boldsymbol{Proportional\ Shift} = (FFS\ Payments\ Proportional\ Shift * 50\%) + (FFS\ Weights\ Proportional\ Shift * 50\%)$$

An example of the calculation of the proportional shift in FFS and weights for a hospital within its Hospital-Specific Market Area is provided in **Exhibit 19**. Overlapping Weights and FFS Payments for Hospital-Specific Market Area hospitals are summed to calculate total MSA weights and dollars for Hospital One's MSA. The proportional change in volume at other hospitals is not displayed because it is not used to calculate Hospital One's proportional shift.

Exhibit 19.A: AHEAD MSA Proportional Shift Example for a Single Hospital – Case Weights

Hospital Number	Year 1 Weight (A)	Year 2 Weight (B)	Year 1 Prop of Weight (C) = A/(Sum of A)	Year 2 Prop of Weight (D) =B/(Sum of B)	Shift in Proportion of Weights (E) =D-C
1	200	270	50.0%	56.8%	**+ 6.8%**
2	90	100	x	x	x
3	50	40	x	x	x
4	45	50	x	x	x
5	0	5	x	x	x
6	15	10	x	x	x
Total	400	475			

Exhibit 19.B: AHEAD MSA Proportional Shift Example for a Single Hospital – FFS Payments

Hospital Number	Year 1 FFS Payments (F)	Year 2 FFS Payments (G)	Year 1 Prop of FFS Payments (H) = F/(Sum of F)	Year 2 Prop of FFS Payments (I) =G/(Sum of G)	Shift in Proportion of FFS Payments (J) =I-H
1	$5,000,000	$6,000,000	55.6%	59.1%	**3.5%**
2	$2,000,000	$2,100,000	x	x	x
3	$900,000	$700,000	x	x	x
4	$800,000	$1,000,000	x	x	x
5	$0	$100,000	x	x	x
6	$300,000	$300,000	x	x	x
Total	**$9,000,000**	**$10,200,000**			
Weighted Proportional Shift for Hospital 1 = (6.8% * 50%) + (3.5% * 50%) = 5.2%					

d. Convert proportional shift in weights and FFS payments to MSA amount

Each Participant Hospital's MSA amount is the weighted proportional shift of FFS payments and weights multiplied by the MSA Shift Allowance.

$$(\boldsymbol{Eq.\ 5})\boldsymbol{Hospital\ MSA\ Amount} = Proportional\ Shift \times MSA\ Shift\ Allowance$$

Small hospitals, particularly those in rural market areas, may experience unpredictable downward volume shifts year-over-year that may disproportionately destabilize the fixed nature of prospective HGBs and pose financial risk due to larger than anticipated reductions to HGBs after accounting for MSA. To provide additional payment stability in HGBs for smaller hospitals, an MSA floor of zero percent is set for hospitals below a threshold of two percent of an AHEAD state's or sub-state region's total Medicare payments, making the MSA upward only. This threshold is assessed and applied annually to each performance year. The MSA floor limits the size of any downward reduction to HGBs that can be applied as the result of the MSA for hospitals where the floor is applicable. For example, a zero percent MSA floor and threshold of two percent

means that any hospital with less than a two percent share of total FFS dollars cannot receive a downward adjustment from the MSA.

Exhibit 20 provides an example of an MSA calculation that converts the proportional shift to an MSA adjustment amount for a hospital. The proportional shift (Item A) and Year 2 Market Area FFS Payments (Item B) are carried through from **Exhibit 19**. For this example, the State Growth Benchmark is assumed to be 1.05 and the Funding Factor is 80 percent.

Exhibit 20: AHEAD MSA Proportional Shift Example for a Single Hospital

Item	Variable	Weights (1)	FFS (2)	Total (3)
A	Proportional Shift	6.8%	3.5%	=(A1 * 50%) + (A2 * 50%) = 5.2%
B	Year 2 Market Area FFS Payments			$10,200,000
C	State Growth Benchmark			1.05
D	Funding Factor			80%
E	MSA Shift Allowance			= B3 * C3 * D3 = $10,200,000 * 1.05 * 80% = $8,568,000
F	MSA Amount			= A3 * E3 = 5.2% * $8,568,000 = $445,536

2.2.2.2 Service Line Adjustment

Unlike the MSA (see **Section 2.2.2.1**), which adjusts prospective HGBs to account for volume shift from one hospital to another based on patient choice in site-of-service in previous PYs, Service Line Adjustments (SLA) adjust prospective HGBs to account for anticipated revenue changes from pre-planned service line changes, including additions, eliminations, expansions, or contractions of service lines within a given market area. Estimated SLAs added to prospective HGBs to account for service line additions or expansions are reconciled back to FFS for two PYs, then subject to the MSA methodology.

As outlined in the Hospital Participation Agreement, all SLAs contemplated by the Participant Hospital under a HGB need to receive CMS approval before any adjustments to the HGB are considered. Accordingly, a Participant Hospital must notify CMS of the following circumstances, in advance of the PY in which the adjustment is to be applied:

- A pre-planned service line addition or expansion that addresses an unmet need in the community.
- A pre-planned service line elimination or contraction.

In making determinations on whether to approve or deny a proposed SLA, CMS considers alignment with the State Population Health Accountability Plan and population health goals, the potential to achieve savings or budget neutrality for Medicare, impact on beneficiary access to care, and fulfillment of existing obligations under Medicare and Medicaid.

DRGs, HCPCS, or revenue codes must be supplied by the Participant Hospital requesting an SLA for analysis and, if approved, calculations needed to add or subtract monies from the HGB. SLAs may be considered and applied to a Participant Hospital's Global Budget in subsequent PYs.

a. Service Line Addition or Expansion

While CMS can prospectively add revenue to the HGBs to account for new or expanded service lines upon AHEAD State recommendation, any Service Line Addition or Expansion is reconciled back to the FFS costs for the first two years of its implementation. This is because utilization may increase over time, and it can be difficult to accurately predict the expected utilization in advance. After this two-year period, the Service Line Addition or Expansion becomes part of the HGBs where it does not reconcile back to FFS outside of the MSA.

The steps to implement a Service Line Addition or Expansion in a HGB are as follows:

- **Step 1:** Participant Hospital notifies CMS of the request to add or expand a specific service line, including forecasting the financial impact of the added service line and supplying impacted DRGs, HCPCS, or revenue codes.
- **Step 2:** CMS reviews the request and determines whether to adjust the HGB. Upon request by CMS, the State will provide consultation to CMS in determining whether to approve or deny the SLA.
- **Step 3:** CMS approves or denies the change in the HGB consistent with the service line change. If approved, CMS reviews and approves the forecasted revenue associated with the SLA and prospectively adds the amount to the Participant Hospital's Global Budget.
- **Step 4:** If approved, the forecasted revenue is added to the HGB, which then is paid through the bi-weekly payments. The Participant Hospital submits No-Pay Claims.
- **Step 5:** Following claims runout for each of the two PYs, CMS performs a full reconciliation to the exact amount of FFS volume for that PY. For the first PY, the reconciliation occurs mid-year of the second PY to allow for sufficient Claims Runout. Any reconciliation amount is applied to and spread over the remaining bi-weekly payments for the second PY. For the second PY, the reconciliation occurs mid-year of the third PY. The reconciliation amount is spread over the forthcoming bi-weekly payments for the rest of that third PY.
- **Step 6:** After two full PYs, the Service Line Addition or Expansion is not reconciled. The mid-year update for PY3 (which includes PY2 reconciliation) ensures that the added revenue is equal to the utilization observed in PY2. While no additional reconciliation adjustments are made for volume, the new service line is subject to the MSA (**Section 2.2.2.1**) in future PYs.

SLAs that are implemented in the Gap Period are billed as FFS during the Gap Period. Participant Hospitals with a Gap Period SLA submit their information to the AHEAD State like other SLAs and the process would follow the previously outlined steps.

Exhibit 21 shows an example of an approved service line addition for a new gastroenterology service line (inpatient and outpatient services) in PY1. In this example, the hospital estimates the annual revenue associated with the new service line is roughly $1M and is approved for inclusion in the HGB for two PYs.

Exhibit 21: Example Service Line Addition

Time	Step for Service Line Addition
Before PY1	Annual Forecasted Revenue submitted to CMS and is approved by the AHEAD State and CMS.
PY1	CMS adds $1M to the HGB for PY1; which is then included in the bi-weekly payments.
PY2	There is insufficient time for Claims Runout from PY1 to update SLA amount to set initial PY2 HGB. CMS includes $1M in PY2 HGB for SLA.
Mid-PY2	CMS performs reconciliation of PY1 by adjusting the remaining bi-weekly payments for PY2. Determining reconciliation amount: • In PY1, the utilization of the SLA was $750,000, compared to the $1M added to the PY1 HGB prospectively. • Therefore, Participant Hospital must return $250,000 to CMS.
PY3	CMS includes $1M in initial PY3 HGB for SLA (still waiting on PY2 Claims Runout).
Mid-PY3	CMS performs reconciliation for PY2 and updates to PY3 SLA amount. Determining reconciliation amount: • In PY2, utilization was $1,100,000, compared to the $1M added to the PY1 HGB prospectively. • Therefore, the Participant Hospital receives an additional $100,000 for PY2 reconciliation. • Since the Service Line Addition for PY3 should be not reconciled, but based at the PY2 observed amount, CMS needs to add an additional $100,000 in PY3 to make the Participant Hospital whole for the PY3 HGB SLA. • Therefore, the Participant Hospital receives a combined $200,000 spread over the remaining bi-weekly payments. • Note: PY3 is subject to MSA, including this Service Line Addition.
PY4+	Participant Hospital has a permanent $1,100,000 added to its annual HGB without reconciliation. It is subject to MSA.

b. Service Line Contraction or Elimination

Participant Hospitals must inform their AHEAD State and CMS of any planned service line contractions or eliminations. Participant Hospitals may request to retain a portion (up to 50 percent, except for CAHs, see **Section 2.2.2.2c** below) of their HGB associated with the eliminated or reduced service line. Any retained funds are meant to provide a financial transition for the Participant Hospital and allow for approved reinvestments in population health and care coordination activities, consistent with its Population Health Accountability Plan or other approved purposes. Participant Hospitals are required to report and confirm how the retained revenue is used in alignment with these purposes. Participating Hospitals must notify CMS for all anticipated service line contractions that happen during the Gap Period as well. This allows CMS to accurately adjust the PY1 HGB.

The steps to implement a service line contraction or elimination in a HGB are as follows:

- **Step 1:** Participant Hospital notifies the CMS of its plan to contract or eliminate a specific service line. The Participant Hospital may also request to retain a percentage of the revenue in the HGB associated with the contracted or eliminated services and propose a defined purpose for utilizing it consistent with the goals of the Model.

- **Step 2:** The CMS reviews the request to retain a percentage of the revenue in the HGB associated with the service line contraction. Upon request by CMS, the State will provide consultation to CMS in determining whether to approve or deny the SLA.
- **Step 3:** CMS approves or denies the change in the HGB consistent with the service line change. Note: CMS approval of HGB adjustments for this change does not indicate approval or bypass other federal, state, or other legal requirements that may apply to service line contractions or eliminations. Participant Hospitals need to work through those processes with any relevant approval bodies.
- **Step 4:** If approved, the Participant Hospital contracts or eliminates services during the following PY and retains up to 50 percent of revenues associated with the service line.

Exhibit 22: Example Service Line Eliminationsummarizes the revenue impact of the elimination of a service line by a Participant Hospital. In this example, the total revenue associated with the service line in the Participant Hospital's Global Budget is $500,000. Due to the service line being eliminated, the Participant Hospital requests and is approved to retain $250,000 (50 percent) of the revenue for care coordination and population health activities with the remaining revenue being eliminated.

Exhibit 22: Example Service Line Elimination

Service Line	Total Service Line Revenue	Retained Revenue for Reinvestment	Reduction to the HGB
Service Line G	$500,000	$250,000	$250,000

c. Service Line Adjustments for Critical Access Hospitals

CAHs provide vital services in medically underserved areas. However, they may need to reassess service lines while maintaining access to care. Upon receiving approval from CMS for a service line reduction or elimination in accordance with steps 1-3 above, CAHs may request retention of up to the entire revenue (100 percent) associated with the reduced or eliminated service line if it is used to specifically target the goals of their Population Health Accountability Plan, State Population Health Accountability Plan, or for another approved purpose (e.g., care management and transition planning).

2.2.2.3 Demographic Adjustment

The Demographic Adjustment (DA) is designed to adjust HGBs to reflect changes in both the size and medical risk of the population served by each Participant Hospital (**Section 1.6**). As the size and risk profile of the population changes, the utilization of services also changes. In many cases, the DA accounts for a more medically complex population as the population ages, new beneficiaries qualify for Medicare coverage, and existing beneficiaries' care becomes more medically complex. The DA also accounts for shifts in enrollment from Medicare FFS to Medicare Advantage by adjusting Medicare FFS HGBs downward as Medicare is no longer the primary payer for those services.

For the DA, beneficiary Hierarchical Condition Category (HCC) scores are used to assess changes in beneficiary clinical and demographic risk. CMS has historically used HCC scores to estimate future healthcare costs for an individual and to account for differences in patient complexity.

The DA is the average percentage change in total HCC scores across all counties served by each Participant Hospital weighted by the percentage of revenue its residents accounted for at the Participant Hospital. For example, if a hospital generates one million in total Medicare FFS revenue and residents from County A accounted for $100k of that revenue, the County A weight for that hospital is ten percent.

The total HCC accounts for both population shifts and clinical and demographic risk changes in the areas served by the Participant Hospital. Each beneficiary in a county is assigned an HCC score, with a value of 1.0 representing the national average risk of a Medicare beneficiary. If additional beneficiaries move into a county or if residents of a county become sicker, the total HCC increases proportionally.

The DA is based on the year-over-year change in HCC scores across all counties served by each Participant Hospital, then applied to the HGB in the subsequent PY. The share of FFS payments from the year ending six months prior to each PY is Y1, and the share of FFS payments from the year ending 18 months prior to each PY is Y2. The share of FFS payments and number of counties served is calculated using data from the more recent time period (Y1) and is updated annually. Claims data is used to calculate HCC scores and the change in Total HCC is calculated using the change between Y2 and Y1 and is updated each time the DA is calculated.

a. Demographic Adjustment Calculation

The DA adjusts HGBs by the weighted average percentage change in total HCC scores across counties served by the Participant Hospital. The change in total HCC scores is applied proportional to the share of Medicare FFS claim payments for Eligible Inpatient and Outpatient Hospital Services generated from each county for the Participant Hospital.

$$(\boldsymbol{Eq.1})\ \boldsymbol{DA_i} = \sum_{j=1}^{j=n} s_j * \Delta\, Total\ HCC$$

Where,

n = Number of Counties Served by the Hospital is the number of counties with at least one resident with an FFS claim (or No-Pay Claim equivalent) for Eligible Inpatient or Outpatient Hospital Services at the Participating Hospital. Counties can be located in- or out-of-state so that the demographic adjustment fully aligns with total hospital Medicare FFS revenue.

s = Share of FFS Payments is equivalent to revenue generated for the Participant Hospital from each county *j* served by the hospital divided by total revenue generated for the Participant Hospital across all counties. Revenue is the sum of Medicare FFS claim payments or No-Pay Claims for Eligible Inpatient and Outpatient Hospital Services using the same inclusion/exclusion logic as in the Baseline Calculation (**Section 2.1**). All factors used to calculate Medicare FFS claim payments are incorporated including base payment rates, adjustments for market conditions, complexity of service (DRG-Weights), policy adjustments, and quality adjustments.

Δ Total HCC = Percentage change in the county sum of HCC scores. The county sum of HCC scores is calculated by summing the HCC score for every Medicare beneficiary that resides in the county. HCC scores are calculated for all Medicare beneficiaries and are summed to better represent the entire distribution of acuity, rather than a single measure of central tendency, such as the mean or median.

HCC scores incorporate data on beneficiary health condition(s) using the ICD-10 codes and demographic factors (e.g., age, gender). Each beneficiary receives a single score that covers a 12-month lookback period. The CMS HCC Model Software for ICD-10 Mappings is used to determine the HCC scores for each beneficiary[15].

b. Demographic Adjustment Example

Exhibit 23 provides an example of how the PY1 DA is calculated for a Participant Hospital that served beneficiaries from three counties.

Exhibit 23: Example Demographic Adjustment Calculation for Participant Hospital

Item	County	County Sum of HCC Scores (Y2)	Total Revenue from County (Y1)	County Sum of HCC Scores (Y1)	Share of FFS Claims (Y1)	Percentage Δ Total HCC	County Adjustment
		(1)	(2)	(3)	(4)	(5)	(6)
A	County A	72.5	$110k	74.5	= A2 / D2 = 35.48%	= (A3 – A1) / A1 = 2.76%	= A4 x A5 = 0.98%
B	County B	68.5	$40k	62.5	=B2 / D2 = 12.90%	= (B3 – B1) / B1 = -8.76%	= B4 x B5 = -1.13%
C	County C	70	$160k	77.5	= C2 / D2 = 51.61%	= (C3 – C1) / C1 = 10.71%	= C4 x C5 = 5.53%
D	Total	-	= A2 + B2 + C2 = $310k	-	-	-	= A6 + B6 + C6 = 5.38%

2.2.2.4 Outlier Adjustment

a. Overview

In Medicare FFS, IPPS and OPPS outlier adjustments provide additional payment to hospitals to mitigate the financial risk associated with encounters that are unusually expensive and resource intensive. IPPS and OPPS outlier payments serve as a protection mechanism for hospitals,

[15] Medicare Advantage Rates and Statistics: Risk Adjustment

ensuring they can continue to provide high-quality care to patients with exceptional medical needs without jeopardizing their financial stability. IPPS and OPPS outlier payments are included in paid amounts used to set the HGB baseline (e.g., BY1-BY3). The HGB outlier adjustment protects Participant Hospitals against changes in the frequency or intensity of outlier cases between the baseline and/or PYs. This approach recognizes and compensates Participant Hospitals for treating exceptionally high-cost patients.

In Version 2.0 of the CMS-Designed HGB, the adjustment for outliers was part of the Annual Payment Adjustment and used outlier payment data from the IPPS Impact File. The outlier adjustment in Version 3.0 uses the actual outlier payment amounts from claims instead of estimated amount sourced from the IPPS Impact File. Shifting from estimated to actual outlier payments that are calculated on a claim-by-claim basis better aligns with what hospitals can expect under Medicare FFS and reinforces the focus on resource intensity at the case level, rather than the overall utilization.

Under current Medicare FFS policy SCHs receive a 7.1% increase above standard OPPS rates, excluding drugs and biologics. The Outlier Adjustment operates the same under both standard and increased OPPS rates, following the provisions of the standard CMS Outlier Payment Policy, and naturally accounts for the higher 7.1% OPPS reimbursement rate for SCHs. CAHs do not receive outlier payments in Medicare FFS and are therefore ineligible for the Outlier Adjustment. The HGB does include a CAH payment floor to protect these hospitals (see **Section 2.1.6**).

b. Outlier Adjustment Calculations

For each performance year, the outlier adjustment for HGBs is calculated as the change in the share of outlier payment from one year to the next. The share of outlier payments for each Participant Hospital and year is calculated as\,

$$(\boldsymbol{Eq.1}) = \boldsymbol{Share\ of\ Outlier\ Payments} = \left(\frac{\sum Outlier\ Payments\ on\ FFS\ or\ No-Pay\ Claims}{\sum Total\ Paid\ on\ FFS\ or\ No-Pay\ Claims}\right)$$

Where,

IPPS or OPPS Outlier Payments on FFS or No-Pay Claims = IPPS or OPPS APC outlier payments as calculated using standard Medicare FFS processing rules. No-Pay Claims are used to calculate what the outlier payment would have been if the Participant Hospital was not participating in global budgets.

Total Paid FFS or No-Pay Claims = The paid amount Medicare FFS payments for Eligible Hospital Services or what would have been paid on No-Pay Claims for during the Performance Year.

The change in the share of outlier payments between years is calculated as shown in **Equation 2**, which is then multiplied by the global budget amount to calculate the value of the adjustment.

$$(\boldsymbol{Eq.2})\ \boldsymbol{Outlier\ Adjustment} = \left(Share\ of\ Outlier\ Payments_{y} - Share\ of\ Outlier\ Payments_{y-1}\right) * H$$

Where,

y = Baseline or Performance Year included in the calculation. See **Exhibits 43 to 45** for details.

H = Hospital global budget after applying the Annual Payment Adjustment and Demographic Adjustment.

To allow for nine months of claims runout, which may be needed for complex outlier claims, the outlier adjustment is calculated late in PY2 and first applied to PY3 global budgets.

Example of outlier adjustments for PY3 and PY4 are provided in **Exhibit 24a** and **Exhibit 24b**. In this scenario, the Participant Hospital's hospital global budget for PY3 is reduced by $2,080,000 to account for the lower share of outlier payment in PY1 compared to the Baseline. The Participant Hospital's HGB for PY4 would increase by $1,097,250 due to a one percent increase in share of outlier payments from PY1 to PY2.

Exhibit 24a: Example Outlier Adjustment Calculation for Performance Year 3 (PY3)

Time Period	IPPS and OPPS Outlier Payment Amount	Total FFS or No-Pay Claims Payment Amount	Percent of Outlier Payment Amount
	(A)	(B)	= (A) / (B)
Baseline	$5,000,000	$100,000,000	5.00%
PY1	$3,300,000	$110,000,000	3.00%
PY3 HGB Baseline	$104,000,000		
PY3 Outlier Adjustment Amount	= (3.00% – 5.00%) ∗ $104,000,000 = - $2,080,000		

Exhibit 24b: Example Outlier Adjustment Calculation for Performance Year 4 (PY4)

Time Period	IPPS and OPPS Outlier Payment Amount	Total FFS or No-Pay Claims Payment Amount	Percent of Outlier Payment Amount
	(A)	(B)	= (A) / (B)
PY1	$3,300,000	$110,000,000	3.00%
PY2	$3,800,000	$95,000,000	4.00%
PY4 HGB Baseline	$109,725,000		
PY4 Outlier Adjustment Amount	= (4.00% –3.00%) ∗ $109,725,000 = $1,097,250		

2.2.3 AHEAD Specific Adjustments

2.2.3.1 Social Risk Adjustment

AHEAD applies an upside-only Social Risk Adjustment (SRA) to HGBs to account for hospital-to-hospital differences in the social risk for their beneficiary populations. The intention of this

adjustment is to provide additional resources for hospitals that are treating higher adversity patient populations.

The SRA is based on a calculated Social Risk Score (SRS) for each hospital. The SRS for a hospital is determined based on the Community Deprivation Index (CDI) and a combination of dual-eligibility and Part D Low Income Subsidy (LIS) referred to as the Low-Income Marker.

- The CDI is a CMI-developed factor-based index that uses US Census indicators – including poverty, education, housing, and employment factors – to characterize census block social risk correlated with health outcomes.[16] The CDI is an update to the Area Deprivation Index (ADI), where:
    - Deprivation factors from the American Community Survey data are standardized by rescaling each input to have a mean of zero and a standard deviation of one
    - Statistical shrinkage is applied for more precise factor measurement
    - Factors are updated and reweighted based on more recent input data

  These updates help to account for differences in income and housing prices. The CDI value for a hospital will not be lower than that determined in the SRA applied to PY1 to account for the possibility that a hospital may positively influence the community deprivation of local areas, and to not penalize them for doing so.
- The Low-Income Marker (LIM) reflects whether a beneficiary is either dually eligible (full or partial dual) or eligible for Part D LIS at any point in the rolling 12-month period immediately preceding the calculation.

To calculate a hospital SRS, first beneficiary addresses are geocoded, and a 12-digit Federal Information Processing Standard (FIPS) code composed of state, county, tract, and block group is assigned to each beneficiary. FIPS codes are based on where beneficiaries reside on their first day of eligibility within the PY[3]. Next, the percentage of FFS revenue (using the same criteria for inclusion/exclusion as the Baseline, see **Section 2.2.2.1** for more detail) for each hospital's claims for beneficiaries living in each census block group (including census block groups from outside of the state) is calculated to weigh the SRS by the geographic distribution of the hospital's Medicare FFS revenue. A weighted SRS is then calculated for a hospital based on the average beneficiary social risk score for the census block group and the percent of revenue that the census block group contributes to total hospital revenue.

The SRA percentage (ranging from zero to two percent) and dollar amount applied to each HGB is calculated by assigning a percentile based on the hospital's total SRS compared to all other hospitals within the AHEAD state or sub-state region. The SRS percentile is referenced against the percentile lookup table in **Exhibit 26** to determine the SRA percentage. To receive an SRA above zero percent, a hospital must fall above the 40th percentile of hospitals in the state. The SRA is calculated annually prior to each PY using the most recent baseline year for PY1 and the prior PY thereafter (**Exhibit 43**).

To calculate the SRA for each Participant Hospital, CMS uses the steps below:

1) **Geocode all beneficiaries to an assigned census block group:** Geocode all Medicare FFS beneficiaries in the AHEAD state or sub-state region to a census block group using beneficiary address information from the IDR against available census data files. Beneficiary addresses that are unable to be geocoded to a census block group based on

address are then geocoded based on the beneficiary address coordinates or the coordinates of the beneficiary zip code centroid.

2) **Calculate the beneficiary-level SRS**. The beneficiary SRS is equal to the National CDI for their assigned census block group and a beneficiary level binary indicator for dual-eligibility and/or Part D Low-Income Status. SRS can range from zero to 150. Note that a beneficiary would not have an SRS (e.g., SRS = 0) if there was no CDI assigned to their specific census block group and if the LIM criteria is unmet. This SRS can be calculated for each beneficiary *b* as:

$$(\boldsymbol{Eq.1})\ \boldsymbol{SRS_b} = National\ CDI + (50 * LIM)$$

Where,

National CDI = National CDI, which is expressed as a percentile with a range of one to 100, is assigned for each eligible beneficiary. Points for National ADI range from one to 100. National CDI is fixed (or higher) based on the PY1 calculation to account for positive hospital influence.

Low-Income Marker (LIM) = Set to one if a beneficiary is either dually eligible (full or partial dual) or deemed eligible for Part D LIS at any point in the rolling 12-month period immediately preceding the calculation. If a beneficiary is not dually eligible and is not eligible for Part D LIS, LIM equals zero for that individual beneficiary. Points for LIM equal zero or 50.

3) **Aggregate beneficiary scores to census block group area**. Beneficiary scores are summed and averaged across all beneficiaries that year for the census block group area. This SRS can be calculated for each census block group *g* as:

$$(\boldsymbol{Eq.2})\ \boldsymbol{SRS_g} = \left(\sum_{j=1}^{j=n} SRS_b\right) \div n$$

Where,

n = Number of beneficiaries in the census block group.

4) **Calculate the Participant Hospital's SRS**. Hospital-level scores are developed by computing a weighted score based on the census block group's proportion of hospital payments (using Medicare FFS claims or No-Pay Claims) multiplied by the average census block group SRS. This SRS can be calculated for each hospital *h* as:

$$(\boldsymbol{Eq.3})\ \boldsymbol{SRS_h} = \sum_{g=1}^{g=n} \left(SRS_g * \frac{P_g}{P_h}\right)$$

Where,

n = Number of total census block groups from which hospital revenue is received

h = Participant Hospital

g = Census block group from which hospital revenue is received

$\mathbf{P_g}$ = For census block group **g** of a Participant Hospital **h**, the sum of Medicare FFS claim payments (or No-Pay Claims during the PY) for Eligible Inpatient and Outpatient Hospital

Services using the same inclusion/exclusion logic as in the Baseline Calculation (**Section 2.1**)

P_h = For all census block groups of a participant hospital **h**, the sum of Medicare FFS claim payments (or No-Pay Claims during the PY) for Eligible Inpatient and Outpatient Hospital Services using the same inclusion/exclusion logic as in the Baseline Calculation (**Section 2.1**)

An example of how to calculate a Participant Hospital's SRS is shown in **Exhibit 25** below:

Exhibit 25: Example Social Risk Score Calculation for Participant Hospital

Defined Geographic Area	Census Block Group Average SRS (A)	Proportion of Hospital Payments (B)	Weighted SRS $\sum A * B$
Census Block Group A	97	50%	48.5
Census Block Group B	87	30%	26.1
Census Block Group C	80	20%	16
Hospital SRS			**90.6**

5) **Determine the Participant Hospital's SRA based on percentile.** To calculate the Participant Hospital SRA, determine the percentile of the Participating Hospitals' SRS Score within the state. The percentile is then referenced against the percentile lookup table in **Exhibit 26** to determine the SRA percentage. This method allows for a smoother cutoff point between hospitals receiving a zero and non-zero SRA, as opposed to a stricter cutoff at the state median.

Exhibit 26: Percentile Lookup Table for Determining SRA Percentage

Percentile of SRS	SRA %
0-9%	0.0%
10-19%	0.0%
20-29%	0.0%
30-39%	0.0%
40-49%	0.2%
50-59%	0.4%
60-69%	0.7%
70-79%	1.1%

Percentile of SRS	SRA %
80-89%	1.6%
90-100%	2.0%

Exhibit 27 is an example of the SRA calculation, after the hospital SRS is established in Steps 1-3 above.

Exhibit 27: Example Calculation of Social Risk Adjustment

Hospital	SRS	Percentile of SRS	SRA Percent Adjustment
Hospital A	46	91	2.0%
Hospital B	42	82	1.6%
Hospital C	38	73	1.1%
Hospital D	37	64	0.7%
Hospital E	36	55	0.4%
Hospital F	35	45	0.2%
Hospital G	35	36	0.0%
Hospital H	31	27	0.0%
Hospital I	25	18	0.0%

2.2.3.2 Transformation Incentive Adjustment

Robust hospital participation will be important for realizing care transformation and sustainable savings under the AHEAD Model. In addition to expectations for states to use regulatory levers to incentivize or otherwise encourage hospital participation, CMS will also include a one percent upward TIA to each Participant Hospital's HGB in the first two PYs of the Applicable Cohort. The one percent adjustment will be applied after all annual trend updates have been completed (**Exhibits 43 to 45**). The TIA serves as both an incentive for early participation and provides additional revenue that hospitals may invest in care management and transformation activities that will generate medium- and long-term savings under the Model, including infrastructure, staffing, technology, or other resources needed to succeed under a HGB construct. The TIA will need to be repaid in full if the Participant Hospital exits the Model before the sixth PY. If the Participant Hospital remains in the Model through PY6 or longer, no repayment is necessary.

2.2.3.3 Adjustments to Hospital Global Budgets Given State Performance on Medicare Fee-for-Service Total Cost of Care Targets

As noted in the AHEAD NOFO, Appendix XI, CMS may take corrective action if the AHEAD State is unable to meet annual targets. This corrective action may include submission of a corrective action plan, modification of CMS-Designed HGB methodology, and/or other modifications to Primary Care AHEAD. A potential modification to the CMS-Designed HGB may include an additional adjustment that may reduce all or some HGBs in the AHEAD State or sub-state region. CMS will consider the magnitude of the missed target, the State's plan to

improve performance, individual hospital performance, among other factors in determining any such methodology, and will consult with the AHEAD State as part of this decision.

2.2.4 Logistical Order of Operations for Annual Trend Updates and AHEAD Specific Adjustments

Exhibit 28 illustrates the order of operations when applying annual trend updates and AHEAD specific adjustments to the HGB.

Exhibit 28: Example Calculation of HGB Annual Trend Updates & AHEAD-Specific Adjustments

Item	Adjustment	Adjustment Amount	Financial Specifications Section
A	Current HGB	$200,000,000	2.1
B	MSA	$200,000	2.2.2.1
C	Service Line Adjustment (SLA)	($20,000)	2.2.2.2
D	Outlier Adjustment	$50,000	2.2.2.4
E = A + B + C + D	HGB Adjusted for Volume	$200,230,000	
F	APA	3.0%	2.2.1
G	DA	2.0%	2.2.2.3
H = E * (1 + F) * (1 + G)	HGB with APA and DA	$210,361,638	
I	SRA	0.5%	2.2.3.1
J = H * (1 + I)	HGB after Annual Updates	$211,413,446	
K	TIA (PY1 and PY2 only)	1.0%	2.2.3.2
L = J * (1 + K)	HGB after annual and AHEAD-specific Adjustments	$213,527,580	

2.3 Performance-Based Adjustments

The following section details the performance-based adjustments that are applied to a Participant Hospital's HGB. In addition to the quality related adjustments described below, HGBs for Acute Care Hospitals are also adjusted for existing CMS national quality programs incorporated into FFS (IQR, OQR, HRRP, HACRP and VBP) as part of the Annual Payment Adjustment (**Section 2.2.1)**. An example of this adjustment is displayed in **Exhibit 15**. CAHs are not required to participate in the CMS national hospital quality programs (e.g., IQR, OQR, HRRP, HACRP, VBP).

2.3.1 Quality Adjustments

2.3.1.1 Critical Access Hospital Quality Adjustment

In AHEAD, CAHs participate in the CAH Quality Incentive Program, an upside-only quality program that begins as pay-for-reporting and advances to pay-for-performance for a select set of measures, including rural-specific measures. The program will begin as pay-for-reporting and

advance to pay-for-performance over the Model lifecycle to support CAHs in this process. The initial years of pay-for-reporting will allow CAHs to familiarize themselves with the measures, reporting requirements, and implement potential interventions or care strategies to prepare for the transition to pay-for-performance. CAHs must report on at least one measure in all three domains to obtain the pay-for-reporting reward. CMS monitors changes in measure outcomes from baseline of Model participation to inform future national quality efforts targeted to CAHs.

This CAH Quality Incentive Program begins as a pay-for-reporting reward in PY3 and progresses to a pay-for-performance reward by PY8. As indicated in **Exhibit 29,** in PY5 through PY7, both reporting and performance impact the reward amount with progressively more emphasis on performance. From PY8 forward, the reward is entirely based on performance. For example, if a CAH qualifies for the maximum pay-to-report reward of one percent and half of their pay-to-perform reward of one percent in PY6, their total CAH quality reward is 1.5 percent (one percent pay-to-report, 0.5 percent pay-to-perform). The CAH quality performance period is the most recent complete year of data two years prior to the PY, and the CAH quality base period is the year prior. For example, the HGB adjustment for PY5 is calculated the November of PY4 and is based on improvement from PY2 to PY3. Quality data is sourced from Medicare Beneficiary Quality Improvement Project (MBQIP) and time periods for each measure are selected to most closely align with performance years in **Exhibit 29**.

Exhibit 29: Critical Access Hospital Quality Incentive Program - Upside Reward

Example Year	2026	2027	2028	2029	2030	2031	2032	2033
	PY1	**PY2**	**PY3**	**PY4**	**PY5**	**PY6**	**PY7**	**PY8**
Pay-for-Reporting			2% Based on PY1	2% Based on PY2	1.5% Based on PY3	1% Based on PY4	0.5% Based on PY5	0%
Pay-for-Performance					0.5% Based on PY3/PY2	1% Based on PY4/PY3	1.5% Based on PY5/PY4	2% Based on PY6/PY5

Exhibit 30 includes a sample set of CAH Quality Program Measures and is subject to modification due to CMS' annual measure update process.

Exhibit 30: AHEAD Critical Access Hospital Quality Program Measures

Domain	Measure	Identifier	Steward	CMS Program Alignment	Data Sources
Health Care Quality and Utilization	CMS Hybrid Hospital-Wide Readmission (Hybrid eHWR)	NQF 2879 CMIT 529	CMS	IQR	Claims; Electronic Health Data; Administrative Data
Health Care Quality and Utilization	Emergency Transfer Communication Measure	NQF 0291 CMIT N/A	University of Minnesota	N/A (MBQIP)	Claims, Electronic Health Data, Paper Medical Records
Health Care Quality and Utilization	Outpatient ED Arrival to Discharge (OP-18b)	CMIT 427	CMS	OQR	Electronic Health Data

Patient Safety	OPI-01 Safe Use of Opioids - Concurrent Prescribing	NQF 3316e CMIT 506	CMS	IQR; Promoting Interoperability Program	Electronic Health Data
Patient Safety	National Healthcare Safety Network (NHSN) Facility-wide Inpatient Hospital onset Clostridium difficile Infection (CDI)	NQF 1717 CMIT 462	CDC	HACRP HIQR HVBP	Electronic Health Data, Other, Paper Medical Records
Patient Safety	VTE-1 Venous Thromboembolism Prophylaxis	NQF 0371 CMIT 758	Joint Commission	IQR; Promoting Interoperability Program	Electronic Health Data
Patient Safety	Sepsis Bundle (SEP-1)	CMIT 678	CMS	IQR; VBP	Electronic Health Data
Patient Safety	Severe Obstetrics Complications (PC-07)	NQF N/A CMIT 1028	The Joint Commission	Promoting Interoperability Program	Electronic Health Data
Patient Experience	HCAHPS - Hospital Consumer Assessment of Healthcare Providers and Systems (multiple measures)	NQF 0166 CMIT 338	CMS	IQR; HVBP	Instrument-Based Data

A CAH's performance is measured on an annual basis and scored for attainment (compared to a measure threshold and benchmark) and improvement (compared to baseline performance). Patient experience measures are also scored separately for consistency. Quality measure data periods vary by quality measure.

Exhibit 31 details the definitions of measure constructs, measure thresholds, and benchmark performance standards that drive the sample hospital calculation. **Exhibit 32** shows an example of AHEAD CAH quality domains, measures, and thresholds and benchmarks performance standards.

Exhibit 31: AHEAD Critical Access Hospital Quality Measure Construct Definitions

CAH Quality Construct Element	Definition
Measure Threshold	Median measure score of CAHs nationally in the CAH quality base period
Measure Benchmark	Mean of top decile score of CAHs nationally in the CAH quality base period
National Measure Floor	Lowest measure score of CAHs nationally in the CAH quality base period
Hospital Measure Baseline	Hospital performance in the CAH quality base period
Improvement Points	Hospital performance compared to its CAH quality base period performance and the national benchmark between 0-9.
Attainment Points	Hospital's performance compared to the national threshold and benchmark between 0-10.
HCAHPS Consistency Points	Compares hospital's lowest scoring HCAHPS dimension to the threshold and awards Consistency Points based on that dimension's score vs. the national measure floor. Consistency Points range from 0 – 20 points.

Achievement Points	Better of Improvement or Attainment Points
Total Performance Score	Sum of all measure achievement points, weighted by domain and divided by total possible achievement points
Domain Weights	Each of the following domains are weighted equally and measures within each domain as follows: - Healthcare Quality and Utilization: 34 percent - Patient Safety: 33 percent - Patient Experience: 33 percent

Exhibit 32: AHEAD Critical Access Hospital Sample Quality Performance Standards for Select Measures (Thresholds and Benchmarks)[16]

Domain	Measure	Improvement Indicator	Threshold	Benchmark
Healthcare Quality and Utilization	Hospital Wide Readmission *(proxy for Hybrid eHWR)*	Lower is Better	15.4	14.5
Health Care Quality and Utilization	Emergency Transfer Communication Measure	Higher is Better	N/A	N/A
Healthcare Quality and Utilization	OP ED Arrival to Discharge - Very High Volume	Lower is Better	173	120
Healthcare Quality and Utilization	OP ED Arrival to Discharge - High Volume	Lower is Better	166	117
Healthcare Quality and Utilization	OP ED Arrival to Discharge - Medium Volume	Lower is Better	146	104.2
Healthcare Quality and Utilization	OP ED Arrival to Discharge - Low Volume	Lower is Better	112	76
Patient Safety	OPI-01 - Safe Use of Opioids	Lower is Better	17	8
Patient Safety	NSHN Clostridium Difficile	Lower is Better	0.523	0.000
Patient Safety	SEP-1 Sepsis Bundle	Higher is Better	60	86
Patient Safety	VTE-1 Venous Thromboembolism Prophylaxis	Higher is Better	91	100
Patient Experience	HCAHPS - Communication with Nurses	Higher is Better	80	88
Patient Experience	HCAHPS - Communication with Doctors	Higher is Better	80	89
Patient Experience	HCAHPS - Responsiveness of Hospital Staff	Higher is Better	67	82

[16] Data Source: HHS Care Compare, January – December 2019 (except Hospital Wide Readmissions July 2019 – December 2019 and eCQMs January – December 2021). This table includes results for both CAHs and Acute Care Hospitals due to data availability for demonstration purposes, however CMS may develop CAH-specific thresholds and targets for this adjustment.

Domain	Measure	Improvement Indicator	Threshold	Benchmark
Patient Experience	HCAHPS - Communication About Medicines	Higher is Better	64	74
Patient Experience	HCAHPS - Discharge Information	Higher is Better	88	92
Patient Experience	HCAHPS - Care Transition Measure	Higher is Better	52	63
Patient Experience	HCAHPS – Overall Hospital Rating	Higher is Better	72	86
Patient Experience	HCAHPS – Cleanliness and Quietness	Higher is Better	66.5	80.5

Note: Data was not available at the time of publication for Emergency Transfer measure.

a. Critical Access Hospital Quality Adjustment – Pay for Reporting

A hospital qualifies for the full upside-only pay-to-report reward if it reports at least one quality measure in all three domains. Hospitals that do not meet this reporting threshold are not eligible for the pay-to-report reward.

b. Critical Access Hospital Quality Adjustment – Pay for Performance

The calculation of CAH's Quality Total Performance Score (TPS) is detailed below. The TPS is used to calculate the CAH reward percentage:

- **Step 1:** Calculate thresholds and benchmarks using national data for ACHs and CAHs for each measure.
  - Threshold – Calculate median (50th percentile) performance of all national hospitals with valid results for each measure.
  - Benchmark – Calculate mean of top decile of performance of all national hospitals with valid results for each measure.
- **Step 2:** Calculate hospital performance in each measure for applicable base period and performance period.
- **Step 3:** Use hospital performance to determine Attainment, Improvement and Consistency (HCAHPS only) Points.
  - **Step 3a:** Attainment Points – Compares hospital's result during the performance period to the national threshold and benchmark during the base period as detailed below:
    - Hospital's result at or better than the benchmark = 10 Attainment Points
    - Hospital's result worse than the threshold = 0 Attainment Points
    - Hospital's result equal to or better than the threshold but less than the benchmark = 1–9 Attainment Points using the formula below (rounded to nearest whole number):

$$(\boldsymbol{Eq.1})\ \boldsymbol{Attainment\ Points_h} = \left(9 * \frac{Perf.Period\ Result - Threshold}{Benchmark - Threshold}\right) + 0.5$$

- **Step 3b:** Improvement Points – Compares hospital's result during the performance period to their own result during the base period as detailed below:
  - Hospital's result at or better than the benchmark = 9 Improvement Points
  - Hospital's result at or worse than its base period result = 0 Improvement Points
  - Hospital's result better than the base period result but worse than the benchmark = 0–9 Improvement Points using the formula below (rounded to nearest whole number):

$$(\boldsymbol{Eq.2})\ \boldsymbol{Improvement\ Points_h} = \left(10 * \frac{Perf.Period\ Result - Base\ Period\ Result}{Benchmark - Base\ Period\ Result}\right) - 0.5$$

- **Step 3c**: HCAHPS Consistency Points – Compares hospital's lowest scoring HCAHPS dimension during the Performance Period to the threshold and awards Consistency Points based on that dimension's score versus the national measure floor. Consistency Points are considered Achievement Points and incorporated into the calculation of the Patient Experience domain score (see Step 4). Consistency Points range from 0 – 20 points and the calculations are detailed below:
  - All dimension scores are greater than or equal to the national thresholds = 20 Consistency Points
  - Any dimension score is less than or equal to the worst national dimension score in the base period = 0 Consistency Points
  - The lowest dimension score is greater than the worst national dimension score but less than the national threshold = 0-20 Consistency Points using the formula below (rounded to nearest whole number):

$$(\boldsymbol{Eq.3})\ \boldsymbol{HCAHPS\ Consistency\ Points_h} = \left(20\ * \frac{Perf.Period\ Score - National\ Floor}{Threshold - National\ Floor}\right) - 0.5$$

- **Step 4:** Calculate Achievement Points for each CAH hospital, *h*, by taking higher of Attainment or Improvement Points.

$$(\boldsymbol{Eq.4})\ \boldsymbol{Achievement\ Points_h} = \max\left(Attainment\ Points_h, Improvement\ Points_h\right)$$

- **Step 5:** Calculate Domain Score by summing total Achievement points divided by total possible points (10 points per included measure, 20 for HCAHPS Consistency Points) in each domain.
- **Step 6:** Calculate Total Performance Score (TPS) by equally weighting each domain score. A minimum of 2 domains is required to calculate a TPS score.

If a CAH's TPS is greater than the national 25th percentile, they are eligible to receive a reward scaled between zero percent and 2 percent of their HGB. A CAH receives the full 2 percent reward if their TPS is greater than the 90th percentile. For CAH *h* with a TPS between the 25th and 90th percentiles, the CAH reward is determined by the following:

$$(\boldsymbol{Eq.5})\ \boldsymbol{CAH\ Reward_h} = .02 - (B_{TPS} - TPS_h)\ * \frac{.02}{B_{TPS} - T_{TPS}}$$

Where,

T = 25th percentile of national TPS scores

B = 90th percentile of national TPS scores

Exhibit 33 provides an example of how to calculate a CAH's quality adjustment:

Exhibit 33: Sample Calculation for AHEAD CAH Quality Measure Performance & Calculation of Total Performance Score

Domain	Measure Name	Base Period Score	Perf Period Score	Thresh-hold	Bench-mark	Attain Pts	Improve Pts	Achieved Pts (Max)	Pts Possible	Domain Score
Healthcare Quality & Utilization	Hospital-Wide Readmissions *(proxy for Hybrid eHWR)*	15.8	14.8	15.4	14.5	7	7	7	**10**	0.43
	Emergency Transfer Communication Measure	N/A	N/A	N/A	N/A	N/A	N/A	5	**10**	
	ED Arrival Time to Departure Time for Discharged Patients	134	127	112	76	0	1	1	**10**	
Patient Experience	Communication with Nurses	87	84	80	88	5	0	5	**10**	0.55
	Communication with Doctors	87	82	80	89	3	0	3	**10**	
	Responsive-ness of Hospital Staff	79	66	67	82	0	0	0	**10**	
	Communication about Medicines	76	73	64	74	9	0	9	**10**	
	Discharge Information	92	90	88	92	5	0	5	**10**	
	Care Transition Measure	61	59	52	63	6	0	6	**10**	
	Overall Rating of this Hospital	83	75	72	86	2	0	2	**10**	
	Cleanliness and Quietness of Hospital Env	78.5	75.5	66.5	80.5	6	0	6	**10**	
	Consistency Points							19	**20**	
Patient Safety	C. Diff	0.76	0	0.52	0	10	9	10	**10**	0.38
	Safe Use of Opioids – Concurrent Prescribing	17	17	17	8	1	0	1	**10**	

Domain	Measure Name	Base Period Score	Perf Period Score	Thresh-hold	Bench-mark	Attain Pts	Improve Pts	Achieved Pts (Max)	Pts Possible	Domain Score
	Sepsis Bundle	31	38	60	86	0	1	1	**10**	
	Venous Thrombo-embolism Prophylaxis	92	92	91	100	2	0	2	**10**	
	Severe Obstetrics Complications	N/A	N/A	N/A	N/A	N/A	N/A	5	**10**	
Overall Total Performance Score (TPS)										0.45
Incentive Reward %										0.67%

Note: Emergency Transfer Communication and Severe Obstetrics Complications are shown as a placeholder. Data not yet available.

2.3.2 Hospital Community Improvement Bonus

The AHEAD HGB methodology includes a Community Improvement Bonus (CIB), which is a bonus earned by Participant Hospitals to reward performance improvement on two community health improvement focused quality measures: Hybrid Hospital Wide Readmission (Hybrid eHWR) and Prevention Quality Indicators (PQI)-90 composite admission rates (**Exhibit 34**). Hybrid eHWR is the predicted over expected rate of readmissions for each Participant Hospital. PQI-90 is the composite admission rates for certain conditions.

The CIB dollar value added to HGBs is equivalent to a percentage of HGB payments, ranging from zero percent to 0.50 percent of a Participant Hospital's HGB after annual updates (see **Exhibits 43-45**) paid on a sliding scale. The maximum 0.50 percent bonus is the sum of the maximum 0.25 percent bonus earned for improvement in each of the two measures.

Performance on each measure is compared to each hospital's historic performance over a fixed-base period. Performance on Hybrid eHWR and PQI-90 is calculated, scaled, and rewarded separately, thus hospitals must improve on both measures to earn the maximum 0.50 percent bonus. The improvement target for the Hybrid eHWR and PQI-90 measures is a performance improvement percentage mapped to a zero percent to 0.25 percent bonus scale. The Hybrid eHWR and PQI-90 rewards results are added together for a maximum total reward of 0.50 percent. Improvement targets increase as the model progresses to continue to improve community health.

To prevent unfairly penalizing Participant Hospitals caring for patients with high social risk due to factors beyond their control, performance accounts for social risk by applying a social risk adjustment multiplier to each select measure. Adjusting for social risk in quality measure performance for the CIB further incentivizes Participant Hospitals to identify and address the needs of their entire patient population, both clinical and social, to improve outcomes.

Exhibit 34: Community Improvement Bonus Maximum by Measure (Measures Subject to Change)

Domain	Measure	Cohort	Maximum CIB Participant Hospitals may Earn
Health Care Quality and Utilization	CMS Hybrid Hospital-Wide Readmission (Hybrid eHWR)	Inpatient	0.25% of HGB Payments
Health Care Quality and Utilization	PQI-90 Prevention Quality Composite (see details below table)	Inpatient and Observation > 23 hours	0.25% of HGB Payments

The CIB is applied to HGBs starting in PY4 using the year ending six months prior to PY1 as the fixed-base period and PY2 as the first performance measurement period. The bonus earned is applied to Participant Hospital's HGB after Annual Trend Updates are applied **(Exhibits 43-45)**. Participant Hospital's level of performance improvement on Hybrid eHWR and PQI-90 in a given PY determines the bonus earned and is applied to the HGB for the PY two years following the performance measure period (e.g., PY2 performance is reflected in the Participant Hospital's PY4 HGB; PY3 performance is be reflected in the Participant Hospital's PY5 HGB). **Exhibit 46** provides a summary of the time periods used for measures included in the EA and CIB.

The CIB applies a Social Risk Score (SRS) multiplier to adjust each measure for social risk using the same hospital-level SRS percentile ranking system applied to the AHEAD SRA (**Section**

2.2.3.1), The SRS percentile is a ranking of hospital SRS within a state or sub-state region that identifies hospitals caring for communities with greater social vulnerability. The hospital SRS percentile, ranging from zero to100 percent for each Participant Hospital, determines the SRS multiplier applied to each measure performance calculation (**Exhibit 35**). Participant Hospitals with the highest SRS percentile in their state receive the maximum SRS multiplier. The greater the SRS multiplier, the greater the improvement rate for each quality measure and thus the greater the bonus.

Exhibit 35: Social Risk Score (SRS) Multiplier by SRS Percentile Categories

SRS Percentile	SRS Multiplier
<30%	1.0
30% - <40%	1.1
40% - <50%	1.2
50% - <60%	1.3
60% - <70%	1.4
70% - <80%	1.6
80% - <90%	1.8
>90%	2.0

Hybrid eHWR Rate[17]: Calculated as the predicted over expected rate of readmissions for each Participant Hospital. It is calculated as,

Standardized Rate of Readmission: $SRR_{cj} = pred_{cj}/exp_{cj}$

Where,

$pred_{cj}$ = the predicted readmission rate for cohort *c* at hospital *j*
exp_{cj} = the expected readmission rate for cohort *c* at hospital *j*

PQI-90 Admission Rate: Calculated as the portion of inpatient hospitalizations and observation stays that satisfy numerator criteria for the PQI-90 Prevention Quality Composite. It is calculated as,

$$(\boldsymbol{Eq.1})\ \boldsymbol{PQI-90\ Admission\ Rate} = \frac{PQI-90\ compliant\ inpatient\ or\ observation\ stays > 23\ hours}{Total\ inpatient\ or\ observation\ stays > 23\ hours}$$

The AHRQ PQI-90 Composite includes the following types of hospitalizations:

- PQI 01 - Diabetes, short-term complications admission rate
- PQI 03 - Diabetes, long-term complications admission rate

[17] https://www.cms.gov/files/document/hybrid-hospital-wide-readmission-methodology-report-03202023.pdf

- PQI 05 - Chronic obstructive pulmonary disease (COPD) or asthma in older adults admission rate
- PQI 07 - Hypertension admission rate
- PQI 08 - Heart failure admission rate
- PQI 11- Bacterial pneumonia admission rate
- PQI 12 - Urinary tract infections admission rate
- PQI 14 - Uncontrolled diabetes admission rate
- PQI 15 -Asthma in younger adults admission rate
- PQI 16 - Lower extremity amputations among patients with diabetes admission rate

Exhibit 36 and Exhibit 37 summarize the bonus earned by Participant Hospitals on a sliding scale of improvement compared to the fixed-based period (improvement targets) in the Hybrid eHWR and PQI-90 measures, respectively. The CIB reward amount scales up as Participant Hospitals meet higher improvement targets that increase each year of the model. The maximum improvement targets for the Hybrid eHWR measure increase from 0.20 percent to one percent from PY4 to PY8. For PQI-90, the improvement targets increase from one percent to five percent.

Exhibit 36: Community Investment Bonus (CIB) Earned for Meeting Hybrid eHWR Improvement Targets in PY4 - PY8 (based on PY2 - PY6 Performance)

	Hybrid eHWR Improvement Target				
CIB Earned (% of HGB Payments)	**PY4**	**PY5**	**PY6**	**PY7**	**PY8**
0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
0.03%	0.02%	0.04%	0.06%	0.08%	0.10%
0.05%	0.04%	0.08%	0.12%	0.16%	0.20%
0.08%	0.06%	0.12%	0.18%	0.24%	0.30%
0.10%	0.08%	0.16%	0.24%	0.32%	0.40%
0.13%	0.10%	0.20%	0.30%	0.40%	0.50%
0.15%	0.12%	0.24%	0.36%	0.48%	0.60%
0.18%	0.14%	0.28%	0.42%	0.56%	0.70%
0.20%	0.16%	0.32%	0.48%	0.64%	0.80%
0.23%	0.18%	0.36%	0.54%	0.72%	0.90%
0.25%	0.20%	0.40%	0.60%	0.80%	1.00%

Exhibit 37: Community Investment Bonus (CIB) Earned for Meeting PQI-90 Improvement Targets in PY4 - PY8 (based on PY2 - PY6 Performance)

PQI-90 Improvement Target					
CIB Earned (% of HGB Payments)	**PY4**	**PY5**	**PY6**	**PY7**	**PY8**
0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
0.03%	0.10%	0.20%	0.30%	0.40%	0.50%
0.05%	0.20%	0.40%	0.60%	0.80%	1.00%
0.08%	0.30%	0.60%	0.90%	1.20%	1.50%
0.10%	0.40%	0.80%	1.20%	1.60%	2.00%
0.13%	0.50%	1.00%	1.50%	2.00%	2.50%
0.15%	0.60%	1.20%	1.80%	2.40%	3.00%
0.18%	0.70%	1.40%	2.10%	2.80%	3.50%
0.20%	0.80%	1.60%	2.40%	3.20%	4.00%
0.23%	0.90%	1.80%	2.70%	3.60%	4.50%
0.25%	1.00%	2.00%	3.00%	4.00%	5.00%

The CIB adjustment calculation is as follows:

- **Step 1:** Calculate a) Hybrid eHWR rate and b) PQI-90 admission rate for the base period (e.g., PY1 for initial PY4 CIB) and the performance measurement period (e.g., PY2 for initial PY4 CIB).
- **Step 2:** Calculate improvement between the performance measurement period (*p*) over the fixed-base period (*b*) in Hybrid eHWR and PQI-90 rates as,

  $$(\boldsymbol{Eq.2})\ \boldsymbol{PQI\ Admission\ Rate\ Improvement} = \frac{PQI\ Admit\ Rate_p - PQI\ Admit\ Rate_b}{PQI\ Admit\ Rate_b}$$

  $$(\boldsymbol{Eq.3})\ \boldsymbol{Hybrid\ HWR\ Rate\ Improvement} = \frac{Hybrid\ HWR\ Rate_p - Hybrid\ HWR\ Rate_b}{Hybrid\ HWR\ Rate_b}$$

  Multiply the rate by -1 to arrive at a positive value for Participant Hospitals that improved their performance.
- **Step 3:** Multiply the Hybrid eHWR and PQI-90 improvement rates in Step 2 by the Participant Hospital's SRS multiplier (**Exhibit 35**) to arrive at the overall improvement rate for each measure.

- **Step 4:** Calculate the CIB amount based on improvement target for Hybrid eHWR and PQI-90. Participant Hospitals can earn a CIB if improvement rates for Hybrid eHWR or PQI-90 (Eq. 1 and 2 above) are > zero percent. The CIB earned for each measure is on a sliding scale (**Exhibit 36 and 37).**

Exhibit 38 demonstrates a sample hospital CIB calculation of improvement in Hybrid eHWR and PQI-90. The improvement rates are then mapped to the improvement target and CIB earned, per **Exhibit 36** and **Exhibit 37.** The CIB dollar value earned is added to the applicable PY HGB.

Exhibit 38: Sample Community Improvement Bonus Calculation

	Calculation Step	Base Performance	Measurement Period Performance (PY2)	
	Hospital PY4 HGB (A)			**$ 41,091,536**
Hybrid eHWR Improvement	Overall Hybrid eHWR Rate Improvement (C) (>0% for CIB reward)	15.67%	15.48%	1.20%
	SRS Multiplier 1.3 (SRS Percentile - 57%)			1.56%
	Readmissions CIB Scaling % (D from Ex. 36)			0.25%
	Readmissions CIB Earned (E = A * D)			**$102,729**
PQI-90 Improvement	Overall PQI-90 Admission Rate Improvement (G) (>0% for CIB reward)	12.70%	11.89%	6.40%
	SRS Multiplier 1.3 (SRS Percentile - 57%)			8.32%
	PQI-90 CIB Scaling % (H from Ex. 37)			0.25%
	PQI-90 CIB Earned (I = A * H)			**$102,729**
	Total CIB Earned Applied to PY4 HGB (E + I)			**$205,458**

2.3.3 Effectiveness Adjustment

The Effectiveness Adjustment (EA) applies a downward adjustment based on a Participant Hospital's Medicare FFS PAU performance relative to all other Eligible Hospitals in the state. The EA is designed to incentivize Participant Hospitals to implement interventions that reduce unnecessary or avoidable care. The EA encourages hospitals to develop strategies such as transitional care programs, better integration with primary care providers to co-manage patients with chronic disease, and engagement with community-based organizations focused on addressing the social drivers of health. Hospitals that effectively reduce PAU relative to other hospitals in the state retain HGB funding to reinvest in clinical and social services that continue to promote the hospital's success under the model.

Starting in PY2, ACH HGBs receive a downward adjustment based on the Participant Hospital's PAU Percent (revenue from PAU encounters out of total revenue) relative to the other ACHs in the state or substate region. For SNHs, the EA begins in PY3, one year later than ACHs. Hospitals with a PAU Percent below the 20th percentile of all ACHs in the state or substate region receive no reduction at all. The EA reduction for hospitals in the 20th to 100th percentile is tiered based on the percentile ranges found in **Exhibit 39**.

The maximum EA reduction amount and the reduction for hospitals falling between the 20th and 100th percentile increases over time. For the first year of the reduction (PY2 for ACHs and PY3 for SNHs) the maximum downward adjustment is 0.5 percent, eventually increasing to a maximum of two percent. The gradual increase provides hospitals time to gain additional experience with implementing processes to control PAU and form partnerships with primary care providers, post-acute care providers, and community-based organizations that can address social drivers of health.

PAU is an inpatient hospitalization or outpatient encounter that satisfies numerator criteria for one of the following measures.

1. Unplanned Readmissions (using the planned readmission algorithm from the CMS' Hospital-Wide All-Cause Unplanned Readmission (HWR) measure)
2. Avoidable Admissions (calculated by the AHRQ PQI-90 indicator)[18]
3. Emergency Department Utilization (using the NCQA Emergency Department Utilization (EDU) measure definition)

CMS continues to evaluate the quality measures used to define PAU and will incorporate stakeholder feedback in the final methodology that will be shared during AHEAD's Pre-Implementation Period as hospitals consider participation in the Model.

PAU Payments are the paid amounts from Medicare FFS claims (or No-Pay Claims during PYs) that are part of a PAU inpatient hospitalization or outpatient encounter. PAU Payments are counted only once, even if the event satisfies criteria for more than one measure. See 'Identification of PAU' below for measure definitions. The PAU Percent is the percentage of total FFS payments (or what would have been paid on No-Pay Claims) for Eligible Hospital Services that is attributable to PAU.

Although the quality measures used to generate the PAU amount are not risk adjusted, Participant Hospital's PAU percent is divided by their SRS to account for the impact of differences in population mix on PAU. Dividing Participant Hospital's PAU percent by their SRS results in higher expected PAU values for Participant Hospitals with greater SRSs.

a. Effectiveness Adjustment Calculation

To calculate the EA for a Participant Hospital, each hospital in the state is ranked in ascending order based on their PAU Percent. If the Participant Hospital's PAU percent is below the 20th percentile or lower (lower PAU Percent is better), the Participant Hospital is designated as a "top performer" and does not receive an EA reduction. Hospitals that fall above the 20th percentile receive a reduction determined based on the hospital's position within the distribution of hospitals in the state (State PAU Percentile). The EA is tiered so that hospitals with a higher PAU Percent receive a greater reduction (**Exhibit 39**).

(**Eq. 1**) **Effectiveness Adjustment** (**EA**) = EA Percentile range lookup in Exhibit 39

Where,

EA Percentile: The State PAU Percentile is calculated across all hospitals in the state, sorting in ascending order based on their PAU Percent and ranked into percentiles. For hospitals below the 20th percentile of the State PAU Percentile, the EA is zero. For all other hospitals **Exhibit**

[18] See AHRQ PQI-90 Overall Composite Technical Specifications

39 provides the EA Adjustment for each PY that is based on ranges or tiers of the EA Percentile.

Exhibit 39: Effectiveness Adjustment by Performance Year

Payment Adjustments PY	Data for PUA Percent and PUA Percentile	ACH EA Percentile 20-49	ACH EA Percentile 50-79	ACH EA Percentile 80-100	SNH EA Percentile 20-49	SNH EA Percentile 50-79	SNH EA Percentile 80-100
PY2	Year ending 6 mo. prior to PY1	-0.25%	-0.38%	-0.50%	NA	NA	NA
PY3	PY1	-0.38%	-0.57%	-0.75%	-0.25%	-0.38%	-0.50%
PY4	PY2	-0.50%	-0.76%	-1.00%	-0.38%	-0.57%	-0.75%
PY5	PY3	-0.63%	-0.95%	-1.25%	-0.50%	-0.76%	-1.00%
PY6	PY4	-0.75%	-1.14%	-1.50%	-0.63%	-0.95%	-1.25%
PY7	PY5	-1.00%	-1.52%	-2.00%	-0.75%	-1.14%	-1.50%
PY8	PY6	-1.00%	-1.52%	-2.00%	-1.00%	-1.52%	-2.00%
PY9 (or Transition Period Year)	PY7	-1.00%	-1.52%	-2.00%	-1.00%	-1.52%	-2.00%

b. PAU Percent Calculation

The overall PAU Percent for a hospital is calculated by dividing PAU Payments by Total Inpatient and Outpatient Medicare FFS revenue (or equivalent from No-Pay Claims during the PY) for Eligible Hospital Services. This value is then divided by a Participant Hospital's SRS to arrive at the adjusted PAU percent.

$$(\boldsymbol{Eq.2})\ \boldsymbol{Overall\ Hospital\ PAU\ Percent} = \frac{PAU\ Payments}{Total\ Inpatient\ and\ Outpatient\ Revenue}$$

$$(\boldsymbol{Eq.3})\ \boldsymbol{Adjusted\ Hospital\ PAU\ Percent} = \frac{Overall\ Hospital\ PAU\ Percent}{Hospital\ Social\ Risk\ Score}$$

c. Identification of PAU

As noted, there are three measures for identifying whether an inpatient hospitalization or outpatient encounter is considered PAU.

Readmissions

Unplanned readmissions within 30 days of an initial inpatient stay discharge or outpatient observation visit greater than 23-hours are counted as PAU. Observation stays are defined by revenue codes 0760 (Treatment or observation room - general classification), 0762 (Treatment or observation room –observation room), and 0769 Treatment or observation room – other). Planned readmissions are defined according to the CMS HWR measure planned readmission algorithm 4.0 and are not counted as PAU. A readmission counts towards the PAU for the hospital responsible for the discharging hospitalization, even if the readmission occurs at another hospital.

Avoidable Admissions

Hospitalizations considered as PAU include inpatient admissions and outpatient observation stays with >23-hour visits that satisfy AHRQ PQI-90. Observation stays are defined by revenue codes 0760 (Treatment or observation room - general classification), 0762 (Treatment or observation room –observation room), and 0769 Treatment or observation room – other). Inpatient admissions are defined by type of bill 1X and in some cases, can incorporate more than one claim (e.g., split periods of an inpatient stay).

The AHRQ PQI-90 Composite includes the following types of hospitalizations:

- PQI 01 - Diabetes, short-term complications admission rate
- PQI 03 - Diabetes, long-term complications admission rate
- PQI 05 - Chronic obstructive pulmonary disease (COPD) or asthma in older adults admission rate
- PQI 07 - Hypertension admission rate
- PQI 08 - Heart failure admission rate
- PQI 11- Bacterial pneumonia admission rate
- PQI 12 - Urinary tract infections admission rate
- PQI 14 - Uncontrolled diabetes admission rate
- PQI 15 -Asthma in younger adults admission rate
- PQI 16 - Lower extremity amputations among patients with diabetes admission rate

Emergency Department Utilization

Emergency Department visits that do not result in an inpatient or observation stay are counted as PAU, as defined by NCQA's EDU measure. Observation stays are defined by revenue codes 0760 (Treatment or observation room - general classification), 0762 (Treatment or observation room – observation room), and 0769 Treatment or observation room – other). The measure excludes emergency department visits for individuals: enrolled in hospice; with more than three (persons aged 65 and older) or five (persons 18-64 years old) emergency department visits in a year; a principal diagnosis of mental health or chemical dependency; with psychiatric disorders; or receiving electroconvulsive therapy. **Exhibit 46** provides a summary of the time periods used for measures included in the EA and CIB.

d. Effectiveness Adjustment Example (PY1 ACH)

Exhibit 40 provides an example of how the EA is calculated for an ACH.

Exhibit 40: Effectiveness Adjustment Calculation Example

Calculation Step	Value	Calculation
Encounters Identified as (1) Readmissions or (2) Avoidable Admissions or (3) Emergency Department Utilization	$15,000,000	A
Total Hospital Revenue	$40,000,000	B
Overall PAU Percent	13.5%	C=A÷B
SRS	64.5	D
Adjusted PAU Percent	0.21%	E=C÷D
Adjusted PAU Percent State Percentile (for the purposes of this example, assume 70th Percentile)	70th Percentile	F
Hospital EA	-0.38%	G Exhibit 39. 70th Percentile for Year ending 6 mo. prior to PY1
Hospital HGB	$40,000,000	H
Reduction in HGB due to EA	-$152,000	I = G * H

2.3.4 Total Cost of Care Performance Adjustment

Participant Hospitals can earn additional incentives for managing TCOC incurred by Medicare FFS beneficiaries residing in the Hospital Specific Market Area they serve (as defined in the Market Shift Adjustment **Section 2.2.2.1**). If the change in TCOC incurred by attributed beneficiaries is below/above the established growth target, and outside the bounds of a performance corridor, the Participant Hospital is rewarded/penalized with up to a two percent adjustment to its HGB in the next PY. This aligns Participant Hospital incentives with those of the model overall, which are to reduce state TCOC while improving population health. In the case where multiple Participant Hospitals have overlapping Hospital Specific Market Areas, Participant Hospitals have shared accountability for the TCOC of beneficiaries residing in the overlapping geography.

Beginning in PY4 for all Participants Hospitals, the TCOC Adjustment is based on the year-over-year change in TCOC, then applied to the HGB in the PY following a gap period to allow time for Claims Runout. For example, the TCOC Performance Adjustment for PY4 is calculated based on TCOC change between PY1 and PY2, noting that cohort of residents residing in the Hospital Specific Market Area can change between the two years.

For ACHs, TCOC Adjustment is upside only in PY4, then becomes bi-directional in PY5. For Critical Access Hospitals and Safety Net Hospitals, the TCOC Adjustment is upside only in PY4 and PY5, then becomes bi-directional in PY6. For more information on when the TCOC Adjustment comes into effect for each type of hospital, please refer to **Exhibit 43 to Exhibit 45**).

a. Hospital Risk Adjusted Attributed PBPM TCOC

For each Participant Hospital, a Risk Adjusted Attributed PBPM TCOC is calculated based on the weighted share of inpatient and outpatient services the Participant Hospital provides to each

geographic area (e.g., zip-code) it serves. The geographic areas used in the TCOC adjustment are the same Hospital Specific Market Areas used in the Market Shift Adjustment (MSA).

$$(\boldsymbol{Eq.1})\ \boldsymbol{Risk\ Adjusted\ Attributed\ PBPM\ TCOC} =$$

$$\left(\left(\sum_{c=1}^{c=n} Hospital\ Specific\ Market\ Area\ Bene\ TCOC_c * IPOPShare_c\right) \div \left(\sum_{c=1}^{c=n} Hospital\ Specific\ Market\ Area\ Months_c * IPOPShare_c\right)\right) \div Weighted\ Average\ HCC\ Score$$

Where,

Hospital Specific Market Area Bene TCOC = Part A or Part B TCOC for beneficiaries with a residential address in each geographic area, *c*, served by the hospital. Geographic areas are the zip-codes included in the Hospital Specific Market Area (same as used in the MSA) For more information, refer to **Section 2.2.2.1**.

Hospital Specific Market Area Bene Months = Total Part A or B beneficiary months in each geographic area, *c*, served by the hospital. Geographic areas are the zip-codes included in the Hospital Specific Market Area.

IPOP Share = Hospital's portion of total zip-code inpatient and outpatient (IPOP) Medicare FFS equivalent revenue from No-Pay Claims for Eligible Hospital services for each Hospital Specific Market Area, *c*, served by the hospital. Geographic areas are the zip-codes included in the Hospital Specific Market Area.

Weighted Average HCC Score = Average Hierarchical Condition Category (HCC) score for beneficiaries in the Hospital Specific Market Area served by the hospital, weighted by IPOP Share.

For consistency with statewide TCOC target calculations, TCOC calculated separately for Part A and for Part B, then summed to create the overall Risk Adjusted Attributed PBPM TCOC.

b. TCOC Performance Benchmark

For each Participant Hospital, Risk Adjusted Attributed PBPM TCOC from the prior performance year is trended forward using the AHEAD state or region wide State Growth Benchmark to calculate the Target PBPM TCOC for the next performance year. The State Growth Benchmark is customized to each state or region, based on spending history and spending goals, and it is the same benchmark used for the state TCOC growth target, so both state and Participant Hospital TCOC incentives are aligned. By using the State Growth Benchmark as the trend, the model accounts for state specific annual growth and aligns with state or regional spending goals.

To establish the AHEAD state or region wide State Growth Benchmark, the model takes several steps, which are further illustrated in **Exhibit 41**:

1. Calculate an Annual Growth Factor, using a weighted combination of two national trend estimates, less a savings component, which is the negotiated savings to CMS that each State has negotiated through the State Agreement process

2. Calculate the State Growth Benchmark by re-weighting the Annual Growth Factor to normalize spending relative to national spending

Annual Growth Factor

The Annual Growth Factor is intended to provide a counterfactual for expected TCOC growth in the absence of the AHEAD Model. It is the weighted average of the fee-for-Service non-ESRD Part A and B United States Per Capita Cost (USPCC) growth rate and AHEAD Accountable Care Prospective Trend (ACPT). In the Annual Growth Factor calculation, the USPCC rate represents 90 percent of the weight in PY1 and decreases by four percent for each subsequent year. The annual USPCC rate and annual ACPT are used to calculate the TCOC growth targets for both the state and Participant Hospitals, thus helping to keep the Participant Hospital and state TCOC goals aligned. Per AHEAD State Agreements, USPCC and ACPT weights vary by PY.

$$(\boldsymbol{Eq.2})\ \boldsymbol{Annual\ Growth\ Factor} =$$

$$(USPCC\ Growth\ Rate \times 0.9) + (AHEAD\ ACPT \times 0.1) - Savings\ Component$$

State Growth Benchmark

The State Growth Benchmark is the Annual Growth Factor re-weighted with two-thirds weight placed on the Annual Growth Factor directly and one-third placed on a state PBPY normalized Annual Growth Factor. This creates a regression to the mean adjustment, to account for how much the state spends relative to total national spending.

$$(\boldsymbol{Eq\ 3.})\ \boldsymbol{State\ Growth\ Benchmark} =$$

$$1 + \left((Annual\ Growth\ Factor - 1) \times 67\%\right)$$

$$+ \left((Annual\ Growth\ Factor - 1) \times \frac{National\ Baseline\ PBPY}{State\ Baseline\ PBPY} \times 33\%\right)$$

To calculate Target PBPM TCOC for the next performance year, each current performance year's Risk Adjusted Attributed PBPM TCOC is multiplied by the State Growth Benchmark.

$$(\boldsymbol{Eq\ 4.})\ \boldsymbol{Target\ PBPM\ TCOC_{PY}} =$$

$$Participant\ Hospital\ Risk\ Adjusted\ Attributed\ PBPM\ TCOC_{PY-1} \times State\ Growth\ Benchmark$$

Exhibit 41 shows a sample calculation of the State Growth Benchmark:

Exhibit 41: Sample AHEAD State Growth Benchmark Calculation

Calculation	Variable	State Value
Risk-adjusted State PBPY 2022	A	$13,339

Calculation	Variable	State Value
Risk-adjusted National PBPY 2022	B	$13,410
USPCC Growth Rate	C	1.0423
AHEAD Accountable Care Prospective Trend (ACPT)	D	1.0400
USPCC Weight	E	90%
ACPT Weight	F	10%
Savings Component	G	0.001
Trend Factor	$H = (C \times E) + (D \times F) - G$	1.041
Percentage Component	$I = (H - 1) \times 67\%$	0.028
Dollar Component	$J = (H - 1) \times \frac{B}{A} \times 33\%$	0.014
State Growth Benchmark	$K = 1 + I + J$	1.042

c. TCOC Performance Adjustment Calculation

For each Participant Hospital, Risk Adjusted Attributed PBPM TCOC is compared to the Target PBPM TCOC calculated in **Equation 4**. The percentage difference between the Risk Adjusted Attributed PBPM TCOC and Target PBPM TCOC determines the value of the TCOC Adjustment. If the percentage difference is less than two percent (plus or minus) then no TCOC adjustment is made to the HGB because the change in PBPM TCOC is within a corridor to account for normal year-to-year variation in TCOC. Participant Hospitals with a difference of greater than two percent (plus or minus) receive an adjustment equal to 20 percent of the percentage difference. This approach recognizes true differences in performance (e.g., those outside of normal variation) and limits risk to Participant Hospitals.

$$(\boldsymbol{Eq.5})\ \boldsymbol{Percentage\ Difference\ Between\ Hospital\ PBPM\ TCOC\ and\ Target\ PBPM\ TCOC} = \frac{Attributed\ PBPM\ TCOC_{PY} - Target\ PBPM\ TCOC_{PY}}{Target\ PBPM\ TCOC_{PY}}$$

If Percentage Difference Between Participant Hospital PBPM TCOC and Target PBPM TCOC is greater than +/- two percent, then the calculation is:

$$(\boldsymbol{Eq.6})\ \boldsymbol{TCOC\ Adjustment} = \frac{Attributed\ PBPM\ TCOC_{PY} - Target\ PBPM\ TCOC_{PY}}{Target\ PBPM\ TCOC_{PY}} * 20\%$$

Exhibit 42 shows a sample TCOC adjustment calculation for five fictitious Participant Hospitals. Hospital B is the only hospital that has a Risk Adjusted Attributed PBPM TCOC that exceeds the two percent performance corridor. Hospital B receives a positive TCOC Adjustment.

Exhibit 42: Sample Total Cost of Care Adjustment Calculation

	Calculation	Variable	Hospital A	Hospital B	Hospital C	Hospital D	Hospital E
Performance Year -1	Hospital Specific Weighted TCOC	A	$27,000,000	$75,000,000	$240,000,000	$19,000,000	$105,000,000
	Hospital Specific Weighted Bene Months	B	30,000	104,000	295,000	25,000	130,000
	Attributed PBPM	A ÷ B = C	$900	$721	$814	$760	$808
	Weighted Avg Risk Score	D	1.05	0.8	1.03	0.9	0.97
	Risk Adjusted Attributed PBPM TCOC	C/D=E	$857	$901	$790	$844	$833
	State Growth Benchmark	F	1%	6%	4%	3%	3%
	Target PBPM TCOC	E * (1 + F) = G	$866	$955	$822	$869	$858
Performance Year 2	Hospital Specific Weighted TCOC	H	$29,000,000	$75,000,000	$250,000,000	$19,500,000	$110,000,000
	Hospital Specific Weighted Bene Months	I	32,000	105,000	295,000	25,000	130,000
Performance Year 2 (continued)	Attributed PBPM	H ÷ I = J	$906	$714	$847	$780	$846
	Weighted Avg Risk Score	K	1.06	0.78	1.05	0.9	0.97
	Risk Adjusted Attributed PBPM TCOC	J ÷ K = L	$855	$915	$807	$867	$872
	% Difference in Attributed and Target PBPM TCOC	- ((L – G) ÷ G) = M	1.3%	4.2%	1.8%	0.2%	-1.6%

	Calculation	Variable	Hospital A	Hospital B	Hospital C	Hospital D	Hospital E
	Receives Adjustment (Yes/No)	N	No	Yes	No	No	No
	HGB After Annual Adjustments	O	$22,000,000	$41,000,000	$141,500,000	$12,100,000	$65,400,000
	Scaling Factor	P	20%	20%	20%	20%	20%
	TCOC Adjustment (% of HGB)	M * P = Q	N/A	0.8%	N/A	N/A	N/A
	TCOC Adjustment ($)	O * Q = R	N/A	$328,000	N/A	N/A	N/A

2.4 Timing and Application of Annual Trend Update and Performance-Based Adjustments to the Hospital Global Budget

Exhibits 43-45 illustrates the timing and application of annual trend updates, AHEAD-specific adjustments, and performance-based adjustments to the HGB for Participant Hospitals over the course of the model.

Exhibit 43: Timing and Application of Annual and Performance-Based Adjustments to the Hospital Global Budget for Acute Care Hospital

Item	Adjustment	PY 1	PY2	PY3	PY4	PY5	PY6	PY7	PY8
A	Current HGB	Base HGB	PY1 HGB w. Annual & DA (Row H)	PY2 HGB w. Annual & DA (Row H)	PY3 HGB w. Annual & DA (Row H)	PY4 HGB w. Annual & DA (Row H)	PY5 HGB w. Annual & DA (Row H)	PY6 HGB w. Annual & DA (Row H)	PY7 HGB w. Annual & DA (Row H)
B	SLA	$ Planned Service Line Changes Gap Period or PY1	$ Planned Service Line Changes PY2	$ Planned Service Line Changes PY3	$ Planned Service Line Changes PY4	$ Planned Service Line Changes PY5	$ Planned Service Line Changes PY6	$ Planned Service Line Changes PY7	$ Planned Service Line Changes PY8
C	Market Shift Adjustment (MSA)	NA	Gap Period-BY3	PY1-Gap Period	PY2-PY1	PY3-PY2	PY4-PY3	PY5-PY4	PY6-PY5
D	Outlier Adjustment	NA	NA	PY1-Baseline	PY2-PY1	PY3-PY2	PY4-PY3	PY5-PY4	PY6-PY5
E = A + B + C + D	HGB Adjusted for Volume	PY1 HGB Adj for Volume	PY2 HGB Adj for Volume	PY3 HGB Adj for Volume	PY4 HGB Adj for Volume	PY5 HGB Adj for Volume	PY6 HGB Adj for Volume	PY7 HGB Adj for Volume	PY8 HGB Adj for Volume
F	Annual Payment Adjustment (APA)	PY1/ BY3	PY2/PY1	PY3/PY2	PY4/PY3	PY5/PY4	PY6/PY5	PY7/PY6	PY8/PY7
G	Demographic Adjustment (DA)	BY3/ BY2	PY2/PY1	PY3/PY2	PY4/PY3	PY5/PY4	PY6/PY5	PY7/PY6	PY8/PY7
H = E * (1 + F) *(1 + G)	HGB with APA & DA	PY1 HGB w/ Annual & DA	PY2 HGB w/ Annual & DA	PY3 HGB w/ Annual & DA	PY4 HGB w/ Annual & DA	PY5 HGB w/ Annual & DA	PY6 HGB w/ Annual & DA	PY7 HGB w/ Annual & DA	PY8 HGB w/ Annual & DA
I	Social Risk Adjustment (SRA)	Up to 2.0% Based on BY3	Up to 2.0% Based on PY1	Up to 2.0% Based on PY2	Up to 2.0% Based on PY3	Up to 2.0% Based on PY4	Up to 2.0% Based on PY5	Up to 2.0% Based on PY6	Up to 2.0% Based on PY7
J = H + (H * I)	HGB after Annual Updates	PY1 HGB after Annual Updates	PY2 HGB after Annual Updates	PY3 HGB after Annual Updates	PY4 HGB after Annual Updates	PY5 HGB after Annual Updates	PY6 HGB after Annual Updates	PY7 HGB after Annual Updates	PY8 HGB after Annual Updates
K	Effectiveness Adjustment (EA)[19]	NA	Up to (0.50%) Based on Gap Period	Up to (0.75%) Based on PY1	Up to (1.00%) Based on PY2	Up to (1.25%) Based on PY3	Up to (1.50%) Based on PY4	Up to (2.00%) Based on PY5	Up to (2.00%) Based on PY6
L	Community Improvement Bonus (CIB)[20]	NA	NA	NA	Up to 0.50% Based on PY2/BY3	Up to 0.50% Based on PY3/BY3	Up to 0.50% Based on PY4/BY3	Up to 0.50% Based on PY5/BY3	Up to 0.50% Based on PY6/BY3
M	Total Cost of Care Adjustment (TCOC)	NA	NA	NA	Up to 2.0% PY2/PY1	Up to +/-2.0% PY3/PY2	Up to +/-2.0% PY4/PY3	Up to +/-2.0% PY5/PY4	Up to +/-2.0% PY6/PY5

[19] The EA uses the quality measures HWR, PQI-90, and EDU.

[20] The CIB uses the quality measures HWR and PQI-90.

Item	Adjustment	PY 1	PY2	PY3	PY4	PY5	PY6	PY7	PY8
N	TIA	1.0%	1.0%	NA	NA	NA	NA	NA	NA
O = J + (J * K) + (J * L) + (J * M) + (J * N)	HGB with Annual and Performance Adjustments	PY1 HGB w/ Perf. Adj.	PY2 HGB w/ Perf. Adj.	PY3 HGB w/ Perf. Adj.	PY4 HGB w/ Perf. Adj.	PY5 HGB w/ Perf. Adj.	PY6 HGB w/ Perf. Adj.	PY7 HGB w/ Perf. Adj.	PY 8 HGB w/ Perf. Adj.
P	Sequestration	-2.0%	-2.0%	-2.0%	-2.0%	-2.0%	-2.0%	-2.0%	-2.0%
Q = O – (O * P)	Final HGB	Final PY1 HGB	Final PY2 HGB	Final PY3 HGB	Final PY4 HGB	Final PY5 HGB	Final PY6 HGB	Final PY7 HGB	Final PY8 HGB
R	Planned SLA Mid-Year Reconciliation	NA	Reconciliation for Service Line Based on PY1 Utilization	Reconciliation for Service Line Based on PY2 Utilization and PY3 Update	NA	NA	NA	NA	NA

Exhibit 44: Critical Access Hospital: Timing and Application of Annual and Performance-Based Adjustments to the Hospital Global Budget

Item	Adjustment	PY 1	PY2	PY3	PY4	PY5	PY6	PY7	PY8
A	Current HGB	Base HGB	PY1 HGB w. Annual & DA (Row H)	PY2 HGB w. Annual & DA (Row H)	PY3 HGB w. Annual & DA (Row H)	PY4 HGB w. Annual & DA (Row H)	PY5 HGB w. Annual & DA (Row H)	PY6 HGB w. Annual & DA (Row H)	PY7 HGB w. Annual & DA (Row H)
B	Service Line Adjustments (SLA)	$ Planned Service Line Changes Gap Period or PY1	$ Planned Service Line Changes PY2	$ Planned Service Line Changes PY3	$ Planned Service Line Changes PY4	$ Planned Service Line Changes PY5	$ Planned Service Line Changes PY6	$ Planned Service Line Changes PY7	$ Planned Service Line Changes PY8
C	Market Shift Adjustment (MSA)	NA	Gap Period – BY3	PY1-Gap Period	PY2-PY1	PY3-PY2	PY4-PY3	PY5-PY4	PY6-PY5
D = A + B + C	HGB Adjusted for Volume	PY1 HGB Adj for Volume	PY2 HGB Adj for Volume	PY3 HGB Adj for Volume	PY4 HGB Adj for Volume	PY5 HGB Adj for Volume	PY6 HGB Adj for Volume	PY7 HGB Adj for Volume	PY8 HGB Adj for Volume
E	Annual Payment Adjustment (APA)	PY1/ BY3	PY2/PY1	PY3/PY2	PY4/ PY3	PY5/PY4	PY6/PY5	PY7/PY6	PY8/PY7
F	Demographic Adjustment (DA)	PY1/ BY3	PY2/PY1	PY3/PY2	PY4/ PY3	PY5/PY4	PY6/PY5	PY7/PY6	PY8/PY7
G = D * (1 + E) * (1 + F)	HGB with Annual & DA	PY1 HGB w/ Annual & DA	PY2 HGB w/ Annual & DA	PY3 HGB w/ Annual & DA	PY4 HGB w/ Annual & DA	PY5 HGB w/ Annual & DA	PY6 HGB w/ Annual & DA	PY7 HGB w/ Annual & DA	PY8 HGB w/ Annual & DA
H	Social Risk Adjustment (SRA)	Up to +2.0% Based on BY3	Up to +2.0% Based on PY1	Up to +2.0% Based on PY2	Up to +2.0% Based on PY3	Up to +2.0% Based on PY4	Up to +2.0% Based on PY5	Up to +2.0% Based on PY6	Up to +2.0% Based on PY7
I = G + (G * H)	HGB after Annual Updates	PY1 HGB after Ann Updates	PY2 HGB after Ann Updates	PY3 HGB after Ann Updates	PY4 HGB after Ann Updates	PY5 HGB after Ann Updates	PY6 HGB after Ann Updates	PY7 HGB after Ann Updates	PY8 HGB after Ann Updates
J	Effectiveness Adjustment (EA)[21]	NA	NA	Up to (0.50%) Based on PY1	Up to (0.75%) Based on PY2	Up to (1.00%) Based on PY3	Up to (1.25%) Based on PY4	Up to (1.50%) Based on PY5	Up to (2.00%) Based on PY6

[21] The EA uses the quality measures HWR, PQI-90, and EDU.

Item	Adjustment	PY 1	PY2	PY3	PY4	PY5	PY6	PY7	PY8
K	CAH Quality Adjustment	NA	NA	2.0% Pay to Report Based on PY1	2.0% Pay to Report Based on PY2	1.5% Pay to Report 0.5% P4P Based on PY3	1.0% Pay to Report 1.0% P4P Based on PY4	0.5% Pay to Report 1.5% P4P Based on PY5	0.0% Pay to Report 2.0% P4P Based on PY6
L	Community Improvement Bonus (CIB)[22]	NA	NA	NA	Up to 0.50% Based on PY2/BY3	Up to 0.50% Based on PY3/BY3	Up to 0.50% Based on PY4/BY3	Up to 0.50% Based on PY5/BY3	Up to 0.50% Based on PY6/BY3
M	Total Cost of Care (TCOC)	NA	NA	NA	Up to 2.0%	Up to 2.0%	Up to +/-2.0%	Up to +/-2.0%	Up to +/-2.0%
N	Transformation Incentive Adjustment (TIA)	1.0%	1.0%	NA	NA	NA	NA	NA	NA
O= I + (I * J) + (I * K) + (I * L) + (I * M) + (I * N)	HGB with Annual and Performance Adjustments	PY1 HGB w/ Perf. Adj.	PY2 HGB w/ Perf. Adj.	PY3 HGB w/ Perf. Adj.	PY4 HGB w/ Perf. Adj.	PY5 HGB w/ Perf. Adj.	PY6 HGB w/ Perf. Adj.	PY7 HGB w/ Perf. Adj.	PY 8 HGB w/ Perf. Adj.
P	Sequestration	-2.0%	-2.0%	-2.0%	-2.0%	-2.0%	-2.0%	-2.0%	-2.0%
Q = O – (O * P)	Final HGB	Final PY1 HGB	Final PY2 HGB	Final PY3 HGB	Final PY4 HGB	Final PY5 HGB	Final PY6 HGB	Final PY7 HGB	Final PY8 HGB
R	Planned SLA Mid-Year Reconciliation	NA	Reconciliation for Service Line Based on PY1 Utilization	Reconciliation for Service Line Based on PY2 Utilization and PY3 Update	NA	NA	NA	NA	NA

[22] The CIB uses the quality measures HWR and PQI-90.

Exhibit 45: Safety Net Hospital: Timing and Application of Annual and Performance-Based Adjustments to the Hospital Global Budget

Item	Adjustment	PY 1	PY2	PY3	PY4	PY5	PY6	PY7	PY8
A	Current HGB	Base HGB	PY1 HGB w. Annual & DA (Row H)	PY2 HGB w. Annual & DA (Row H)	PY3 HGB w. Annual & DA (Row H)	PY4 HGB w. Annual & DA (Row H)	PY5 HGB w. Annual & DA (Row H)	PY6 HGB w. Annual & DA (Row H)	PY7 HGB w. Annual & DA (Row H)
B	Service Line Adjustment (SLA)	$ Planned Service Line Changes Gap Period or PY1	$ Planned Service Line Changes PY2	$ Planned Service Line Changes PY3	$ Planned Service Line Changes PY4	$ Planned Service Line Changes PY5	$ Planned Service Line Changes PY6	$ Planned Service Line Changes PY7	$ Planned Service Line Changes PY8
C	Market Shift Adjustment (MSA)	NA	Gap Period – BY3	PY1-Gap Period	PY2-PY1	PY3-PY2	PY4-PY3	PY5-PY4	PY6-PY5
D	Outlier Adjustment	NA	NA	PY1-Baseline	PY2-PY1	PY3-PY2	PY4-PY3	PY5-PY4	PY6-PY5
E = A + B + C + D	HGB Adjusted for Volume	PY1 HGB Adj for Volume	PY2 HGB Adj for Volume	PY3 HGB Adj for Volume	PY4 HGB Adj for Volume	PY5 HGB Adj for Volume	PY6 HGB Adj for Volume	PY7 HGB Adj for Volume	PY8 HGB Adj for Volume
F	Annual Payment Adjustment (APA)	PY1/BY3	PY2/PY1	PY3/PY2	PY4/PY3	PY5/PY4	PY6/PY5	PY7/PY6	PY8/PY7
G	Demographic Adjustment (DA)	PY1/BY3	PY2/PY1	PY3/PY2	PY4/PY3	PY5/PY4	PY6/PY5	PY7/PY6	PY8/PY7
H = E * (1 + F) * (1 + G)	HGB with Annual & DA	PY1 HGB w/ Annual & DA	PY2 HGB w/ Annual & DA	PY3 HGB w/ Annual & DA	PY4 HGB w/ Annual & DA	PY5 HGB w/ Annual & DA	PY6 HGB w/ Annual & DA	PY7 HGB w/ Annual & DA	PY8 HGB w/ Annual & DA
I	Social Risk Adjustment (SRA)	Up to +2.0% Based on BY	Up to +2.0% Based on PY1	Up to +2.0% Based on PY2	Up to +2.0% Based on PY3	Up to +2.0% Based on PY4	Up to +2.0% Based on PY5	Up to +2.0% Based on PY6	Up to +2.0% Based on PY7
J = H + (H * I)	HGB after Annual Updates	PY1 HGB after Ann Updates	PY2 HGB after Ann Updates	PY3 HGB after Ann Updates	PY4 HGB after Ann Updates	PY5 HGB after Ann Updates	PY6 HGB after Ann Updates	PY7 HGB after Ann Updates	PY8 HGB after Ann Updates
K	Effectiveness Adjustment (EA)[23]	NA	NA	Up to (0.50%) Based on PY1	Up to (0.75%) Based on PY2	Up to (1.00%) Based on PY3	Up to (1.25%) Based on PY4	Up to (1.50%) Based on PY5	Up to (2.00%) Based on PY6

[23] The EA uses the quality measures HWR, PQI-90, and EDU.

Item	Adjustment	PY 1	PY2	PY3	PY4	PY5	PY6	PY7	PY8
L	Community Improvement Bonus (CIB)[24]	NA	NA	NA	Up to 0.50% Based on PY2/BY3	Up to 0.50% Based on PY3/BY3	Up to 0.50% Based on PY4/BY3	Up to 0.50% Based on PY5/BY3	Up to 0.50% Based on PY6/BY3
M	Total Cost of Care (TCOC)	NA	NA	NA	Up to 2.0%	Up to 2.0%	Up to +/-2.0%	Up to +/-2.0%	Up to +/-2.0%
N	Transformation Incentive Adjustment (TIA)	1.0%	1.0%	NA	NA	NA	NA	NA	NA
O = J + (J * K) + (J * L) + (J * M) + (J * N)	HGB with Annual and Performance Adjustments	PY1 HGB w/ Perf. Adj.	PY2 HGB w/ Perf. Adj.	PY3 HGB w/ Perf. Adj.	PY4 HGB w/ Perf. Adj.	PY5 HGB w/ Perf. Adj.	PY6 HGB w/ Perf. Adj.	PY7 HGB w/ Perf. Adj.	PY 8 HGB w/ Perf. Adj.
P	Sequestration	-2.0%	-2.0%	-2.0%	-2.0%	-2.0%	-2.0%	-2.0%	-2.0%
Q = O – (O * P)	Final HGB	Final PY1 HGB	Final PY2 HGB	Final PY3 HGB	Final PY4 HGB	Final PY5 HGB	Final PY6 HGB	Final PY7 HGB	Final PY8 HGB
R	Planned SLA Mid-Year Reconciliation	NA	Reconciliation for Service Line Based on PY1 Utilization	Reconciliation for Service Line Based on PY2 Utilization and PY3 Update	NA	NA	NA	NA	NA

[24] The CIB uses the quality measures HWR and PQI-90.

Exhibit 46: HGB Quality Measures Performance Period Applications in Cohort 2

Adjustment	PY	2025		2026		2027		2028		2029		2030		2031		2032	
		Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec
Effectiveness Adjustment (Measures: HWR, PQI-90, EDU)	PY 2 (2028)				*												
	PY 3 (2029)					*	*										
	PY 4 (2030)							*	*								
	PY 5 (2031)									*	*						
	PY 6 (2032)											*	*				
	PY 7 (2033)													*	*		
	PY 8 (2034)															*	*
Community Improvement Bonus (Measures: HWR, PQI-90)	PY 4 (2030)		Base Period		→	→	→	*	*								
	PY 5 (2031)		Base Period		→	→	→	→	→	*	*						
	PY 6 (2032)		Base Period		→	→	→	→	→	→	→	*	*				
	PY 7 (2033)		Base Period		→	→	→	→	→	→	→	→	→	*	*		
	PY 8 (2034)		Base Period		→	→	→	→	→	→	→	→	→	→	→	*	*

3. Operational

The following section details the roles and responsibilities of each party, state-specific flexibility, the Model Governance Structure that aids the AHEAD State and CMS in overseeing the development of HGBs, the operational timeline, payments to participating hospitals, and cost-reporting requirements.

3.1 Roles and Responsibilities

Exhibit 47 describes the roles and responsibilities of each party in setting, monitoring, adjusting, and administering the HGB.

Exhibit 47: Roles and Responsibilities

Organization	Role
CMS	Lead Federal Government agency administering the AHEAD Model. Responsible for model policy, payment methodology, and making payments to hospitals on a bi-weekly basis. CMS works with the MACs and other contractors to update payment processes and issue payments for the HGBs.
State	States apply to participate in AHEAD Model; recruit hospitals, primary care providers, and commercial insurers to participate in the model; develop State Population Health Accountability Plans; set up the Model Governance Structure; and administer cooperative agreement funding as needed. Responsible for achieving all-payer and Medicare FFS TCOC and primary care investment targets and population health and community health outcomes. Also responsible for reviewing and making recommendations to CMS regarding HGB adjustments for service line additions and contractions.
Participant Hospital	Eligible Hospitals may voluntarily opt to participate in a HGB that sets a prospective budget for Medicare FFS, and other payers as appropriate.
Medicare Administrative Contractor (MAC)	Participant Hospitals are not paid FFS for Eligible Hospital Services furnished to attributed beneficiaries. The MACs use files supplied by CMS to process, but not pay, claims submitted by Participant Hospitals.

3.2 Waivers

Participant Hospitals may request certain Medicare payment or fraud and abuse waivers that enable participants to develop innovative care transformation strategies to advance the goals of the AHEAD Model. Those waivers are related to concurrent care for hospice beneficiaries, cost sharing support, telehealth, care management home visits, home health homebound waiver, nurse practitioner and physician assistant services, and CAH 96-hour certification. AHEAD Medicare HGBs includes additional elements that hospitals can use to innovate and advance goals of the model.

Additionally, CMS may issue Medicare payment waivers for the purposes of administering and testing the AHEAD Model. CMS clarifies these provisions and reserves the right to make changes or withdraw the waivers in the State Agreement and Hospital Participation Agreement, as applicable. Additional details are available in Hospital Participation Agreements made between CMS and Participant Hospitals.

3.3 Additional Model Requirements

As part of the Model's focus on multi-payer alignment, CMS requires states that participate in AHEAD to offer HGBs to Eligible Hospitals via their state Medicaid agencies. States participating in the Model must also recruit at least one commercial payer to offer HGBs by PY2. Participating states develop an aligned methodology for Medicaid. More information on Medicaid alignment expectations is available in the AHEAD Notice of Funding Opportunity (NOFO).

In addition, states with existing statewide hospital rate setting or hospital budget setting authority and prior experience with population-based payments or global budgets may develop their own HGB methodology, including for Medicare FFS, subject to CMS approval.[25] This document outlines the technical financial specifications for the CMS-Designed HGB methodology, which is offered in states or sub-state regions who are eligible to participate in the AHEAD Model and do not develop their own methodology.

3.4 Issuing Payments to Participant Hospitals

CMS makes bi-weekly lump-sum payments to Participant Hospitals under the approved, prospective HGBs. To determine the specific payments, the Medicare FFS global budget for that PY is divided into 26 bi-weekly payments. While Participant Hospitals receive these bi-weekly payments, they continue to submit claims to CMS during the year, but these become No-Pay Claims.

3.5 Cost Reporting

Participant Hospitals continue to submit Medicare Hospital Cost Reports. The Medicare Hospital Cost Reports are amended to include information on the Medicare Part A and B global budget payment amounts made to the Participant Hospitals. Additionally, the Medicare Hospital Cost Reports also show the amounts that would have been paid had the hospitals been paid under Medicare FFS for monitoring purposes. Additional guidance is provided in the Hospital Participation Agreement on cost reporting for all Participant Hospitals, including guidance specific to CAHs.

[25] Notice of Funding Opportunity, States Advancing AHEAD Model Funding Opportunity, U.S. Department of Health and Human Services, Centers for Medicare & Medicaid Services, November 29, 2023.

Appendix A: Formulas and Calculations

The following provides a summary of all formulas included in this document. The tables provide more details about the calculations in each section.

Baseline Payment Amount Formulas

Exhibit A.1: Baseline Payment Amount Table of Formulas

Equation	Formula
(Eq. 1a) Weighted Inpatient Baseline Payment	$$\boldsymbol{Weighted\ Inpatient\ Baseline} = \Big(\big(0.1 * \big(Inpatient\ Baseline\ Paid\ Amounts\ for\ BY1 * (1 + BY1\ to\ BY3\ APA)\big)\big) + \big(0.3 * (Inpatient\ Baseline\ Paid\ Amounts\ for\ BY2) * (1 + BY2\ to\ BY3\ APA)\big) + \big(0.6 * (Inpatient\ Baseline\ Paid\ Amounts\ for\ BY\ 3)\big)\Big) * Baseline\ Adjustment\ Factor$$
(Eq. 1b) Weighted Outpatient Baseline Payment	$$\boldsymbol{Weighted\ Outpatient\ Baseline} = \Big(\big(0.1 * \big(Outpatient\ Baseline\ Paid\ Amounts\ for\ BY\ 1 * (1 + BY1\ to\ BY3\ APA)\big)\big) + \big(0.3 * \big(Outpatient\ Baseline\ Paid\ Amounts\ for\ BY\ 2 * (1 + BY2\ to\ BY3\ APA)\big)\big) + \big(0.6 * (Outpatient\ Baseline\ Paid\ Amounts\ for\ BY\ 3)\big)\Big) * Baseline\ Adjustment\ Factor$$
(Eq. 2) Baseline Adjustment Factor	$$\boldsymbol{Baseline\ Adjustment\ Factor} = 1 + \big(P(H)\big) * Scaling\ Factor$$
(Eq. 2b) Logistic Regression Equation	$$\boldsymbol{Logistic\ Regression\ Equation\ P(H)} = \frac{1}{1 + e^{-(b_1 * x_1 + \ldots + b_k * x_k + b_h * h + a)}}$$
(Eq. 3) Inpatient Baseline Paid Amount for Non-CAH Hospitals	$$\boldsymbol{Inpatient\ Baseline\ Paid\ Amount\ for\ Non\ CAH\ Hospitals} = Paid\ Amounts\ on\ FFS\ Claims + Medicare\ Settlement\ on\ Cost\ Reports + Sequestration$$

Equation	Formula
(Eq. 4) Inpatient Baseline Paid Amount for CAH Hospitals	$$\textbf{\textit{Inpatient Baseline Paid Amount for CAH Hospitals}} = Paid\ Amount\ on\ Interim\ Inpatient\ Claims + Paid\ Amount\ on\ Interim\ Swing\ Bed\ Claims + Settlement\ to\ 101\%\ on\ Cost\ Reports + Sequestration$$
(Eq. 5) Outpatient Baseline Paid Amount for Non-CAH Hospitals	$$\textbf{\textit{Outpatient Baseline Paid Amount for Non CAH Hospitals}} = Paid\ Amounts\ on\ FFS\ Claims + Sequestration$$
(Eq. 6) Outpatient Baseline Paid Amount for CAH Hospitals	$$\textbf{\textit{Outpatient Baseline Paid Amount for CAH Hospitals}} = Paid\ Amount\ on\ Interim\ Outpatient\ Claims + Settlement\ to\ 101\%\ on\ Cost\ Reports + Sequestration$$

Annual Payment Adjustment Formulas

Exhibit A.2: Annual Payment Adjustment Table of Formulas

Equation	Formula
(Eq. 1) Annual Inpatient Adjustment	$$\textbf{\textit{Annual Inpatient Adjustment}} = \frac{Year\ 2\ CAR - Year\ 1\ CAR}{Year\ 1\ CAR}$$
(Eq. 2) AHEAD CAR	$$\textbf{\textit{AHEAD CAR}} = \frac{\frac{Estimated\ Medicare\ Payments + Policy\ and\ Quality\ Adjustments}{Case\ Mix\ Index}}{Medicare\ Discharges} + \frac{UCC\ Operating\ Adjustment}{Medicare\ Discharges}$$
(Eq. 3) Estimated Medicare Payments	$$\textbf{\textit{Estimated Medicare Payments}} = (Operating\ Amount + Capital\ Amount) * (1 + Low\ Volume\ Adjustment\ Factor) * (HACRP\ Adjustment\ Factor) - Estimated\ Deductibles * (1 - Sequetration\ Percentage)$$
(Eq. 4) Operating Amount	$$\textbf{\textit{Operating Amount}} = (((National\ Operating\ Labor\ Base\ Rate * Medicare\ Wage\ Index) + (National\ Operating\ Non\ Labor\ Base\ Rate * Operating\ COLA)) * Medicare\ Discharges * Case\ Mix\ Index)$$
(Eq. 4a) Operating Amount for SCH	$$\textbf{\textit{Operating Amount For Sole Community Hospitals}} = (Hospital\ Specific\ Operating\ Labor\ Base\ Rate * Medicare\ Discharges * Case\ Mix\ Index)\ IF\ greater\ than\ Operating\ Amount\ calculated\ in\ Eq.4$$
(Eq. 5) Capital Amount	$$\textbf{\textit{Capital Amount}} = \big((National\ Capital\ Base\ Rate * Geographic\ Adjustment\ Factor\ for\ Capital * Capital\ COLA) * Medicare\ Discharges * Case\ Mix\ Index\big)$$
(Eq. 6) Estimated Deductibles	$$\textbf{\textit{Estimated Deductibles}} = Medicare\ Annual\ Inpatient\ Deductible\ Amount * Total\ Number\ of\ Medicare\ Discharges$$
(Eq. 7) Policy and Quality Adjustments	$$\textbf{\textit{Policy and Quality Adjustments}} = (Operating\ Policy\ \&\ Quality\ Adj + Capital\ Policy\ \&\ Quality\ Adj) * (1 + Low\ Volume\ Adjustment\ Factor) * (HACRP\ Adjustment\ Factor) * (1 - Sequetration\ Percentage)$$ *Details for the Operating and Capital Policy & Quality Adjustments are below*
(Eq. 7 Detail) Operating Policy & Quality Adjustments	$$\textbf{\textit{Operating Policy \& Quality Adjustments}} = Readmission\ Adjustment + Value\ Based\ Payment\ Net\ Amount + IME\ Operating\ Adjustment\ Amount + DSH\ Operating\ Adjustment\ Amount + Hospital\ Specific\ Adjustment\ in\ Excess\ of\ Federal\ Rate$$
(Eq. 7 Detail) Readmission Adjustment to Operating Payment	$$\textbf{\textit{Readmission Adjustment to Operating Payment}} = (\mathbf{1} - Readmissions\ Adjustment\ Factor) * Location\ \&\ Case\ Mix\ Adjusted\ Operating\ Amount$$

Equation	Formula
(Eq. 7 Detail) Value Based Payment Net Amount	$$\textbf{\textit{Value Based Payment Net Amount}} = \textit{VBP Amount Redistributed (with 2\%)} + \textit{VBP 2\% Withhold}$$ **Where,** $$\textbf{\textit{VBP Amount Redisributed (with 2\%)}} = ((\textit{Actual Hospital VBP Adjustment Factor} - 1) + 0.02) * \textit{Location Adjusted Operating Amount}$$ $$\textbf{\textit{VBP 2\% Withhold}} = \textit{Location \& Case Mix Adjusted Operating Amount} * -0.02$$
(Eq. 7 Detail) IME Adjustment Amount	$$\textbf{\textit{IME Operating Adjustment Amount}} = \textit{IME operating adjustment factor} * \textit{Location \& Case Mix Adjusted Operating Amount}$$
(Eq. 7 Detail) DSH Operating Adjustment Amount	$$\textbf{\textit{DSH Operating Adjustment Amount}} = \textit{DSH operating adjustment factor} * \textit{Location \& Case Mix Adjusted Operating Amount}$$ **Note**: For DSH operating, two years of IPPS data from the IPPS Impact File are reviewed (the PY and the prior PY), and the higher value for the DSH Operating Adjustment Factor is utilized.
(Eq. 7 Detail) UCC Adjustment Amount	$$\textbf{\textit{UCC Operating Adjustment Amount}} = \textit{UCC Per Claim Amount} * \textit{\# Medicare Discharges}$$ **Note**: For UCC, two years of IPPS data IPPS data from the IPPS Impact File are reviewed (the PY and the prior PY), and the higher value for the UCC Per Claim Amount is utilized.
(Eq. 7 Detail) Capital Policy & Quality Adjustments	$$\textbf{\textit{Capital Policy}} \ \& \ \textbf{\textit{Quality Adjustments}} = \textit{IME Capital Adjustment Amount} + \textit{DSH Capital Adjustment Amount}$$
(Eq. 7 Detail) IME Capital Adjustment Amount	$$\textbf{\textit{IME Capital Adjustment Amount}} = \textit{IME Capital Adjustment Factor} * \textit{Location \& Case Mix Adjusted Capital Amount}$$
(Eq. 7 Detail) DSH Capital Adjustment Amount	$$\textbf{\textit{DSH Capital Adjustment Amount}} = \textit{DSH Capital Adjustment Factor} * \textit{Location \& Case Mix Adjusted Capital Amount}$$ **Note**: For DSH capital, two years of IPPS data IPPS data from the IPPS Impact File are reviewed (the PY and the prior PY), and the higher value for the DSH Capital Adjustment Factor is utilized.
(Eq. 8) Inpatient PY1 APA Adjusted Amount	$$\textbf{\textit{Inpatient PY1 APA Adjusted Amount}} = \textit{Inpatient Baseline Amount} * (1 + \textit{Annual Inpatient Adjustment for BY3 to PY1})$$
(Eq. 9) Annual Outpatient Adjustment	$$\textbf{\textit{Annual Outpatient Adjustment}} = \frac{\textit{Year 2 WAACF} - \textit{Year 1 WAACF}}{\textit{Year 1 WAACF}}$$
(Eq. 10) Wage Adjusted APC Conversation Factor	$$\textbf{\textit{WAACF}} = ((\textit{OPPS APC Conversion Factor} * 0.6 * \textit{Hospital Specific Wage Index}) + (\textit{OPPS APC Conversion Factor} * 0.4)$$

Equation	Formula
(Eq. 11) PY1 Outpatient APA	$$\textbf{\textit{Outpatient PY1 APA Adjusted Amount}} = \textit{Outpatient Baseline Amount} * (1 + \textit{Annual Outpatient Adjustment for BY3 to PY1})$$

Market Shift Adjustment Formulas

Exhibit A.3: Market Shift Adjustment Table of Formulas

Equation	Formula
(Eq. 1) MSA Shift Allowance	$$\textbf{\textit{MSA Shift Allowance}} = \textit{Sum of FFS Year 1 Payments in Overlapping Market Area Zip codes} \times \textit{State Growth Benchmark} \times \textit{Funding Factor}$$
(Eq. 2) FFS Payment Proportional Shift	$$\textbf{\textit{FFS Payment Proportional Shift}} = \left(\frac{\textit{Hospital FFS Payment}_{Year2}}{\textit{Market Area FFS Payment}_{Year2}} - \frac{\textit{Hospital FFS Payment}_{Year1}}{\textit{Market Area FFS Payment}_{Year1}}\right)$$
(Eq. 3) FFS Weights Proportional Shift	$$\textbf{\textit{FFS Weights Proportional Shift}} = \left(\frac{\textit{Hospital Weights}_{Year2}}{\textit{Total Market Area Weights}_{Year2}} - \frac{\textit{Hospital Weights}_{Year1}}{\textit{Total Market Area Weights}_{Year1}}\right)$$
(Eq. 4) Proportional Shift	$$\textbf{\textit{Proportional Shift}} = (\textit{FFS Payments Proportional Shift} * 50\%) + (\textit{FFS Weights Proportional Shift} * 50\%)$$

Equation	Formula
(Eq. 5) Hospital MSA Amount	$$\boldsymbol{Hospital\ MSA\ Amount} = Proportional\ Change \times MSA\ Shift\ Allowance Pool\ of\ Funds$$

Demographic Adjustment Formulas

Exhibit A.4: Demographic Adjustment Table of Formulas

Line	Formula
(Eq. 1) DA	$$\boldsymbol{DA_i} = \sum_{j=1}^{j=n} s_j * \Delta\, Total\ HCC$$ **Where,** **N =** Number of Counties Served by the Hospital **S =** Share of FFS payments **Δ Total HCC** = Percentage change in county sum of HCC scores between the two years prior to the PY.
(Eq. 2) County Share of FFS Claims or No-Pay Claims	**County Share of FFS Claims or No − Pay Claims** = (Inpatient Baseline Paid Amount + Outpatient Baseline Paid Amount) for County j ÷ ((Inpatient Baseline Paid Amount + Outpatient Baseline Paid Amount) $for\ all\ Counties\ Served\ by\ Hospital$

Outlier Adjustment Formulas

Exhibit A.5 Outlier Adjustment Table of Formulas

Line	Formula
Share of Outlier Payments (Eq. 1)	$$\boldsymbol{Share\ of\ Outlier\ Payments} = \left(\frac{\sum Outlier\ Payments\ on\ FFS\ or\ No-Pay\ Claims}{\sum Total\ Paid\ on\ FFS\ or\ No-Pay\ Claims}\right)$$
Outlier Adjustment (Eq. 2)	$$(\boldsymbol{Eq.2})\ \boldsymbol{Outlier\ Adjustment} = \left(Share\ of\ Outlier\ Payments_y - Share\ of\ Outlier\ Payments_{y-1}\right) * H$$ **Where,** **y** = Baseline or Performance Year included in the calculation. See **Exhibits 43 to 45** for details. **H** = Hospital global budget after applying the Annual Payment Adjustment and Demographic Adjustment.

Social Risk Adjustment Formulas

Exhibit A.5: Social Risk Adjustment Table of Formulas

Line	Formula
(Eq. 1) Social Risk Score (Beneficiary)	$\boldsymbol{SRS_b} = \ National\ CDI + (50 \ * \ LIM)$ **Where,** **National CDI** = National Standardized CDI which is expressed as a percentile with a range of 1 to 100, is assigned for each eligible beneficiary. Points for National CDI ranges from 1 to 100. National CDI has a downward cap at the PY1 level. **Low-Income Marker (LIM)** = Set to 1 if a beneficiary is either dual-eligible (full or partial dual) or deemed eligible for Part D LIS at any point in the rolling 12-month period immediately preceding the calculation. If a beneficiary is not dual-eligible and is not eligible for Part D LIS, LIM equals 0.
(Eq. 2) Social Risk Score (Geographic Area)	$\boldsymbol{SRS_g} = (\sum_{j=1}^{j=n} SRS_b) \ \div \ n$ **Where,** **n** = Number of beneficiaries in the census block group
(Eq. 3) Social Risk Score (Hospital)	$\boldsymbol{SRS_h} = \sum_{g=1}^{g=n} SRS_g \ * \frac{P_g}{P_h}$ **Where,** **n** = Number of total census block groups from which hospital revenue is received **h** = Hospital **g** = Census Block Group $\mathbf{P_g}$= For census block group **g** of a participant hospital **h**, the sum of Medicare FFS claim payments (or No-Pay Claims during the PY) for Eligible Inpatient and Outpatient Hospital Services using the same inclusion/exclusion logic as in the Baseline Calculation (**Section 2.1**) $\mathbf{P_h}$= For all census block groups of a participant hospital **h**, the sum of Medicare FFS claim payments (or No-Pay Claims during the PY) for Eligible Inpatient and Outpatient Hospital Services using the same inclusion/exclusion logic as in the Baseline Calculation (**Section 2.1**)

Critical Access Hospital Quality Adjustment Formulas

Exhibit A.6: Critical Access Hospital Quality Adjustment Table of Formulas

Line	Formula
(Eq. 1) Attainment Points	$\boldsymbol{Attainment\ Points_h} = \left(9 \ * \ \frac{Perf.Period\ Result - Threshold}{Benchmark - Threshold}\right) + 0.5$

Line	Formula
(Eq. 2) Improvement Points	$$\boldsymbol{Improvement\ Points_h} = \left(10 * \frac{Perf.Period\ Result - Base\ Period\ Result}{Benchmark - Base\ Period\ Result}\right) - 0.5$$
(Eq. 3) HCAHPS Consistency Points	$$\boldsymbol{HCAHPS\ Consistency\ Points_h} = \left(20 * \frac{Perf.Period\ Score - National\ Floor}{Threshold - National\ Floor}\right) - 0.5$$
(Eq. 4) Achievement Points	$$\boldsymbol{Achievement\ Points_h} = \max\left(Attainment\ Points_h, Improvement\ Points_h\right)$$
(Eq. 5) CAH Reward	$$\boldsymbol{CAH\ Reward_h} = .02 - (B_{TPS} - TPS_h) * \frac{.02}{B_{TPS} - T_{TPS}}$$

Effectiveness Adjustment Formulas

Exhibit A.7: Effectiveness Adjustment Table of Formulas

Line	Formula
(Eq. 1) EA	$\boldsymbol{EA} = EA\ Percentile\ range\ lookup\ in\ Exhibit\ 39$ **Where,** **EA Percentile:** For hospitals below the 20th percentile of the State PAU Percentile, the Scaled EA Percentile, and the EA are zero. For all other hospitals the hospital's State PAU Percentile is cross walked to EA adjustment values in Exhibit 39 based on ranges of percentiles.
(Eq. 2) Hospital Overall PAU Percent	$$\boldsymbol{Hospital\ Overall\ PAU\ Percent} = \frac{PAU\ Payments}{Total\ Inpatient\ and\ Outpatient\ Revenue}$$
(Eq. 3) Hospital Adjusted PAU Percent	$$\boldsymbol{Hospital\ Adjusted\ PAU\ Percent} = \frac{Hospital\ Overall\ PAU\ Percent}{Hospital\ Social\ Risk\ Score}$$

Community Improvement Bonus Adjustment Formulas

Exhibit A.8: Community Improvement Bonus Table of Formulas

Line	Formula
(Eq. 1) PQI-90 Admission Rate	$$(\boldsymbol{Eq.1})\ \boldsymbol{PQI - 90\ Admission\ Rate} = \frac{PQI - 90\ compliant\ inpatient\ or\ observation\ stays > 23\ hours}{Total\ inpatient\ or\ observation\ stays > 23\ hours}$$ See **Section 2.3.2** for more information about how PQI-90 is specified.

Line	Formula
(Eq. 2) Readmission Rate Improvement	$$(Eq.\,2)\ \textbf{PQI Admission Rate Improvement} = \frac{PQI\ Admit\ Rate_p - PQI\ Admit\ Rate_b}{PQI\ Admit\ Rate_b}$$ **Where,** b = fixed base period and p = performance measurement period.
(Eq. 3) Hybrid HWR Rate Improvement	$$(Eq.\,3)\ \textbf{Hybrid HWR Rate Improvement} = \frac{Hybrid\ HWR\ Rate_p - Hybrid\ HWR\ Rate_b}{Hybrid\ HWR\ Rate_b}$$ See **Section 2.3.2** for more information about how Hybrid HWR is specified.

Total Cost of Care Performance Adjustment Formulas

Exhibit A.9: Total Cost of Care Performance Adjustment Table of Formulas

Line	Formula
(Eq. 1) Risk Adjusted Attributed PBPM TCOC	$$\textbf{Risk Adjusted Attributed PBPM TCOC} = \left(\left(\sum_{c=1}^{c=n} Hospital\ Specific\ Market\ Area\ Bene\ TCOC_c * IPOPShare_c\right) \div \left(\sum_{c=1}^{c=n} Hospital\ Specific\ Market\ Area\ Bene\ Months_c * IPOPShare_c\right)\right) \div Weighted\ Average\ HCC\ Score$$ **Where,** **Geographic Area Bene TCOC** = Part A or Part B TCOC for beneficiaries in each geographic area, *c*, served by the hospital. Geographic areas are the zip-codes included in the hospital specific market area (same as used in the MSA). For more information, refer to **Section 2.2.2.1**. **Geographic Area Bene Months** = Total Part A or B beneficiary months in each geographic area, *c*, served by the hospital. Geographic areas are the zip-codes included in the hospital specific market area (same as used in the MSA). **IP-OP Share =** Hospital's portion of total zip-code inpatient and outpatient spending for each geographic area, *c*, served by the hospital. Geographic areas are the zip-codes included in the hospital specific market area (same as used in the MSA). **Weighted Average HCC Score =** Average HCC score for beneficiaries in geographic areas served by the hospital, weighted by IP-OP Share.
(Eq. 2) Annual Growth Factor	$$\textbf{Annual Growth Factor} = (USPCC\ Growth\ Rate \times 0.9) + (AHEAD\ ACPT \times 0.1) - Savings\ Component$$

Line	Formula
(Eq. 3) State Growth Benchmark	$$\boldsymbol{State\ Growth\ Benchmark} = 1 + ((\boldsymbol{Annual\ Growth\ Factor} - 1) \times 67\%) + ((\boldsymbol{Annual\ Growth\ Factor} - 1) \times \frac{National\ Baseline\ PBPY}{State\ Baseline\ PBPY} \times 33\%)$$
(Eq. 4) Target PBPM TCOC	$$\boldsymbol{Target\ PBPM\ TCOC_{PY}} = Participant\ Hospital\ Risk\ Adjusted\ Attributed\ PBPM\ TCOC_{PY-1} \times State\ Growth\ Benchmark$$
(Eq. 5) Percentage Difference Between Hospital PBPM TCOC and Target TCOC	$$\boldsymbol{Percentage\ Difference\ Between\ Hospital\ PBPM\ TCOC\ and\ Target\ PBPM\ TCOC} = \frac{Attributed\ PBPM\ TCOC_{PY} - Target\ PBPM\ TCOC_{PY}}{Target\ PBPM\ TCOC_{PY}}$$ If the Percentage Difference Between Hospital PBPM TCOC and Target PBPM TCOC > +/- 2% then the TCOC Adjustment proceeds
(Eq. 6) TCOC Adjustment	$$\boldsymbol{TCOC\ Adjustment} = \frac{Attributed\ PBPM\ TCOC_{PY} - Target\ PBPM\ TCOC_{PY}}{Target\ PBPM\ TCOC_{PY}} * 20\%$$ Hospitals with a percentage difference between Attributed PBPM TCOC and Target PBPM TCOC that is within $\pm 2\%$ does not receive a TCOC adjustment. The maximum amount of reward/penalty applied to HGBs in PY4 is limited to between 0% and 2% in PY4 or -2% and +2% thereafter.

Appendix B: Data Sources

The following provides a summary and description of the data source(s) for all data points included within the formulas in **Appendix A: Formulas and Calculations**. The noted sections provide additional details and, where necessary, any additional formulas used to obtain the data point.

Baseline Payment Amount Data Sources

Exhibit B.1: Baseline Payment Amount Data Sources

Data Element	Source
Paid Amounts on IPPS FFS Claims	IDR Inpatient Claims (claim type 60, bill type 11X or 12X)
CAH Inpatient Cost Settlements	HCRIS Full Cost Report Files
Paid Amounts on Inpatient Swing Bed Claims	IDR SNF Claims (claim type 30 and Z in third position of CCN)
CAH Inpatient Swing Bed Settlements	HCRIS Full Cost Report Files
Paid Amounts on OPPS FFS Payment Claims	IDR Outpatient Claims (claim type 40, bill types, 13X, 14X, 85X, or 18X)
Outpatient Drug Supply Carve Out Amounts	CMS published annual Addendum A/B files
Outpatient New Technology Carve Out Amounts	CMS published annual Addendum A file
Cost Settlements on Outpatient CAH Hospital Claims	HCRIS Full Cost Report Files

Annual Payment Adjustment Data Sources

Exhibit B.2: Annual Payment Adjustment Data Sources

Data Element	Source
National Operating Labor Base Rate	CMS Final Rule IPPS CN Table 1a or 1b (National base rates)
Hospital Specific Wage Index	CMS Final Rule IPPS CN Impact File (FY Wage Index)
National Operating Non-Labor Base Rate	CMS Final Rule IPPS CN Table 1a or 1b (National base rates)
Hospital Specific COLA	CMS Final Rule IPPS CN Impact File (only HI and Alaska hospitals receive this)
Readmission Adjustment Factor	CMS Final Rule IPPS Table 15 - Final Readmission Adjustment Factor
Hospital VBP Adjustment Factor	CMS Final Rule IPPS Table 16B - Final VBP Adjustment Factor
IME Operating Adjustment Factor	CMS Final Rule IPPS CN Impact File (IME Operating Adj Factor)
DSH Operating Adjustment Factor	CMS Final Rule IPPS CN Impact File (Operating Disproportionate Share Adjustment Factor)
UCC Per Claim Amount	CMS Final Rule IPPS CN Impact File (UCC)

National Capital Base Rate	CMS Final Rule IPPS CN Table 1d (National base rates)
Capital Wage Index (GAF)	CMS Final Rule IPPS CN Impact File, GAF
Low Volume Adjustment Factor	CMS Final Rule IPPS CN Impact File or if not populated CMS IPPS Supplemental Table 14 (FY18) - lookup from tab '13- Low Vol Adj'
Capital COLA	CMS Final Rule IPPS CN Impact File
IME Capital Adjustment Factor	CMS Final Rule IPPS CN Impact File, IME Adjustment Factor for Capital
DSH Capital Adjustment Factor	CMS Final Rule IPPS CN Impact File, Disproportionate Share Adjustment Factor for Capital
HACRP Adjustment	Hospital-Acquired Condition (HAC) Reduction Program | Provider Data Catalog (cms.gov) Hospital-Acquired Condition (HAC) Reduction Program Dataset, lookup from tab '9- HACRP'
Medicare Annual Inpatient Deductible Amount	CMS 20XX Medicare Parts A & B Premiums and Deductibles Fact Sheet
Hospital Case Mix Index	CMS Final Rule IPPS CN Table 2, Col. 2 CMI
Total Number Medicare Bills	CMS Final Rule IPPS CN Impact File, BILLS
OPPS APC Conversion Factor	Calculated from the final CMS OPPS Addendum B Tables
Outpatient Location Specific Wage Index	Same as Wage Index used for IPPS. CMS Final Rule IPPS CN Table 2, Col. 3 Wage Index

Market Shift Adjustment Data Sources

Exhibit B.3: Market Shift Adjustment Data Sources

Data Element	Source
Cases (unique claims/discharges)	Claims data, count of distinct claim IDs
Case Weights	Inpatient: DRG Weights Outpatient: See **Appendix F**
Case Payments without Sequestrations or Deductions	Claims data. Case Payments = Payment amount / 0.98 (adds back in sequestration/deduction amount)
HGB Hospitals – Names, IDs, Locations	Determined by State and CMMI in pre-implementation phase.

Demographic Adjustment Data Sources

Exhibit B.4: Demographic Adjustment Data Sources

Data Element	Source
HCC Score	CMS-HCC Model Software/ICD-10 Mappings

Social Risk Adjustment Data Sources

Exhibit B.5: Social Risk Adjustment Data Sources

Data Element	Source
Eligible Beneficiary Details and Claim Payments by Block Group	CMS IDR eligibility and claims data
12-digit Federal Information Processing Standard (FIPS) Codes	Datasets for geocoding generated from Census Bureau (TIGER/Line shapefiles)
National CDI Scores	5-Year American Community Survey data, CMS-designed methodology for calculation, standardization, and applying statistical shrinkage

Appendix C: Inpatient Prospective Payment System and Outpatient Prospective Payment System Payment Components

Exhibit C.1: Inpatient Prospective Payment System Fee-for-Service Payment Components and Inclusion in the Baseline Payment Amount

Inpatient Prospective Payment System Fee-For-Service Payment Factor	Application to Inpatient Prospective Payment System Operating and Capital Amount
Operating Base Payment Rate	The national base operating rate, split between labor and non-labor costs, serves as the baseline amount for the operating payment.
Capital Base Payment Rate	The national base capital rate serves as the baseline amount for the capital payment.
Wage Index	The operating base rate labor related operating amount is adjusted by the location-specific Medicare Wage Index.
Geographic Adjustment Factor for Capital (GAF)	The capital base rate is adjusted by the location-specific GAF to reflect location specific labor costs
Cost of Living Adjustment (COLA)	The operating base rate non-labor related amount is adjusted by the location-specific operating cost-of-living adjustment. The capital base rate is adjusted by the location-specific capital cost-of-living adjustment to reflect non-labor capital costs.
DRG Weight	The operating and capital base payment amounts are multiplied by the MS-DRG relative weight. *Used in the APA to normalize prices for changes in acuity.*
Indirect Medical Education (IME) Adjustment	If applicable, a hospital specific operating and capital IME adjustment factor is applied.
DSH Adjustments	If applicable, a hospital specific operating and capital DSH adjustment factor is applied.
Low Volume Adjustment	If applicable, a hospital specific low volume adjustment factor is applied to the total operating and capital amount.
Uncompensated Care (UCC) Adjustment	If applicable, a UCC adjustment is added on a per discharge basis to the operating amount.

Outlier Adjustment	If applicable, a hospital specific operating and capital outlier adjustment factor is applied.
New Technology Adjustment	Not Applicable
Hospital Readmissions Reduction Program (HRRP)	If applicable, a hospital specific HRRP adjustment factor is applied to the operating amount. The reduction is capped at three percent.
Value-Based Purchasing (VBP) Program	If applicable, a hospital specific VBP adjustment factor is applied to the operating amount.
Hospital-Acquired Condition Reduction Program (HACRP)	If applicable, depending on performance reduces overall operating and capital payments by one percent.
Medicare Hospital Inpatient Quality Reporting (IQR)	Pay-for-reporting program for ACHs that impacts operating and capital base rates.

Exhibit C.2: Outpatient Prospective Payment System Fee-For-Service Payment Components and Inclusion in the Baseline Payment Amount

Outpatient Prospective Payment System Fee-For-Service Payment Factor	Application To Outpatient Prospective Payment System Payment Amount
OPPS Conversion Factor	The national base payment amount, prior to adjustments made for wages and the APC relative weight.
Hospital Wage Index	The labor portion of the conversion factor (accounting for 60% of the OPPS conversion factor) is adjusted by the location-specific Medicare Wage Index. The non-labor portion of the conversion factor is not adjusted. *Note: The OPPS Conversion Factor and Hospital Wage Index are used to develop the Wage Adjusted APC Conversion Factor (WAACF). This is the primary unit of analysis for the Outpatient APA calculation.*
APC Relative Weight	The wage adjusted conversation factor is adjusted by the APC relative weight which is based on the resource requires of the service. APC Weight is not incorporated into the APA but is included as the baseline amount.
Sole-Community Hospitals (SCH) Add-On	A payment increase (currently 7.1%) is added for SCHs.
Hold Harmless Payments for Cancer Centers and Children's Hospitals	If applicable, applied for Cancer Centers and Children's Hospitals
High-Cost Outlier Adjustment	If applicable, a hospital specific outlier adjustment factor is applied.
Outpatient Drug Supply	Not Applicable for specific carve outs noted in **Appendix D: Payment Exclusions**
Outpatient New Technology	Not Applicable
Professional Payment on CAH Hospital Claims	Not Applicable

Appendix D: Payment Exclusions

Exhibit D.1: Payment Exclusions from the Hospital Global Budget

	Adjustment	Background on Payment Types	Hospital Global Budget Exclusion Rationale
Claim payments; included in paid amount on FFS claims	New Technology Adjustment Payments (NTAP)	Technologies eligible for these add-on payments are identified based on the applicable codes from the International Classification of Diseases, Clinical Modification (ICD-10)[26]. Claims submitted with an ICD procedure code that indicates the involvement of a new technology in the treatment of the patient is then eligible for add-on payments.	Excluded: NTAPs are available for a limited time and are, by definition, specific to certain services and are paid separately from the HGB.
	CAH Method II Billing	Typically, CAHs may elect to bill for both facility and professional outpatient services on a hospital claim. This is only permitted if the submitting physician has reassigned their billing right to the CAH. These payments can be identified based on UB-04 revenue codes in the range of 0960-0989.	Excluded: These amounts for the professional services are excluded from the HGB and continue to be paid under established methodologies.
Pass-through payments	Bad Debt	Bad debts are amounts considered to be uncollectible from accounts and notes receivable that were created or acquired in providing services. Acute Care Hospitals are reimbursed for 70 percent of bad debts resulting from Medicare deductible and coinsurance amounts, which are uncollectible from Medicare beneficiaries after a reasonable effort has been made to collect the unpaid amounts. Pass-through payments for bad debt, reported on cost report form S-10, are not included in claims.	Excluded: In Medicare FFS, pass-through payments are made by the MAC outside of the FFS claims processing systems. These payments are excluded from the HGB and continue to be paid under established methodologies.
	DGME	Payments to hospitals for the costs of approved GME programs. The methodology includes a hospital-specific, base-period PRA that is calculated by dividing a hospital's allowable costs of GME for a base period by its number of residents during the base period. Medicare DGME payments are calculated by multiplying the PRA by the weighted number of FTE residents working in all areas of the hospital (and non-hospital sites, when applicable), and the hospital's Medicare share of total inpatient days.	Excluded: In Medicare FFS, pass-through payments are made by the MAC outside of the FFS claims processing systems. These payments are excluded from the HGB and continue to be paid under established methodologies.
	IME for Medicare Advantage Beneficiaries	When a beneficiary is enrolled in a Medicare Advantage plan and is an inpatient at an approved teaching hospital, the facility receives a percentage add-on payment for each case. Hospitals submit Medicare FFS claims for these beneficiaries to receive payment for IME or DGME and submit claims to the Medicare Advantage plan for the remainder of the services provided.	Excluded: In Medicare FFS, pass-through payments are made by the MAC outside of the FFS claims processing systems. These payments are excluded from the HGB and continue to be paid under established methodologies.

[26] https://www.cdc.gov/nchs/icd/index.htm.

	Adjustment	Background on Payment Types	Hospital Global Budget Exclusion Rationale
Pass-through payments (cont.)	Nurse and Allied Health Education (NAHE)	Payments to hospitals for the costs of nursing and allied health education activities. Payment for a provider's net cost of nursing and allied health education activities is determined on a reasonable cost basis, subject to certain conditions and limitations.	Excluded: In Medicare FFS, pass-through payments are made by the MAC outside of the FFS claims processing systems. These payments are excluded from the HGB and continue to be paid under established methodologies.
	Organ Acquisition Costs	There are two payment components for organ transplantation. Approved transplant centers are paid a PPS rate based on a MS-DRG for the actual organ transplant. They are also reimbursed for the reasonable and necessary costs associated with acquiring the organ (i.e., organ acquisition costs). Organ acquisition costs for heart, kidney, liver, lung, pancreas, and intestinal/multi-visceral transplantations incurred by approved transplant centers are treated as an adjustment (pass through payment) to the hospital's IPPS payment.	Excluded: In Medicare FFS, pass-through payments are made by the MAC outside of the FFS claims processing systems. These payments are excluded from the HGB and continue to be paid under established methodologies.
Other	Medicare Secondary Payer (MSP)	When another entity is responsible for paying a claim before Medicare.	Excluded: Beneficiaries are only included in the AHEAD Model if Medicare is the primary payer; thus, any payments for services are excluded.

Appendix E: Outpatient Market Shift Weighting Methodology

In addition to the inpatient MSA, the outpatient MSA is designed to adjust for volume changes between hospitals. Net volume changes are neutral; positive market gains awarded to some hospitals are offset by declines at other hospitals. The two main steps of the outpatient market shift are to first assign a service category to the claim and secondly to assign case mix weights to the claim. Weights are used to quantify the case-mix adjusted volume to shift from one hospital to another and used in the calculation to determine the amount of dollars to adjust in the HGB.

APC Background

APCs assign outpatient services that are paid under OPPS. Certain services are excluded from OPPS and are paid under a different methodology (such as the CMS Physician Fee Schedule, CMS National Lab Fee Schedule, ASP Drug, Vaccine Payment Limit, and Allowable Costs for CAHs). CMS develops an index to put these services on the same basis as services paid via APCs, with the exception of ASP/AWP Drugs, which is detailed below. These services are identified by a status indicator in the HCPCS/CPT table as published annually (OPPS Addendum B).

ASP/AWP Drugs Weighting

Part B facility-administered drugs, excluding cancer drugs, are included in HGBs. To assign APC weights, AHEAD creates a scale factor that converts ASP/AWP prices to APC weights as outlined in **Exhibit F.1**. The scale factor represents the average payment made by CMS in dollars per unit of APC weight for outpatient services paid via APC. The CMS OPPS Addendum B (HCPCS/CPT table) provides APC weights for the scale factor calculation.

Exhibit F.1: Scale Factor and ASP/AWP Weight Calculation

Calculation Steps	Calculation
Scale Factor (A)	$\frac{Sum\ (APC\ Claim\ Weights)}{Sum\ (APC\ HOPD\ Payments)}$
ASP/AWP Weight (B)	$ASP/AWP\ Claim\ Payment \times Scale\ Factor$

In **Exhibit F.2**, claim one is a pneumococcal vaccine injection, claim two is an oral medication given for nausea, and claim three is a 90-minute infusion for patients with Fabry disease. All APC claim weights were divided by all APC Hospital Outpatient Department Payments to yield a scale factor of 0.01. Each claim payment is multiplied by this scale factor to calculate a relative weight. The calculated relative weights reflect the difference in the acquisition and administration costs of these medications as claim two has the lowest relative weight (0.04) while claim three has the highest relative weight (176.6). Multiplying by the constant scale factor (0.01) preserves the differences in payment that are incorporated by CMS into ASP/AWP pricing.

Exhibit F.2: APC Weight Calculation for Part B Facility Administered Drugs

HCPCS	Description	Claim Paid Amount (A)	APC SF (B)	Calculated Relative Weight (A*B)
90677	Pcv20 vaccine im	$270	0.01	2.7
Q0162	Ondansetron 1 mg	$3	0.01	0.04
J0180	Injection, agalsidase beta, 1 mg	$17,669	0.01	176.7

Case Mix Weights

Case weights on Medicare FFS claims or No-Pay Claims are adjusted based on the claim's corresponding revenue discount indicator. **Exhibit F.3** shows the final weight calculation for each revenue discount indicator.

Exhibit F.3: Outpatient Weighted Volume Calculations for Short-Term Acute Care Hospitals

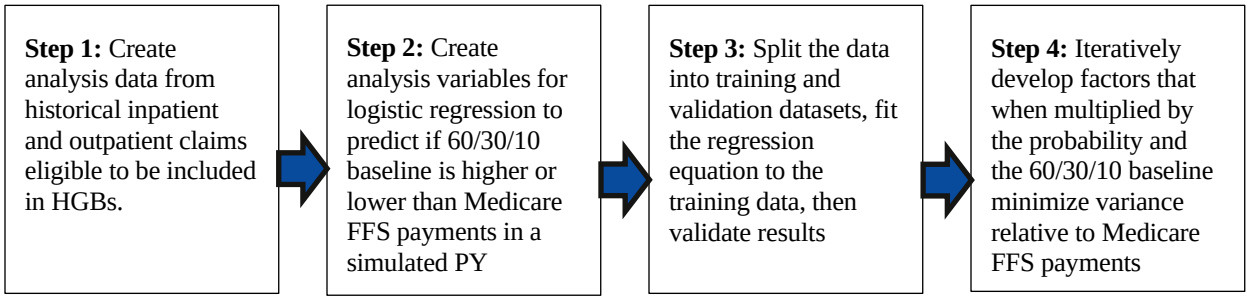
Revenue Discount Indicator	Weighting formula
0	Final weight = APC weight
1	Final weight = APC weight * Service unit quantity
2	Final weight = APC weight * ((1 + .5*(Service unit quantity - 1)) / Service unit quantity)
3	Final weight = APC weight * (.5 / Service unit quantity)
4	Final weight = APC weight * (1.5 / Service unit quantity)
5	Final weight = APC weight * (.5 * Service unit quantity)
6	Final weight = APC weight * (.25 / Service unit quantity)
7	Final weight = APC weight * (.75 / Service unit quantity)
Other	Final weight = APC weight * (2 / Service unit quantity)

Currently CAHs are not paid under the APC methodology but are reimbursed 101 percent of allowable costs. CAH claims data are processed through an APC grouper, which allows for comparable data between Acute Care Hospitals and CAHs.

Appendix F: Baseline Optimization Adjustment Methodology

For PY1 only, after the baseline calculation described in **Equation 1.a and 1.b**, CMS uses logistic regression to adjust the weighted baseline (**Exhibit 8**), and ensure it appropriately represents what Medicare FFS payments to the hospital would have been in the absence of HGB payments. The logistic regression uses historical claims data to estimate a probability that is multiplied by a scaling factor to calculate a Baseline Adjustment Factor. The Baseline Adjustment Factor is multiplied by the Weighted Inpatient Baseline and Weighted Outpatient Baseline to set the baseline for PY1 (**Eq 1.a and Eq. 1.b**). The Baseline Adjustment Factor is calculated using the steps described in **Exhibit 1** and is explained in more detail in the remainder of this appendix.

Exhibit 1: Overview of Baseline Adjustment Factor Calculation



Calculating the Baseline Adjustment Factor involves the following steps:

Step 1: Create Analysis Data

A. Create an analysis dataset of inpatient and outpatient claims for Eligible Hospital Services with dates of service between 2010 to 2023, except 2020 and 2021 (due to COVID-19) for all AHEAD states. These are the Simulated PYs.

B. For each Simulated PY in Step 1.A, create Simulated 60/30/10 Baselines using the same retrospective time intervals (three years, ending 6 months prior to the PY), weights (60/30/10), and claims (inpatient and outpatient claims for Eligible Hospital Services) as described in the HGB specifications.

   For example, the Simulated 60/30/10 baseline for 2018 would include BY1=2015, BY2=2016, and BY3=2017. Each BY is adjusted for price differences using CMS Market Basket Update instead of the Annual Payment Adjustment (APA) due to differences in the Impact File over time that complicate calculation of the APA.

C. Apply completion factors to BY3 and the last 3 months of BY2.

D. Remove Critical Access Hospitals (CAHs). This is done to simplify methodology development and because CAHs receive a floor of 101% of cost, eliminating the risk of underpayment relative to Medicare FFS payments.

Step 2: Create Analysis Variables

A. **Dependent Variable:** To estimate the probability that the baseline will be too high or too low, create a binary dependent variable to indicate if the Simulated 60/30/10 Baseline was higher or lower than actual Medicare payments in the Simulated PY. For example, the Simulated 60/30/10 Baseline for Simulated PY 2018 would be compared to 2018 actual Medicare FFS payments to the hospital. The dependent variable (subsequently referred to as under FFS) is set to 1 if the Simulated 60/30/10 Baseline is less than actual Medicare FFS payments, or 0 if not.

B. For each hospital, create 36 monthly variables that are ratio of cumulative Medicare FFS payments for claims incurred and paid through the month.

$$M_i = \frac{\sum_{n=0}^{n=i} Medicare\ FFS\ payments\ incurred\ and\ paid}{hospital's\ 60/30/10\ baseline}$$

Exhibits 48 and 49 demonstrate two timeframes for global budget calculation that are replicated in historical data for developing the Baseline Adjustment Factor. The Estimated HGB calculation will be performed in July prior to the PY to help hospitals make participation decisions. The Final HGB calculation will be performed in November prior to the PY to take advantage of the most recent data available. The four step process described in these specifications is repeated for both HGB calculations. The monthly variables would correspond to cells left of the yellow highlight in **Exhibits 48 and 49**. For example, for Final HGBs calculated in November prior to the PY, month 1 would include Medicare FFS payments for services incurred and paid in October, divided the 60/30/10 baseline. Month 2 would include sum of Medicare FFS payments for services incurred and paid in September and October divided by the 60/30/10 baseline.

Exhibit 48: Timeframes for Calculating Estimated HGB Baselines in July prior to PY

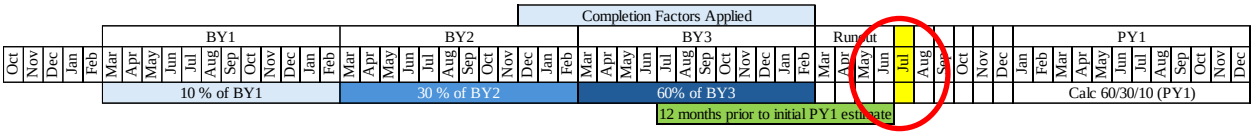
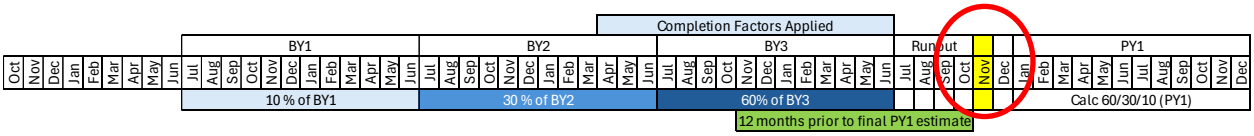


Exhibit 49: Timeframes for Calculating Final HGB Baselines in November prior to PY



C. **Independent Variable**: Transform 36 monthly variables into a single value for use in the logistic regression in Step 3 using Principal Components Analysis (PCA) to create multiple eigenvectors or indices that measure variance within the data but are not correlated with each other. The first eigenvector which explains the greatest portion of variation in the data is used as the independent variable in the logistic regression (referred to as Vector 1). **Exhibit 50** provides an example of the analysis data file. CMS will make available sample

data files and statistical programs necessary to replicate the Baseline Optimization Adjustment calculation on request.

Exhibit 50: Overview of Baseline Adjustment Factor Calculation

State	Hospital	PY1	PY 1 - Actual	PY1 - 60/30/10 Estimate	Under FFS	Month 1 incurred & paid / [60/30/10 estimate]	Month 2 incurred & paid / [60/30/10 estimate]	Vector 1
CT	A	2014	$508.3 M	$374.2 M	1	12.0	5.0	-11.27
CT	A	2019	$462.4 M	$576.5 M	0	11.9	6.5	0.83
CT	A	2016	$232.3 M	$258.3 M	0	13.6	5.9	-0.98
CT	B	2023	$83.3 M	$84.4 M	0	12.3	6.2	-4.52
CT	C	2016	$28.0 M	$31.5 M	0	12.7	6.1	0.50
CT	D	2014	$31.8 M	$31.7 M	1	13.8	6.3	-1.62
CT	D	2017	$36.6 M	$33.5 M	1	12.5	5.8	-2.80
CT	E	2016	$74.8 M	$75.3 M	0	12.7	5.7	-1.77

Step 3: Logistic Regression using PCA Outputs

A. Randomly split the data into three datasets by hospital and year (training 50% of observations, validation 35% of observations, test 15% of observations). Note that the test dataset is not used until Step 4.F.

B. Using the training dataset, fit a logistic regression equation to predict if the Simulated 60/30/10 Baseline will be higher or lower than Medicare FFS spending in the Simulated PY. The dependent variable is Under FFS (Step 2.A) and the independent variable is Vector 1 or the first eigenvector created by the PCA (Step 2.C).

C. Apply the logistic regression estimated in Step 3.B to the validation dataset to ensure similar accuracy, precision, sensitivity and specificity in predictions (**Exhibit 51**). Note that the values in **Exbibit 51** are subject to change as CMS re-runs the logistic regression prior to the PY.

Exhibit 51: Logistic Regression Prediction Performance Validation Statistics

Statistic	Regression fit to Training Data	Regression fit to Validation Data
Accuracy	0.7139	0.6801
Precision	0.6772	0.6033

Statistic	Regression fit to Training Data	Regression fit to Validation Data
Sensitivity	0.5722	0.5703
Specificity	0.8118	0.7526

Accuracy, precision, sensitivity and specificity are standard diagnostics for evaluating the quality predictions and are calculated from a 2x2 matrix (**Exhibit 52**). Logistic regression outputs a probability that ranges from 0 to 1. Positive predictions (Yes below) are those with a probability greater than 0.5.

Exhibit 52: Sample 2x2 Classification Matrix

		Actual Value	
		Yes	**No**
Predicted Value	**Yes**	TP= True Positive	FP= False Positive
	No	FN= False Negative	TN= True Negative

Where,

Accuracy = (TP + TN) / (TP + FP + FN + TN)

Precision = TP / (TP + FP)

Sensitivity = TP / (TP + FN)

Specificity = TN / (TN + FP)

D. Center the probability by subtracting 0.5 from the output of the logistic regression, estimated using the training dataset.

E. Apply the logistic regression from training dataset to the validation dataset and center the probability for use in Step 4F.

F. Apply the logistic regression from the training dataset to the test dataset and center the probability for final testing in Step 4.G.

Step 4: Develop Increase and Decrease Scaling Factors

A. Using the training dataset, develop Increase Factors and Decrease Factors specific to each AHEAD state to adjust HGBs up or down. Develop the factor by starting at 0 then increment each factor by 0.02 until 1.5. Repeat steps 4.B to 4.D for each test factor value.

This results in 5,776 iterations for each state.

B. For hospitals with a centered probability <=0 (Step 3.D), test the Increase Factor by calculating an Adjusted Baseline as,
   - Adjusted Baseline = 60/30/10 baseline * (1 + centered-probability * Increase Factor)

C. For hospitals with a centered probability > 0 (Step 3.D), test the Decrease Factor by calculating an Adjusted Baseline as,
   - Adjusted Baseline = 60/30/10 baseline * (1 + centered-probability * Decrease Factor)

D. Calculate the difference between the Adjusted Baseline and actual Medicare FFS paid amounts during the Simulated PY.

E. Keep only Increase Factors and Decrease Factors from the iterative testing in steps 4.B to 4.D that a) improve the number of hospitals underpredicted, b) reduce the interquartile range and c) improve the coefficient of variation compared to the original 60/30/10 baseline (without any adjustments) in the training dataset.

F. Apply the remaining Increase Factors and Decrease Factors to the validation dataset and select the factors for each state that minimize a) the interquartile range and b) coefficient of variation compared to the original 60/30/10 baseline. Increase and Decrease factors from prior testing are found in **Exhibit 53**. These values are subject to change.

Exhibit 53: Sample Increase and Decrease Scaling Factors by State

State	Increase Factor	Decrease Factor
CT	0.54	0.18
HI	0.28	0.02
NY	0.58	0.06
RI	0.56	0.18
VT	0.44	0.06

G. Apply the Increase Factors and Decrease Factors selected in Step 4.F for each state to the test dataset from Step 3.F to calculate final results that compare Adjusted Baselines to the original 60/30/10 baselines.