maryland
health services
cost review commission

Identifying the Population for a Care Transformation Initiative: Care Transitions for Inpatient Discharges

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Introduction

Under the All-Payer Model, Maryland hospitals have engaged in numerous efforts to reduce avoidable utilization of healthcare services by investing in programs to help address specific population needs and provide more valuable health services to the beneficiaries they serve. The HSCRC evaluates these efforts, known as Care Transformation Initiatives (CTIs), to reward and incentivize individual hospitals who put forth investments to meaningfully connect the healthcare system and transform care. The HSCRC believes that the evaluation of hospitals' CTI efforts will also help to develop a systematic understanding of best practices for improving care and reducing unnecessary utilization across the State, ultimately leading to further dissemination, broader implementation, and the acceleration of care transformation in Maryland.

A CTI is an initiative undertaken by a hospital, group of hospitals, or collaborative partnering with a hospital to reduce the total cost of care (TCOC) of a defined population. CTIs focus on hospital investments that provide a return to the hospital through beneficiary-level TCOC reductions. CTIs are describable, quantifiable and within the purview of individual hospitals to implement, therefore returns on these investments can be awarded to the participating entities. (Payments to reward participants for CTI savings are known as "reconciliation payments.").

Hospitals must be able to identify specific beneficiaries impacted by their proposed initiative and HSCRC staff must be able to reliably calculate short-term TCOC savings, else the hospital's proposed initiative cannot be included in the CTI framework. Currently, CTI populations only include Medicare fee-for-service (FFS) beneficiaries, though HSCRC staff may develop a framework for other payers in the future.

In general, there are four steps to evaluate a participants' CTI and determine reconciliation payments:

1. **Identify the population** of beneficiaries to be attributed to the participant if the participant-specified conditions for "triggering" an episode are met.
2. **Construct the episodes** based on the participant-specified episode length.
3. **Calculate a "target price"** based on historical "baseline" data.
4. **Compare** the average TCOC for episodes during the performance period to the target price.

This document describes the data, specifications, and methods used to identify the population (Step 1) targeted by a hypothetical CTI in the thematic area titled *Care Transitions for Inpatient Discharges* (or "Care

Transitions") and construct a database of episodes (Step 2) that were "triggered" by beneficiaries in that population during a one-year "target" period. This document also describes the methodology for calculating total episode costs, determining a participant's target price (Step 3), and computing reconciliation payments (Step 4). This document is intended to enable the user to

- Identify the beneficiaries in their patient populations that would or would not qualify for their proposed or approved CTI using the universe of Maryland residents' Medicare FFS claims and enrollment data,
- Construct a set of episodes triggered during a one-year target period and attributed to the CTI participant to track total costs of care incurred during the length of the episodes (or "episode window"), and
- Understand how HSCRC constructs a participant and CTI specific target price and determines each participant's reconciliation payment.

Required Data

HSCRC constructs CTI populations and episodes using the Maryland All-Payer Model (MDAPM) Claim and Claim Line Feed (CCLF) data provided by CMS to the State of Maryland. This data file contains Medicare final action claims for all Part A and Part B services received by beneficiaries who reside in Maryland, regardless of where the services were received. The file also contains claims information on all Medicare-covered services furnished within Maryland to non-residents; however, non-residents are excluded from CTI episode construction. The data do not include Substance Abuse and Mental Health Service Association (SAMHSA) claims.

Episode triggers and episode costs are derived from Medicare FFS claims in the CCLF data for which Medicare is the primary payer, as are any flags based on beneficiaries' history of healthcare utilization that might be used to identify a given CTI's population. Beneficiaries who are enrolled in Medicare Advantage or other group health arrangements during an episode (or during the timeframe used to determine their history of healthcare utilization) are not included in CTI populations. In addition, exclusions are made for beneficiaries eligible for Medicare because of end-stage renal disease (ESRD) or for whom Medicare is the secondary payer.

Medicare Beneficiaries excluded from clinical episodes:

- Non-Maryland residents
- Managed care enrollees
- ESRD patients
- Hospice enrollees

Medicare Parts A and B claims excluded from episode triggers and total episode costs:

- Non-final action
- Unpaid/Denied
- SAMHSA

Final paid claim amounts are used to calculate episode costs. Paid claim amounts are based on services provided but are also subject to CMS adjustments for geography,

quality incentives, and other factors. We describe how total episode costs are calculated in the sections below.

To identify the CTI population, construct episodes, and calculate total costs of care, the user will need access the following types of files from the Medicare administrative data:

- Medicare enrollment and demographic file
- Inpatient
- Outpatient
- Carrier (i.e., claims submitted by professional providers, including physicians, physician assistants, clinical social workers, and nurse practitioners)
- Durable Medical Equipment
- Skilled Nursing Facility
- Home Health Agency

The Chesapeake Regional Information System for Our Patients (CRISP) provides the HSCRC with supplemental data files constructed by CRISP to identify specific subgroups of the Maryland patient population. To precisely identify a CTI population the user will also need access to the following files:

- *"DRG Details"* – a file containing the All Patient Refined Diagnostic Related Groups (APR-DRG) code, Severity of Illness (SOI) code, and Risk of Mortality (ROM) code for each inpatient hospital claim in the CCLF data, which are constructed using proprietary algorithms based on diagnostic information on inpatient claims.

- *"Address File"* – a file containing the first and last dates that each beneficiary resided at a given address throughout the calendar year.

- *"Taxonomy Crosswalk"* – a file that links provider taxonomy code(s) to each national provider identifier (NPI) number found in the Medicare Part B physician claims.

- *"First PAC"* – a file indicating the first post-acute care setting that the patient was referred to after every hospital discharge (determined using MADE's algorithm to identify *first* PAC settings after hospital discharge, i.e., admissions to LTCHs or IRFs are determined within two days of hospital discharge, SNF admissions are determined within three days of hospital discharge, and the start of HHA care is determined within 14 days of hospital discharge).

To completely identify the CTI population for a given target period, users must have access to Medicare claims data that span the entire period in which they might need to "look back" from the beginning of the target period. Users will need to collect claims data from before and during the target period if they specify one of the following types of inclusion or exclusion criteria allowed for *Care Transitions* CTIs:

- The number of inpatient stays, observation stays, or emergency department (ED) visits beneficiaries experienced before they were hospitalized (the look back period is specified by the participant).
- Beneficiaries who had a medical encounter with certain provider types before they were hospitalized (the look back period is specified by the participant).

Participants are also allowed to specify the length of the episodes in their *Care Transitions* CTI – ranging from 30 to 365 days. For users to calculate total cost of care for all episodes in the target period, they will need data that spans the full target period (total episode costs are prorated when if an episode ends after the target period ends, as described in the sections below).

Optional and General Criteria for Care Transitions CTIs

The HSCRC provides an "intake template" to CTI participants that allows them to customize their CTI for the population they are targeting. The optional criteria are customized for each thematic area and finalized by the Care Transformation Steering Committee. For *Care Transitions* CTIs, participants are allowed to select any combination of the criteria described in Exhibit 1 to target a specific patient population. The criteria have default options that are implemented by the HSCRC if the participant chooses not to use the given criterion to customize their CTI population.

Exhibit 1. Optional Criteria for Participants to Customize their Care Transitions CTI.

Type of Criteria	Options	Default	Example
Geographic Service Area	Hospitals may submit a list of five-digit ZIP codes in which targeted patients must reside.	No restrictions	List of 20 Maryland ZIP codes.
Primary Diagnosis, APR-DRG, SOI, or ROM	Hospitals may submit a list of inpatient ICD-10-CM primary diagnosis codes or APR-DRG, SOI and/or ROM codes required to trigger an episode.	No restrictions	Cardiac APR-DRG codes (no SOI, ROM, ICD-10-CM specified)
Chronic Conditions	Hospitals may indicate a minimum number of the 27 CCW Chronic Conditions[1] with which a patient must have been diagnosed. Alternatively, hospitals may submit a list of specific CCW Chronic Conditions with which a patient must have been diagnosed.	No restrictions	One or more CCW Chronic Conditions
Prior Utilization	Hospitals may require thresholds on prior medical utilization. This requires selecting the setting (Inpatient hospital, outpatient observation, or ED), then the threshold (e.g., 2 inpatient discharges) and time window for when that threshold was reached (e.g., 2 inpatient discharges in past 60 days).	No restrictions	One inpatient hospital discharge during the 365 days preceding the episode begin date.

Type of Criteria	Options	Default	Example
Look Back	Hospitals may require that patients had a medical encounter in one or more specific healthcare settings (Primary Care/E&M visit, HHA, SNF, Assisted Living, Acute Care, Psychiatric Care Facilities) before an inpatient admission and a time window for the encounter (e.g., SNF discharge in past 60 days). *Alternatively, hospitals may exclude patients on the same basis.*	No restrictions	Default
Look Forward	Hospitals may require that patients were discharged from the hospital to one or more specific post-acute care settings (LTCH, IRF, SNF, HHA, Community with a physician consult).[2] *Alternatively, hospitals may exclude patients on the same basis.*	No restrictions	Discharged to LTCH, IRF, SNF, or HHA (i.e., not discharged home)
Episode Length	Each hospital must select the length of their CTI intervention to serve as the episode window. All healthcare services covered by Medicare Parts A and B that occur during this episode window will be included in calculations of total cost of care. The episode window begins upon discharge from the hospital.	90 days	Default

Abbreviations: *CTI*, Care Transformation Initiative; *ICD-10-CM*, International Classification of Diseases-Tenth Revision-Clinical Modification; *APR-DRG*, All Patient Refined Diagnostic Related Groups; *SOI*, Severity of Illness; *ROM*, Risk of Mortality; *CCW*, Chronic Conditions Data Warehouse; *ED*, Emergency Department; *E&M*, Evaluation and Management; *HHA*, Home Health Agency; *SNF*, Skilled Nursing Facility; *LTCH*, Long Term Care Hospital; *IRF*, Inpatient Rehabilitation Facility.

[1] Chronic Conditions Data Warehouse. Chronic Conditions. Accessed February 27, 2023, at: https://www2.ccwdata.org/web/guest/condition-categories-chronic.

[2] First post-acute care settings are determined using MADE's algorithm to identify patients' first PAC setting after hospital discharge: post-acute care admissions to LTCHs or IRFs are determined within two days of hospital discharge, SNF admissions are determined within three days of hospital discharge, and the start of HHA care is determined within 14 days of hospital discharge.

To further customize participants' CTIs, the intake template also requires the hospital to select a Maryland fiscal year (e.g., FY 2019 starts July 1, 2018 and ends June 30, 2019) as a baseline period in which to calculate the CTI target price (there is no default option for the baseline period, all hospitals must specify their baseline period). They must also choose whether to include or exclude the costs of the triggering hospital stay as part of the total cost of care during the episodes (**the default option is to include the costs of the hospitalization in total episode costs of care**).

In addition to the customizable criteria in Exhibit 1, all *Care Transitions* CTI populations have the same set of general inclusion or exclusion criteria for beneficiaries described in Exhibit 2. The identification of these general criteria depends on the various beginning and end dates of the constructed episodes.

Exhibit 2. General Criteria for all Care Transitions CTI Episodes.

Criteria	Description
Maryland Resident	The beneficiary must reside in Maryland during the hospitalization that triggered the episode ("index hospitalization"), throughout the episode window, and (if chosen as part of a participant's customizable criteria) throughout the time window for identifying prior healthcare utilization or previous medical encounters.
Medicare Parts A and B Enrollment	The beneficiary must be enrolled in both Medicare Parts A and B during the index hospitalization, throughout the episode window, and (if chosen as part of a participant's customizable criteria) throughout the time window for identifying prior healthcare utilization or previous medical encounters.
Medicare as Primary Payer	Medicare must be the primary payer on every claim (of any type) that occurred during the index hospitalization and throughout the episode window. Episodes are excluded if there is one or more claims during the index hospitalization or episode window on which Medicare was not the primary payer.
No ESRD Treatment	Episodes are excluded from the CTI if the beneficiary ever received treatment for end-stage renal disease (ESRD) during the calendar year in which they were discharged from the index hospitalization.
Patient Alive at the End of the Episode	Episodes are excluded from the CTI if the beneficiary died during the index hospitalization or during the episode window (including the final day of the episode).

A Hypothetical Care Transitions CTI

The last column in Exhibit 1 describes a *Care Transitions* CTI customized by a hypothetical participant to target a hypothetical patient population. The sections below describe the Medicare datafiles, variables, variable values, and overall logic the user would use to identify all inpatient discharges during the specified target period, construct episode windows based on the episode length specified by CTI participants, and restrict the set of potential episodes based the general and customizable criteria. The "Example" criteria listed in Exhibit 1 is used to provide numerical examples for the output that one would expect to see as they address each set of customized and general criteria to isolate their target population. Subsequent sections discuss how the HSCRC excludes episodes that trigger multiple CTIs from the final list of attributed episodes (e.g., a hospital discharge can only trigger one episode, attributed to one CTI participant, across all thematic areas), how the HSCRC calculates total episode costs, determines a participant's target price, and calculates reconciliation payments.

Identifying a Care Transitions CTI Population

This section of the document describes the data files, variables, and logic necessary to restrict the overall set of Medicare claims to inpatient discharges that meet the general and customizable criteria for a *Care Transitions* CTI. The logical descriptions are followed by an example of the output that one would expect to find after implementing this logic, based on the hypothetical *Care Transitions* CTI described in Exhibit 1.

The order in which the steps are presented below reflect the order in which the user can apply the inclusion and exclusion criteria to minimize the time it takes to identify the final list of episodes from the "raw" Medicare claims and enrollment data.

Target Period

The hypothetical *Care Transitions* CTI for the example output below uses Maryland FY 2018 as its target period. The output is derived from Medicare FFS claims and enrollment data that span July 1, 2016 to June 30, 2018. This includes a one year "look back" period (July 2016–June 2017) and the target period (July 2017–June 2018).

Hospitals must specify one of the following baseline periods for calculating a target price:

- July 2016 – June 2017
- July 2017 – June 2018
- July 2018 – June 2019

Performance periods are defined as Maryland fiscal years:

- Year 1: July 2021 – June 2022
- Year 2: July 2022 – June 2023
- Year 3: July 2023 – June 2024

Inpatient Discharges from Participating Facilities

The *Care Transitions* CTI thematic area focuses on patients discharged from short-term hospitalizations during the target year and referred for post-acute care or care management in their communities. Inpatient discharges are identified from Medicare Inpatient Hospital claims with discharge dates during the target year. The user should use the six-digit claim provider number (i.e., Provider Medicare Certification Number) to restrict the set of all inpatient discharges during the target year to discharges from the specific short-term hospital(s) pertinent to their Care Transitions CTI. Exhibit 3-A provides detailed specifications for identifying inpatient discharges from a participating facility that occurred during the target period.

Exhibit 3-A. Identify Inpatient Hospital Discharges During the Target Year.

Objective	Identify all patient discharges from a Maryland hospital during the target year.
Required File Types	Inpatient (Medicare Part A) Claims
Required Variables	Claim type code (CLM_TYPE_CD), Provider Medicare Certification Number (PROV_NUM), Discharge date (DSCHRG_DT)

Logic	1) Identify all claims for discharges from short-term hospitals using the following criteria: ✓ CLM_TYPE_CD equal to 60 or 61 ✓ PROV_NUM between 210001–210879[1] 2) Exclude hospital discharge claims that do *not* meet the following criteria: ✓ July 1, 20Y1 ≥ DSCHRG_DT ≥ June 30, 20Y2, where 20Y1 is the calendar year in which the target period begins and 20Y2 is the calendar year in which the target period ends.

[1] The first two digits of a Medicare Certification Number (or CCN) identify the State in which the provider is located. CCNs for Maryland hospitals begin with 21. The next four digits identify the type of provider. The last four digits for short-term (general and specialty) hospitals are between 0001—0879.

Example Output Based on a Hypothetical Care Transitions CTI: Inpatient Discharges from a Given Facility

As an example of the output one would expect to see after the first criteria are applied to the data, Exhibit 3-B provides the count of inpatient hospital discharges identified in the CCLF data from Maryland FY 2018 that could potentially trigger a *Care Transitions* CTI, and the number of discharges from a hypothetical participant's short-term hospital facility (hypothetical provider number 210XXX).

Exhibit 3-B. Example Output – Identify Inpatient Hospital Discharges from a Given Facility.

Input Files	Medicare Part A Claims
Target Period	Maryland Fiscal Year 2018 (July 1, 2017–June 30, 2018)
Total Number of Inpatient Hospital Discharges During Target Period	233,000
Total Number of Inpatient Hospital Discharges from Provider Number 210XXX	7,600

Beginning and End Dates for Each Potential Episode

The next steps require the user to restrict the set of inpatient discharges that could potentially trigger a *Care Transitions* CTI based on patient outcomes and characteristics observed during the potential episode window and (if necessary) look back periods. The episode begin date is the date that the patient was admitted to the hospital if the participant chooses to include the cost of the hospital stay in the total episode costs. Otherwise, the episode begin date is the date that the patient was discharged from the hospital. The episode end date and look back periods are determined by episode length, prior utilization, and look back criteria specified by the participant.

Exhibit 4. Define the Episode Window and Look back Period for Each Potential Episode.

Objective	For each inpatient hospital discharge, define an episode begin date, episode end date, look back period, and look forward period: • The episode begin date is hospital discharge date. • The episode end date is the discharge date plus the participant-specified episode length, minus one day (to include the day of hospital discharge in the episode window). • The look back period is determined from the participant-specified prior utilization and look back criteria (Exhibit 1). ○ Define the look back period as the *maximum* length of time specified by the participant, e.g., if the participant specified a one-year look back for prior hospitalization and a six-month look back for prior ED visits, then the look back period for each episode will be 365 days before the episode begin date.
Required File Types	Not applicable (only output from previous steps)
Required Variables	Inpatient admission date (ADMSN_DT), Inpatient discharge date (DSCHRG_DT)
Logic	For each inpatient hospital discharge claim: 1) Define an Episode Begin Date as ADMSN_DT if costs of the index inpatient hospitalizations are included in total episode costs, else use DSCHRG_DT. 2) Define an Episode End Date as DSCHRG_DT + *Episode Length* – 1 day. 3) The start of the look back period is ADMSN_DT – α (where α is the maximum number of days specified by the participant to look back for any type of prior utilization or previous medical encounter). 4) The end of the look back period is ADMSN_DT – 1 day.

Maryland Residency and Medicare Parts A and B Enrollment

All beneficiaries in a CTI population are required to have been Maryland residents who were continuously enrolled in both Medicare Parts A and B during the entire inpatient stay and episode window. If the participant specified inclusion or exclusion criteria that requires looking back before the trigger date to identify a threshold for prior utilization or medical encounter with a specific type of provider, then the beneficiary must also have been a Maryland resident and enrolled in Medicare Parts A and B during the entire length of the specified look back period to ensure a complete claims-history. Exhibit 5-A provides detailed specifications for identifying Maryland residents enrolled in Medicare Parts A and B during the episode window and, if necessary, the required look back period.

Exhibit 5-A. Identify Maryland Residents and Beneficiaries Enrolled in Both Medicare Parts A and B.

Objective	Exclude inpatient hospital discharges if the patient was not a Maryland resident or not enrolled in Medicare Parts A and B during the entire hospital stay, episode window, and look back period.
Required File Types	Medicare enrollment and demographic file
Required Variables	Medicare eligibility during year and month (ELIG_YYYY_MM), Maryland residency during year and month (MD_YYYY_MM), Inpatient admission date (ADMSN_DT*), Inpatient discharge date (DSCHRG_DT*)
Logic	1) Exclude hospital discharge claims that do *not* meet the following criteria: ✓ MD_YYYY_MM = 1 during every calendar month that overlaps the start of the look back period through the end of the episode window. ✓ ELIG_YYYY_MM = 'AB' during every calendar month that overlaps the start of the look back period through the end of the episode window. ✓ If a look back period is not required, then MD_YYYY_MM = 1 and ELIG_YYYY_MM = 'AB' during every calendar month that overlaps the hospital admission date (ADMSN_DT*) through the episode end date (DSCHRG_DT* + *Episode Length* – 1 day). where YYYY is the calendar year and MM is the calendar month.

* Inpatient admission (ADMSN_DT) and discharge (DSCHRG_DT) dates corresponding to inpatient hospital discharges that could potentially trigger an episode.

Example Output Based on a Hypothetical Care Transitions CTI: Maryland Resident and Medicare Coverage

Exhibit 5-B provides the count of inpatient hospital discharges (i.e., potential episodes) from Provider Number 210XXX during FY 2018, excluding discharges where the patient was not a Maryland Resident or not enrolled in Medicare Parts A and B during the entire inpatient stay, episode window, and look back period. The length of the episodes, look back period and look forward period were defined by the prior utilization, look back, and look forward criteria for the "Example" CTI described in Exhibit 1.

Exhibit 5-B. Example Output – Exclude Inpatient Discharges if the Patient Did Not Meet the Maryland Residency and Medicare Coverage Criteria.

Total Number of Inpatient Hospital Discharges from Provider 210XXX	7,600
Total Number of Inpatient Hospital Discharges After Excluding Non-Maryland Residents and Beneficiaries Not Covered by Parts A and B	6,924
Percent of Hospital Discharges from Provider 210XXX	91.1%

End Stage Renal Disease (ESRD) Status

ESRD patients are excluded from CTIs because they have a different cost profile than non-ESRD patients. Exhibit 6-A provides detailed specifications for identifying patients with ESRD.

Exhibit 6-A. Identify Beneficiaries Who Received Treatment for ESRD.

Objective	Exclude inpatient hospital discharges if the patient received treatment for ESRD during the same calendar year as the hospital discharge.
Required File Types	Medicare enrollment and demographic file
Required Variables	Medicare eligibility during year (MS_CD_YYYY), Inpatient discharge date (DSCHRG_DT*)
Logic	1) Exclude hospital discharge claims if MS_CD_YYYY = 11, 21, or 31, where YYYY is the calendar year in which the patient was discharged from the hospital (i.e., the episode begin date).

* Inpatient discharge (DSCHRG_DT) dates corresponding to inpatient hospital discharges that could potentially trigger an episode.

Example Output Based on a Hypothetical Care Transitions CTI: ESRD Status

Exhibit 6-B provides the count of inpatient hospital discharges (i.e., potential episodes) after applying all criteria above and excluding hospital discharges for patients who received ESRD treatment during the same calendar year.

Exhibit 6-B. Example Output – Exclude Inpatient Discharges if the Patient Received Treatment for ESRD During the Same Calendar Year.

Total Number of Inpatient Hospital Discharges from Previous Output	6,924
Total Number of Inpatient Hospital Discharges After Excluding Patients Who Received ESRD Treatment	6,785
Percent of Hospital Discharges from Provider 210XXX (n=7,600)	89.2%

Deaths

Patients who died during an episode tend to have different cost profiles than those who had not died during an episode. Inpatient hospital discharges were excluded from the set of potential episodes if the patient was discharged from the hospital upon death or who died during the potential episode window. Exhibit 7-A provides detailed specifications for identifying patients who died during the hospitalization or the episode window.

Exhibit 7-A. Identify Beneficiaries Who Died During the Hospitalization or the Episode Window.

Objective	Exclude inpatient hospital discharges if the patient was discharged upon death or if the patient died during the episode window.
Required File Types	Medicare enrollment and demographic file
Required Variables	Beneficiary Date of Death (BENE_DEATH_DT), Inpatient admission date (ADMSN_DT*), Inpatient discharge date (DSCHRG_DT*)
Logic	1) Exclude hospital discharge claims where: ✓ ADMSN_DT* ≤ BENE_DEATH_DT ≤ (DSCHRG_DT* + *Episode Length* – 1 day)

* Inpatient admission (ADMSN_DT) and discharge (DSCHRG_DT) dates corresponding to inpatient hospital discharges that could potentially trigger an episode.

Example Output Based on a Hypothetical Care Transitions CTI: Deaths

Exhibit 7-B provides the count of inpatient hospital discharges (i.e., potential episodes) after applying all criteria above and excluding hospital discharges for patients who died during the hospital stay or during the episode window.

Exhibit 7-B. Example Output – Exclude Inpatient Discharges if the Patient Received Treatment for ESRD During the Same Calendar Year.

Total Number of Inpatient Hospital Discharges from Previous Output	6,785
Total Number of Inpatient Hospital Discharges After Excluding Patients Who Died During the Hospitalization or Episode Window	6,378
Percent of Hospital Discharges from Provider 210XXX (n=7,600)	83.9%

Beneficiaries for Whom Medicare is Not the Primary Payer

To ensure that the CCLF data contains every patient's complete claims history, inpatient hospital discharges are excluded from the set of potential episodes if the beneficiary had one or more claims with a date of service during the hospital stay or episode window that are covered by a primary payer other than Medicare (which means that there may be payments or claims for the patient that are not included in the CCLF data). Exhibit 8-A provides detailed specifications for identifying patients with claims during the hospitalization or episode window that were covered by a primary payer other than Medicare.

Exhibit 8-A. Identify Beneficiaries with Claims for Which Medicare is Not the Primary Payer.

Objective	Exclude inpatient hospital discharges if the patient had one or more claims with service dates during the hospitalization or episode window that were covered by a primary payer other than Medicare.
Required File Types	Inpatient, Outpatient, Carrier, Durable Medical Equipment, Skilled Nursing Facility, Home Health Agency (i.e., all FFS claims)
Required Variables	Primary payer claim paid amount (PRPAYAMT), Claim service dates (CLM_FROM_DT – CLM_THRU_DT), Inpatient admission date (ADMSN_DT*), Inpatient discharge date (DSCHRG_DT*)
Logic	1) Exclude hospital discharge claims if the patient/beneficiary had one or more Medicare FFS claims (of any type) where: ✓ ADMSN_DT* ≤ CLM_THRU_DT ✓ CLM_FROM_DT ≤ (DSCHRG_DT* + *Episode Length* – 1 day) ✓ PRPAYAMT > 0

* Inpatient admission (ADMSN_DT) and discharge (DSCHRG_DT) dates corresponding to inpatient hospital discharges that could potentially trigger an episode.

Example Output Based on a Hypothetical Care Transitions CTI: Medicare Not Primary Payer

Exhibit 8-B provides the count of inpatient hospital discharges (i.e., potential episodes) after applying all criteria above and excluding hospital discharges for patients who had claims with service dates during the hospital stay or episode window for which Medicare was not the primary payer.

Exhibit 8-B. Example Output – Exclude Inpatient Discharges if the Patient had Any Claims for Which Medicare is Not the Primary Payer During the Hospitalization or Episode Window.

Total Number of Inpatient Hospital Discharges from Previous Output	6,378
Total Number of Inpatient Hospital Discharges After Excluding Patients with Claims for Which Medicare is Not the Primary Payer	6,059
Percent of Hospital Discharges from Provider 210XXX (n=7,600)	79.7%

Geographic Service Area

Many participants choose to restrict their CTI population to a particular service area. Participants can choose to provide a list of five-digit ZIP codes in which the patients must reside at the time of their hospital discharge to be included in the given CTI population. Exhibit 9-A provides detailed specifications to identify beneficiaries' residential ZIP codes.

Exhibit 9-A. Identify the ZIP Code in Which a Patient Resided at the Time They Were Discharged from the Hospital.

Objective	Exclude inpatient hospital discharges when the patient did not reside in one of the ZIP codes specified by the participant.
Required File Types	Supplemental "Address File"
Required Variables	Medicare Beneficiary Identification number (MBI_NUM), Beneficiary mailing address ZIP code (BENE_MLG_CNTCT_ZIP), Effective date (EFCTV_DT) and End date (END_DT) for beneficiary mailing address, Inpatient hospital discharge date (DSCHRG_DT*)
Logic	1) Identify the Medicare Beneficiary Identification number (MBI_NUM) for each patient discharged from the hospital. 2) Using the MBI_NUM, identify the patient's mailing address ZIP code (BENE_MLG_CNTCT_ZIP) corresponding to the date they were discharged from the hospital, (i.e., where EFCTV_DT ≤ DSCHRG_DT* ≤ END_DT). 3) Exclude inpatient hospital discharge claims if the BENE_MLG_CNTCT_ZIP does not match one of the five-digit ZIP codes specified by the CTI participant.

* Inpatient discharge (DSCHRG_DT) dates corresponding to inpatient hospital discharges that could potentially trigger an episode.

Example Output Based on a Hypothetical Care Transitions CTI: Geographic Service Area

Exhibit 9-B provides the count of inpatient hospital discharges (i.e., potential episodes) after applying all criteria above and excluding hospital discharges for patients that did not reside in in one of the 20 ZIP codes specified by the hypothetical CTI participant for the "Example" CTI described in Exhibit 1.

Exhibit 9-B. Example Output – Exclude Inpatient Hospital Discharges if the Patient Did Not Reside in the Set of ZIP Codes Specified by the CTI Participant.

Total Number of Inpatient Hospital Discharges from Previous Output	6,059
Total Number of Inpatient Hospital Discharges After Excluding Patients Who Did Not Reside in the Specified Set of ZIP Codes	2,003
Percent of Hospital Discharges from Provider 210XXX (n=7,600)	26.4%

Primary Diagnosis or APR-DRG-SOI

The participants may choose to focus their intervention on patients who were hospitalized for specific conditions. In this case, the participant can restrict their *Care Transitions* CTI population based on

- Primary ICD-10-CM diagnosis codes,
- All Patient Refined Diagnostic Related Group (APR-DRG) codes, or
- Severity of Illness (SOI) codes

corresponding to hospital discharge claims. Participants may choose to restrict their CTI population based only on primary diagnosis codes, APR-DRG codes, SOI codes, or a specific combination of APR-DRG-SOI codes; or they may widen the scope of their search by using an assortment of these types of codes. Exhibits 10-A and 10-B provide detailed specifications for identifying the primary diagnosis and APR-DRG-SOI codes associated with inpatient hospital discharges and excluding those that do not meet the participant's specified diagnostic criteria.

Exhibit 10-A. Identify Inpatient Hospital Discharges with Primary Diagnosis Codes Specified by the Participant.

Objective	Identify inpatient hospital discharges with a primary diagnosis code that matches the list of primary diagnosis codes specified by the CTI participant.
Required File Types	Inpatient claims
Required Variables	Primary diagnosis code (ICD_DGNS_CD1)
Logic	1) Exclude hospital discharge claims that do *not* meet the following criteria: ✓ ICD_DGNS_CD1 equals any ICD-10-CM code selected by the participant.

Abbreviations: *ICD-10-CM*, International Classification of Diseases-Tenth Revision-Clinical Modification.

Exhibit 10-B. Identify Inpatient Hospital Discharges with APR-DRG, SOI, or ROM Specified by the Participant.

Objective	Identify inpatient hospital discharges with APR-DRG, SOI, or ROM codes that match the list of APR-DRG, SOI, or ROM codes specified by the CTI participant.
Required File Types	Supplemental "DRG_Details" file
Required Variables	Current Unique Claim Identifier (CUR_CLM_UNIQ_ID), APR-DRG code (APRDRG), Severity of Illness code (SOI), Risk of Mortality code (ROM)
Logical	1) Identify the Current Unique Claim Identifier (CUR_CLM_UNIQ_ID) for each of the remaining inpatient hospital discharge claims in the set of potential episodes.

	2) Using the CUR_CLM_UNIQ_ID, identify the APRDRG, SOI, and ROM corresponding to each inpatient hospital discharge claim. 3) Exclude inpatient hospital discharge claims if the APRDRG, SOI, and ROM codes do not match one of the APRDRG, SOI, and ROM codes, or combinations of these codes, specified by the CTI participant.

Abbreviations: *APR-DRG*, All Patient Refined Diagnostic Related Groups; *SOI*, Severity of Illness; *ROM*, Risk of Mortality.

Example Output Based on a Hypothetical Care Transitions CTI: Primary Diagnosis or APR-DRG-SOI

Exhibit 10-C provides the count of inpatient hospital discharges (i.e., potential episodes) after applying all criteria above and excluding hospital discharges that did not correspond to the subset of Cardiac APR-DRG codes specified by the hypothetical CTI participant for the "Example" CTI described in Exhibit 1.

Exhibit 10-C. Example Output – Exclude Inpatient Hospital Discharges if the corresponding APR-DRG did Not Match the Subset of APR-DRG Codes Specified by the Participant.

Total Number of Inpatient Hospital Discharges from Previous Output	2,003
Total Number of Inpatient Hospital Discharges with APR-DRG Codes Matched to the Specified list of APR-DRG Codes	524
Percent of Hospital Discharges from Provider 210XXX (n=7,600)	6.9%

Chronic Conditions

The participants may choose to focus their intervention on patients who were previously diagnosed with one or more CCW Chronic Conditions (see Exhibit 1 for references). Alternatively, hospitals may submit a list of specific CCW Chronic Conditions, any one of which a patient must have been diagnosed with prior to hospital discharge. Exhibit 11-A provides detailed specifications for identifying patients diagnosed with one or more CCW Chronic Conditions and excluding those that do not meet the participant's specified criteria.

Exhibit 11-A. Identify Inpatient Hospital Discharges for Patients Diagnosed with Certain CCW Chronic Conditions or a Certain Number of CCW Chronic Conditions.

Objective	Identify inpatient hospital discharges for patients previously diagnosed with the number of CCW Chronic Conditions, or the specific CCW Chronic Conditions, specified by the CTI participant.
Required File Types	Medicare enrollment and demographic file

Required Variables	Inpatient hospital discharge date (DSCHRG_DT*), Mid-year flags (CCC_MID_YYYY or CCCM_YYYY) and End-year flags (CCC_YYYY) for all 27 CCW Chronic Conditions (CCC**) and the two calendar years ("YYYY") overlapping with the targeted Maryland fiscal year.
Logic	1) Let 20Y1 represent the calendar year in which the target period begins and 20Y2 is the calendar year in which the target period ends. 2) If July 1, 20Y1 ≥ DSCHRG_DT* ≥ December 31, 20Y1 then use the mid-year chronic conditions flags for the given year (CCC_MID_20Y1 or CCCM_20Y1) to determine whether a patient was previously diagnosed with chronic condition "CCC." Beneficiaries were diagnosed with chronic condition "CCC" if CCC_MID_20Y1 = 1 or 3. 3) If January 1, 20Y2 ≥ DSCHRG_DT* ≥ June 30, 20Y2 then use the end-year chronic conditions flags for the previous year (CCC_20Y1) to determine whether a patient was previously diagnosed with chronic condition "CCC." Beneficiaries were diagnosed with chronic condition "CCC" if CCC_20Y1 = 1 or 3. 4) Let the minimum threshold for the total number of chronic conditions, specified by the participant, equal *N* (default is *N* = 0). Exclude inpatient hospital discharge claims if the total number of chronic conditions with which the patient was previously diagnosed is not greater than or equal to *N*. 5) If the participant specified a subset of chronic conditions (CCC**), then exclude inpatient hospital discharge claims if the patient was not previously diagnosed with one or more of the specific chronic conditions in subset CCC**.

* Inpatient discharge (DSCHRG_DT) dates corresponding to inpatient hospital discharges that could potentially trigger an episode.

** Possible "CCC" values include ALZH, ALZHDMTA (or ALZHDMT), AMI, ANEMIA, ASTHMA, ATRIALFB, CATARACT, CHF, CHRNKIDN, CNCRENDM, CNCRBRST (or CNCRBRS), CNCRCLRC (or CNCRCLR), CNCRLUNG (or CNCRLNG), CNCRPRST (or CNCRPRS), COPD, DEPRESSN (or DEPRSSN), DIABETES (or DIABTES), GLAUCOMA (or GLAUCMA), HIPFRAC, HYPERL, HYPERP, HYPERT, HYPOTH, ISCHMCHT (or ISCHMCH), OSTEOPRS (or OSTEOPR), RA_OA, and STRKETIA (or STRKTIA).

Example Output Based on a Hypothetical Care Transitions CTI: Chronic Conditions

Exhibit 11-B provides the count of inpatient hospital discharges (i.e., potential episodes) after applying all criteria above and excluding hospital discharges for patients that did not meet the chronic conditions specified by the hypothetical CTI participant for the "Example" CTI described in Exhibit 1. In the example, the participant indicated that patients must have been diagnosed with at least one of the 27 CCW chronic conditions.

Exhibit 11-B. Example Output – Exclude Inpatient Hospital Discharges if the Patient was Not Previously Diagnosed with at Least One CCW Chronic Conditions.

Total Number of Inpatient Hospital Discharges from Previous Output	524
Total Number of Inpatient Hospital Discharges After Excluding Patients Without At least One Chronic Condition	144
Percent of Hospital Discharges from Provider 210XXX (n=7,600)	1.9%

Prior Utilization

Participants may also define their CTI populations through thresholds on prior medical utilization. Participants can specify the setting (i.e., inpatient hospital discharges, outpatient observation stay, or outpatient emergency department visit), the threshold (e.g., 3 inpatient discharges), and the time window for when that threshold was reached (e.g., 3 inpatient discharges in 60 days preceding the index hospitalization). Participants may choose to specify thresholds and time windows for each setting or one threshold and time window for a combination of settings (e.g., 3 inpatient discharges, emergency department visits, or observation stays in 60 days preceding the index hospitalization). Exhibit 12-A provides detailed specifications for identifying patients' prior utilization of inpatient hospital, observation, and emergency department services and excluding those that do not meet the participant's specified criteria.

Exhibit 12-A. Identify Patients' Prior Utilization of Inpatient Hospital, Observation, and Emergency Department Services Prior to the Index Hospitalization.

Objective	Identify inpatient hospital discharges for patients who meet the threshold(s) for prior inpatient discharges, outpatient observation stays, and outpatient emergency department (ED) visits specified by the CTI participant.
Required File Types	Inpatient and Outpatient claims
Required Variables	Claim type code (CLM_TYPE_CD), Provider Medicare Certification Number (PROV_NUM), Inpatient Hospital Discharge date (DSCHRG_DT), Claim service dates (CLM_FROM_DT – CLM_THRU_DT), Revenue Center code (PROD_REV_CTR_CD), Claim Line procedure codes (CLM_LINE_HCPCS_CD), Inpatient Hospital Admission date (ADMSN_DT*)
Logic	1) Let α be the number of days, selected by the participant, to look back from the index hospital admission date (ADMSN_DT*) to identify prior inpatient hospital discharges. Identify all claims for inpatient hospital discharges that occurred during the look back period using the following criteria:

- ✓ CLM_TYPE_CD equal to 60 or 61 (inpatient hospital claim)
- ✓ PROV_NUM between 210001–210879[1]
- ✓ (ADMSN_DT* – α) ≤ DSCHRG_DT < ADMSN_DT*

2) Let β be the number of days, selected by the participant, to look back from the index hospital admission date (ADMSN_DT*) to identify prior outpatient observation stays. Identify all claims for outpatient observation stays that occurred during the look back period using the following criteria:

- ✓ CLM_TYPE_CD equal to 40 (outpatient claim)
- ✓ Any PROD_REV_CTR_CD equal to 0760 or 0762,
  or any CLM_LINE_CHPCS_CD equal to G0378 or G0379
- ✓ (ADMSN_DT* – β) ≤ CLM_THRU_DT ***and*** CLM_FROM_DT < ADMSN_DT*

3) Let γ be the number of days, selected by the participant, to look back from the index hospital admission date (ADMSN_DT*) to identify prior outpatient ED visits. Identify all claims for outpatient ED visits that occurred during the look back period using the following criteria:

- ✓ CLM_TYPE_CD equal to 40 (outpatient claim)
- ✓ Any PROD_REV_CTR_CD in (0450, 0451, 0452, 0456, 0459),
  or any CLM_LINE_CHPCS_CD between 99281–99285
- ✓ (ADMSN_DT* – γ) ≤ CLM_THRU_DT ***and*** CLM_FROM_DT < ADMSN_DT*

4) If the participant chose to count a combination of inpatient hospital discharges, observation stays, or outpatient ED visits, then follow Steps 1–3 to identify those events that occurred within the participant-specified number of days to look back before the index hospital admission date (ADMSN_DT*), and use the following hierarchy to count overlapping events as only one event:

   a) Combine two or more overlapping inpatient hospital stays (and hospital transfers) into a single inpatient event, retaining the earliest ADMSN_DT and latest DSCHRG_DT. Define a hospital transfer as a hospital admission that occurs on the same day or within one day of a previous hospital discharge.

   b) Exclude outpatient ED visits that overlap with an outpatient observation stay: $CLM\_FROM\_DT^{obs} \leq CLM\_THRU\_DT^{ED}$ ***and*** $CLM\_FROM\_DT^{ED} \leq CLM\_THRU\_DT^{obs}$

   c) Exclude outpatient ED visits that overlap with an inpatient hospital stay: $ADMSN\_DT \leq CLM\_THRU\_DT^{ED}$ ***and*** $CLM\_FROM\_DT^{ED} \leq DSCHRG\_DT$

   d) Exclude outpatient observations stays that overlap with an inpatient hospital stay: $ADMSN\_DT \leq CLM\_THRU\_DT^{obs}$ ***and*** $CLM\_FROM\_DT^{obs} \leq DSCHRG\_DT$

5) Exclude inpatient hospital discharge claims from the set of potential episodes if the total number of inpatient stays, outpatient observation stays, and outpatient ED

	visits, respectively or in combination, is not greater than or equal to the threshold specified by the participant.

Abbreviations: *HCPCS*, Healthcare Common Procedure Coding System.

* Inpatient admission (ADMSN_DT) dates corresponding to inpatient hospital discharges that could potentially trigger an episode (i.e., the "index hospitalization").

[1] The first two digits of a Medicare Certification Number (or CCN) identify the State of District in which the provider is located. CCNs for Maryland hospitals begin with 21. The next four digits identify the type of provider. The last four digits for short-term (general and specialty) hospitals are between 0001—0879.

Example Applying Prior Utilization Hierarchy to Overlapping Acute Care Claims

If the participant chose to include a combination of inpatient hospital discharges, observation stays, or outpatient ED visits as part of their prior utilization criteria, then Step 4 in Exhibit 12-A describes the HSCRC hierarchy to apply to count overlapping acute care events as only one event. Exhibit 12-B shows an example scenario in which the hierarchy was applied to the multiple acute care claims identified during one Medicare beneficiary's look back period. After Steps 1 – 3 in Exhibit 12-A were applied, this beneficiary had separate claims for three inpatient hospital discharges, two outpatient ED visits, and one outpatient observation stay during their look back period. After applying the hierarchy, they were considered to have had one outpatient ED visit and two inpatient stays during their look back period.

Exhibit 12-B. Example Applying Prior Utilization Hierarchy to Overlapping Acute Care Claims

Medicare Beneficiary ID	Claim Type	Admission Date / Claim From Date	Discharge Date / Claim Thru Date
ABC1DE2FG34	Outpatient ED	1/28/2018	1/28/2018
ABC1DE2FG34	Inpatient	2/1/2018	2/2/2018
ABC1DE2FG34	Inpatient	2/3/2018	2/4/2018
ABC1DE2FG34	Outpatient Obs.	2/4/2018	2/5/2018
ABC1DE2FG34	Outpatient ED	2/15/2018	2/15/2018
ABC1DE2FG34	Inpatient	2/15/2018	2/18/2018

Medicare Beneficiary ID	Claim Type	Admission Date / Claim From Date	Discharge Date / Claim Thru Date
ABC1DE2FG34	Outpatient ED	1/28/2018	1/28/2018
ABC1DE2FG34	Inpatient	2/1/2018	2/4/2018
ABC1DE2FG34	Inpatient	2/15/2018	2/18/2018

The second inpatient claim's admission date was within one day of the discharge date on the first inpatient claim (red dates), therefore these two inpatient claims were suppressed to create one inpatient hospital stay based on the earliest admission date and latest discharge date between the two inpatient claims. The

service “from” date on the subsequent claim for outpatient observation was the same as the discharge date for the latter hospital stay (blue dates), therefore the observation stay was part of the hospitalization, and the claim was not counted as part of the patient’s prior utilization. Finally, the second outpatient ED visit occurred on the same day as the beneficiary’s most recent inpatient stay during the look back period (purple dates). Therefore, the outpatient ED visit is considered as part of the subsequent hospital stay, and the claim was not counted as part of the patient’s prior utilization.

Example Output Based on a Hypothetical Care Transitions CTI: Prior Utilization

Exhibit 12-C provides the count of inpatient hospital discharges (i.e., potential episodes) after applying all criteria above and excluding hospital discharges for patients that did not meet the threshold for prior utilization specified by the hypothetical CTI participant for the “Example” CTI described in Exhibit 1. In the example, the participant indicated that patients must have had at least one prior hospitalization during the past 365 days.

Exhibit 12-C. Example Output – Exclude Inpatient Hospital Discharges if the Patient did Not Meet the Threshold for Prior Utilization Specified by the Participant.

Total Number of Inpatient Hospital Discharges from Previous Output	144
Total Number of Inpatient Hospital Discharges After Excluding Patients Without At least One Inpatient Hospital Discharge in the Past 365 Days	101
Percent of Hospital Discharges from Provider 210XXX (n=7,600)	1.3%

Look Back for Previous Medical Encounters

Participants may also define their CTI populations by “looking back” to determine whether the patient discharged from the hospital had a medical encounter with a particular type of healthcare provider within a specified number of days before their hospitalization. Participants can specify the type of provider (i.e., primary care, home health agency, skilled nursing facility, short-term acute care hospital, or emergency department), the time window for the encounter, and whether to include or exclude inpatient hospital discharges from the set of potential episodes based on each criterion. More than one criterion can be specified to broaden the CTI population, but combinations of provider types (e.g., one encounter with at a short-term acute care hospital *and* one encounter with a home health agency within 180 days) cannot be specified. Exhibit 13-A provides detailed specifications for identifying previous medical encounters and excluding inpatient hospital discharges where the patient did not meet the participant’s specified criteria.

Exhibit 13-A. Look Back to Identify Discharged Hospital Patients' Previous Medical Encounters.

Objective	Identify inpatient hospital discharges for patients who had a previous medical encounter with a primary care provider, home health agency, skilled nursing facility, short-term acute care hospital, or emergency department within a certain number of days, as specified by the CTI participant.
Required File Types	Supplemental "Taxonomy Crosswalk" file and Inpatient, Outpatient, Carrier, Skilled Nursing Facility, and Home Health Agency claims
Required Variables	Claim type code (CLM_TYPE_CD), Provider Medicare Certification Number (PROV_NUM), Inpatient Hospital Discharge date (DSCHRG_DT), Claim service dates (CLM_FROM_DT – CLM_THRU_DT), Revenue Center code (PROD_REV_CTR_CD), Claim Line procedure codes (CLM_LINE_HCPCS_CD), Carrier Rendering Provider National Provider Identifier number (RNDRG_PRVDR_NPI_NUM), National Provider Identifier number (NPI) in the "Taxonomy Crosswalk" file, Primary taxonomy code ("PRIMARY"), Inpatient Hospital Admission date (ADMSN_DT*)
Logic	1) Let α be the number of days, selected by the participant, to look back from the index hospital admission date (ADMSN_DT*) to identify prior inpatient hospital discharges. Identify all claims for inpatient hospital discharges that occurred during the look back period using the following criteria: ✓ CLM_TYPE_CD equal to 60 or 61 (inpatient hospital claim) ✓ PROV_NUM between 210001–210879[1] ✓ (ADMSN_DT* – α) ≤ DSCHRG_DT < ADMSN_DT* 2) Let γ be the number of days, selected by the participant, to look back from the index hospital admission date (ADMSN_DT*) to identify prior outpatient ED visits. Identify all claims for outpatient ED visits that occurred during the look back period using the following criteria: ✓ CLM_TYPE_CD equal to 40 (outpatient claim) ✓ Any PROD_REV_CTR_CD in (0450, 0451, 0452, 0456, 0459), ***or*** any CLM_LINE_CHPCS_CD between 99281–99285 ✓ (ADMSN_DT* – γ) ≤ CLM_THRU_DT *and* CLM_FROM_DT < ADMSN_DT* 3) Let ε be the number of days, selected by the participant, to look back from the index hospital admission date (ADMSN_DT*) to identify a previous stay at a skilled nursing facility. Identify whether the patient was admitted to a skilled nursing facility on any day during the look back period using the following criteria: ✓ CLM_TYPE_CD equal to 20 or 30 ✓ (ADMSN_DT* – ε) ≤ CLM_THRU_DT *and* CLM_FROM_DT < ADMSN_DT*

4) Let ζ be the number of days, selected by the participant, to look back from the index hospital admission date (ADMSN_DT*) to identify a previous encounter with a home health agency. Identify whether the patient was in the care of a home health agency on any day during the look back period using the following criteria:

   - ✓ CLM_TYPE_CD equal to 10
   - ✓ (ADMSN_DT* – ζ) ≤ CLM_THRU_DT *and* CLM_FROM_DT < ADMSN_DT*

5) Let θ be the number of days, selected by the participant, to look back from the index hospital admission date (ADMSN_DT*) to identify a previous encounter with a primary care provider. Identify whether the patient had an encounter with a primary care provider on any day during the look back period using the following criteria:

   - ✓ CLM_LINE HCPCS_CD equal to any procedure code listed in Exhibit 13-B

     or

     CLM_LINE_HCPCS_CD equal to any procedure code listed in Exhibit 13-C ***and*** TAXONOMY (linked to Carrier claims by matching the corresponding NPI in the "Taxonomy Crosswalk" file to the RNDRG_PRVDR_NPI_NUM on the Carrier claims) equal to any taxonomy code listed in Exhibit 13-C.
   - ✓ (ADMSN_DT* – θ) ≤ CLM_THRU_DT and CLM_FROM_DT < ADMSN_DT*

6) *Exclude* inpatient hospital discharge claims from the set of potential episodes if the participant specified that the patient should be *included* when they had a previous encounter with a primary care provider, home health agency, skilled nursing facility, short-term acute care hospital, or emergency department within a certain number of days, *and none of those criteria were met* (i.e., only one of the participant's specified *inclusion criteria* needs to have been met).

7) *Exclude* inpatient hospital discharge claims from the set of potential episodes if the participant specified that the patient should be *excluded* when they had a previous encounter with a primary care provider, home health agency, skilled nursing facility, short-term acute care hospital, or emergency department within a certain number of days, *and at least one of those criteria were met* (i.e., only one of the participant's specified exclusion criteria needs to have been met).

* Inpatient admission (ADMSN_DT) dates corresponding to inpatient hospital discharges that could potentially trigger an episode (i.e., the "index hospitalization").

[1] The first two digits of a Medicare Certification Number (or CCN) identify the State of District in which the provider is located. CCNs for Maryland hospitals begin with 21. The next four digits identify the type of provider. The last four digits for short-term (general and specialty) hospitals are between 0001—0879.

Exhibit 13-B provides the list of procedure codes that can be used alone to identify a primary care claim. Exhibit 13-C provides the list of procedure codes and Maryland Primary Care Practitioner Taxonomy Codes that must both be on the same claim to identify primary care claims.

Exhibit 13-B. Procedure Codes That Indicate a Primary Care Visit

Description	Procedure Codes (HCPCS/CPT)
Welcome to Medicare	G0402
Annual Wellness Visit	G0438, G0439
Chronic Care Management, Complex Chronic Care Management, and Care Planning for Chronic Care Management Beneficiary Services	99487, 99489-99491
Transitional Care Evaluation and Management Services	99495, 99496
Home Care	99324–99328, 99334–99337, 99339–99345, 99347–99350
Prolonged Services	99354, 99355
Advance care planning	99497, 99498

Abbreviations: *HCPCS*, Healthcare Common Procedure Coding System; *CPT*, Current Procedural Terminology (CPT)

Exhibit 13-C. Procedure Codes and Maryland Primary Care Practitioner Taxonomy Codes: One Procedure Code and One Taxonomy Code Must be on a Single Claim to Indicate a Primary Care Visit

Description	Procedure Codes (HCPCS/CPT)
Psychiatric Collaborative Care Management Services	99492-99494, G0502-G0504[1]
Office or Other Outpatient Services	99201-99205, 99211-99215
Preventive Medicine Services	99381-99429
Cognition and Functional Assessment for Patient with Cognitive Impairment	99483, G0505[1]

Taxonomy	Code	Taxonomy	Code
Family Medicine	207Q00000X	Hospice and Palliative Medicine	207VH0002X
Adolescent Medicine	207QA0000X	Maternal & Fetal Medicine	207VM0101X
Addiction Medicine	207QA0401X	Obstetrics	207VX0000X
Adult Medicine	207QA0505X	Pediatrics	208000000X
Geriatric Medicine	207QG0300X	Psychiatry	2084P0800X
Hospice and Palliative Medicine	207QH0002X	General Practice	208D00000X
Internal Medicine	207R00000X	Physician Assistant	363A00000X
Adolescent Medicine	207RA0000X	Medical	363AM0700X
Addiction Medicine	207RA0401X	Nurse Practitioner	363L00000X
Geriatric Medicine	207RG0300X	Acute Care	363LA2100X
Hospice and Palliative Medicine	207RH0002X	Adult Health	363LA2200X
Obstetrics & Gynecology	207V00000X	Community Health	363LC1500X
Gynecology	207VG0400X	Family	363LF0000X

Abbreviations: *HCPCS*, Healthcare Common Procedure Coding System; *CPT*, Current Procedural Terminology (CPT)

* G-codes are obsolete as of 12-31-2017

Example Output Based on a Hypothetical Care Transitions CTI: Look Back for Previous Medical Encounters

In the "Example" CTI described in Exhibit 1, the hypothetical CTI participant did not specify a previous medical encounter as a criterion for the inclusion or exclusion of inpatient hospital discharges in the set of potential episodes. That is, the Participant chose the default option for this subset of criteria. The total number of inpatient hospital discharges remains the same as in the previous output (see Exhibit 12-C).

Exhibit 13-D. Example Output – Exclude Inpatient Hospital Discharges if the Patient did Not Meet the (Default) Threshold for Previous Medical Encounters Specified by the Participant

Total Number of Inpatient Hospital Discharges from Previous Output	101
Total Number of Inpatient Hospital Discharges After Accounting for Previous Medical Encounters	101
Percent of Hospital Discharges from Provider 210XXX (n=7,600)	1.3%

Look Forward to the First Setting of Care Post Discharge

Participants can choose to specify the first setting of care for patients after they were discharged from hospitalization, i.e., inpatient post-acute care (long term care hospital or inpatient rehabilitation facility), skilled nursing facility, home health agency, or community). Participants can choose to include or exclude patients based on whether they were referred to each setting and more than one setting of care can be specified to broaden the CTI population. Exhibit 14-A provides detailed specifications for identifying patients' first setting of care after hospital discharge and excluding hospital discharges where the patient did not meet the participant's specified criteria.

Exhibit 14-A. Look Forward to Identify the First Setting of Care After Hospital Discharge.

Objective	Identify inpatient hospital discharges for patients referred to inpatient post-acute care (long term care hospital or inpatient rehabilitation facility), a skilled nursing facility, a home health agency, or the community and exclude if the criteria specified by the CTI participant were not met. *
Required File Types	Supplemental "First PAC" file
Required Variables	Medicare beneficiary Identification number (MBI_NUM), Current Unique Claim Identifier (CUR_CLM_UNIQ_ID), Index admission claim number (INDXADM_CLAIM_NO) in the "First PAC" file, First post-acute care setting after hospital discharge (EPIS_FIRST_PAC).
Logic	1) Identify the Current Unique Claim Identifier (CUR_CLM_UNIQ_ID) for each of the remaining inpatient hospital discharge claims in the set of potential episodes.

	2) Match the CUR_CLM_UNIQ_ID to index admission claim number (INDXADM_CLAIM_NO) in the "First PAC" file to identify the first post-acute care setting after hospital discharge (EPIS_FIRST_PAC) corresponding to each inpatient hospital discharge claim. 3) *Exclude* inpatient hospital discharge claims from the set of potential episodes if the first post-acute care setting does not match one of the settings specified by the participant to be *included* in the CTI population. 4) *Exclude* inpatient hospital discharge claims from the set of potential episodes if the first post-acute care setting does match one of the settings specified by the participant to be *excluded* from the CTI population.

** First post-acute care settings are determined using MADE's algorithm to identify patients' first PAC setting after hospital discharge.*

Example Output Based on a Hypothetical Care Transitions CTI: Look Forward to the First Setting of Care Post Discharge

Exhibit 14-B provides the count of inpatient hospital discharges (i.e., potential episodes) after applying all criteria above and excluding hospital discharges for patients that did not meet the look forward criteria specified by the hypothetical CTI participant for the "Example" CTI described in Exhibit 1. In the example, the participant chose to *exclude* all inpatient hospital discharges where the patient was referred home (to the community).

Exhibit 14-B. Example Output – Exclude Inpatient Hospital Discharges if the Patient did Not Meet the Look forward Criteria Specified by the Participant.

Total Number of Inpatient Hospital Discharges from Previous Output	101
Total Number of Inpatient Hospital Discharges After Excluding Patients Without Whose First Setting After Hospital Discharge was in the Community	80
Percent of Hospital Discharges from Provider 210XXX (n=7,600)	1.1%

Construct the CTI Population

Once the general and customizable criteria have been addressed by the user, the remaining set of inpatient hospital discharge claims represent the set of *potential* episodes in the given CTI population. The inpatient hospital discharge claim is known as the "triggering" claim or event. The episode begin date is the hospital admission date if the participant chose to include the costs of the triggering hospital stay in total episode costs. The episode begin date is the hospital discharge date if they chose not to include the costs of the triggering hospital stay. The episode end date is the discharge date plus the episode length specified by the participant (minus one day).

Unprohibited and Prohibited Episode Overlaps Across CTI Definitions and Thematic Areas

Overlaps That are Not Allowed:

- Episodes that trigger multiple episode-based CTI definitions for the same hospital participant.
- Beneficiaries attributed to more than one of the same hospital participant's panel-based CTIs.

Allowed Overlaps:

- Episodes or beneficiaries attributed to two different hospital participants.
- Episodes or beneficiaries attributed to the same hospital participant, but under one episode-based CTI and one Panel-based CTI.

The ***final*** set of episodes for a given CTI definition is determined after removing episodes where the hospital discharge:

- Occurred during the episode window of another potential episode that was triggered earlier, based on the same CTI definition; or
- Triggered episodes under multiple CTI definitions in which the hospital is participating.

CTI episodes *are allowed* to overlap if they are attributed to different participants (i.e., under different CTI definitions), even if it was the same hospital discharge that triggered episodes for multiple participants.

Exclude Overlapping Episodes Within a Given CTI Definition

To avoid duplicating costs when calculating total episode costs, beneficiaries can only have one active episode per day under the same CTI definition. Using the remaining set of inpatient hospital discharges *for this CTI definition*, eliminate hospital discharges that occurred during the episode window of another potential episode (i.e., episodes under the same CTI definition that were triggered by a previous inpatient hospital discharge). Exhibit 15-A provides detailed specifications for eliminating overlapping episodes.

Exhibit 15-A. Exclude Inpatient Hospital Discharges That Occurred During Other Potential Episodes.

Objective	Exclude inpatient hospital discharges that were triggered during the episode window for a potential episode triggered by a previous inpatient hospital discharge.
Required File Types	Not applicable (only output from previous steps)

Required Variables	Medicare Beneficiary Identification Number (MBI_NUM), Inpatient Hospital Admission date (ADMSN_DT), Inpatient Hospital Discharge date (DSCHRG_DT)
Logic	1) Sort potential episodes by MBI_NUM and from earliest to latest begin date. 2) For each MBI_NUM: Start with the earliest episode begin date and exclude the hospital discharge claim if the episode begin date occurs between the begin date and end date of an earlier potential episode, or where: ✓ Other episode begin date ≤ DSCHRG_DT* ✓ DSCHRG_DT* ≤ Other episode end date 3) Repeat Step 2 for the MBI_NUM's remaining episodes.

* Replace DSCHRG_DT with ADMSN_DT if the costs of the index inpatient hospitalizations are included in total episode costs.

Exhibit 15-B shows an example scenario in which there are two sets of overlapping potential episodes triggered by the same beneficiary under a given CTI definition. Episode 2 (in red) begins during the episode window for Episode 1. Episode 3 begins during the episode window for Episode 2. After eliminating Episode 2, Episode 3 does not overlap with any of the remaining episodes for this beneficiary and is retained in the final set of episodes for this CTI definition.

Exhibit 15-B. Example Excluding One of Two Overlapping Episode for the Same Beneficiary.

Medicare Beneficairy ID	Episode ID	Admission Date	Discharge Date	Length of Episode	Episode Begin Date	Episode End Date
ABC1DE2FG34	1	2/1/2018	2/2/2018	90	2/2/2018	5/2/2018
ABC1DE2FG34	2	2/23/2018	2/25/2018	90	2/25/2018	5/25/2018
ABC1DE2FG34	3	5/5/2018	5/9/2018	90	5/9/2018	8/6/2018

Note: The user should exclude Episode 2 because it overlaps with Episode 1. The user should not exclude Episode 3 because it does not overlap any of the remaining episodes for this beneficiary after Episode 2 is excluded.

Example Output Based on a Hypothetical Care Transitions CTI: Overlapping Episodes

Exhibit 15-C provides the count of inpatient hospital discharges (i.e., potential episodes) after applying all criteria above and excluding hospital discharges for patients that occurred during the episode window of another potential episode.

Exhibit 15-C. Example Output – Exclude Inpatient Hospital Discharges That Occurred During Other Potential Episodes.

Total Number of Inpatient Hospital Discharges from Previous Output	80
Total Number of Inpatient Hospital Discharges After Excluding Overlapping Potential Episodes	52
Percent of Hospital Discharges from Provider 210XXX (n=7,600)	0.7%

Eliminate Episodes that Overlap Other CTI Definitions

Beneficiaries can only have one active CTI episode attributed to the same hospital participant, per day. Overlapping episodes between different CTI definitions are resolved according the HSCRC's CTI hierarchy, which prioritizes CTIs from lowest to highest episode volume to ensure that smaller CTIs are attributed as many episodes as possible. Moreover, a specific triggering event (e.g., an inpatient hospital discharge) is allowed to trigger only one CTI episode. If a single event could trigger multiple episode-based CTI definitions, then the CTI definition with the highest precedence in the CTI hierarchy is retained and the others are excluded from their respective CTI populations.[1]

Participants that are participating in more than one CTI definition are allowed to designate their own hierarchy to determine the precedence between overlapping CTIs, as a substitute for HSCRC's default CTI hierarchy.

Calculate Total Episode Costs

Total cost of each episode equals the total cost of care accrued by the beneficiary during the episode window. If the participant chose to include the cost of the triggering hospital stay in the total episode costs, then the episode window starts on the day the patient was admitted to the hospital. Otherwise, the episode window starts on the day the patient was discharged from the hospital. Total costs of care equal the cumulative Medicare Parts A and B expenditures accrued by the beneficiary during the episode window, after excluding certain types of Medicare payments.

Excluded Episode Costs

Exhibit 16 lists the specific types of payments that the HSCRC excludes before calculating total costs of care. If the level of payment is at the claim-line level, then only the claim-line should be removed from the dataset before calculating total costs of care (i.e., all other payments made on the given claim contribute to

[1] Episodes or beneficiaries attributed to the same hospital participant, but under one episode-based CTI and one Panel-based CTI, are allowed. However, beneficiaries who qualify to be attributed to more than one of a hospital's panel-based CTIs are only allowed to be attributed to one panel-based CTI.

the total costs of care). If the level of payment is at the claim level, then the entire claim can be removed from dataset before calculating total costs of care.

Exhibit 16. Medicare Payments Excluded from Calculations of Total Episode Costs.

Description	Level of Payment
Claims with negative standardized amounts	Claim
Payments on outpatient, carrier, and durable medical equipment claims for blood clotting factor (CLM_LINE_HCPCS_CD = J7199).	Claim-Line
Payments on Inpatient claims for new technology add-ons (CLM_VAL_CD = 77)	Claim-Line
Medical device pass-through payments on outpatient claims (REVSTIND = H).	Claim-Line
Per-beneficiary-per-month payments on carrier and hospice claims (CLM_LINE_HCPCS_CD = G9678).	Claim-Line
Per-beneficiary-per-month payments on hospice claims made under the Medicare Care Choices Model (DEMO_ID_NUM = 73 ***and*** CLM_BILL_FAC_TYPE_CD = 8 ***and*** CLM_BILL_CLSFCTN_CD = 1 or 2).	Claim

Calculate Episode Costs

Exhibit 17. Calculate Total Episode Costs for a Given CTI Definition.

Objective	Calculate total episode costs as the cumulative Medicare Parts A and B expenditures accrued by each beneficiary during their episode window, after excluding certain types of expenditures.
Required File Types	All Fee-For-Service (FFS) Claims
Required Variables	Medicare Beneficiary Identification Number (MBI_NUM), User generated Episode ID, Episode Begin Date, and Episode End Date, Claim service dates (CLM_FROM_DT – CLM_THRU_DT), Claim Payment Amount (CLM_PYMT_AMT)
Logic	1) Exclude claim or claim-line payments for the services listed in Exhibit 16. 2) For each episode, retain all FFS claims that meet the following criteria: ✓ MBI_NUM = MBI_NUM associated with the attributed patient. ✓ Episode begin date ≤ CLM_THRU_DT ✓ CLM_FROM_DT ≤ Episode end date. 3) Prorate claim payments (see proration methodology in Exhibits 18 and 19) that span beyond the episode window to allocate the appropriate portion of those payments to the episode. 4) Sum the total or prorated paid amounts (CLM_PYMT_AMT) on all claims meeting the criteria in Steps 1 and 2 to obtain the total episode costs.

Prorated Episode Costs

The HSCRC prorates claims and payments that span beyond the episode window to appropriately allocate a portion of those payments to the episode. The HSCRC uses two methods to prorate claims, depending on the claim type.

- The ***per diem method*** prorates payments based on the number of days in the claim that occur during the clinical episode.
- The ***length of stay (LOS) method*** prorates *non-outlier* payments by comparing the number of days of an inpatient stay that overlaps the episode window with the mean length of stay for the same Diagnosis Related Group (DRG) during the same fiscal year.

Exhibit 18 lists the proration method used for all claim types. Exhibit 19 describes the steps used by the HSCRC to prorate all claims that overlap with a beneficiary's episode window.

Exhibit 18. Proration Method by Claim Type

Claim Type	Proration Method
Carrier (i.e., professional)	Never prorate
Critical access hospitals	Per diem
Durable medical equipment	Never prorate
Home health agency	Per diem
Hospice	Per diem
Inpatient psychiatric facility	Per diem
Hospital Inpatient (non-outlier payments)	LOS
Hospital Inpatient (outlier payments)	Per diem
Long-term care hospital (non-outlier payments)	LOS
Long-term care hospital (outlier payments)	Per diem
Hospital Outpatient	Never prorate
Skilled nursing facility	Per diem

Exhibit 19. Prorate Claims and Payments That Span Beyond the Episode Window.

Objective	Identify all claims that overlap with the clinical episode but end after the clinical episode and retain the subset of payments that should be assigned to the clinical episode.
Required File Types	All Fee-For-Service (FFS) Claims (after excluding payment types in Exhibit 16).
Required Variables	Claim type code (CLM_TYPE_CD), Episode Begin Date and Episode End Date, Claim service dates (CLM_FROM_DT – CLM_THRU_DT), Claim Payment Amount (CLM_PYMT_AMT)
Logic	1) Identify claims to prorate: Identify all claims that overlap with the clinical episode but end after the clinical episode to determine if all or a subset of payments are assignable to the clinical episode. Never prorate outpatient, carrier and durable medical equipment claims. Assign them to the clinical episode. 2) Identify and prorate the following types of claims based upon a per-diem rate: Assign payments to the clinical episode proportionate to the total number of days on the claim that occur during the clinical episode. ✓ Critical Access Hospitals ✓ Home Health Agency ✓ Hospice ✓ Inpatient Psychiatric Facility ✓ Skilled Nursing Facility 3) Distinguish outlier payment amounts from and non-outlier payment amounts on the remaining claim types to be prorated (Inpatient Rehabilitation Facility, Long Term Care Hospital, and Hospital Inpatient): • Outlier payment amounts: https://www.cms.gov/medicare/medicare-fee-for-service-payment/acuteinpatientpps/outlier 4) Prorate outlier payments on a per-diem basis, as described in Step 2 5) For non-outlier payments, calculate the number of days of the inpatient stay (on the claim that needs to be prorated) that overlap with the episode window *and* the average length of stay for inpatient stays with the same diagnosis related group (DRG) during the same fiscal/target year: • If the number of days that overlap the episode window is greater than the average length of stay, then assign the full non-outlier payment amount to the episode. • Otherwise, prorate on a per-diem basis, giving double weight to the first day of the overlap.

Disclaimer: Episode Costs Cannot be Perfectly Replicated Using CCLF Data

All regulated payments are standardized using the CMS methodology for standardized allowed amounts to avoid feedback effects from the Global Budget Revenue. After standardization, regulated payments are

converted back to real dollars using the ratio of actual to standardized payments. The ratio is based on total regulated payments for each hospital over full performance years (the same ratio is used to calculate target prices and determine reconciliation). The episode costs calculated by the HSCRC cannot be perfectly replicated using the CCLF data files because the CCLF data does not include standardized amounts.

Completion Factors

The claims processing, adjudication, and finalization process can take up to a year to complete, which introduces considerable delays into reporting for most claims-based program evaluation. Until this process works its course, claims are considered *incomplete*, making comparative assessments of payments on these claims difficult. The proportion of claim payments reflected by final action claims in the CCLF at any given point in time relative to the final, total paid amount is called the *claims completion factor*.

To facilitate faster turnaround on participants' performance data while ensuring a consistent and accurate evaluation of program payments, the HSCRC developed a method of extrapolating the amounts on nearly complete claims, called the *claims completion process*. This is done by 'freezing' each claim after three months of runout from the date of service, as opposed to delaying claim reporting until all claims are totally complete. A *claims completion factor* is then applied to this amount to inflate it to the expected final amount. This period was determined via actuarial analysis of claims throughout the history of the Total Cost of Care model, which found that at three months of claims payments – in aggregate – are about 93% complete.

Each type of claim has a different completion curve which varies over time, so individual completion factors are calculated for each claim type and period, then applied to the claim paid amounts for matching claims before calculating the final paid amount. This is done for both baseline and performance period calculations. Exhibit 20 shows a *hypothetical* example of how completion factors are applied. The completed amount is then used as the input for all downstream payment calculations.

Exhibit 20. Example of How Three-Month Completion Factors are Applied to Claim Payments.

Type of Service	3 Month Completion Factor (FY 2020)	3-Month Paid Amount	Completed 12-Month Paid Amount
10 – Home Health	.9280	$100	$107.76
20 – Non-Swing Bed SNF	.9431	$100	$106.03
30 – Swing Bed SNF	.9152	$100	$109.27
40 – Outpatient	.9540	$100	$104.82
50 – Hospice	.9427	$100	$106.08
60 - Inpatient	.9800	$100	$102.04
71 – Carrier Non-DMEPOS	.9515	$100	$105.10
72 – Carrier DMEPOS	.8764	$100	$114.11
81 – DMERC non-DMEPOS	.9169	$100	$109.06
82 – DMERC DMEPOS	.8962	$100	$111.58

Inflation Adjustments

All claims are inflated to performance period dollars prior to calculating episode costs, revised target prices, and reconciliation amounts. All payments for a given period displayed in the CTP (baseline and performance) are displayed in same-year dollars for comparability. Non-regulated payments are inflated based on CMS' PPS-specific market basket update factors. Regulated payments are inflated based on HSCRC update factors. Additional adjustments account for unique policy scenarios (e.g., suspension of sequestration during the Covid-19 PHE) or changes in policy during the performance year. For example, the HSCRC implemented a special adjustment to payments during the first CTI performance year to account for overpayments in the Skilled Nursing Facility Prospective Payment System (PPS) due to a change in CMS payment policy beginning in 2019.

Inflation Adjustments for Unregulated Payments

Actual regulation market basket update data used by CMS for PPS values are used to inflate the unregulated Medicare fee-for-service payments used for assessing CTI episodes. Data files and methodology are available from the CMS.gov research, statistics, data, and systems site (https://www.cms.gov/research-statistics-data-and-systems/statistics-trends-and-reports/medicareprogramratesstats/marketbasketdata). Only the general CMS inflation update policy is applied. The inflation process is not intended to replicate any program-specific inflation policies from other CMS initiatives (e.g., MIPS), as these may vary from program to program.

For each PPS claim type, the full market basket updates for every intervening period between the baseline and performance periods, less the productivity adjustment, are used to calculate the cumulative amount of inflation between the baseline and performance period. Then, every claim payment variable (e.g., CLM_PYMT_AMT) is adjusted by the cumulative inflation amount. Exhibit 21 provides a simplified example of inflation adjustments for an episode with only two claims with unregulated payments contributing to the total episode costs.

Exhibit 21. Simplified Example of an Episode That Includes Two Claims with Unregulated Payments.

Skilled Nursing Facility PPS	FY2017	FY2018	FY2019	FY2020	FY21	FY22
Actual Regulation Market Basket Update	2.4	2.0	2.0	2.4	2.2	2.0
Actual baseline 2017 claim payment total: $100 Cumulated SNF Inflation Factor = 1.02 * 1.02 * 1.024 * 1.022 * 1.02 = 1.11058 Inflated claim payment total = $100 * 1.11058 = $111.05						
Home Health Agency PPS	**FY2017**	**FY2018**	**FY2019**	**FY2020**	**FY21**	**FY22**
Actual Regulation Market Basket Update	2.5	1.9	2.2	2.6	2.0	2.6
Actual baseline 2017 claim payment total: $50 Cumulated HHA Inflation Factor = 1.019 * 1.022 * 1.026 * 1.02 * 1.026 = 1.1182 Inflated claim payment total = $50 * 1.1182 = $55.91						
Uninflated episode total = $150 ($100.00 + $50.00) **Inflated episode total = $166.97** ($111.05 + $55.91)						

Inflation Adjustments for Regulated Payments

All regulated setting payments (hospital inpatient PPS and hospital outpatient PPS for Maryland regulated hospitals) are standardized, inflated, and renormalized to derive an inflation adjusted amount that eliminates any GBR fluctuations or payment policy from influencing or penalizing payment evaluation:

1) All regulated payments are first standardized using the CMS standardization methodology for allowed amounts at the claim level.

2) A hospital-specific Standardization Ratio is then calculated as the ratio of actual paid to standardized paid over the entire Program Baseline Period (i.e., Actual Paid Amount / Standardized Payment Amount). For example, if the actual Maryland charges are $100 in the program baseline period and standardized payments are $60, then the Standardization Ratio is 1.66 (= 100 / 60).

3) For each period, a cumulative HSCRC inflation factor is calculated as the cumulative HSCRC inflation for the prior year multiplied by (1 + the current year update factor). The program baseline period cumulative HSCRC inflation factor is equal 1.0. The HSCRC provides update factors for each period based on the actual Maryland policy for that time window. This process is otherwise similar to the inflation factor cumulation example shown in Exhibit 21.

4) The standardized amounts are multiplied by the cumulated inflation factor for the given performance period to arrive at a standardized, inflated amount.

5) The standardized, inflated amount is then converted to an inflation-adjusted actual amount by multiplying by the standardization ratio for that hospital:

$$\textbf{Final Inflated Regulated Claim Payment Amount} = Standardized\ Payment * Inflation_{Period} * Standardization\ Ratio_{Participant}$$

Calculating a Participant's Target Price for a Single CTI Definition

For each participant and CTI definition, the target price is calculated as the predicted level of episode spending during the performance period, based on:

- The participant's average episode spending during a selected baseline period.
- The average Hierarchical Condition Categories (HCC) score among the participant's attributed beneficiaries.
- The average All Patients Refined Diagnosis Related Groups and Severity of Illness (APR-DRG-SOI) weight among the participant's attributed beneficiaries (*Note*: APR-DRG weights are only included when episodes are triggered by an inpatient hospital stay).

Calculating a Preliminary Targe Price

The HSCRC uses state-wide data to assigns a preliminary target price to each CTI definition in a CTI thematic area based on the following equation:

$$\textbf{Total Episode Costs} = \alpha_{state} + \alpha_{attributed} + \beta * HCC + \gamma * APRDRG$$

where:

- HCC: average HCC score of beneficiaries in all episodes triggered in Maryland during the baseline period.
- $APRDRG$ is the average APR-DRG-SOI weight associated with the triggering hospital stay for all episodes triggered in Maryland during the baseline period (only included when episodes are triggered by an inpatient hospital stay; currently, these include the *Care Transitions* and *Palliative Care* CTIs).
- α is a series of fixed effects that capture the average baseline costs of unattributed (α_{state}) and attributed ($\alpha_{attributed}$) episodes for each hospital provider in the state of Maryland during the baseline period, adjusted for the HCC scores and APR-DRG weights of the beneficiaries. (*Note: α_{state} was added to the target price equation in PY2. PY1 Target Prices were calculated using only one series of fixed effects to capture the average baseline cost of each provider's attributed episodes, adjusted for HCC score and APR-DRG.)*
- β captures the state-wide average effect of the HCC score on episode costs (one value for all potential episodes for a given CTI definition).

- γ captures the state-wide average effect of the APR-DRG weight on episode costs (one value for all potential episodes for a given CTI definition).

A participant's ($\boldsymbol{p}$) preliminary target price for a given CTI definition is calculated using the model parameters estimated from baseline data and the average risk scores ($\overline{\boldsymbol{HCC}}^{\boldsymbol{p}}$ and $\overline{\boldsymbol{APRDRG}}^{\boldsymbol{p}}$) among the patients/episodes that were attributed to the participant during the baseline period:

$$\boldsymbol{Preliminary\ Target\ Price^{p} = \alpha^{p}_{attributed} + \beta * \overline{HCC}^{p} + \gamma * \overline{APRDRG}^{p}}$$

Calculating a Final Targe Price

The target price for a given CTI definition is revised prior to reconciliation to account for changes in a participant's average risk score between the baseline and intervention periods. A participant's final target price is based on the preliminary model parameters estimated from baseline data and the average risk scores ($\overline{\boldsymbol{HCC}}^{\boldsymbol{p}}$ and $\overline{\boldsymbol{APRDRG}}^{\boldsymbol{p}}$) among the patients that were attributed to the participant during the performance period. Exhibit 22 provides an example of how a hypothetical CTI definition's target price could be revised based on the change in the average HCC score and average APR-DRG-SOI weight among beneficiaries attributed to the participant during the baseline and performance periods.

Exhibit 22. Example Calculation of a CTI Definitions Preliminary and Final Target Prices

CTI	Period	Intercept (α)	Average HCC Score	HCC Coefficient (β)	Average APR-DRG Weight	APR-DRG Coefficient (γ)	Target Price
01-999	**Baseline**	$14,915	3.69	$172.22	1.23	$16,507.13	**$35,854.26**
01-999	**Performance**	$14,915	3.23	$172.22	1.24	$16,507.13	**$35,940.11**

Calculating Reconciliation Payments for a CTI Participant

A participating hospital's reconciliation payments are based on the cumulative amount of savings that the participant achieves across all episode-based CTIs in all CTI thematic areas in which they chose to participate. A participant's cumulative savings rate, across all episode-based CTIs, is calculated as

$$\textbf{\textit{Cumulative Savings Rate}} = \sum_{n=1}^{N}\left[1 - \left(\frac{Total\ Episode\ Costs}{Final\ Target\ Price * Episode\ Volume}\right)\right]_n$$

where N is the total number of episode-based CTI definitions in which the hospital participated during the performance year, across all CTI thematic areas.

The HSCRC reconciles a participant's actual cumulative savings against a participant-specific Minimum Savings Rate (MSR) that is determined by the total volume of episodes across all episode-based CTIs in all CTI thematic areas in which they participate. A participant's cumulative episode-based CTI savings must be greater than the MSR to receive a CTI reconciliation payment. The participant's episode-based CTI reconciliation payment is equal to the amount of cumulative savings exceeding their episode-based MSR ***minus the statewide savings offset***.

Determining the Minimum Savings Rate

Episode-based and Panel-based CTI Savings are calculated separately for each CTI participant. A hospital participant is assigned a single MSR for all its episode-based CTIs, according to the total volume of episodes across all its episode-based CTIs. A hospital participant is also assigned a single MSR for all its panel-based CTIs, according to the total volume of beneficiaries across all its panel-based CTIs. The table in Exhibit 23 shows how the MSR increases with the participant's total volume of episodes or beneficiaries.

Episode Versus Panel-Based CTIs

Episode-based CTIs (e.g., *Care Transitions* CTI):

- "Triggered" by a specific type of medical encounter and a specific patient profile.
- Episodes are attributed to providers involved in the medical encounter.
- Episodes begin on any date during the performance year and end after a specified length of time.

Panel-based CTIs:

- Patients meeting a specific patient profile are attributed to providers based on a
  - History of medical encounters between them (e.g., *Primary Care* CTI)
  - Specified provider service area (e.g., *Community Based Care* CTI)
- Patients are attributed to a provider for the full performance year.

Exhibit 23. Minimum Savings Rates for Episode-based and Panel-based CTIs, by Volume

Minimum Savings Rate (%)	Episode-Based CTI Volume	Panel-Based CTI Volume
1.0	> 8,977	> 19,655
1.5	3,991 – 8,977	8,736 – 19,655
2.0	2,246 – 3,990	4,916 – 8,735
2.5	1,441 – 2,245	3,146 – 4,915
3.0	1,001 – 1,440	1,286 – 3,145
3.5	731 – 1,000	1,606 – 1,285
4.0	561 – 730	1,231 – 1,605
4.5	441 – 560	971 – 1,230
5.0	361 – 440	791 – 970
5.5	301 – 360	651 – 790
6.0	251 – 300	551 – 650
6.5	210 – 250	466 – 550
7.0	181 – 210	401 – 465
7.5	161 – 180	351 – 400
8.0	141 – 160	311 – 350
8.5	126 – 140	271 – 310
9.0	111 – 125	246 – 270
9.5	101 – 110	221 – 245
10.0	91 – 100	201 – 220
15.0	< 91	< 201

Calculate the Reconciliation Amount

A participant's reconciliation amount is calculated in the following manner:

1) Rank the participant's episode-based CTIs (i.e., each CTI definition) according to how much actual CTI savings exceeded the required CTI savings. Required CTI savings for each CTI is equal to the sum of Total Episode Costs across all episodes multiplied by the participant-specific MSR.
2) Starting from the CTI with the most savings:
    - Actual and required savings are accumulated over subsequent CTIs and compared.
    - If the cumulative actual savings exceed the cumulative required savings, then another CTI is added.
    - If not, the hospital earns the cumulative amount of actual savings prior to the addition of the most recently added CTI.
3) Reconciliation payments are equal to the recognized amount of cumulative savings *minus the statewide savings offset*.

Exhibit 24 presents a hypothetical scenario for a hypothetical participant in seven different episode-based CTIs. In this scenario, the participant's total recognized savings is $1,013,000.

Exhibit 24. Example Scenario for Calculating the Total Recognized Savings for a CTI Participant

CTI	Number of Episodes	Total Episode Costs (Thousands $)	Minimum Savings Rate (MSR)	Required Savings (Thousands $)	Actual Savings (Thousands $)	Difference (Ranked Highest to Lowest)	Cumulative Episode Costs	Cumulative Required Savings	Cumulative Actual Savings
CTI 3	175	$6,300	3.0%	$189	$485	$359	$6,300	$189	$485
CTI 6	115	$600	3.0%	$18	$35	$17	$6,900	$207	$520
CTI 1	250	$5,000	3.0%	$150	$151	$1	$11,900	$357	$671
CTI 4	300	$10,500	3.0%	$315	$292	($23)	$22,400	$672	$963
CTI 5	160	$3,000	3.0%	$90	$50	($40)	$25,400	**$762**	**$1,013**
CTI 2	100	$9,800	3.0%	$294	($200)	($494)	$35,200	$1,056	$813
CTI 7	330	$4,500	3.0%	$135	($210)	($345)	$39,700		