Detailed Business Requirements acute and non-acute PCI episodes

a1.2 c07 d01

State of Ohio

August 31, 2015

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1. INTRODUCTION

1.1 Versions and revisions

Episode design is an iterative process that typically involves multiple stakeholders. Once the design is finalized and the episode implemented, experience with the new payment model may generate new insights. The insights can in turn be leveraged to modify and improve the initial episode design. To keep track of the version of an episode used at any given time, a versioning system consisting of three numbers is employed:

- The algorithm version reflects the version of the software code used to produce the outputs for a particular episode. It is indicated by a major and minor version number, e.g., a1.1. The major algorithm version does not reset. The minor algorithm version resets when the major algorithm version is incremented.
- The configuration version reflects the version of the parameter settings and medical codes used to produce the outputs for a particular episode. The configuration includes for example the dollar amounts for the gain/risk sharing thresholds and the trigger diagnosis codes. The configuration version is indicated by a two digit number, e.g., c01. It is specific to the design decisions made by the organization that is implementing an episode and it does not reset.
- The documentation version reflects the version of the Detailed Business Requirements describing a particular episode. It is indicated by a two digit number, e.g., d01, and increments when a revision is made to the documentation without making a change to the algorithm or the configuration. It resets every time the algorithm or the configuration version changes.

Version	Date	Changes
a1.0 c01 d01	02/14/2014	■ Initial design based on Clinical Advisory Group recommendations
a1.1 c02 d01	06/30/2014	■ Design based on episode customization decisions by Ohio Medicaid
a1.1 c03 d01	07/11/2014	■ Configuration and DBR: Added risk factors, risk coefficients, and high outlier values

Version	Date	Changes
		■ DBR: Added description of restriction to pre-trigger window definition – if the diagnostic angiogram overlaps with a hospitalization it does not start a pre-trigger window ■ Configuration: Updated definition of quality metric adverse outcome myocardial infraction with a more specific requirement for diagnosis codes that must occur ■ Configuration: Removed code 99672 from quality metric adverse outcome stent complication
a1.1 c04 d01	07/28/2014	■ DBR: Moved multiple payer exclusion to main sections from glossary and updated definition to only use enrollment dates, not whether FFS and MCP claims are assigned to an episode ■ DBR: Updated FQHC and RHC exception to TPL episode exclusion to only apply to FFS claims for MCP enrollees, not all FQHC and RHC claims ■ Configuration and DBR: Changed name to incomplete episode exclusion instead of low outlier ■ Configuration: Removed ICD-9 Px codes from included procedures, included complication procedures, and diagnostic angiogram because they are not used ■ DBR: Updated definition of *Rendering Provider ID* for acute PCI episodes to be rendering provider on claim that is used to set the *TriggerClaimID*, not *PAPID*
a1.1 c05 d01	07/29/2014	■ Configuration: Corrected typo for low age exclusion from 2 to 18 years of age
a1.1 c06 d01	11/06/2014	■ Configuration: Revised list of transplant exclusion codes to remove transplant donor and back bench codes and add transplant-related complication codes ■ Configuration: Added discharge code '20' (Expired) to list of Death exclusion codes ■ Configuration: Updated configuration file to include dated change log **Clarifications:** ■ DBR: Updated section 2.3.8 to clarify that payers are not expected to run their own risk adjustment process

Version	Date	Changes
		■ DBR: Updated section 3.1 to clarify that payers should use the historical data from FFS and other MCPs that they are provided when a member enrolls ■ DBR: Updated section 4.1 to clarify that the confirming diagnosis on the associated facility claim must be found in *Header Diagnosis Code Primary* ■ DBR: Updated section 4.6 to clarify that TPL, long-term care, and long hospitalization exclusions are not dependent on claims being included in episode spend ■ DBR: Updated section 4.6 to clarify that indicators of active cancer treatment may be either procedures or diagnoses and may or may not appear on the same claim as the cancer diagnosis ■ DBR: Updated glossary with Ohio Department of Medicaid definition of long-term care claims ■ DBR: Updated glossary to clarify that the member age calculation is based on the patient age at the start of the trigger window (and not episode window)
a1.2 c07 d01	08/31/2015	■ Configuration: Removed seventeen benign cancer diagnoses from the "Comorbidities Contingent – Cancer Diagnoses" list ■ Configuration: Aligned HIV exclusion codes across all episodes ■ Configuration and DBR: Revised section 4.1 to reflect that anesthesia modifier codes are now used as well as assistant surgeon and discontinued surgery codes to identify non relevant claims. In the configuration file, added anesthesiologist procedure modifier codes to the code list, "Modifiers - Assistant Surgeons and Discontinued Surgery" and renamed the list "Modifiers - Assistant Surgeons, Anesthesiologists, and Discontinued Surgery" ■ Configuration and DBR: Added note indicating only first digit of aid categories should be used to match against the provided code list in section 4.6. In the configuration, updated aid categories used to identify full Medicaid enrollment and dual eligibility. Aid category code lists now only contain the first digit of the aid category, as it is the only part of the code relevant for the purposes of episode based payment ■ Configuration and DBR: Added a transportation cost exclusion to the algorithm to avoid the unintentional inclusion of transport spend and better align with the intentions of the clinical advisory groups. The changes in algorithm logic are

Version	Date	Changes
		reflected in sections 2.3.3 and 4.3. The transportation HCPCS codes to facilitate a new transportation cost exclusion are in the configuration file ■ DBR: Updated sections 2.3.9 and 4.9 for clarity and to align with currently proposed approach to gain/risk sharing ■ DBR: Added "Included Complication Diagnoses" to the detail-paid hospitalization inclusion logic in section 4.3 ■ DBR: Changed the long-term care exclusion, defined in sections 2.3.6 and 4.6, to exclude any episode where a long-term care is provided after the start of the episode and before the last day of the trigger window ■ DBR: Added long-term care claim detail lines to the list of claims included during the trigger window in both sections 2.3.3 and 4.3 ■ DBR: Added the field output 'PAP Name' to the episode output table and revised section 4.5 accordingly **Clarifications:** ■ Configuration: Updated code list names for "Clinical Exclusions – Death" and "Clinical Exclusions – Left Against Medical Advice" to match the DBR in correctly identifying these exclusions as clinical rather than business ■ DBR: Updated section 4.2 to emphasize that the input data precedes the reporting period by 15 months, so potential triggers may not trigger episodes due to overlap with episodes that end prior to the current reporting period ■ DBR: Updated section 3.1 to clarify that payers should only report on episodes where they paid the triggering claim. Episodes triggered off historical data should still be generated to test for overlap, but should not generate reports ■ DBR: Updated section 4.1 to clarify that claim types are defined in the glossary ■ DBR: Updated PAP out of state exclusion language in section 4.6 to directly reference the "Business Exclusion – PAP Out Of State" code list. ■ DBR: Updated the glossary to clarify that the *Header From Date Of Service* of a hospitalization is the start of that hospitalization and the *Discharge Date* of a hospitalization is the end of that hospitalization.

Version	Date	Changes
		■ DBR: Made multiple small clarifying edits and updates throughout the document, including using only "episode window" when referring to the specific duration of an episode

1.2 Scope of this document

The Detailed Business Requirements (DBR) document serves as a guide to understand the definition of an episode. The DBR addresses three audiences:

- The episode owner who is accountable overall for the episode design and implementation
- The analytics team tasked with pressure testing the design of an episode and quality controlling the outputs from the episode algorithm
- The IT team tasked with implementing the algorithm to produce outputs for an episode

Section 2 of the DBR contains a description of the episode and is aimed at the episode owner and the analytics team. It addresses the following questions:

- **Patient journey**: Which patient cases are addressed by the episode?
- **Sources of value**: At which points in the patient journey do providers have most potential to improve quality of care and outcomes?
- **Design dimensions**: What decisions underlie the design of the episode?
  - Trigger: What events trigger an episode?
  - Episode duration: What is the duration of the episode?
  - Claims included and excluded: Which claims are included in or excluded from the episode spend?
  - Episode spend: How is the spend for an episode calculated?
  - Principal Accountable Provider (PAP): Which provider is primarily held accountable for the outcomes of an episode?
  - Excluded episodes: Which episodes are excluded from a PAP's average episode spend for the purposes of calculating any gain/risk sharing?
  - Quality metrics: Which quality metrics are employed to inform PAPs about their quality of care?

- Risk adjustment: What approach is taken to adjust episodes for risk factors that cannot be directly influenced by the PAP?
- Gain and risk sharing: How are the gain and risk sharing amounts for PAPs determined?

Section 3 of the DBR explains the data flow of an episode. It is aimed at the analytics team and the IT team and addresses the following questions:

- **Input data**: What inputs does the episode algorithm require to build the episode?
- **Episode algorithm**: What is the intent of the episode design that needs to be reflected in the software code to produce the episode outputs?
- **Episode configuration**: What parameters (e.g., dollar amounts) and medical codes (e.g., diagnosis codes) need to be specified to define the episode?
- **Outputs**: What are the outputs of an episode algorithm?
- **Provider reports**: What information is included in the provider reports?

The algorithm logic in section 4 of the DBR is aimed at the IT team. It may also be helpful to the analytics team in their communication with the IT team over the course of quality controlling an episode. The algorithm logic addresses the following questions:

- What are the logical steps the episode algorithm needs to complete in order to produce the required outputs?
- Which cases does the algorithm need to address?
- Are there exceptions to the overall logic and, if so, how are they handled?

The DBR document does not cover the following topics:

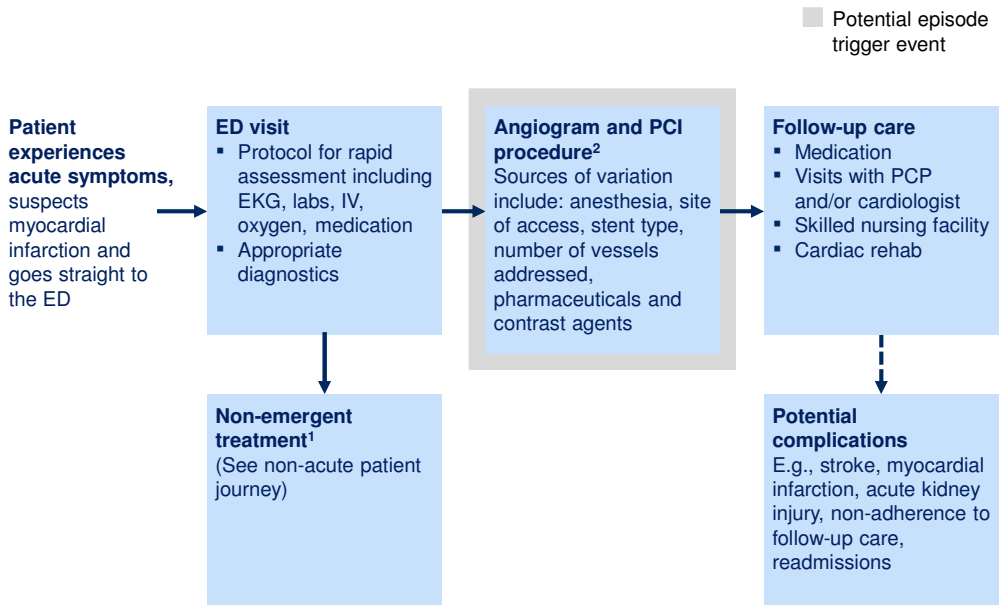
- Background on how episodes compare to the current payment system
- Clinical rationale for inclusions and exclusions
- Intermediate analyses used during design of the episode
- Meeting materials used during design of the episode
- Guidance on data collection/transformation/storage
- Guidance on the episode algorithm coding approach

2. DESCRIPTION OF THE EPISODE

2.1 Patient journey

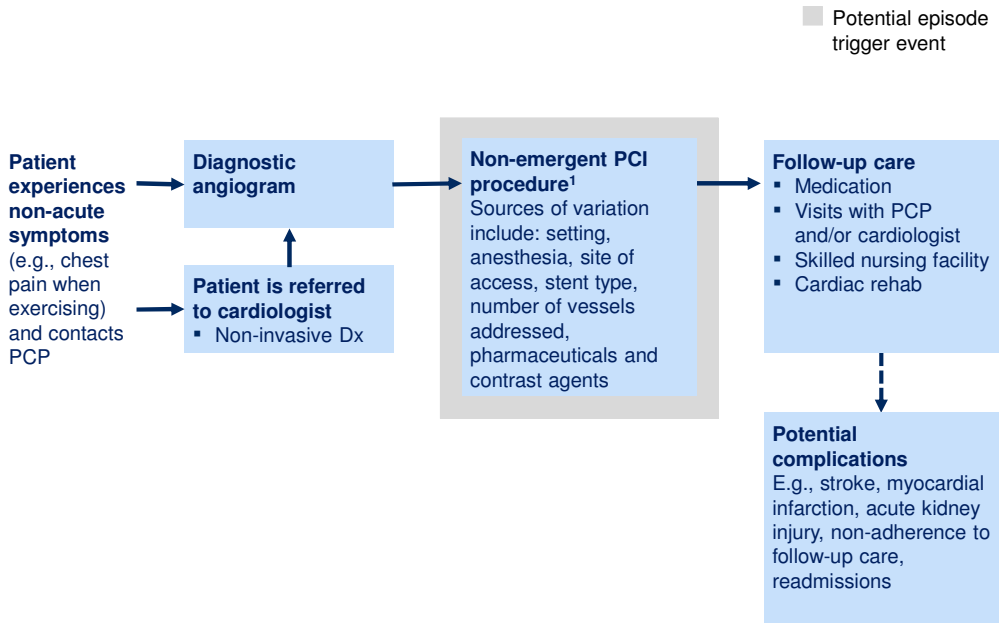
The episodes described in this document pertain to patients who receive a Percutaneous Coronary Intervention (PCI) under acute or non-acute circumstances. As depicted in Exhibit 1, an acute PCI episode typically starts with an Emergency Department visit immediately followed by the PCI procedure. As depicted in Exhibit 2, a non-acute PCI episode may start with a diagnostic angiogram in the weeks before the PCI procedure followed by the PCI procedure itself. After an acute or non-acute PCI procedure, the patient undergoes follow-up care which may include visits by a nurse, patient monitoring, cardiovascular rehabilitation, and certain medications. Some patients may develop complications requiring further treatment in an inpatient or outpatient facility or admission to a long-term care facility for longer-term care.

EXHIBIT 1 – PATIENT JOURNEY FOR ACUTE PCI



1 Some non-acute patients self-admit to the ED and are either treated or discharged to the non-acute pathway
2 STEMI guidelines indicate intervention within 2 hours; NSTEMI and others within 48 hours when urgent

EXHIBIT 2 – PATIENT JOURNEY FOR NON-ACUTE PCI

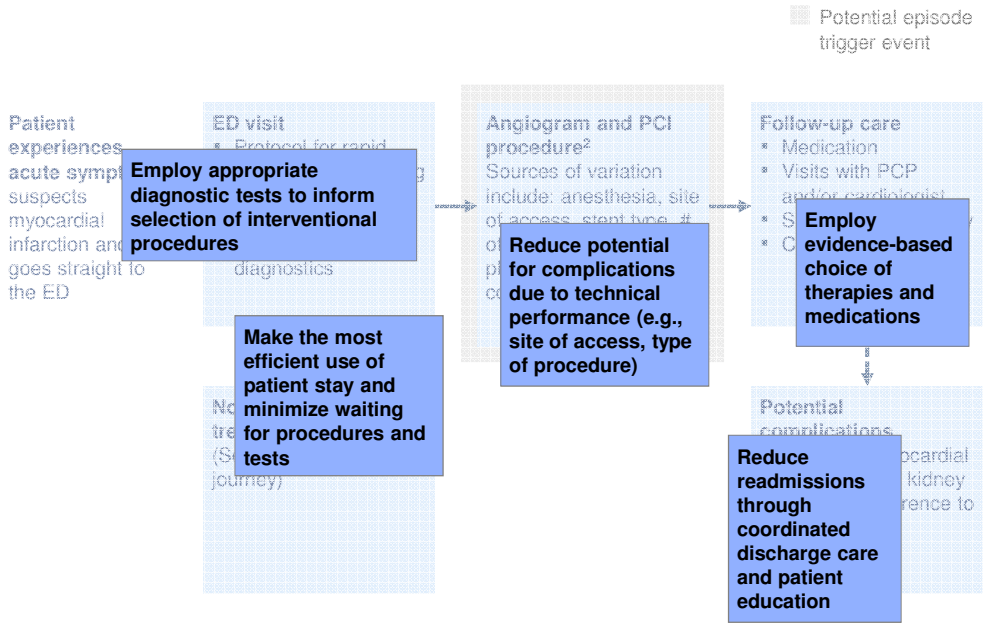


1 May be performed in an inpatient or outpatient setting

2.2 Sources of value

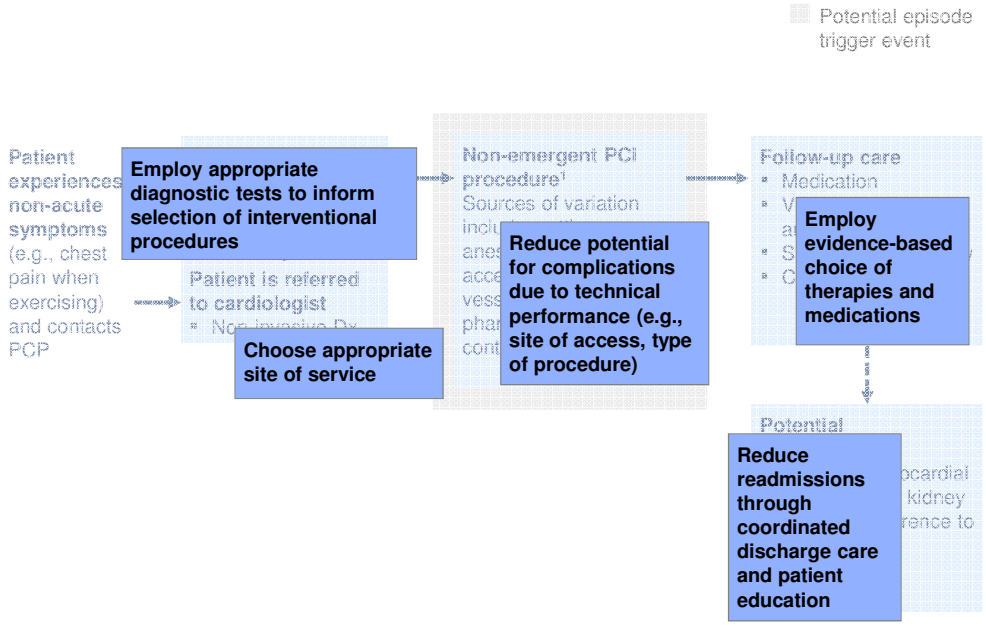
In treating patients receiving PCI, providers have several opportunities to improve the quality and cost of care (see Exhibits 3 and 4) and reduce clinical variation. For example, providers may be able to reduce the rate of complications, minimize patient wait times and length of stay, and, in non-acute cases, select the most appropriate setting for care. Providers can also administer and prescribe appropriate medications for the patient and ensure appropriate follow-up care. In general, these practices could reduce the likelihood of avoidable re-admissions or conversions to coronary artery bypass graft (CABG) and the overall cost of care for a PCI.

EXHIBIT 3 – SOURCES OF VALUE FOR ACUTE PCI EPISODE



1 Some non-acute patients self-admit to the ED and are either treated or discharged to the non-acute pathway
2 STEMI guidelines indicate intervention within 2 hours; NSTEMI and others within 48 hours when urgent

EXHIBIT 4 – SOURCES OF VALUE FOR NON-ACUTE PCI EPISODE

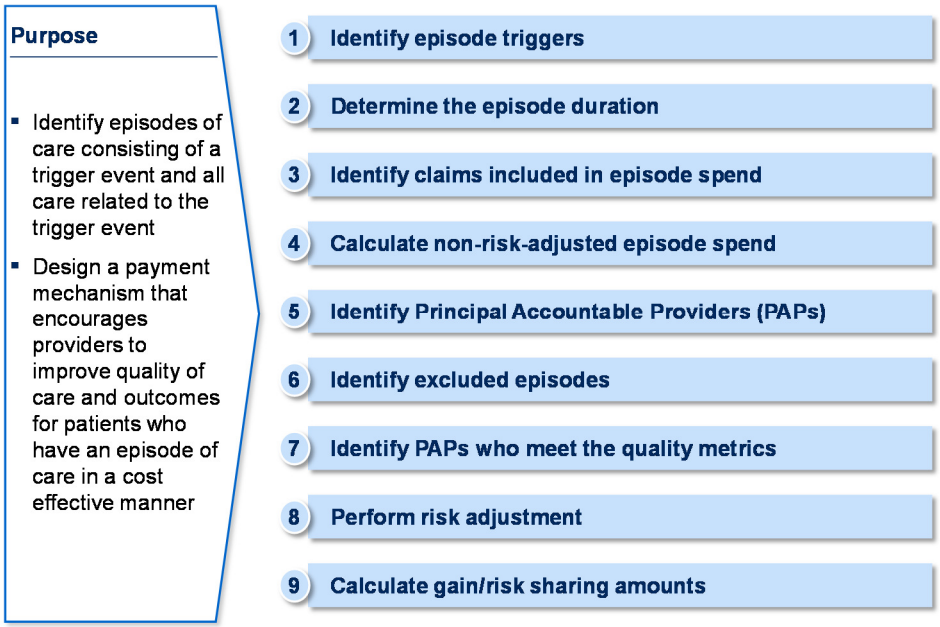


1 May be performed in an inpatient or outpatient setting

2.3 Design dimensions

Designing and building an acute or non-acute PCI episode comprises nine dimensions, as depicted in Exhibit 5. Each dimension is associated with a set of data manipulations that convert the data inputs to the desired data outputs. Section 3 provides additional details on the episode data flow.

EXHIBIT 5 – EPISODE DESIGN DIMENSIONS



2.3.1 Episode trigger

A potential trigger for an acute or non-acute PCI episode is a PCI procedure. Potential triggers are identified based on a professional claim with a procedure code denoting a percutaneous transluminal coronary angioplasty, atherectomy, thrombectomy, or stent placement. The professional claim must be associated with a hospitalization or an outpatient claim with a primary diagnosis of ischemic heart disease: ST elevation myocardial infarction (STEMI), non-ST elevation myocardial infarction (NSTEMI), unstable angina, angina pectoris, or other ischemic heart disease. Hospitalizations denote periods of time when a patient was continuously hospitalized in an inpatient facility. They may consist

of one or more inpatient claims. The configuration file lists the trigger procedure codes and confirming diagnosis codes under "PCI Procedure Codes – CPT Or HCPCS" and "Trigger Diagnosis Codes – <description of diagnosis>". Hospitalizations and the claim types referenced throughout the DBR are defined in the glossary.

A potential trigger extends for the entire duration of the professional claim and the hospitalization or outpatient claim.

Potential triggers are categorized as acute or non-acute based on the primary diagnosis of the hospitalization or the outpatient claim. Diagnosis codes for STEMI, NSTEMI, or unstable angina are considered acute. Diagnosis codes for angina pectoris and other ischemic heart disease are considered non-acute.

A professional claim with a PCI procedure code but without an associated hospitalization or outpatient claim does not constitute a potential trigger and vice versa.

2.3.2 Episode duration

The duration of the acute PCI episode has two components: the trigger window and the post-trigger window. The duration of the non-acute PCI episode has three components: the pre-trigger window, the trigger window, and the post-trigger window. Overall, the duration of the episode is referred as the episode window.

- **Pre-trigger window**: A non-acute PCI episode has a pre-trigger window if the patient had a diagnostic angiogram during the 30 days before the trigger window. The pre-trigger window begins on the date of the earliest diagnostic angiogram within 30 days before the trigger window. If no diagnostic angiogram was performed within 30 days before the trigger window, the episode does not have pre-trigger window and starts with the trigger window.
- **Trigger window**: The trigger window begins on the first day of a potential trigger that starts an episode and ends on the last day of a potential trigger that starts an episode.
- **Post-trigger window**: The post-trigger window begins the day after the trigger window ends and extends for 30 days. If a hospitalization begins on or before the 30th day of the post-trigger window and extends beyond the 30th day (i.e., is ongoing on the 30th day of the post-trigger window), then

the post-trigger window is extended until discharge from the hospitalization. Extending the episode in this way may only occur once per episode and does not lead to further extensions.

Based on the definitions of the pre-trigger, trigger, and post-trigger window, potential triggers are divided into trigger PCI and repeat PCI:

- **Trigger PCI**: Potential triggers that do not occur during another episode and therefore constitute the trigger window of a new episode.
- **Repeat PCI**: Potential triggers that occur during the post-trigger window of an episode and therefore do not constitute the trigger window for a new episode.

PCI episodes are classified as acute PCI episodes or non-acute PCI episodes based on the classification of the potential trigger that constitutes the trigger PCI as acute or non-acute. Repeat-PCI may be in an acute or non-acute setting but do not influence the categorization of the episode.

2.3.3 Claims included in episode spend

Episode spend is calculated on the basis of claims directly related to or stemming from the acute or non-acute PCI. Claims that are included in the calculation of episode spend are referred to as included claims. Claims that are not included in the calculation of episode spend are referred to as excluded claims. The criteria to identify included claims depend on the time window during which a claim occurs.

- **Pre-trigger window**: For non-acute PCI episodes with a pre-trigger window, outpatient, professional, and pharmacy claims during the pre-trigger window that are related to the PCI are included claims. Hospitalizations during the pre-trigger window and any outpatient, professional, and pharmacy claims that occur during the hospitalizations are excluded claims. Included claims during the pre-trigger window fall into the following groups:
  - Included diagnoses: Outpatient and professional claims with an included diagnosis code as the primary diagnosis and that do not occur during a hospitalization are included claims.

- Included procedures: Outpatient and professional claims with an included procedure code and that do not occur during a hospitalization are included claims.
- Included medications: Pharmacy claims with an included medication code and that do not occur during a hospitalization are included claims.

- **Trigger window**: All inpatient, outpatient, long-term care, professional, and pharmacy claims during the trigger window are included claims.
- **Post-trigger window**: Inpatient, outpatient, long-term care, professional, and pharmacy claims during the post-trigger window that are related to the PCI or indicate potential complications are included claims. Included claims during the post-trigger window fall into the following groups:
  - Included hospitalizations: Hospitalizations are included in the calculation of episode spend unless the reason for the hospitalization was unrelated to the episode. Hospitalizations that are unrelated to the episode are identified using excluded APR-DRG (for header-paid inpatient claims) or the absence of an included diagnosis code in the primary diagnosis field (for detail-paid inpatient claims). The excluded APR-DRGs were derived from the readmission exclusion MS-DRGs used by the Centers for Medicare and Medicaid Services for the Bundled Payments for Care Improvement (BPCI) Initiative. All inpatient claims that are part of an included hospitalization are included claims. Any pharmacy, outpatient, and professional claims that occur during an included hospitalization are included claims. Any pharmacy, outpatient, and professional claims that occur during an excluded hospitalization are excluded claims.
  - Included diagnoses and included complication diagnoses: Outpatient, long-term care and professional claims with an included diagnosis code or an included complication diagnosis code as the primary diagnosis and that do not occur during a hospitalization are included claims.
  - Included procedures and included complication procedures: Outpatient, long-term care, and professional claim detail lines with an included procedure code or an included complication procedure code and that do not occur during a hospitalization are included claim detail lines. To capture bundled outpatient procedures, all claim detail lines on the same outpatient claim that have the same service start date and service end date as the claim detail line with an included procedure or included complication procedure are also included claim detail lines.

- Included medications: Pharmacy claims with an included medication code and that do not occur during a hospitalization are included claims.

The one exception to the above logic are claims related to transportation, which are always excluded claims no matter when they occur.

The codes used to identify excluded APR-DRG as well as included diagnoses, included complication diagnoses, included procedures, included complication procedures, included medications, and excluded transportation are listed in the configuration file under "Excluded APR-DRG", "Included Diagnoses", "Included Complication Diagnoses", "Included Procedures", "Included Complication Procedures", "Included Medications", and "Excluded Transportation".

2.3.4 Episode spend

The episode spend is the amount that reflects the totality of spend for included claims. Since the totality of spend for included claims is not risk-adjusted, it is referred to as non-risk-adjusted episode spend. Based on the available data, Ohio Medicaid calculates the non-risk-adjusted episode spend as the sum of the allowed amount for included claims from Medicaid Fee For Service (FFS) and the sum of the paid amount for included claims from Medicaid Managed Care Plans (MCPs). Given variation in data and payment practices, payers should use their judgment in determining which fields to utilize so as to best reflect the entire spend of an episode.

To remove variation in inpatient spend that is intentionally not addressed by the episode-based payment model, spend for included, DRG-paid inpatient claims is calculated by summing the APR-DRG base payment and the APR-DRG outlier payment for each included, DRG-paid inpatient claim. Medical education and capital expenditure payments are not included in non-risk-adjusted episode spend.

The non-risk-adjusted episode spend is calculated overall and by claim type, by window during the episode, and by claim type and window during the episode.

For the purpose of risk-adjustment only, a separate measure of episode spend, referred to as normalized-non-risk-adjusted episode spend, may be used. Normalized-non-risk-adjusted episode spend is calculated using normalized APR-DRG base rates for DRG-paid inpatient claims to remove variation in unit

prices before performing risk adjustment. DRG-exempt inpatient, outpatient, long-term care, professional, and pharmacy spend is calculated the same way for normalized-non-risk-adjusted episode spend as for non-risk-adjusted episode spend.

To calculate the DRG-paid inpatient spend component of normalized-non-risk-adjusted episode spend the APR-DRG base payment for each included DRG-paid inpatient claim is normalized using the following method: The normalized base rate is calculated as the average hospital base rate across all DRG-paid inpatient claims weighted by volume of DRG-paid inpatient claims. The DRG base payment on each DRG-paid inpatient claim is then multiplied by the ratio of the normalized base rate to the actual base rate of each hospital. Outlier payments, if present, are added unchanged. The medical education payment and the capital expenditure payment are not included in normalized-non-risk-adjusted episode spend.

2.3.5 Principal Accountable Provider

The Principal Accountable Provider (PAP) is the provider deemed to be in the best position to influence the quality and cost of care for a patient receiving a PCI. The PAP is different for acute and non-acute PCI episodes:

- **Acute PCI episodes:** The PAP is the inpatient or outpatient facility where the PCI is performed. The PAP is identified using the billing provider ID on the associated inpatient or outpatient claim during the trigger window.
- **Non-Acute PCI episodes:** The PAP is the physician entity performing the PCI. The PAP is identified using the billing provider ID on the professional claim during the trigger window.

2.3.6 Excluded episodes

Episode exclusions ensure that the remaining episodes are comparable to each other and allow fair comparisons between patient panels. After all exclusions that identify invalid episodes have been applied, a set of valid episodes remains. The valid episodes form the basis to assess the performance of PAPs.

- **Business exclusions:**

- Inconsistent enrollment: An episode is excluded if there are gaps in full Medicaid coverage (FFS or with an MCP) of the patient during the episode window.
- Multiple payers: An episode is excluded if a patient changes enrollment between FFS and an MCP or between two MCPs during the trigger window or during the post-trigger window. The rules to attribute an episode to a payer are described in the glossary under "Payer attribution".
- Third-party liability: An episode is excluded if third-party liability charges are present on any claim or claim detail line during the episode window or if the patient has relevant third-party coverage at any time during the episode window.
- Duals: An episode is excluded if a patient has dual coverage by Medicaid and Medicare at any time during the episode window.
- Exempt PAP: An acute PCI episode is excluded if the PAP is a DRG-exempt inpatient facility. The exempt PAP exclusion only applies to acute PCI episodes.
- PAP out of state: An episode is excluded if the PAP's practice address is outside Ohio.
- No PAP: An episode is excluded if the billing provider number is not available.
- Long hospitalization: An episode is excluded if a hospitalization longer than (>) 30 days occurs during the episode window.
- Long-term care: An episode is excluded if the patient lives in a long-term care facility as identified by long-term care claims occurring during pre-trigger or trigger window, with the exception of claims starting the last day of the trigger window.
- Missing APR-DRG: An episode is excluded if a DRG-paid inpatient claim during the episode is missing the APR-DRG and severity of illness.
- Incomplete episodes: An episode is excluded if the non-risk-adjusted episode spend (not the risk-adjusted episode spend) is less than the incomplete episode threshold. Spend less than the incomplete episode threshold may be an indication that claims are miscoded or incomplete. The incomplete episode threshold was set at the cost of the minimum services required to treat an episode. The incomplete episode threshold is listed as a parameter in the configuration file under "Excluded Episodes".

- **Clinical exclusions**:
  - Age: An acute or non-acute PCI episode is excluded if the patient is younger than eighteen (<18) or older than sixty four (>64) years of age.
  - Left Against Medical Advice: An episode is excluded if a patient has a discharge status of "left against medical advice or discontinued care" on any inpatient or outpatient claim during the episode window.
  - Death: An episode is excluded if the patient has a discharge status of "expired" on any inpatient or outpatient claim during the episode window or has a date of death before the end of the episode window.
  - Comorbidity: An episode is excluded if the patient has one or more of the following comorbidities during a specified time window. The configuration file lists the comorbidity codes and time windows under "Comorbidities <comorbidity name>". Comorbidity codes are searched for on inpatient, outpatient, and professional claims. The comorbidities are:
    - Arteritis during the episode window or during the 365 days before the episode window
    - Conversion to CABG during the trigger window
    - Cancer under active management during the episode window or during the 90 days before the episode window
    - Cardiogenic shock during the episode window or during the 365 days before the episode window
    - Circulatory congenital anomalies during the episode window or during the 365 days before the episode window
    - End stage renal disease during the episode window or during the 365 days before the episode window
    - Heart valve congenital anomalies during the episode window or during the 365 days before the episode window
    - Human immunodeficiency virus (HIV) during the episode window or during the 365 days before the episode window
    - Multiple Sclerosis during the episode window or during the 365 days before the episode window

    - Paralysis during the episode window or during the 365 days before the episode window
    - Parkinson's disease during the episode window or during the 365 days before the episode window
    - Sickle cell anemia during the episode window or during the 365 days before the episode window
    - Organ transplant during the episode window or during the 365 days before the episode window
  - Multiple other comorbidities: An episode is excluded if it is affected by too many risk factors to reliably risk adjust the episode spend. The configuration file lists the number of risk factors beyond which an episode is excluded as a parameter under "Excluded Episodes".
- **Outliers:**
  - High outlier: An episode is excluded if the risk-adjusted episode spend (not the non-risk-adjusted episode spend) is greater than the high outlier threshold. The high outlier threshold was set based on analyses of episode spend distributions for episodes that ended between June 2012 and May 2013, inclusive. It was set at three standard deviations above the average risk-adjusted episode spend for otherwise valid episodes. The high outlier threshold is listed as a parameter in the configuration file under "High Outlier – Acute" and "High Outlier – Non-acute".

2.3.7 Quality metrics

A PAP must pass all quality metrics tied to gain sharing to be eligible for gain sharing. In addition, PAPs receive information on additional quality metrics that allow them to assess their performance, but do not affect their eligibility to participate in gain sharing. Quality metrics are calculated for each individual PAP across valid episodes attributed to the PAP. The quality metrics are based on information contained in the claims filed for each patient. Additional information on how the quality metrics could be tied to gain sharing is provided in section 2.3.9 ("Gain and risk sharing").

- **Quality metric tied to gain sharing**:
  - Quality metric 1: Percent of episodes with an adverse outcome during the trigger window or the post-trigger window. Adverse outcomes are defined

as AV fistula or dissection of coronary artery, post-operative hemorrhage, post-operative infection, myocardial infarction, pulmonary embolism or vein thrombosis, stent complication, or stroke. The codes used to identify inpatient, outpatient, or professional claims indicating adverse outcomes are listed in the configuration file under "Quality metric 01(a-g) – <name of adverse outcome>".

- **Quality metrics not tied to gain sharing** (i.e., included for information only):
  - Quality metric 2: Percent of episodes where the trigger PCI involves multiple vessels (including multiple branches). A trigger PCI involves multiple vessels if the professional claim contains two or more single vessel procedure codes or if the professional claim contains one or more multiple vessel procedure codes. The configuration file lists the single vessel PCI procedure codes under "Quality Metric 02 – Multiple Vessels A" and the multiple vessel PCI procedure codes under "Quality Metric 02 – Multiple Vessels B".
  - Quality metric 3: Percent of episodes with a repeat PCI. Repeat PCI are defined in section 2.3.2.

2.3.8 Risk adjustment

Principal Accountable Providers (PAPs) participating in episode-based payment models are compared based on their performance on quality metrics and based on the average spend for episodes treated by each PAP. The credibility and effectiveness of an episode-based payment model therefore rests on the comparability and fairness of the episode spend measure used in the comparisons. Risk adjustment is one of several mechanisms that episode-based payment models may use to achieve comparability in episode spend across PAPs.

Risk adjustment specifically captures the impact on episode spend of documented clinical risk factors that typically require additional care during an episode and are outside the control of the PAP. The goal of risk adjustment is to account for different levels of medical risk across patient panels and, by doing so, reduce incentives for tactical selection of patients (i.e., avoiding riskier and more costly patients) when payments are tied to episode spend performance.

Risk factors and risk coefficients are identified in an iterative process informed by medical best practice, expert opinion, and statistical testing. The risk coefficients are used to calculate a risk score for each episode given the risk factors that are present for the episode. The risk score represents the ratio of the expected episode spend when no risk factors are present to the expected episode spend given the set of risk factors present for the episode. Multiplying the observed episode spend by the risk score results in the risk-adjusted episode spend. Risk-adjusted episode spend represents how much spend would have been incurred during the episode had there been no risk factors present, all other things being equal. By minimizing the effect of clinically documented medical risk that is outside the control of the PAP on episode spend, risk-adjustment contributes to the fairness of the episode spend comparisons that underlie episode-based payment models.

For additional details on the risk adjustment process, please refer to the document "Supporting documentation on episode risk adjustment".

This process was conducted as part of episode design by the Ohio Department of Medicaid. Risk factors and coefficients derived from this process are included in the accompanying configuration file. At this time it is not expected that individual payers run their own risk adjustment process.

The same set of risk factors apply for the acute and non-acute PCI episodes:

- Acute trigger PCI
- STEMI during the trigger PCI
- Cardiac arrest during the trigger window
- Complex hypertension during the episode window or during the 365 days before the episode window
- Fluid and electrolyte disorders during the episode window or during the 365 days before the episode window
- Multiple vessel or staged PCI procedures during the episode
- Pleurisy, pneumothorax and pulmonary collapse during the episode window or during the 365 days before the episode window
- Respiratory failure, insufficiency and arrest during the episode window or during the 365 days before the episode window

The risk coefficients associated with each risk factor are listed as parameters in the configuration file under "Risk Adjustment".

2.3.9 Gain and risk sharing

The State of Ohio and the MCPs will send provider reports to PAPs to inform them about their performance in the episode-based payment model. A detailed description of the provider reports is beyond the scope of the Detailed Business Requirements. Please refer to the "Episode of Care Payment Report Sample" provided separately as a general guide for the layout and metrics of the provider reports.

At some point after thresholds are set, provider reports will include gain/risk sharing information. Gain/risk sharing is determined based on the comparison of the average risk-adjusted episode spend for valid episodes of each PAP to three pre-determined thresholds. The thresholds and relevant calculations are detailed below. Note that, throughout this section, the average risk-adjusted episode spend for valid episodes will be referred to as the 'average risk-adjusted spend':

- **Acceptable threshold**: PAPs with an average risk-adjusted spend above the acceptable threshold and that also have a minimum of five valid episodes during the performance period owe a risk-sharing payment.
- **Commendable threshold**: PAPs with an average risk-adjusted spend between the commendable threshold and above the gain sharing limit threshold that also have a minimum of five valid episodes and pass the quality metrics tied to gain sharing during the performance period receive a gain sharing payment.
- **Gain sharing limit threshold**: PAPs with average risk-adjusted spend below the gain sharing limit threshold that also have a minimum of five valid episodes and pass the quality measures tied to gain sharing receive a gain sharing payment that is proportional to the difference between the commendable threshold and the gain sharing limit as a percentage of average risk-adjusted episode spend.

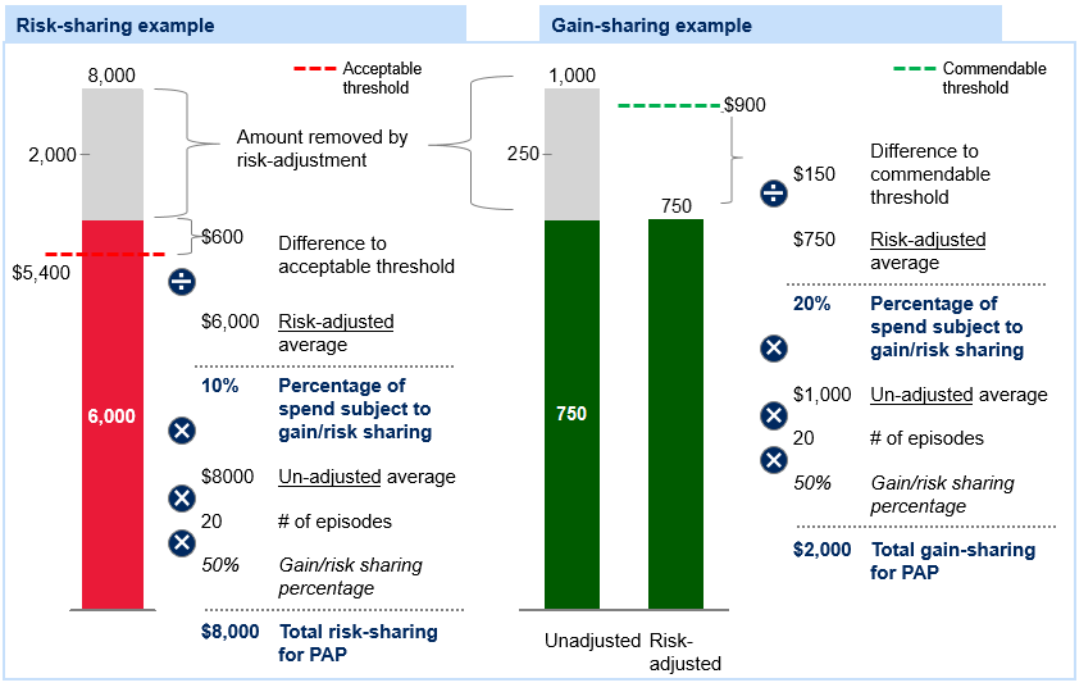
PAPs with average risk-adjusted episode spend between the acceptable and commendable thresholds may neither owe a risk sharing payment nor receive a gain sharing payment.

The gain or risk sharing payment of each PAP is calculated based on episodes that ended during a performance period of a certain length (e.g., 12 months). The calculation of the gain or risk sharing payment is as follows (Exhibit 6):

- **Risk sharing:** The calculation of the risk-sharing amount involves multiplying the percentage of spend subject to risk-sharing by the total non risk-adjusted episode spend for all valid episodes of the PAP and the risk-sharing proportion (e.g., 50%). The percentage of spend subject to risk-sharing is the difference between the PAP's risk-adjusted spend and the acceptable threshold as a percentage of the PAP's risk-adjusted spend.
- **Gain sharing:** The calculation of the gain-sharing amount involves multiplying the percentage of spend subject to gain sharing by both a PAP's total non risk-adjusted episode spend for valid episodes and the gain-sharing proportion (e.g., 50%). The calculation of the percentage of spend subject to gain sharing depends on whether the PAP's average risk-adjusted spend is above or below the gain-sharing limit:
  - If a PAP's average risk-adjusted spend is above the gain sharing limit, the percentage of spend subject to gain-sharing is the difference between the PAP's average risk-adjusted spend and the commendable threshold as a percentage of the PAP's average risk-adjusted spend.
  - If the PAP's average risk-adjusted spend is below the gain sharing limit, the percentage of spend subject to gain sharing is the difference between the gain sharing limit and the commendable threshold as a percentage of the PAP's average risk-adjusted spend.

EXHIBIT 6 – CALCULATION OF RISK- AND GAIN- SHARING PAYMENTS

ILLUSTRATIVE EXAMPLE



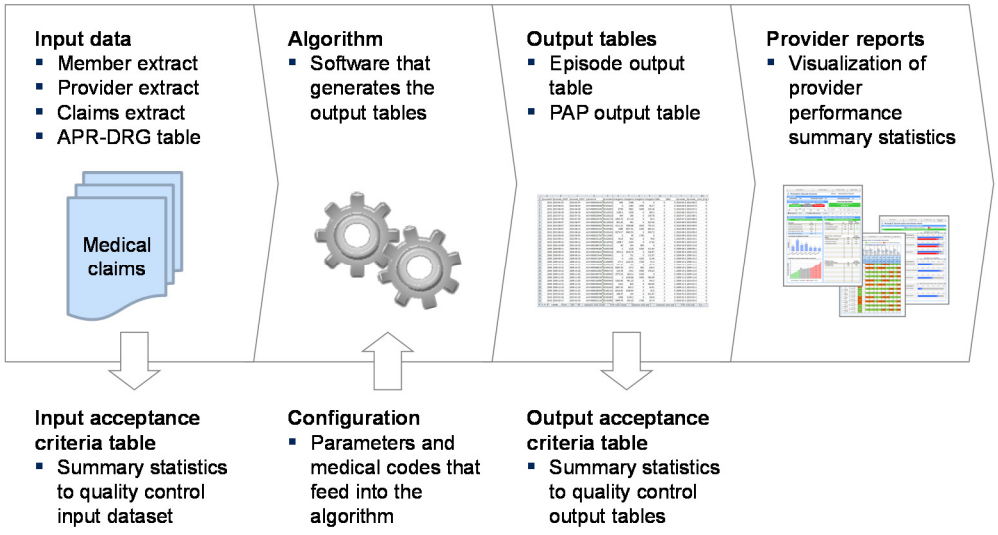
3. EPISODE DATA FLOW

The analytics underlying an episode-based payment model are performed by an episode algorithm. The algorithm takes an input dataset, transforms the data in accordance with the intent of the episode design, and produces a set of output tables (Exhibit 7). The output tables are used to create provider reports.

Several of the episode design dimensions require input parameters such as age ranges and medical codes such as diagnosis, procedure, and medication codes to specify the intent of the episode. The parameters and medical codes are provided in the episode configuration.

It is recommended that the episode data flow include two elements for quality assurance: (1) An input acceptance criteria table to assess the content and quality of the input dataset. (2) An output acceptance criteria table to assess the content and quality of the output tables. It is the responsibility of each payer to determine the details of appropriate quality assurance measures.

EXHIBIT 7 – EPISODE DATA FLOW



3.1 Input data

To build an episode, the following input data are needed:

- **Member Extract**: List of patients and their health insurance enrollment information.
- **Provider Extract**: List of participating providers and their addresses.
- **Claims Extract**: Institutional claims (UB-04 claim form), professional claims (CMS1500 claim form), and pharmacy claims (NCPDP claim form) at the patient level.
- **APR-DRG Base Rate Table**: Table containing the APR-DRG base rate for each DRG-paid provider.

The table below lists the required input fields using the source field abbreviations and source table names provided in the Ohio Vendor Extracts Companion Guides. The algorithm logic (section 4) describes the use of each input field. In the algorithm logic, input fields are referred to by the "Source field name in DBR" and written in italics.

Table – Input fields

Source field name in DBR	Source field abbreviation OH Medicaid	Source table names OH Medicaid
Member Extract		
Member ID	ID_MEDICAID	DSS.T_RE_BASE_DN
Eligibility Start Date	DTE_EFFECTIVE	DSS.T_RE_AID_ELIG_DN
Eligibility End Date	DTE_END	DSS.T_RE_AID_ELIG_DN
Aid Category	CDE_AID_CATEGORY	DSS.T_RE_AID_ELIG_DN
MCP Start Date	DTE_EFFECTIVE	DSS.T_RE_PMP_ASSIGN
MCP End Date	DTE_END	DSS.T_RE_PMP_ASSIGN
Date Of Birth	DTE_BIRTH	DSS.T_RE_BASE_DN
Date Of Death	DTE_DEATH	DSS.T_RE_BASE_DN
TPL Effective Date	DTE_TPL_EFFECTIVE	DSS.T_COVERAGE_XREF
TPL End Date	DTE_TPL_END	DSS.T_COVERAGE_XREF
Coverage Type	CDE_COVERAGE	DSS.T_COVERAGE_XREF
Provider Extract		
Provider ID	ID_PROVIDER_MCAID	DSS.T_PR_SVC_LOC_DN
Provider Name	NAME	DSS.T_PR_APPLN
Practice Address Line 1	ADR_MAIL_STRT1	DSS.T_PR_ADR_DN
Practice Address Line 2	ADR_MAIL_STRT2	DSS.T_PR_ADR_DN
Practice City	ADR_MAIL_CITY	DSS.T_PR_ADR_DN

Source field name in DBR	Source field abbreviation OH Medicaid	Source table names OH Medicaid
Practice State	ADR_MAIL_STATE	DSS.T_PR_ADR_DN
Practice Zip Code	ADR_MAIL_ZIP	DSS.T_PR_ADR_DN
Claims Extract		
Internal Control Number	NUM_ICN	DSS.T_CA_ICN
FFS Or MCP Indicator	IND_CLAIM	DSS.T_CA_ICN
MCP ID	ID_PROVIDER_MCAID	T_CA_PROV_KEY
Header Or Detail Indicator	IND_HDR_DTL	DSS.T_CA_IND_KEY
Claim Type	CDE_CLM_TYPE	DSS.T_CA_CLAIM_KEY
Header Paid Status	CDE_HDR_STATUS	DSS.T_CA_CLAIM_KEY
Detail Paid Status	CDE_DTL_STATUS	DSS.T_CA_CLAIM_KEY
Member ID	ID_MEDICAID	DSS.T_CA_ICN
Billing Provider ID	ID_PROVIDER_MCAID	T_CA_PROV_KEY T_CA_ICN.BILL_PROV_KEY
Billing Provider Type	CDE_PROV_TYPE_PRIM	DSS.T_CA_PROV_KEY T_CA_ICN.BILL_PROV_KEY
Attending Provider ID	ID_PROVIDER_MCAID	T_CA_PROV_KEY T_CA_ICN.REFER_PROV_KEY
Rendering Provider ID	ID_PROVIDER_MCAID	T_CA_PROV_KEY T_CA_ICN.PERF_PROV_KEY
Header From Date Of Service	DTE_FIRST_SVC_H	DSS.T_CA_ICN
Header To Date Of Service	DTE_LAST_SVC_H	DSS.T_CA_ICN
Detail From Date Of Service	DTE_FIRST_SVC_D	DSS.T_CA_ICN
Detail To Date Of Service	DTE_LAST_SVC_D	DSS.T_CA_ICN
Admission Date	DTE_ADMISSION	DSS.T_CA_ICN
Discharge Date	DTE_DISCHARGE	DSS.T_CA_ICN
Patient Status Indicator	CDE_PATIENT_STATUS	DSS.T_CA_UB92
Header Diagnosis Code Primary	CDE_DIAG and CDE_DIAG_SEQ = 01	DSS.T_CA_DIAG
Header Diagnosis Code 2-28	CDE_DIAG and CDE_DIAG_SEQ = 02-28	DSS.T_CA_DIAG
Surgical Procedure Code Primary	CDE_PROC_ICD9 and NUM_SEQ = 01	DSS.T_CA_ICD9_PROC
Surgical Procedure Code 2-24	CDE_PROC_ICD9 and NUM_SEQ = 02-24	DSS.T_CA_ICD9_PROC
Detail Procedure Code	CDE_PROC_PRIM	DSS.T_CA_ICN DSS.T_CA_HDR_DTL

Source field name in DBR	Source field abbreviation OH Medicaid	Source table names OH Medicaid
Modifier 1-4	CDE_MODIFIER_X	DSS.T_CA_ICN DSS.T_CA_HDR_DTL
Place Of Service	CDE_POS	DSS.T_CA_CLAIM_KEY
Revenue Code	CDE_REVENUE	DSS.T_CA_ICN DSS.T_CA_HDR_DTL
National Drug Code	CDE_NDC	DSS.T_CA_DRUG
Header FFS Allowed Amount	AMT_ALWD_H	DSS.T_CA_ICN
Detail FFS Allowed Amount	AMT_ALWD_D	DSS.T_CA_ICN
Header MCP Paid Amount	AMT_PAID_MCO_H	DSS.T_CA_ICN
Detail MCP Paid Amount	AMT_PAID_MCO_D	DSS.T_CA_ICN
Header TPL Amount	AMT_TPL_APPLD_H	DSS.T_CA_ICN
Detail TPL Amount	AMT_TPL_APPLD_D	DSS.T_CA_ICN
APR-DRG	CDE_DRG	DSS.T_CA_ICN
Severity of Illness	CDE_SOI	DSS.T_CA_DRG
DRG Base Payment	AMT_BASE_DRG	DSS.T_CA_UB92
DRG Outlier Payment A	AMT_DAY_OUTLIER	DSS.T_CA_UB92
DRG Outlier Payment B	AMT_COST_OUTLIER	DSS.T_CA_UB92
APR-DRG Base Rate Table		
Provider ID	Medicaid Provider ID	APR DRG Base Rates to Plans.xlsx
Base Rate	Base Rate	APR DRG Base Rates to Plans.xlsx

The date range for the input data has to include the 12 months duration reporting period as well as the 15 months preceding the reporting period. The 15 months preceding the reporting period are needed to allow for identification of risk factors and comorbidities as well as to provide sufficient input data to identify the episode start date for the first episodes that end during the reporting period.

The input data includes claims from the payer responsible for the episode as well as historical claims from other Medicaid payers prior to the episode trigger. Payers are provided with this claims data upon member enrollment. The inclusion of this data is particularly important in generating appropriate risk factors and exclusions.

Historical data should be treated exactly the same as claims that were submitted directly to the payer with one exception: Payers should only report on episodes

for which they paid the triggering claim in order to avoid double-counting of episodes across plans.

The input data has to contain only unique and paid claims. It is the responsibility of each payer to apply appropriate methods to ensure that all claims in the input data are valid, de-duplicated, and paid. For Ohio Medicaid, the methods provided by the State are used to remove duplicate and void claims. The input fields *Header Paid Status* and *Detail Paid Status* are used to determine whether a claim or claim detail line was paid.

If the value of an input field from the Claims Extract that is required to build an episode is missing or invalid, then the corresponding claim is ignored when building the episode. For example, a claim that would be a potential trigger, but is missing the *Header From Date Of Service*, cannot be a potential trigger.

3.2 Episode algorithm

The intent of the episode algorithm is detailed in the algorithm logic (section 4) of the DBR.

3.3 Episode configuration

The parameters and medical codes needed to define an episode are listed in the configuration file which is provided as an attachment to the DBR. The acute and non-acute PCI episodes share the same configuration file. The file includes:

- **Parameters sheet:** Values for parameters used in the episode, for example the outlier thresholds and risk coefficients.
- **Code sheet:** Medical codes used in the episode, for example trigger diagnosis or procedure codes and codes to identify included claims. Diagnosis and procedure codes may be provided as complete or incomplete codes. If an incomplete code is provided, the incomplete code itself as well as all complete codes that stem from it need to be taken into account when using the code.

The algorithm logic (section 4) explains the intended use of the parameters and medical codes by the episode algorithm. References to medical codes in the configuration file are made using the name for the relevant design dimension subcategory in the code sheet of the configuration file. References to parameters

in the configuration file are made using the name for the relevant design dimension in the parameters sheet of the configuration file.

3.4 Output tables

Using the input data tables and the configuration file, an episode algorithm creates two output tables: the episode output table and the PAP output table. The algorithm logic (section 4) describes the definition of each output field. In the algorithm logic, output fields are referred to by the output field names provided in the tables below and are written in italics.

3.4.1 Episode output table

The episode output table contains the set of episodes identified by the algorithm and the characteristics of each episode. The table below lists the required output fields.

Table – Episode Output Table

Output field name	Output field abbreviation
Episode identification	
Trigger Claim ID	TriggerClaimID
Member ID	MemberID
Member Age	MemberAge
Episode Start Date	EpisodeStartDate
Episode End Date	EpisodeEndDate
Pre-trigger Window Start Date	PreTriggerWindowStartDate
Pre-trigger Window End Date	PreTriggerWindowEndDate
Trigger Window Start Date	TriggerWindowStartDate
Trigger Window End Date	TriggerWindowEndDate
Post-trigger Window Start Date	PostTriggerWindowStartDate
Post-trigger Window End Date	PostTriggerWindowEndDate
PAP ID	PAPID
PAP Name	PAPName
Rendering Provider ID	RenderingID
Rendering Provider Name	RenderingName
Acute PCI Indicator	IsAcute
Excluded episodes	
Any Exclusion	ExclAny
Exclusion Inconsistent Enrollment	ExclEnrollment

Output field name	Output field abbreviation
Exclusion Multiple Payers	ExclMultiPayer
Exclusion Third-party Liability	ExclTPL
Exclusion Dual Eligibility	ExclDual
Exclusion Exempt PAP	ExclExemptPAP
Exclusion PAP Out Of State	ExclOutOfState
Exclusion No PAP	ExclNoPAP
Exclusion Long Hospitalization	ExclLongHosp
Exclusion Long-term Care	ExclLTC
Exclusion Missing DRG	ExclNoDRG
Exclusion Incomplete Episode	ExclIncomplete
Exclusion Age	ExclAge
Exclusion Left Against Medical Advice	ExclAMA
Exclusion Death	ExclDeath
Exclusion Comorbidity	ExclComorbid
Exclusion Multiple Other Comorbidities	ExclMultiComorbid
Exclusion High Outlier	ExclHighOutlier
Count Of Included Claims	
Count Of Included Claims	EpiClaimCount
By Pre-trigger Window	EpiClaimCountPreTrig
By Trigger Window	EpiClaimCountTrig
By Post-trigger Window	EpiClaimCountPostTrig
By Inpatient	EpiClaimCountIP
By Outpatient	EpiClaimCountOP
By Long-term Care	EpiClaimCountLTC
By Professional	EpiClaimCountProf
By Pharmacy	EpiClaimCountPharma
By Pre-trigger Window And Inpatient	EpiClaimCountPreTrigIP
By Pre-trigger Window And Outpatient	EpiClaimCountPreTrigOP
By Pre-trigger Window And Long-term Care	EpiClaimCountPreTrigLTC
By Pre-trigger Window And Professional	EpiClaimCountPreTrigProf
By Pre-trigger Window And Pharmacy	EpiClaimCountPreTrigPharma
By Trigger Window And Inpatient	EpiClaimCountTrigIP
By Trigger Window And Outpatient	EpiClaimCountTrigOP
By Trigger Window And Long-term Care	EpiClaimCountTrigLTC
By Trigger Window And Professional	EpiClaimCountTrigProf
By Trigger Window And Pharmacy	EpiClaimCountTrigPharma
By Post-trigger Window And Inpatient	EpiClaimCountPostTrigIP
By Post-trigger Window And Outpatient	EpiClaimCountPostTrigOP
By Post-trigger Window And Long-term Care	EpiClaimCountPostTrigLTC

Output field name	Output field abbreviation
By Post-trigger Window And Professional	EpiClaimCountPostTrigProf
By Post-trigger Window And Pharmacy	EpiClaimCountPostTrigPharma
Episode spend	
Non-risk-adjusted Episode Spend	EpiSpendNonadjCustom
Same breakouts as for claim counts	
Normalized-non-risk-adjusted Episode Spend	EpiSpendNonAdjNorm
Risk-adjusted Episode Spend	EpiSpendAdjCustom
Risk adjustment	
Episode Risk Score	EpiRiskScore
Risk Factor 001	RF001
Risk Factor 002	RF002
Risk Factor 003	RF003
Number of RF depends on episode	
Quality metrics	
Quality Metric 01 Indicator	EpiQM01
Quality Metric 02 Indicator	EpiQM02
Quality Metric 03 Indicator	EpiQM03
Number of QM depends on episode	

3.4.2 PAP output table

The PAP output table contains information about each PAP and their episodes. The table below lists the required output fields.

Table – PAP Output Table

Output field name	Output field abbreviation
PAP identification	
PAP ID	PAPID
PAP Name	PAPName
PAP Address Line 1	PAPAddress1
PAP Address Line 2	PAPAddress2
PAP City	PAPCity
PAP State	PAPState
PAP Zip Code	PAPZip
Episode counts	
Count Of Total Episodes Per PAP	PAPEpisodesTotal
Count Of Valid Episodes Per PAP	PAPEpisodesValid
With Inpatient	PAPEpiWithIP
With Outpatient	PAPEpiWithOP

Output field name	Output field abbreviation
With Long-term Care	PAPEpiWithLTC
With Professional	PAPEpiWithProf
With Pharmacy	PAPEpiWithPharma
PAP performance	
Gain Sharing Quality Metric Pass	PAPQMPassOverall
Gain/Risk Sharing Amount	PAPGainRiskShare
PAP Sharing Level	PAPSharingLevel
Minimum Episode Volume Pass	MinEpiPass
PAP spend	
Average Non-risk-adjusted PAP Spend	PAPSpendNonadjCustomAvg
Inpatient A/B	PAPSpendNonadjCustomAvgIP A/B
Outpatient A/B	PAPSpendNonadjCustomAvgOP A/B
Long-term Care A/B	PAPSpendNonadjCustomAvgLTC A/B
Professional A/B	PAPSpendNonadjCustomAvgProf A/B
Pharmacy A/B	PAPSpendNonadjCustomAvgPharma A/B
Total Non-risk-adjusted PAP Spend	PAPSpendNonadjCustomTotal
PAP Risk Adjustment Ratio	PAPRiskAdjRatioCustom
Average Risk-adjusted PAP Spend	PAPSpendAdjCustomAvg
Total Risk-adjusted PAP Spend	PAPSpendAdjCustomTotal
Quality metrics performance	
PAP Quality Metric 01 Performance	PAPQM01
PAP Quality Metric 02 Performance	PAPQM02
PAP Quality Metric 03 Performance	PAPQM03
Number of QM depends on episode	

3.5 Provider reports

During the initial implementation phase, each PAP receives a report to inform them about their performance in the episode-based payment model. The information shown in the provider report is based on the episode and PAP output tables. The reports show episodes with an episode end date during the reporting period. A detailed description of the provider report is beyond the scope of the Detailed Business Requirements. Please refer to the "Episode of Care Payment Report Sample" provided separately as a general guide for the layout and metrics of the provider report.

4. ALGORITHM LOGIC

The algorithm logic forms the basis to code an episode algorithm. It explains the intent of the episode design at a level of granularity that will allow an IT implementation team to create an algorithm that matches the episode design.

4.1 Identify episode triggers

The first design dimension of building an acute or non-acute PCI episode is to identify potential triggers.

Episode output fields created: *Trigger Claim ID, Member ID*

Potential triggers are identified over the entire date range of the input data. For the PCI episode, a potential trigger is defined as a professional claim with an associated inpatient or outpatient claim for the same patient as identified by the same *Member ID*. Professional, inpatient, and outpatient claims are identified based on the input field *Claim Type*. For the definition of each claim type see the glossary.

The professional claim must meet all of the following conditions:

- The claim has a procedure code for PCI in the input field *Detail Procedure Code* of one or more of its claim detail lines. The configuration file lists the PCI procedure codes under "PCI Procedure Codes – CPT Or HCPCS".
- At least one of the claim detail lines with a PCI procedure code does not contain a modifier that indicates assistant, anesthesiologist, or discontinued procedure in one of the input fields *Modifier 1-4*. The configuration file lists the modifiers under "Modifiers – Assistant Surgeons, Anesthesiologists, and Discontinued Procedures".
- The provider type of the billing provider of the professional claim must match one of the provider types listed in the configuration file under "Trigger Provider Type – Professional". The billing provider and their provider type are identified using the input fields *Billing Provider ID* and *Billing Provider Type*.

An associated inpatient claim must meet all of the following conditions:

- The inpatient claim must have a *Header From Date Of Service* on or before the *Detail From Date Of Service* of the professional claim detail line(s) with

the PCI procedure and also a *Discharge Date* on or after the *Detail From Date Of Service* of the professional claim detail line(s) with the PCI procedure.

- The inpatient claim must have an acute or non-acute ischemic heart disease diagnosis code in the input field *Header Diagnosis Code Primary*.
- The provider type of the billing provider of the inpatient claim must match one of the provider types listed in the configuration file under "Trigger Provider Type – Facility". The billing provider and their provider type are identified using the input fields *Billing Provider ID* and *Billing Provider Type*.

An associated outpatient claim must meet all of the following conditions:

- The outpatient claim must have a minimum *Detail From Date Of Service* that is within two days (i.e., as early as two days before or as late as two days after, inclusive) of the *Detail From Date Of Service* of the professional claim detail line(s) with the PCI procedure.
- The outpatient claim must have an acute or non-acute ischemic heart disease diagnosis code in the input field *Header Diagnosis Code Primary*.
- The provider type of the billing provider of the outpatient claim must match one of the provider types listed in the configuration file under "Trigger Provider Type – Facility". The billing provider and their provider type are identified using the input fields *Billing Provider ID* and *Billing Provider Type*.

The following definitions and rules apply in identifying associated inpatient and outpatient claims:

- An acute diagnosis code on an inpatient or outpatient claim is defined as one of the diagnosis codes listed in the configuration file under "Trigger Diagnosis Codes – STEMI", "Trigger Diagnosis Codes – NSTEMI", or "Trigger Diagnosis Codes – Unstable Angina" occurring in the input field *Header Diagnosis Code Primary* of the inpatient or outpatient claim.
- A non-acute diagnosis on an inpatient or outpatient claim is defined as one of the diagnosis codes listed in the configuration file under "Trigger Diagnosis Codes – Angina Pectoris" or "Trigger Diagnosis Codes – Other Ischemic Heart" occurring in the input field *Header Diagnosis Code Primary* of the inpatient or outpatient claim.

The output field *Trigger Claim ID* is set to the input field *Internal Control Number* of the professional claim that identifies a potential trigger. The output field *Member ID* is set to the input field *Member ID* of the professional claim that identifies a potential trigger.

The start date of a potential trigger is the earlier of the *Detail From Date Of Service* of the professional claim detail line(s) with the PCI procedure or the *Header From Date Of Service* of the associated inpatient claim (if the professional claim is associated with an inpatient claim) or the minimum *Detail From Date Of Service* of the associated outpatient claim (if the professional claim is associated with an outpatient claim). The end date of a potential trigger is the later of the *Detail To Date Of Service* of the professional claim detail line(s) with the PCI procedure or the *Discharge Date* of the associated inpatient claim (if the professional claim is associated with an inpatient claim) or the maximum *Detail To Date Of Service* of the associated outpatient claim (if the professional claim is associated with an outpatient claim).

A specific rule applies for potential triggers where the associated inpatient claim is part of a hospitalization consisting of two or more inpatient claims. For the definition of hospitalizations see the glossary. If an associated inpatient claim is part of a hospitalization consisting of two or more inpatient claims, the potential trigger starts on the earlier of the *Detail From Date Of Service* of the professional claim detail line(s) with the PCI procedure or the *Header From Date Of Service* of the hospitalization that the associated inpatient claim is a part of. The potential trigger ends on the later of the *Detail To Date Of Service* of the professional claim detail line(s) with the PCI procedure or the *Discharge Date* of the hospitalization that the associated inpatient claim is a part of.

To address cases where a professional claim is associated with two or more inpatient or outpatient claims, the following hierarchy is used such that each professional claim is unambiguously associated with one inpatient or outpatient claim. Only the inpatient or outpatient claim that has the highest priority is associated with the potential trigger. The inpatient or outpatient claims that are lower in the hierarchy are treated like any other claims during a potential trigger, not like an associated inpatient or outpatient claim.

- An associated inpatient claim with an acute diagnosis and one of the procedure codes for PCI that are listed in the configuration file under "PCI Procedure Codes – ICD-9 Px" in the input fields *Surgical Procedure Code Primary* or *Surgical Procedure Code 2-24* has highest priority.

- An associated inpatient claim with an acute diagnosis, but no PCI procedure code has second priority.
- An associated outpatient claim with an acute diagnosis and one of the procedure codes for PCI that are listed in the configuration file under "PCI Procedure Codes – CPT Or HCPCS" in the input field *Detail Procedure Code* of one of its claim detail lines has third priority.
- An associated outpatient claim with an acute diagnosis, but no PCI procedure code has fourth priority.
- An associated inpatient claim with a non-acute diagnosis and one of the procedure codes for PCI that are listed in the configuration file under "PCI Procedure Codes – ICD-9 Px" in the input fields *Surgical Procedure Code Primary* or *Surgical Procedure Code 2-24* has fifth priority.
- An associated inpatient claim with a non-acute diagnosis, but no PCI procedure code has sixth priority.
- An associated outpatient claim with a non-acute diagnosis and one of the procedure codes for PCI that are listed in the configuration file under "PCI Procedure Codes – CPT Or HCPCS" in the input field *Detail Procedure Code* of one of its claim detail lines has seventh priority.
- An associated outpatient claim with a non-acute diagnosis, but no PCI procedure code has eighth priority.

Throughout the hierarchy the following rules apply:

- At each step of the hierarchy, if two or more associated inpatient claims meet the required criteria, the inpatient claim with the earliest *Header From Date Of Service* is chosen. If two or more associated inpatient claims meet the required criteria and have the same *Header From Date Of Service*, the inpatient claim belonging to the hospitalization with the latest *Discharge Date* is chosen. If the *Discharge Date* is the same, the inpatient claim with the lower *Internal Control Number* is chosen.
- At each step of the hierarchy, if two or more associated outpatient claims meet the required criteria, the outpatient claim with the earliest minimum *Detail From Date Of Service* is chosen. If two or more associated outpatient claims meet the required criteria and have the same minimum *Detail From Date Of Service*, the claim with the greater duration is chosen. The duration of a claim is defined in the glossary. If the duration is the same, the outpatient claim with the lower *Internal Control Number* is chosen.

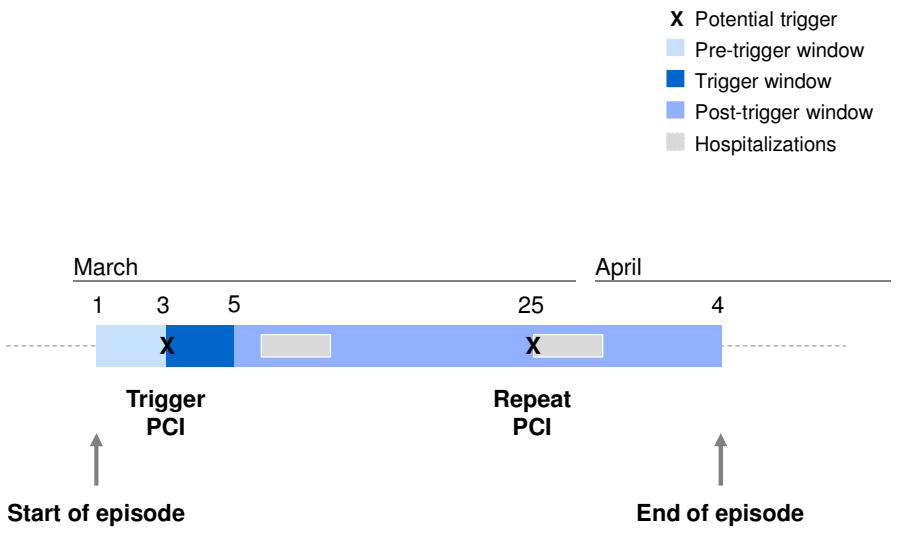
4.2 Determine the episode duration

The second design dimension of building a PCI episode is to define the duration of the episode and to assign claims and claim detail lines to each episode.

Episode output fields created: *Pre-trigger Window Start Date*, *Pre-trigger Window End Date, Trigger Window Start Date*, *Trigger Window End Date, Post-trigger Window Start Date, Post-trigger Window End Date, Episode Start Date, Episode End Date, Acute PCI Indicator*

Three time windows are of relevance in determining the episode duration (see Exhibit 8).

EXHIBIT 8 – EPISODE DURATION



- **Pre-trigger window**: Non-acute PCI episodes have a pre-trigger window if a procedure code for a diagnostic angiogram occurs in the input field *Detail Procedure Code* of a professional or outpatient claim detail line with a *Detail From Date Of Service* from up to 30 days before (inclusive) to one (1) day before the *Trigger Window Start Date* and also the claim detail line with the diagnostic angiogram does not overlap with a hospitalization of the patient. A claim detail line with a diagnostic angiogram is considered to overlap with

a hospitalization if its *Detail From Date Of Service* occurs on or after the *Header From Date Of Service* of a hospitalization and also occurs before or on the *Discharge Date* of the same hospitalization. The procedure codes for a diagnostic angiogram are listed in the configuration file under "Diagnostic Angiogram".

The *Pre-trigger Window Start Date* is the *Detail From Date Of Service* of the claim detail line with the diagnostic angiogram procedure code. The *Pre-trigger Window End Date* is the day before the *Trigger Window Start Date*. If two or more diagnostic angiograms occur during the 30 days before the *Trigger Window Start Date*, the earliest diagnostic angiogram is used to set the *Pre-trigger Window Start Date*. For non-acute PCI episodes with a pre-trigger window, the *Pre-trigger Window Start Date* is also the *Episode Start Date*. Acute PCI episodes do not have a pre-trigger window.

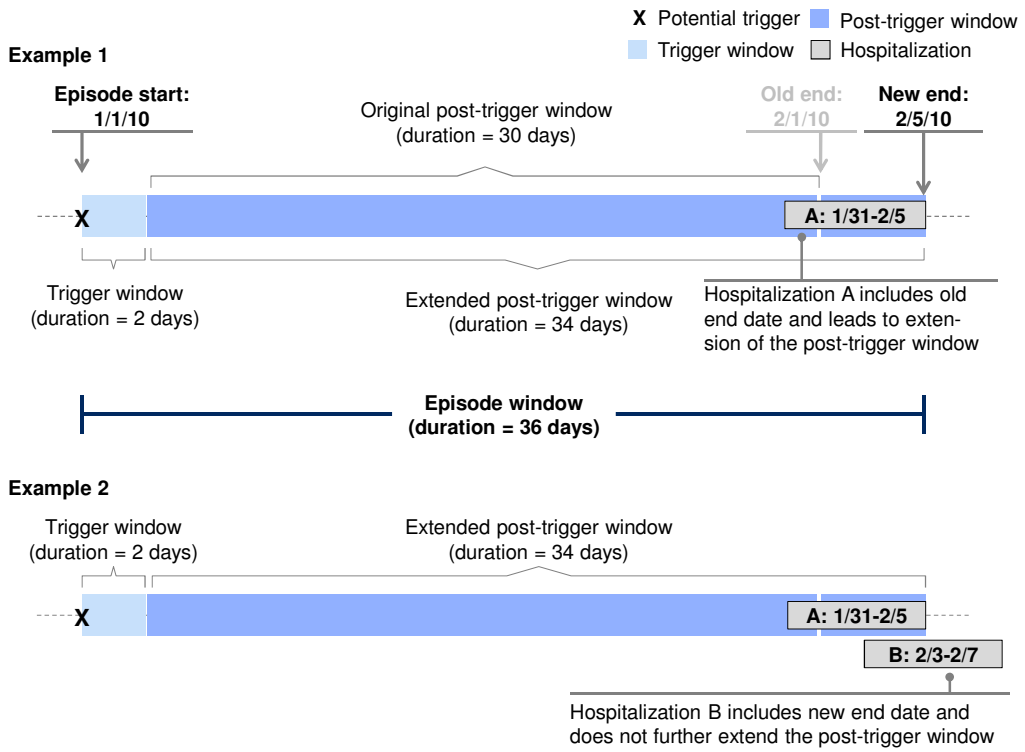
- **Trigger window**: The output fields *Trigger Window Start Date* and *Trigger Window End Date* are set using the potential trigger start and end dates which are defined in section 4.1. For non-acute PCI episodes without a pre-trigger window and for acute PCI episodes, the output field *Trigger Window Start Date* is also the *Episode Start Date*. Only potential triggers that constitute a trigger PCI can set the duration of a trigger window. The approach to determine whether a potential trigger is a trigger PCI is described below.

- **Post-trigger window**: The output field *Post-trigger Window Start Date,* is set to the day after the *Trigger Window End Date*. The output field *Post-trigger Window End Date* is set to the 29th day after the *Post-trigger Window Start Date* (for a post-trigger window of 30 days duration) or, if a hospitalization is ongoing on the 30th day of the post-trigger window, to the *Discharge Date* of the hospitalization. A hospitalization is ongoing on the 30th day of the post-trigger window if the hospitalization has a *Header From Date Of Service* during the trigger window or during the first 30 days of the post-trigger window and a *Discharge Date* beyond the first 30 days of the post-trigger window. If more than one hospitalization is ongoing on the 30th day of the post-trigger window, the latest *Discharge Date* present on a hospitalization sets the end date of the post-trigger window. Hospitalizations are defined in the glossary. The output field *Post-trigger Window End Date* is also the *Episode End Date*.

  The extension of an episode due to a hospitalization may not lead to further extensions of the episode, i.e., if the post-trigger window is set based on the *Discharge Date* of a hospitalization and a different hospitalization starts

during the extension of the post-trigger window and ends beyond it the episode is not extended a second time (Exhibit 9).

EXHIBIT 9 – EPISODE EXTENSIONS



The combined duration of the pre-trigger window, trigger window, and post-trigger window is the episode window. All time windows are inclusive of their first and last date. For a definition of how the duration of time windows is calculated see the glossary.

The logic that determines the duration of the episode window assigns potential triggers to one of two groups:

- **Trigger PCIs**: potential triggers that start a new episode and thereby define the trigger window for an episode.
- **Repeat PCIs**: potential triggers that have a potential trigger start and end date during a post-trigger window.

To define episode windows for each patient a chronological approach is taken. The first trigger PCI of a given patient is identified as the earliest (i.e., furthest in the past) potential trigger in the input data. Once the first trigger PCI for a patient has been identified, the trigger window, the post-trigger window, and –

if applicable – the pre-trigger window are set. Any potential triggers that fall into the post-trigger window are classified as repeat PCIs. The next potential trigger that falls outside the post-trigger window constitutes the second trigger PCI for a given patient. The process of setting episode windows continues for each patient until the last episode window that ends during the input data date range is defined. Note that the input data begins 15 months prior to the reporting window, so potential triggers may be repeat PCIs, and thus not trigger a PCI episode, due to a PCI that occurred prior to the reporting period.

The following special cases may occur when determining the episode duration:

- If two or more potential triggers of the same patient overlap, i.e., the start date of one potential trigger falls between the start date and the end date (inclusive) of one or more other potential triggers of the same patient, then only one of the overlapping potential triggers is chosen as a trigger PCI or repeat PCI. The other overlapping potential triggers do not count as trigger PCI or repeat PCI, but are treated like any other claims. The following hierarchy is applied to identify the one potential trigger out of two or more overlapping potential triggers that is assigned as a trigger PCI or repeat PCI:
  - The potential trigger with the earliest start date has highest priority.
  - If there is a tie, the potential trigger with the latest end date is selected.
  - If there is still a tie, the potential trigger with the earliest *Detail From Date Of Service* for the professional claim detail line with the PCI procedure is selected.
  - If there is still a tie, the potential trigger with the lowest *Trigger Claim ID* is selected.
- If the start date of a potential trigger occurs during the post-trigger window of an episode but its end date is outside of the post-trigger window of the episode, the potential trigger is neither a repeat PCI nor a trigger PCI, and the claims in the potential trigger are treated like any other claims.
- The setting of a pre-trigger window may lead to the overlap of a pre-trigger window with the post-trigger window of a preceding episode of the same patient. In such a case, the *Pre-trigger Window Start Date* of the second episode is set to the day after the *Episode End Date* of the preceding episode.

The episode output field *Acute PCI Indicator* marks episodes where the associated inpatient or outpatient claim during the trigger PCI has an acute diagnosis. The episodes marked by the *Acute PCI Indicator* constitute the set of

acute PCI episodes. All other episodes have a non-acute diagnosis on the associated inpatient or outpatient claim during the trigger PCI and constitute the set of non-acute PCI episodes. The diagnosis code on the associated inpatient or outpatient claim during a repeat PCI does not influence the classification of an episode as acute PCI or non-acute PCI. While the intent of the acute and non-acute PCI episodes is similar, the PAP differs for the two sets of episodes (see section 4.5) and separate provider reports are produced.

To determine which claims and claim detail lines occur during an episode and before an episode the following assignment rules are used. In addition, specific rules apply to assign claims and claim detail lines to windows during the episode (the trigger window, the pre-trigger window, the post-trigger window, and hospitalizations).

- **Assignment to the episode window**:
  - Hospitalizations, all inpatient claims within them, and all claim detail lines of the inpatient claims are assigned to the episode window if both the *Header From Date Of Service* and the *Discharge Date* of the hospitalization occur during the episode window.
  - Pharmacy claims and all their claim detail lines are assigned to the episode window if both the *Header From Date Of Service* and the *Header To Date Of Service* occur during the episode window.
  - Outpatient, long-term care, and professional claims are assigned to the episode window if at least one of their claim detail lines is assigned to the episode window. Outpatient, long-term care, and professional claim detail lines are assigned to the episode window if both the *Detail From Date Of Service* and the *Detail To Date Of Service* occur during the episode window.
- **Assignment to a window before the episode**:
  - Hospitalizations, all inpatient claims within them, and all claim detail lines of the inpatient claims are assigned to a window before the episode (e.g., 365 days to 1 day before the *Episode Start Date*, 90 days to 1 day before the *Episode Start Date*) if the *Header From Date Of Service* of the hospitalization occurs during the specified time window before the *Episode Start Date*.

- Pharmacy claims and all their claim detail lines are assigned to a window before the episode if the *Header From Date Of Service* occurs during the specified time window before the *Episode Start Date*.
- Outpatient, long-term care, and professional claims are assigned to a window before the episode if all their claim detail lines are assigned to the window before the episode. Outpatient, long-term care, and professional claim detail lines are assigned to a window before the episode if the *Detail From Date Of Service* occurs during the specified time window before the *Episode Start Date*.

- **Assignment to the trigger window**:
  - Hospitalizations, all inpatient claims within them, and all claim detail lines of the inpatient claims are assigned to the trigger window if both the *Header From Date Of Service* and the *Discharge Date* of the hospitalization occur during the trigger window.
  - Pharmacy claims and all their claim detail lines are assigned to the trigger window if both the *Header From Date Of Service* and the *Header To Date Of Service* occur during the trigger window.
  - Outpatient, long-term care, and professional claims are assigned to the trigger window if all their claim detail lines are assigned to the trigger window. Outpatient, long-term care, and professional claim detail lines are assigned to the trigger window if both the *Detail From Date Of Service* and the *Detail To Date Of Service* occur during the trigger window.

- **Assignment to the pre-trigger window**:
  - Hospitalizations, all inpatient claims within them, and all claim detail lines of the inpatient claims are assigned to the pre-trigger window if the hospitalization is assigned to the episode window and also has a *Header From Date Of Service* during the pre-trigger window.
  - Pharmacy claims and all their claim detail lines are assigned to the pre-trigger window if they are assigned to the episode window and also have a *Header From Date Of Service* during the pre-trigger window.
  - Outpatient, long-term care, and professional claims are assigned to the pre-trigger window if at least one of their claim detail lines is assigned to the pre-trigger window. Outpatient, long-term care, and professional claim detail lines are assigned to the pre-trigger window if they are

assigned to the episode window and also have a *Detail From Date Of Service* during the pre-trigger window.

- **Assignment to the post-trigger window**:
  - Hospitalizations, all inpatient claims within them, and all claim detail lines of the inpatient claims are assigned to the post-trigger window if the hospitalization is assigned to the episode window and also has a *Discharge Date* during the post-trigger window. For hospitalizations with a *Header From Date Of Service* during the pre-trigger window and a *Discharge Date* during the post-trigger window, assignment to the pre-trigger window takes precedence.
  - Pharmacy claims and all their claim detail lines are assigned to the post-trigger window if they are assigned to the episode window and also have a *Header To Date Of Service* during the post-trigger window. For claims with a *Header From Date Of Service* during the pre-trigger window and a *Header To Date of Service* during the post-trigger window, assignment to the pre-trigger window takes precedence.
  - Outpatient, long-term care, and professional claims are assigned to the post-trigger window if at least one of their claim detail lines is assigned to the post-trigger window and none of their claim detail lines are assigned to the pre-trigger window. Outpatient, long-term care, and professional claim detail lines are assigned to the post-trigger window if they are assigned to the episode window and also have a *Detail To Date Of Service* during the post-trigger window. For claim detail lines with a *Detail From Date Of Service* during the pre-trigger window and a *Detail To Date Of Service* during the post-trigger window assignment to the pre-trigger window takes precedence.
- **Assignment to hospitalizations**:
  - Pharmacy claims are assigned to a hospitalization if they are not assigned to the trigger window and both the *Header From Date Of Service* and the *Header To Date Of Service* occur during the hospitalization.
  - Outpatient and professional claims are assigned to a hospitalization if they are not assigned to the trigger window and all their claim detail lines are assigned to the hospitalization. Outpatient and professional claim detail lines are assigned to a hospitalization if both the *Detail From Date Of Service* and the *Detail To Date Of Service* occur during the hospitalization.

- Long-term care claims or claim detail lines are never assigned to a hospitalization.

4.3 Identify claims included in episode spend

The third design dimension of building an acute or non-acute PCI episode is to identify which claims and claim detail lines are included in the calculation of episode spend. For short, such claims or claim detail lines are referred to as included claims or included claim detail lines. Claims or claim detail lines that are excluded from the calculation of episode spend are referred to as excluded claims or excluded claim detail lines.

Episode output fields created: *Count Of Included Claims*

Different rules for the inclusion of claims and claim detail lines apply to claims and claim detail lines assigned to the pre-trigger window, the trigger window, and the post-trigger window. The assignment of claims and claim detail lines to windows during the episode is detailed in section 4.2.

- **Pre-trigger window**: Pharmacy claims as well as outpatient and professional claim detail lines that are assigned to the pre-trigger window but are not assigned to a hospitalization are checked for included diagnoses, included procedures, or included medications. The configuration file lists the codes under "Included Diagnoses", "Included Procedures", and "Included Medications".
  - All hospitalizations that are assigned to the pre-trigger window are excluded hospitalizations. All pharmacy claims as well as all outpatient and professional claim detail lines assigned to an excluded hospitalization are excluded claims or excluded claim detail lines, regardless of whether they contain included diagnosis, procedure, or medication codes.
  - If an outpatient or professional claim contains an included diagnosis code in the input field *Header Diagnosis Code Primary* then all claim detail lines of the claim that are assigned to the pre-trigger window and not assigned to a hospitalization are included claim detail lines.
  - If an outpatient or professional claim detail line that is assigned to the pre-trigger window and not assigned to a hospitalization contains an included procedure code in the input field *Detail Procedure Code*, then the claim detail line is an included claim detail line. For outpatient claims, all other

claim detail lines on the same claim with the same *Detail From Date Of Service* and *Detail To Date Of Service* as the included claim detail line are also included claim detail lines.

  - If a pharmacy claim that is assigned to the pre-trigger window and not assigned to a hospitalization contains an included medication code in the input field *National Drug Code*, then the claim is an included claim. The configuration file lists included medications using Hierarchical Ingredient Code Level 3 (HIC3) identifiers provided by First Databank. To search for included medications, the HIC3 codes must be cross-walked to National Drug Codes (NDCs). Since NDCs change over time an updated crosswalk including current and historical NDCs must be used for each reporting period.
  - If a pharmacy claim or outpatient or professional claim detail line that is assigned to the pre-trigger window and not assigned to a hospitalization does not contain an included diagnosis, included procedure, or included medication code, then the claim or claim detail line is an excluded claim or excluded claim detail line.

- **Trigger window**: All inpatient claims that are contained within a hospitalization that is assigned to the trigger window are included claims. All pharmacy claims as well as all outpatient, long-term care, and professional claim detail lines that are assigned to the trigger window are included claims.
- **Post-trigger window**: For claims and claim detail lines assigned to the post-trigger window, a hierarchy is applied to identify included claims and included claim detail lines:
  - First, included hospitalizations are identified. Two approaches are used: one for hospitalizations that contain one or more header-paid (i.e., DRG-paid) inpatient claims, the other for hospitalizations that contain only detail-paid (i.e., DRG-exempt) inpatient claims. The field *Header Or Detail Indicator* is used to determine if an inpatient claim is header-paid (‘H’) or detail-paid (‘D’).
    - If a hospitalization contains one or more header-paid inpatient claims then all the header-paid inpatient claims are searched for excluded APR-DRG in the input field *APR-DRG* (see the configuration file under “Excluded APR-DRG” for the codes used). If any of the header-paid inpatient claims that are part of the hospitalization contain an

excluded APR-DRG then the hospitalization is an excluded hospitalization and all inpatient claims in the hospitalization are excluded inpatient claims. If none of the header-paid inpatient claims that are part of the hospitalization contain an excluded APR-DRG then the hospitalization is an included hospitalization and all inpatient claims in the hospitalization are included inpatient claims.

  - If a hospitalization contains only detail-paid inpatient claims then all the inpatient claims are searched for included diagnoses in the input field *Header Diagnosis Code Primary* (see the configuration file under "Included Diagnoses" and "Included Complication Diagnoses" for the codes used). If all the inpatient claims that are part of the hospitalization contain an included diagnosis code then the hospitalization is an included hospitalization and all inpatient claims in the hospitalization are included inpatient claims. If any of the inpatient claims that are part of the hospitalization do not contain an included diagnosis code in the input field *Header Diagnosis Code Primary* then the hospitalization is an excluded hospitalization and all inpatient claims in the hospitalization are excluded inpatient claims.

- Second, all pharmacy claims as well as all outpatient and professional claim detail lines assigned to a hospitalization are included or excluded based on whether the hospitalization they are assigned to is included or excluded:
  - All pharmacy claims as well as all outpatient and professional claim detail lines assigned to an excluded hospitalization are excluded claims or excluded claim detail lines, regardless of whether they contain included diagnosis, included complication diagnosis, included procedure, included complication procedures, or included medication codes.
  - All pharmacy claims as well as all outpatient and professional claim detail lines assigned to an included hospitalization and not assigned to an excluded hospitalization are included claims or included claim detail lines, regardless of whether they contain included diagnosis, included complication diagnosis, included procedure, included complication procedures, or included medication codes.
- Third, pharmacy claims as well as outpatient, long-term care, and professional claim detail lines that are assigned to the post-trigger window

but are not assigned to a hospitalization are checked for included diagnoses, included complication diagnoses, included procedures, included complication procedures, or included medications. The configuration file lists the codes under "Included Diagnoses", "Included Complication Diagnoses", "Included Procedures", "Included Complication Procedures", and "Included Medications".

- If an outpatient, long-term care, or professional claim contains an included diagnosis code or an included complication diagnosis code in the input field *Header Diagnosis Code Primary* then all claim detail lines of the claim that are assigned to the post-trigger window and not assigned to a hospitalization are included claim detail lines.
- If an outpatient, long-term care, or professional claim detail line that is assigned to the post-trigger window and not assigned to a hospitalization contains an included procedure code or included complication procedure code in the input field *Detail Procedure Code*, then the claim detail line is an included claim detail line. For outpatient claims, all other claim detail lines on the same claim with the same *Detail From Date Of Service* and *Detail To Date Of Service* as the included claim detail line are also included claim detail lines.
- If a pharmacy claim that is assigned to the post-trigger window and not assigned to a hospitalization contains an included medication code in the input field *National Drug Code*, then the claim is an included claim. The configuration file lists included medications under "Included Medications" using Hierarchical Ingredient Code Level 3 (HIC3) identifiers provided by First Databank. To search for included medications, the HIC3 codes must be cross-walked to National Drug Codes (NDCs). Since NDCs change over time an updated crosswalk including current and historical NDCs must be used for each reporting period.
- If a pharmacy claim or outpatient, long-term care, or professional claim detail line that is assigned to the post-trigger window and not assigned to a hospitalization does not contain an included diagnosis, included complication diagnosis, included procedure, included complication procedure, or included medication code, then the claim or claim detail line is an excluded claim or excluded claim detail line.

- **Episode window**: Professional claim detail lines that are assigned to the episode window (whether they are part of an included or excluded hospitalization or not) are checked for excluded procedures. These exclusions supersede any other reason a claim detail line might be included. The configuration file lists the codes under "Excluded Transportation Procedures".
    - If a professional claim detail line that is assigned to the episode window contains an excluded procedure code in the input field *Detail Procedure Code*, then the claim detail line is an excluded claim detail line.

The output field *Count Of Included Claims* is defined as the number of unique claims that contribute to episode spend. A claim is counted as contributing to episode spend if it is an included claim or if one or more of its claim detail lines are included claim detail lines. The output field *Count Of Included Claims* is calculated overall as well as broken out by claim type, by window during the episode, and by claim type and window during the episode. Breakouts by window are calculated based on the window to which each claim is assigned.

4.4 Calculate non-risk adjusted episode spend

The fourth design dimension of building an acute or non-acute PCI episode is to calculate the non-risk-adjusted spend for each episode.

Episode output fields created: *Non-risk-adjusted Episode Spend, Normalized-non-risk-adjusted Episode Spend*

PAP output fields created: *Average Non-risk-adjusted PAP Spend, Total Non-risk-adjusted PAP Spend*

The *Non-risk-adjusted Episode Spend* is defined as the sum of:

- The spend for included, header-paid inpatient claims. The spend for each included, header-paid inpatient claim is calculated as the value in the input field *DRG Base Payment* plus the values in the input fields *DRG Outlier Payment A* and *DRG Outlier Payment B*. Header-paid inpatient claims are identified based on a *Header Or Detail Indicator* of 'H'. Other components of the DRG payment are not taken into account.
- The spend for included, detail-paid inpatient claims. The spend for each included, detail-paid inpatient claim is calculated as the sum of the input

fields *Detail Paid Amount* for claims from MCPs and the sum of the inputs fields *Detail Allowed Amount* for claims from FFS.

- The *Header Paid Amount* of included pharmacy claims from MCPs.
- The *Header Allowed Amount* of included pharmacy claims from FFS.
- The *Detail Paid Amount* for included outpatient, long-term care, and professional claim detail lines from MCPs.
- The *Detail Allowed Amount* for included outpatient, long-term care, and professional claim detail lines from FFS.

Claims from MCPs and FFS are distinguished based on the input field *FFS Or MCP Indicator*. A value of 'E' in the input field *FFS Or MCP Indicator* indicates an MCP claim; a value of 'F' indicates a FFS claim. The output field *Non-risk-adjusted Episode Spend* is calculated overall and broken out by claim type, by window during the episode, and by claim type and window during the episode.

The *Normalized-non-risk-adjusted Episode Spend* is defined as the sum of:

- The normalized spend for included, header-paid inpatient claims. The normalized spend for each included, header-paid inpatient claim is calculated as the value in the input field *DRG Base Payment* multiplied by the ratio of the *Normalized Base Rate* to the *Base Rate* plus the values in the input fields *DRG Outlier Payment A* and *DRG Outlier Payment B*. The configuration file lists the *Normalized Base Rate* as a parameter under "Episode Spend". The *Base Rate* is determined by looking up the appropriate value in the input field *Base Rate* from the APR-DRG Base Rate Table using the input field *Provider ID* to link to the *Billing Provider ID* of each included, header-paid inpatient claim. Header-paid inpatient claims are identified based on a *Header Or Detail Indicator* of 'H'. Other components of the DRG payment are not taken into account.
- The spend for included, detail-paid inpatient claims. The spend for each included, detail-paid inpatient claim is calculated as the sum of the input fields *Detail Paid Amount* for claims from MCPs and the sum of the inputs fields *Detail Allowed Amount* for claims from FFS.
- The *Header Paid Amount* of included pharmacy claims from MCPs.
- The *Header Allowed Amount* of included pharmacy claims from FFS.

- The *Detail Paid Amount* for included outpatient, long-term care, and professional claim detail lines from MCPs.
- The *Detail Allowed Amount* for included outpatient, long-term care, and professional claim detail lines from FFS.

If a claim detail line is included for two or more reasons (e.g., due to an included diagnosis and an included procedure), its *Detail Allowed Amount* or *Detail Paid Amount* counts only once towards the *Non-risk-adjusted Episode Spend* or the *Normalized-non-risk-adjusted Episode Spend*.

For the provider reports, the fields *Average Non-risk-adjusted PAP Spend* and *Total Non-risk-adjusted PAP Spend* are added to the PAP output table. *Average Non-risk-adjusted PAP Spend* is calculated as the average of the *Non-risk-adjusted Episode Spend* across valid episodes for a given PAP. *Total Non-risk-adjusted PAP Spend* is calculated as the sum of the *Non-risk-adjusted Episode Spend* across valid episodes for a given PAP. See section 4.5 for the identification of PAPs and section 4.6 for the definition of valid episodes.

The *Average Non-risk-adjusted PAP Spend* is shown overall as well as broken out by claim type, by window during the episode, and by claim type and window during the episode. The breakouts of *Average Non-risk-adjusted PAP Spend* are calculated in two ways:

- Breakout A: The averages are calculated across all valid episodes of a PAP.
- Breakout B: The averages are calculated across valid episodes of a PAP that have spend greater zero dollars (>$0) in the category that is broken out.

For example, a PAP has 100 valid episodes and 80 of the episodes have any inpatient spend, the remaining 20 do not have any inpatient spend. To calculate breakout A for *Average Non-risk-adjusted PAP Spend Inpatient*, the denominator is 100 valid episodes. To calculate breakout B for *Average Non-risk-adjusted PAP Spend Inpatient* the denominator is 80 valid episodes with any inpatient spend.

4.5 Identify Principal Accountable Providers

The fifth design dimension of building an acute or non-acute PCI episode is to assign each episode to a Principal Accountable Provider (PAP).

Episode output fields created: *PAP ID, PAP Name, Rendering Provider ID, Rendering Provider Name*

PAP output fields created: *PAP ID, PAP Name, PAP Address Line 1, PAP Address Line 2, PAP City, PAP State, PAP Zip Code*

The method for assigning a PAP to a PCI episode depends on whether the episode is an acute PCI or a non-acute PCI. For the definition of acute and non-acute PCI see section 4.2.

- **Acute PCI:** The output field *PAP ID* is set using the input field *Billing Provider ID* of the inpatient or outpatient claim that is associated with the trigger PCI. The associated inpatient or outpatient claim is defined in section 4.1.
- **Non-acute PCI:** The output field *PAP ID* is set using the input field *Billing Provider ID* of the professional claim that is used to set the *Trigger Claim ID*.

For acute and non-acute PCI episodes, the output field *Rendering Provider ID* is set using the input field *Rendering Provider ID* of the claim that is used to set the *Trigger Claim ID*.

The output fields *PAP Name, PAP Address Line 1, PAP Address Line 2, PAP City, PAP State,* and *PAP Zip Code* are set based on the Provider Extract input fields *Provider Name, Practice Address Line 1, Practice Address Line 2, Practice City, Practice State,* and *Practice Zip Code*, respectively. The output fields are linked to the Provider Extract by matching the output field *PAP ID* to the input field *Provider ID* of the Provider Extract.

The output field *Rendering Provider Name* is set based on the Provider Extract input field *Provider Name*. The output field is linked to the Provider Extract by matching the output field *Rendering Provider ID* to the input field *Provider ID* of the Provider Extract.

4.6 Identify excluded episodes

The sixth design dimension of building an acute or non-acute PCI episode is to identify episodes that are excluded from the episode-based payment model.

Episode output fields created: *Any Exclusion, Exclusion Inconsistent Enrollment, Exclusion Multiple Payers, Exclusion Third-party Liability,*

Exclusion Dual Eligibility, Exclusion Exempt PAP, Exclusion PAP Out Of State, Exclusion No PAP, Exclusion Long Hospitalization, Exclusion Long-term Care, Exclusion Missing DRG, Exclusion Incomplete Episode, Exclusion Age, Exclusion Left Against Medical Advice, Exclusion Death, Exclusion Comorbidity, Exclusion Multiple Other Comorbidities, Exclusion High Outlier

Each *Exclusion <name of exclusion>* output field indicates whether an episode is excluded for a given reason and therefore invalid for the purpose of the episode based payment model. If an episode is excluded for more than one reason each exclusion is indicated. The output field *Any Exclusion* indicates whether an episode contains any exclusion. Episodes may be excluded for business reasons, for clinical reasons, or because they are outliers. After all exclusions have been applied, a set of valid episodes remains.

Business exclusions

- **Inconsistent enrollment**: An episode is excluded if the patient was not continuously enrolled in Ohio Medicaid during the episode window. Enrollment is verified using the *Eligibility Start Date* and *Eligibility End Date* from the Member Extract where the *Aid Category* indicates full Medicaid enrollment. *Aid Category* codes that indicate full Medicaid enrollment are listed in the configuration file under "Business Exclusions – Inconsistent Enrollment". Note that only the first digit of the *Aid Category* code is used for this purpose.

  A patient is considered continuously enrolled if the patient's *Eligibility Start Date* for full Medicaid falls before or on (≤) the *Episode Start Date* and the *Eligibility End Date* for full Medicaid falls on or after (≥) the *Episode End Date*. The output field *Member ID* is linked to the input field *Member ID* from the Member Extract to identify the enrollment information for each patient.

  A patient may have multiple entries for *Eligibility Start Date* and *Eligibility End Date* for full Medicaid and some of the dates may be overlapping. In such cases, continuous, non-overlapping records of a patient's enrollment are created before confirming whether the patient was continuously enrolled during an episode. If a patient has an *Eligibility Start Date* without a corresponding *Eligibility End Date* for full Medicaid, enrollment is considered to be ongoing through the last date of the input data.

If a patient was not continuously enrolled in Ohio Medicaid before or after the episode window, but was continuously enrolled during the episode window, the episode is not excluded.

- **Multiple payers:** An episode is excluded if a patient changes enrollment between FFS and an MCP or between MCPs during the trigger window or during the post-trigger window. Episodes are identified as having multiple payers if the patient has an *MCP Start Date* or an *MCP End Date* from the Member Extract during the trigger window or the post-trigger window.

  If a patient changes enrollment between FFS and an MCP or between MCPs during the pre-trigger window (if any) or before the episode, it is the responsibility of the payer to whom the episode is attributed to utilize the claims history of the patient with the prior payer (FFS or MCP) to build the episode. Attribution of an episode to a payer is defined in the glossary under "Payer attribution".

- **Third-party liability**: An episode is excluded if either:
  - An inpatient, outpatient, or professional claim that is assigned to the episode window is associated with a third-party liability amount. A claim is considered to be associated with a third-party liability amount if either the input field *Header TPL Amount* or any of the input fields *Detail TPL Amount* have a value greater than (>) zero. The claim with a positive TPL amount may or may not be included in the calculation of episode spend.

    As an exception, a third party liability amount in the input field *Header TPL Amount* or the input field *Detail TPL Amount* of a professional FFS claim from an FQHC or RHC does not lead to exclusion of the episode if the episode is attributed to an MCP. Professional claims from FQHC or RHC are identified based on one or more detail lines that are assigned to the episode window and also have a *Place Of Service* of FQHC or RHC. The relevant values for *Place Of Service* are listed in the configuration file under "Business Exclusions – TPL FQHC And RHC". Claims from FFS are identified based on the input field *FFS Or MCP Indicator* having a value of 'F'. Attribution of an episode to a payer is defined in the glossary under "Payer attribution".
  - A patient was enrolled with a relevant source of third party liability during the episode window. Enrollment is verified using the *TPL Effective Date* and *TPL End Date* from the Member Extract where the *Coverage Type* indicates relevant TPL coverage. *Coverage Type* codes that indicate

relevant TPL are listed in the configuration file under "Business Exclusions – TPL Relevant Coverage".

A patient is considered enrolled with a relevant source of TPL if the patient's *TPL Effective Date* falls before or on (≤) the *Episode End Date* and the *TPL End Date* falls on or after (≥) the *Episode Start Date*. The output field *Member ID* is linked to the input field *Member ID* from the Member Extract to identify the enrollment information for each patient.

If a patient has a *TPL Effective Date* without a corresponding *TPL End Date* the enrollment with a relevant source of TPL is considered to be ongoing through the last date of the input data.

If a patient was enrolled with a relevant TPL source before or after the episode window, but was not enrolled during the episode window, the episode is not excluded.

- **Dual eligibility**: An episode is excluded if the patient had dual coverage by Medicare and Medicaid during the episode window. Dual coverage is determined using the *Eligibility Start Date* and *Eligibility End Date* from the Member Extract where the *Aid Category* indicates dual coverage. *Aid Category* codes that indicate dual coverage are listed in the configuration file under "Business Exclusions – Duals". Note that only the first digit of the *Aid Category* code is used for this purpose.

  A patient is considered to have dual coverage during the episode window if the patient's *Eligibility Start Date* for dual coverage falls before or on (≤) the *Episode End Date* and the *Eligibility End Date* for dual coverage falls on or after (≥) the *Episode Start Date*. The input field *Member ID* is linked to the output field *Member ID* from the Member Extract to identify the enrollment information for each patient.

  If a patient has an *Eligibility Start Date* without a corresponding *Eligibility End Date* for dual coverage, the dual coverage is considered to be ongoing through the last date of the input data.

  If a patient had dual coverage before or after the episode window, but not during the episode window, the episode is not excluded.

- **Exempt PAP**: An acute PCI episode is excluded if the claim that is used to set the *PAP ID* is a detail-paid inpatient claim. Detail-paid claims are identified based on a *Header Or Detail Indicator* of 'D'. The exempt PAP exclusion applies only to acute PCI episodes.

- **PAP out of state**: An episode is excluded if the PAP has a practice address outside of Ohio. The state of the practice address is determined using the output field *PAP State* and the state code for Ohio is listed in the configuration file under "Business Exclusions – PAP Out Of State".
- **No PAP**: An episode is excluded if the PAP cannot be identified. A PAP cannot be identified if the *Billing Provider ID* is not available.
- **Long hospitalization:** An episode is excluded if a hospitalization that is assigned to the episode window has a duration greater than (>) 30 days. The hospitalization may or may not be included in the episode spend.
- **Long-term care**: An episode is excluded if the patient has one or more long-term care claim detail lines which overlap the pre-trigger or trigger windows, unless that claim starts on the last day of the trigger window. A long-term care claim detail line which overlaps the pre-trigger or trigger window, but does not start on the last day of the trigger window is defined as one with both a *Detail From Date Of Service* prior to (<) the *Trigger End Date* and a *Detail To Date Of Service* on or after (≥) the *Episode Start Date*. The long-term care claim may or may not be included in the episode spend.
- **Missing DRG:** An episode is excluded if a header-paid inpatient claim assigned to the episode window has an invalid or missing value in the input fields *APR-DRG* or *Severity Of Illness*. Header-paid inpatient claims are identified based on a *Header Or Detail Indicator* of 'H'.
- **Incomplete episodes**: An episode is excluded if the *Non-risk-adjusted Episode Spend* (not the *Risk-adjusted Episode Spend*) is less than (<) the incomplete episode threshold. The incomplete episode threshold is listed as a parameter in the configuration file under "Excluded Episodes".

Clinical exclusions

- **Age**: An episode is excluded if the output field *Member Age* does not fall into the valid age range or if it is invalid. See the glossary for the definition of *Member Age*. The valid age range for the acute and non-acute PCI episodes is listed as parameters in the configuration file under "Excluded Episodes".
- **Left against medical advice**: An episode is excluded if the patient has a *Patient Status Indicator* of "Left Against Medical Advice or Discontinued Care" on any inpatient or outpatient claim assigned to the episode window. The claim may be an included claim or not. The value of the *Patient Status*

Indicator used to identify whether the patient left against medical advice is listed in the configuration file under "Clinical Exclusions – Left Against Medical Advice".

- **Death**: An episode is excluded if either:
  - The patient has a *Patient Status Indicator* of "Expired" on any inpatient or outpatient claim assigned to the episode window. The claim may be an included claim or not. The values of the *Patient Status Indicator* used to identify whether the patient expired are listed in the configuration file under "Clinical Exclusions – Death".
  - The input field *Date Of Death* in the Member Extract contains a date before or equal to the *Episode End Date*. The output field *Member ID* is linked to the input field *Member ID* from the Member Extract to identify the *Date Of Death* for each patient.
- **Comorbidity**: An episode is excluded if the patient has a comorbidity code during a specified time window. The following approaches are used to identify comorbidities:
  - Comorbidity diagnosis codes are searched for in the input fields *Header Diagnosis Code Primary* or *Header Diagnosis Code 2-28* of inpatient, outpatient, and professional claims that are assigned to the specified time windows. The configuration file lists the codes and time windows under "Comorbidities <name of comorbidity> – Diagnoses".
  - Comorbidity CCS codes are first converted into ICD-9 diagnosis codes using the definition of the multi-level CCS categories for ICD-9 diagnosis codes available from AHRQ (http://www.hcup-us.ahrq.gov/toolssoftware/ccs/ccs.jsp). As with comorbidity diagnosis codes, the diagnosis codes associated with the Comorbidity CCS codes are searched for in the input fields *Header Diagnosis Code Primary* or *Header Diagnosis Code 2-28* of inpatient, outpatient, and professional claims that are assigned to the specified time windows. The configuration file lists the codes and time windows used under "Comorbidities <name of comorbidity> – CCS".
  - Comorbidity CPT and HCPCS procedure codes are searched for in the input field *Detail Procedure Code* of outpatient and professional claim detail lines that are assigned to the specified time windows. The configuration file lists the codes and time windows used under "Comorbidities <name of comorbidity> – CPT Or HCPCS".

- Comorbidity ICD-9 procedure codes are searched for in the input fields *Surgical Procedure Code Primary* and *Surgical Procedure Code 2-24* of inpatient claims that are assigned to the specified time windows. The configuration file lists the codes and time windows used under "Comorbidities <name of comorbidity> – ICD-9 Px".
- Comorbidity contingent codes require both the presence of a cancer diagnosis code and also an indicator of active cancer treatment during the specified time window:
  - Cancer diagnosis codes are searched for in the input fields Header Diagnosis Code Primary or Header Diagnosis Code 2-28 of inpatient, outpatient, and professional claims assigned to the specified time window. The configuration file lists the codes and time windows used under "Comorbidities Cancer – Diagnoses".
  - An indicator of active cancer treatment is the presence of either a diagnosis or procedure code for active cancer treatment during the specified time window. The indicator may occur on the same claim as a cancer diagnosis code or on a different claim. Diagnosis codes for active cancer treatment are searched for in the input fields Header Diagnosis Code Primary or Header Diagnosis Code 2-28 of inpatient, outpatient, and professional claims that are assigned to the specified time window. The configuration file lists the codes and time windows used under "Comorbidities Cancer Active – Diagnoses". CPT and HCPCS codes for active cancer treatment are searched for in the input field Detail Procedure Code of outpatient and professional claim detail lines that are assigned to the specified time window. The configuration file lists the codes and time windows used under "Comorbidities Cancer Active – CPT Or HCPCS". ICD-9 procedure codes for active cancer treatment are searched for in the input fields Surgical Procedure Code Primary and Surgical Procedure Code 2-24 of inpatient claims that are assigned to the specified time window. The configuration file lists the codes and time windows used under "Comorbidities Cancer Active – ICD-9 Px".

The claims and claim detail lines that are searched for comorbidities do not have to be included claims or included claim detail lines. If a patient lacked continuous eligibility during the year before the episode or during the episode window, comorbidities are checked in the data available.

- **Multiple other comorbidities**: An episode is excluded if it is affected by too many risk factors to reliably risk adjust the episode spend. The output fields *Risk Factor <risk factor number>* as defined in section 4.8 are used to identify how many risk factors affect an episode. Each output field *Risk Factor <risk factor number>* indicates whether an episode is affected by one risk factor. If an episode is affected by more (>) risk factors than the value listed as a parameter in the configuration file under "Excluded Episodes", the episode is excluded.

Outliers

- **High outlier**: An episode is excluded if the *Risk-adjusted Episode Spend* (not the *Non-risk-adjusted Episode Spend*) is above (>) the high outlier threshold. The high outlier thresholds for the acute and non-acute PCI episodes are listed as parameters in the configuration file under "Excluded Episodes". See section 4.8 for the definition of *Risk-adjusted Episode Spend*.

4.7 Identify Principal Accountable Providers who pass the quality metrics

The seventh design dimension of building an acute or non-acute PCI episode is the calculation of the quality metrics and the identification of PAPs who meet the quality metrics performance requirement.

Episode output fields created: *Quality Metric 01(a-g) Indicator*, *Quality Metric 02 Indicator, Quality Metric 03 Indicator*

PAP output fields created: *PAP Quality Metric 01(a-g) Performance*, *PAP Quality Metric 02 Performance, PAP Quality Metric 03 Performance*

The acute and non-acute PCI episodes have two quality metrics that are tied to gain sharing and four informational (i.e., not tied to gain sharing) quality metrics

Quality metric 1: Adverse outcomes

- Quality metric 1 is composed of seven sub-metrics, each indicating a potential adverse outcome of PCI:
  - Quality metric 01a: AV fistula or dissection of coronary artery
  - Quality metric 01b: Post-operative hemorrhage
  - Quality metric 01c: Post-operative infection

- Quality metric 01d: Myocardial infarction
- Quality metric 01e: Pulmonary embolism or deep vein thrombosis
- Quality metric 01f: Stent complication
- Quality metric 01g: Stroke

- Each *Quality Metric 01(a-c) Indicator* marks episodes with an adverse outcome of AV fistula or dissection of coronary artery, post-operative hemorrhage, or post-operative infection, respectively. Each of the adverse outcomes is identified as one or more of the following occurring:
  - An inpatient, outpatient, or professional claim that is assigned to the trigger window or the post-trigger window and also has a diagnosis code for the given adverse outcome in the input fields *Header Diagnosis Code Primary* or *Header Diagnosis Code 2-28*. The configuration file lists the diagnosis codes under "Quality Metric 01a AV Fistula – Diagnosis", "Quality Metric 01b Post-operative Hemorrhage – Diagnosis", and "Quality Metric 01c Post-operative Infection – Diagnosis".
  - An outpatient or professional claim detail line that is assigned to the trigger window or the post-trigger window and also has a CPT procedure code for the given adverse outcome in the input field *Detail Procedure Code*. The configuration file lists the CPT codes under "Quality Metric 01a AV Fistula – CPT", "Quality Metric 01b Post-operative Hemorrhage – CPT", and "Quality Metric 01c Post-operative Infection – CPT".
  - An inpatient claim that is assigned to the trigger window or the post-trigger window and also has an ICD-9 procedure code for the given adverse outcome in the input fields *Surgical Procedure Code Primary* or *Surgical Procedure Code 2-24*. The configuration file lists the ICD-9 procedure codes for AV fistula under "Quality Metric 01a AV Fistula – ICD-9 Px", "Quality Metric 01b Post-operative Hemorrhage – ICD-9 Px", and "Quality Metric 01c Post-operative Infection – ICD-9 Px".
- *Quality Metric 01d Indicator* marks episodes with an adverse outcome of myocardial infarction. An adverse outcome of myocardial infarction is identified by an inpatient claim assigned to the post-trigger window that has either a diagnosis of myocardial infarction in the input field *Header Diagnosis Code Primary* or has both a diagnosis of angina, coronary artery disease, or chest pain in the input field *Header Diagnosis Code Primary* and a diagnosis of myocardial infarction in one of the input fields *Header*

Diagnosis Code 2-28. The configuration file lists the diagnosis codes and time windows for myocardial infarction under "Quality Metric 01d Myocardial Infarction" and the diagnosis codes for or angina, coronary artery disease, or chest pain under "Quality Metric 01d Angina CAD Chest Pain".

- Each *Quality Metric 01(e-g) Indicator* marks episodes with an adverse outcome of pulmonary embolism or deep vein thrombosis, stent complication, or stroke, respectively. Each of the adverse outcomes is identified based on an inpatient, outpatient, or professional claim that is assigned to the specified window and also has a diagnosis code for the given adverse outcome in the input fields *Header Diagnosis Code Primary* or *Header Diagnosis Code 2-28*. The configuration file lists the diagnosis codes and time windows under "Quality Metric 01(e-g) <name of adverse outcome>".
- The *PAP Quality Metric 01(a-g) Performance* is expressed as a percentage for each PAP and for each adverse outcome a-g based on the following ratio:
  - Numerator: Number of valid episodes of the PAP with one of the adverse outcomes a-g
  - Denominator: Number of valid episodes of the PAP

Quality metric 2: Single-vessel and multi-vessel PCI

- The *Quality Metric 02 Indicator* marks whether the trigger PCI is conducted on a single vessel or on multiple vessels (including multiple branches). The trigger PCI is considered to involve multiple vessels if one or both of the following conditions apply:
  - The professional claim that is used to set the *Trigger Claim ID* contains two or more detail lines with a CPT code listed in the configuration file under "Quality Metric 02 Multiple Vessels A" in the input field *Detail Procedure Code*.
  - The professional claim that is used to set the *Trigger Claim ID* contains at least one claim detail line with a CPT code listed in the configuration file under "Quality Metric 02 Multiple Vessels B" in the input field *Detail Procedure Code*.

  All episodes where the trigger PCI did not involve multiple vessels are counted as single vessel PCI episodes.

- If any of the claim detail lines with a code for multiple vessels have a modifier for assistant surgeon, anesthesiologist, or a discontinued procedure in one of the input fields *Modifier 1-4*, then they do not count towards determining whether a multiple vessel PCI was performed. The configuration file lists the modifiers under "Modifiers – Assistant Surgeons, Anesthesiologists and Discontinued Procedures".
- The *PAP Quality Metric 02 Performance* is expressed as a percentage for each PAP based on the following ratio:
  - Numerator: Number of valid episodes of the PAP where the trigger PCI is conducted on multiple vessels
  - Denominator: Number of valid episodes of the PAP

Quality metric 3: Staged PCI

- The *Quality Metric 03 Indicator* marks episodes with one or more repeat PCIs. Repeat PCIs are defined in Section 4.2.
- The *PAP Quality Metric 03 Performance* is expressed as a percentage for each PAP based on the following ratio:
  - Numerator: Number of valid episodes of the PAP with one or more repeat PCIs
  - Denominator: Number of valid episodes of the PAP

4.8 Perform risk adjustment

The eighth design dimension of building an acute or non-acute PCI episode is to risk adjust the non-risk-adjusted episode spend for risk factors that may contribute to higher episode spend given the characteristics of a patient.

Episode output fields created: *Risk Factor <risk factor number>, Episode Risk Score, Risk-adjusted Episode Spend*

PAP output fields created: *Average Risk-adjusted PAP Spend*, *Total Risk-adjusted PAP Spend*

Risk adjustment first requires identification of the risk factors that affect each episode. Then the *Non-risk-adjusted Episode Spend* is multiplied by the risk score that applies to the episode given its risk factors. The derivation of the risk

factors and their coefficients is not part of the algorithm to produce an episode and is therefore not described in the DBR.

Flag episodes that are affected by risk factors: The following types of risk factors apply:

- Risk factor Acute PCI: The output field *Risk Factor 001* for the acute PCI episode indicates whether the diagnosis of the associated inpatient or outpatient claim during the trigger PCI was acute. The diagnosis of the associated inpatient or outpatient claim is defined in section 4.1.
- Risk factor STEMI Trigger: The output field *Risk Factor 002* indicates whether the diagnosis of the associated inpatient or outpatient claim during the trigger PCI had a diagnosis of STEMI. The diagnosis of the associated inpatient or outpatient claim is defined in section 4.1.
- Risk factor Multiple Vessels Or Staged PCI: The output field *Risk Factor 003* indicates whether the episode involves a multi-vessel PCI procedure during the trigger PCI and/or a repeat PCI. The identification of episodes with a multi-vessel PCI procedure during the trigger PCI is the same as for quality metric 2. The identification of episodes with a repeat PCI is the same as for quality metric 3. See section 4.7 for the definition of quality metrics 2 and 3.
- Diagnosis-based risk factors: The output fields *Risk Factor <risk factor number>* for diagnosis-based risk factors indicate whether an inpatient, outpatient, or professional claim that is assigned to the specified time window contains a risk factor diagnosis code in any of the input fields *Header Diagnosis Code Primary* or *Header Diagnosis Code 2-28*. The risk factor diagnosis codes and the time windows are listed in the configuration file under "Risk Factors <risk factor number and name> – Diagnoses".
- CCS category-based risk factors: The output fields *Risk Factor <risk factor number>* for CCS category-based risk factors indicate whether an inpatient, outpatient, or professional claim that is assigned to the specified time window contains a risk factor diagnosis code associated with the CCS code in any of the input fields *Header Diagnosis Code Primary* or *Header Diagnosis Code 2-28*. CCS codes are converted into ICD-9 diagnosis codes using the definition of the multi-level CCS categories for ICD-9 diagnosis codes available from AHRQ (http://www.hcup-us.ahrq.gov/toolssoftware/ccs/ccs.jsp). The configuration file lists the codes and time windows used under "Risk Factor <risk factor number and name> – CCS".

The claims that are searched for risk factors do not have to be included claims. If a patient was not continuously enrolled during the year before the episode window or during the episode window, risk factors are searched for in the claims available.

Calculate the episode risk score: Each risk factor is associated with a risk coefficient, the values for which are listed as parameters in the configuration file under "Risk Adjustment". For the acute and non-acute PCI episodes, the *Episode Risk Score* for an episode is the product of the risk coefficients for all the risk factors that affect the episode. For example, if an episode is affected by two risk factors, *Risk Factor 001* and *Risk Factor 002*, the *Episode Risk Score* is:

*Episode Risk Score = Risk Coefficient 001 * Risk Coefficient 002*

If an episode is not affected by any risk factors, the *Episode Risk Score* is equal to one (1).

Calculate risk-adjusted episode spend: To calculate the episode output field *Risk-adjusted Episode Spend*, the *Non-risk-adjusted Episode Spend* is multiplied by the *Episode Risk Score*.

Risk-adjusted Episode Spend =

*Non-risk-adjusted Episode Spend * Episode Risk Score*

The PAP output field *Average Risk-adjusted PAP Spend* is calculated as the average of the *Risk-adjusted Episode Spend* across valid episodes of each PAP. The *Total Risk-adjusted PAP Spend* is calculated as the sum of the *Risk-adjusted Episode Spend* across valid episodes of each PAP.

4.9 Calculate gain/risk sharing amounts

The ninth and final design dimension of building an acute or non-acute PCI episode is to calculate the gain or risk sharing amount for each PAP. The description below outlines one possible approach of linking PAP performance to payments. The State of Ohio may choose to provide further guidance at a future point in time when gain/risk sharing payments will be implemented.

PAP output fields created: *Count Of Total Episodes Per PAP, Count Of Valid Episodes Per PAP, Minimum Episode Volume Pass, Gain Sharing Quality Metric Pass*, *Gain/Risk Sharing Amount, PAP Sharing Level*

Gain and risk sharing amounts are calculated based on the episodes of each PAP that end during the reporting period. The State's proposed approach to calculating the gain or risk sharing amount paid to/by each PAP uses the following pieces of information:

- Number of episodes of each PAP: The output field *Count Of Total Episodes Per PAP* is defined as the number of total episodes each PAP treats during the reporting period. The output field *Count Of Valid Episodes Per PAP* is defined as the number of valid episodes each PAP treats during the reporting period. Episodes are counted separately by each payer. For the provider reports the field *Count Of Valid Episodes Per PAP* is also shown broken out by the number of valid episodes with spend of each claim type (*Count Of Valid Episodes Per PAP With Inpatient/With Outpatient/With Professional/With Pharmacy*). To calculate the breakouts, the number of valid episodes of each PAP are counted that have greater than zero dollars (>$0) in *Non-risk-adjusted Episode Spend* for a given claim type.
- Minimum episode requirement: Only PAPs who pass the minimum episode requirement of five or more (≥5) valid episodes receive a provider report and are eligible for gain and risk sharing. The output field *Minimum Episode Volume Pass* is set to indicate whether a PAP has five or more valid episodes during the reporting period. Whether a PAP passes the minimum episode requirement is determined independently by each payer based on the episodes a PAP has for patients enrolled with the payer. The assignment of episodes to a payer is detailed in the glossary under payer attribution.
- Performance of each PAP on quality metrics tied to gain sharing: Only PAPs who pass the quality metrics tied to gain sharing are eligible for gain sharing. The thresholds to pass the quality metrics are set in accordance with the definition of each quality metric and are provided as input parameters for the episode algorithm. The output field *Gain Sharing Quality Metric Pass* indicates whether a PAP passes all quality metrics tied to gain sharing.
- *Commendable Threshold*, *Acceptable Threshold*, and *Gain Sharing Limit Threshold*: The thresholds are set based on the historical performance of PAPs with five or more episodes. The values for the thresholds are provided as input parameters for the episode algorithm.
- *Gain Share Proportion* and *Risk Share Proportion*: The split of the gains and losses in the episode-based payment model between payer and provider is at

the discretion of each payer. The proportions are provided as input parameters for the episode algorithm.

Gain sharing payment: To receive a gain sharing payment, a PAP must meet all of the following three criteria:

- Pass the quality metrics thresholds tied to gain sharing
- Pass the minimum episode requirement,
- Have an *Average Risk-adjusted PAP Spend* below (<) the *Commendable Threshold*.

Is the three conditions are met, the *Gain/Risk Sharing Amount* is set based on the following formula:

[*Gain/Risk Sharing Amount*] =

$$[Total\ Non\text{-}risk\text{-}adjusted\ PAP\ Spend] \times [Gain\ Share\ Proportion] \times \left(\frac{[Commendable\ Threshold] - [Average\ Risk\text{-}adjusted\ PAP\ Spend]}{[Average\ Risk\text{-}adjusted\ PAP\ Spend}\right)$$

Risk sharing payment: To owe a risk-sharing payment, a PAP must meet both of the following criteria:

- Pass the minimum episode requirement
- Have an *Average Risk-adjusted PAP Spend* above (>) the *Acceptable Threshold*.

The risk-sharing payment applies irrespective of the performance of the PAP on the quality metrics. If the above two conditions are met, the *Gain/Risk Sharing Amount* is set based on the following formula:

[*Gain/Risk Sharing Amount*] =

$$[Total\ Non\text{-}risk\text{-}adjusted\ PAP\ Spend] \times [Risk\ Share\ Proportion] \times \left(\frac{[Acceptable\ Threshold] - [Average\ Risk\text{-}adjusted\ PAP\ Spend]}{[Average\ Risk\text{-}adjusted\ PAP\ Spend}\right)$$

If neither the conditions for a gain sharing payment nor a risk sharing payment are met, the output field *Gain/Risk Sharing Amount* is set to zero dollars ('$0').

To summarize the performance of each PAP in the episode-based payment model the output field *PAP Sharing Level* is set to

- "1" if *Average Risk-adjusted PAP Spend* < *Gain Sharing Limit Threshold*
- "2" if *Average Risk-adjusted PAP Spend* < *Commendable Threshold* and also >= *Gain Sharing Limit Threshold*
- "3" if *Average Risk-adjusted PAP Spend* <= *Acceptable Threshold* and also >= *Commendable Threshold*
- "4" if *Average Risk-adjusted PAP Spend* > *Acceptable Threshold*

*** End of algorithm ***

5. GLOSSARY

- **Acute PCI episode:** See section 4.2
- **Claim types:** The claim types used in the acute and non-acute PCI episodes are based on the input field *Claim Type*. The required claim types are:
  - Inpatient (I)
  - Outpatient (O)
  - Long-term care (L)
  - Pharmacy (P)
  - Professional (M)

  Note that the State of Ohio Department of Medicaid defines long-term care claims based on the input field *Type of Bill* values beginning with 21, 22, 23, 28, 65, and 66.
- **CPT:** Current Procedural Terminology
- **DBR:** Detailed Business Requirements
- **Duration of time windows:** The duration of a time window (e.g., the episode window, the trigger window), the duration of a claim or claim detail line, and the length of stay for inpatient stays is calculated as the last date minus the first date plus one (1). For example:
  - A trigger window with a *Trigger Window Start Date* of January 1, 2014 and a *Trigger Window End Date* of January 1, 2014 has a duration of one (1) day.
  - A trigger window with a *Trigger Window Start Date* of January 1, 2014 and a *Trigger Window End Date* of January 3, 2014 has a duration of three (3) days.
  - A claim with a *Header From Date Of Service* of January 1, 2014 and a *Header To Date of Service* of January 2, 2014 has a duration of two (2) days.
- **Episode window:** See section 4.2
- **FFS:** Fee For Service
- **HCPCS:** Healthcare Common Procedure Coding System

- **HIC3:** Hierarchical Ingredient Code at the third level based on the classification system by First Databank
- **Hospitalization:** A hospitalization is defined as all the inpatient claims a patient incurs while being continuously hospitalized in one or more inpatient facilities. A hospitalization may include more than one inpatient claim because the inpatient facility may file interim inpatient claims and/or because the patient may be transferred between two or more inpatient facilities. A hospitalization consisting of just one inpatient claim starts on the *Header From Date Of Service* and ends on the *Discharge Date* of the inpatient claim. A hospitalization where two or more inpatient claims are linked together starts on the *Header From Date Of Service* of the first inpatient claim and ends on the *Discharge Date* of the last inpatient claim in the hospitalization. Within the DBR, the start of a hospitalization is referred to as the *Header From Date Of Service* for that hospitalization and the end of the hospitalization is referred to as the *Discharge Date* of that hospitalization.

  Inpatient claims are linked together into one hospitalization consisting of two or more inpatient claims if any of the following conditions apply:

  - Interim billing or reserved/missing discharge status: An inpatient claim with a *Patient Status Indicator* that indicates interim billing (see the configuration file under "Hospitalization – Interim Billing" for the codes used), that is reserved (see the configuration file under "Hospitalization – Reserved" for the codes used), or that is missing is linked with a second inpatient claim into one hospitalization if either of the following conditions apply:
    - There is a second inpatient claim with a Header From Date Of Service on the same day as or the day after the Discharge Date of the first inpatient claim
    - There is a second inpatient claim with an Admission Date on the same day as the Admit Date of the first inpatient claim and also a Header From Date Of Service on the same day as or within thirty (≤ 30) days after the Discharge Date of the first inpatient claim
  - Transfer: An inpatient claim with a *Patient Status Indicator* indicating a transfer (see the configuration file under "Hospitalization – Transfer" for the codes used) is linked with a second inpatient claim into one hospitalization if there is a second inpatient claim with a *Header From*

Date Of Service on the same day as or the day after the *Discharge Date* of the first inpatient claim.

  - If the second inpatient claim (and potentially third, fourth, etc.) also has a *Patient Status Indicator* indicating interim billing, reserved, missing, or transfer the hospitalization is extended further until an inpatient claim with a discharge status other than interim billing, reserved, missing, or transfer occurs, or until the inpatient claim that follows does not satisfy the required conditions.

- **ICD-9:** International Classification of Diseases, Ninth Revision
- **ICN:** Internal Control Number
- **Invalid episodes:** See section 4.6
- **Length of stay:** See glossary entry Duration of time windows.
- **MCP:** Managed Care Plan
- **Member Age:** The output field *Member Age* reflects the patient's age in years at the episode trigger. *Member Age* is calculated as the difference in years between the start of the claim that is used to set the *Trigger Claim ID* and the date of birth of the patient. The start of the claim is determined using the input field *Header From Date Of Service* for inpatient claims and the earliest *Detail From Date Of Service* across all claim detail lines for outpatient and professional claims. The date of birth of the patient is identified by linking the *Member ID* of the patient in the episode output table to the *Member ID* of the patient in the Member Extract and looking up the date in the input field *Date of Birth*. *Member Age* is always rounded down to the full year. For example, if a patient is 20 years and 11-months old at the start of the episode, the *Member Age* is set to 20 years. If the *Date of Birth* is missing, greater than (>) 100 years, or less than (<) 0 years, then the output field *Member Age* is treated as invalid.
- **NDC:** National Drug Code
- **Non-Acute PCI episode:** See section 4.2
- **PAP:** Principal Accountable Provider
- **Patient:** An individual with a PCI episode
- **Payer attribution:** Patients may be enrolled with Ohio Medicaid Fee For Service or with a Managed Care Plan. An episode is assigned to the payer

that paid for the claim that is used to set the *Trigger Claim ID*. The payer that paid for a claim is identified using the input data field *MCP ID*.

- **PCI:** Percutaneous Coronary Intervention
- **Post-trigger window:** See section 4.2
- **Pre-trigger window**: See section 4.2
- **Total episodes:** All episodes, valid plus invalid.
- **Trigger window:** See section 4.2
- **Valid episodes:** See section 4.6