Detailed Business Requirements Appendectomy and Cholecystectomy Episodes

a1.1 c04 d01

State of Ohio

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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	08/31/2015	■ Initial design based on Clinical Advisory Group recommendations
a1.0 c02 d02	11/20/2015	■ Configuration: Added diagnosis codes to the transplant exclusion in the cholecystectomy code sheet to bring it into alignment with other episodes

Version	Date	Changes
		■ DBR and configuration: Updated configuration file and DBR with risk adjustment factors, code lists, and coefficients, as well as high cost outlier and multi-comorbidity thresholds ■ DBR and configuration: Based on the risk adjustment process, added exclusions for meningitis, encephalitis, and specific CNS infections and poliomyelitis to both appendectomy and cholecystectomy and added an exclusion for dementia to appendectomy
a1.1 c03 d01	04/27/2016	■ DBR: Revised sections 2.3.3 and 4.2 to reflect that professional, outpatient, and pharmacy claims are not assigned to hospitalizations ■ DBR: Removed ICD-9 Px codes from quality metric 05 ■ DBR: Updated description of average length of stay in quality metric 06 to clarify that it is the length of stay of the hospitalization ■ DBR: Updated definition of transfer hospitalizations in glossary to specify that transfers are separate hospitalizations ■ DBR: Changed prefix of exclusions from 'Excl' to 'EE', exclusion name 'LongHosp' changed to 'LongAdmission', spend columns 'Custom' to 'Performance' and 'ClaimCount' to 'ClaimsIncluded' in section 3.2 ■ DBR: Updated section 4.9 to clarify conditions that must be met for gain sharing and risk sharing payments ■ Configuration: Removed one diagnosis code from HIV exclusion list
a1.1 c04 d01	6/13/2016	■ Configuration: Updated code sheet to include ICD-10 diagnosis and procedure codes in all appropriate sub-dimensions ■ Configuration: Removed six ICD-9 diagnosis codes from 'Relevant Diagnoses' list (Appendectomy only) ■ Configuration: Added ICD-9 and ICD-10 Pick's disease and senile degeneration diagnosis codes to the 'Comorbidities Dementia - Diagnoses' list (Appendectomy only) ■ Configuration: Added ICD-9 hemorrhage diagnosis codes to the 'Quality metric 02 Severe Or Surgical Adverse Outcomes' list (Appendectomy only) ■ Configuration: Removed three ICD-9 diagnosis codes from the ' Relevant Diagnoses' list (Cholecystectomy only)

Version	Date	Changes
		■ Configuration: Removed eight ICD-9 diagnosis codes from the 'Included Complication Diagnoses' list (Cholecystectomy only) ■ Configuration: Changed from CCS category to CCSsinglediagnosis to accomodate ICD-10 codes

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 an appendectomy or cholecystectomy procedure. These two episodes share a similar journey, logic, and structure, so are covered together in this document. Functionally, they should be considered separately and treated as if they each had individual documentation. A separate configuration file is provided for appendectomy and cholecystectomy episodes and providers receive separate reports for appendectomy and cholecystectomy episodes.

As depicted in Exhibit 1, an appendectomy episode often starts with an emergency department visit immediately followed by an appendectomy procedure.

As depicted in Exhibit 2, a cholecystectomy episode may start with an initial visit to the surgeon in the weeks before the cholecystectomy procedure followed by the cholecystectomy procedure itself.

After an appendectomy or cholecystectomy procedure, the patient undergoes follow-up care which may include a follow-up visit with the surgeon, visits by a nurse, patient monitoring, and certain medications. Some patients may develop complications requiring further treatment in an inpatient or outpatient facility or other follow-up care.

EXHIBIT 1 – PATIENT JOURNEY FOR THE APPENDECTOMY EPISODE

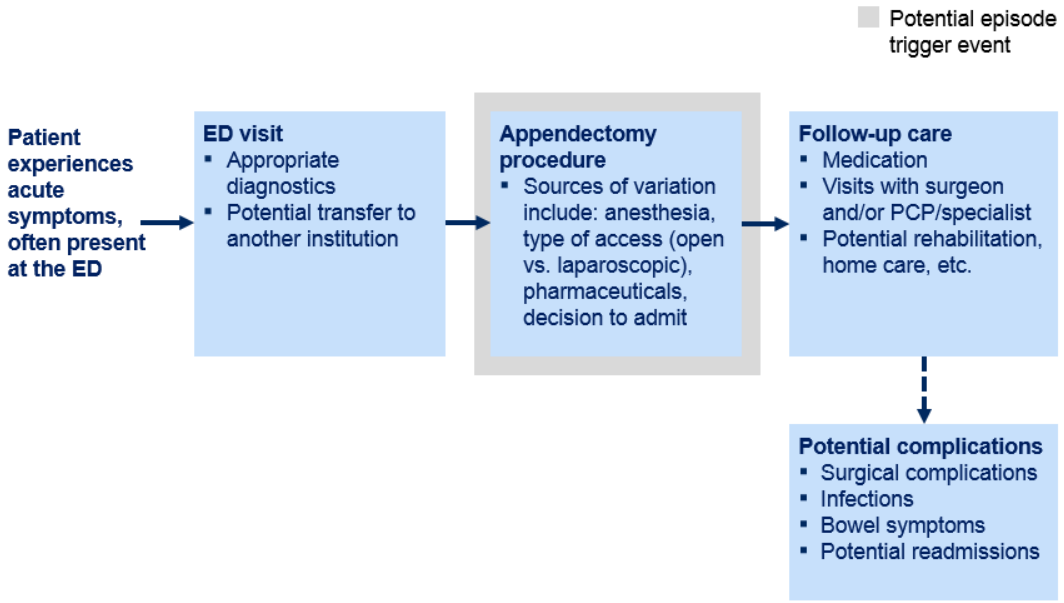
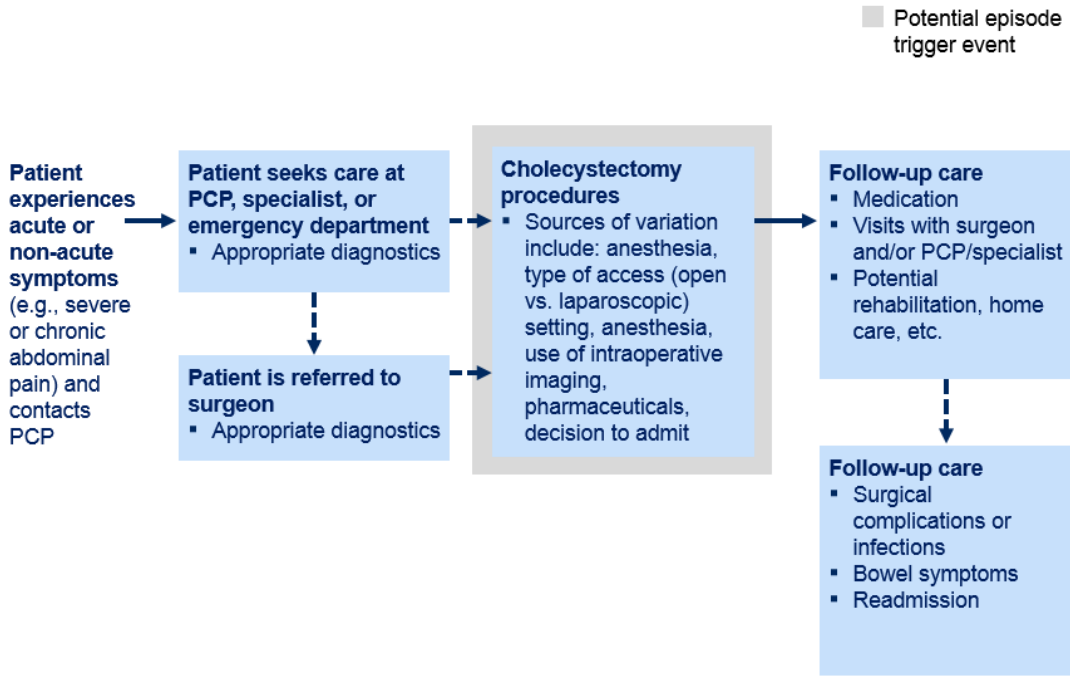


EXHIBIT 2 – PATIENT JOURNEY FOR THE CHOLECYSTECTOMY EPISODE



2.2 Sources of value

In treating patients receiving an appendectomy or cholecystectomy procedure, providers have several opportunities to improve the quality and cost of care and reduce clinical variation (see Exhibits 3 and 4). For example, providers may be able to reduce the rate of complications and unnecessary surgeries through the appropriate use of diagnostic imaging and testing driven by an accurate patient history and physical exam, minimize unnecessary admissions, and, in cholecystectomy episodes that have pre-operative surgeon involvement, select the most appropriate setting for care. In general, these practices could reduce the likelihood of avoidable readmissions and complications as well as the overall cost of care for an appendectomy or cholecystectomy procedure.

EXHIBIT 3 – SOURCES OF VALUE FOR THE APPENDECTOMY EPISODE

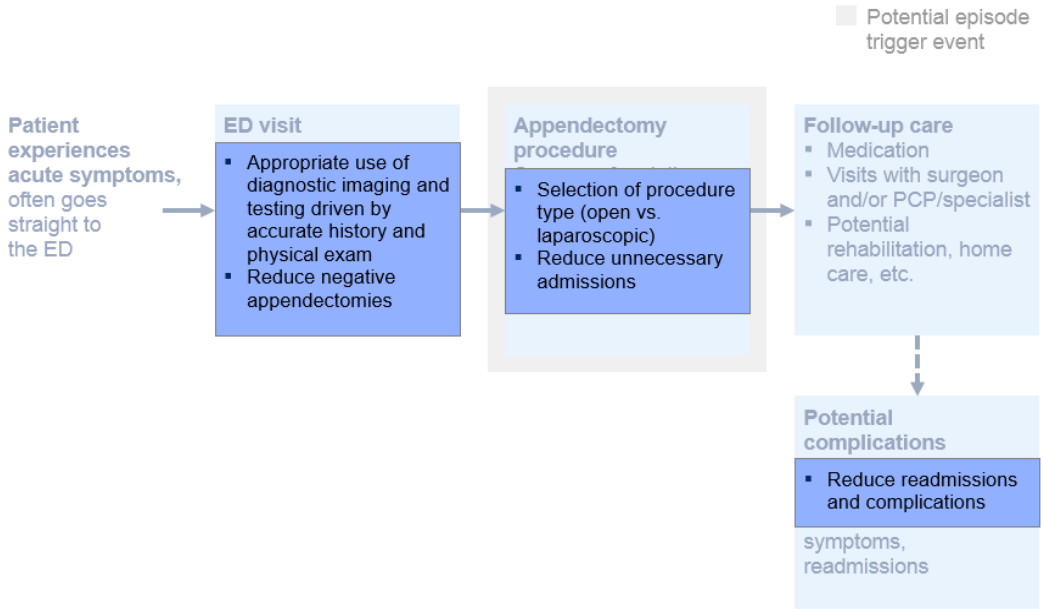
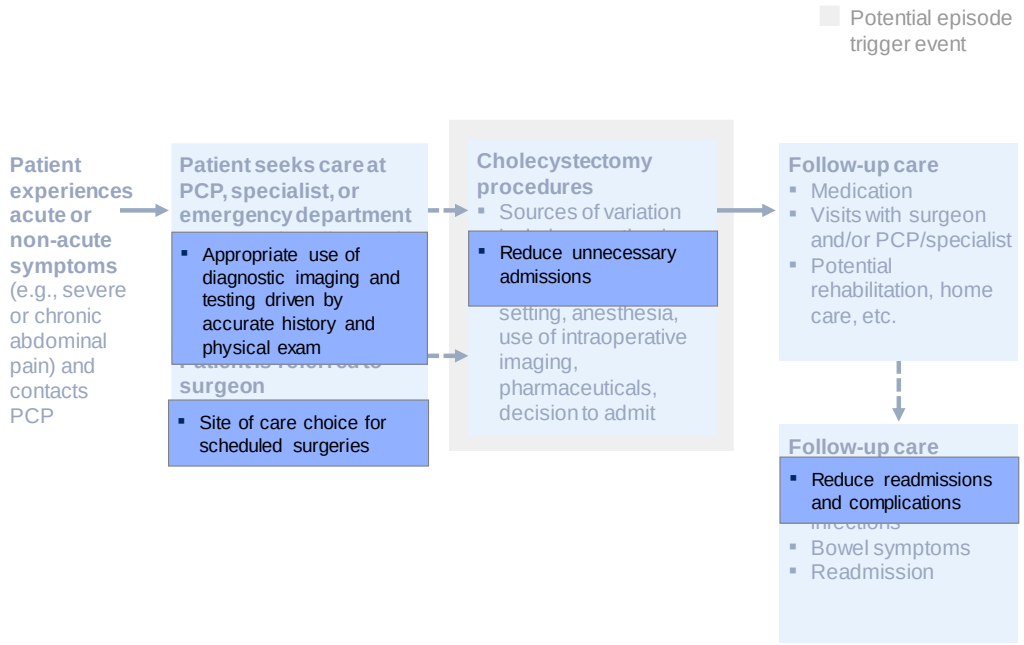


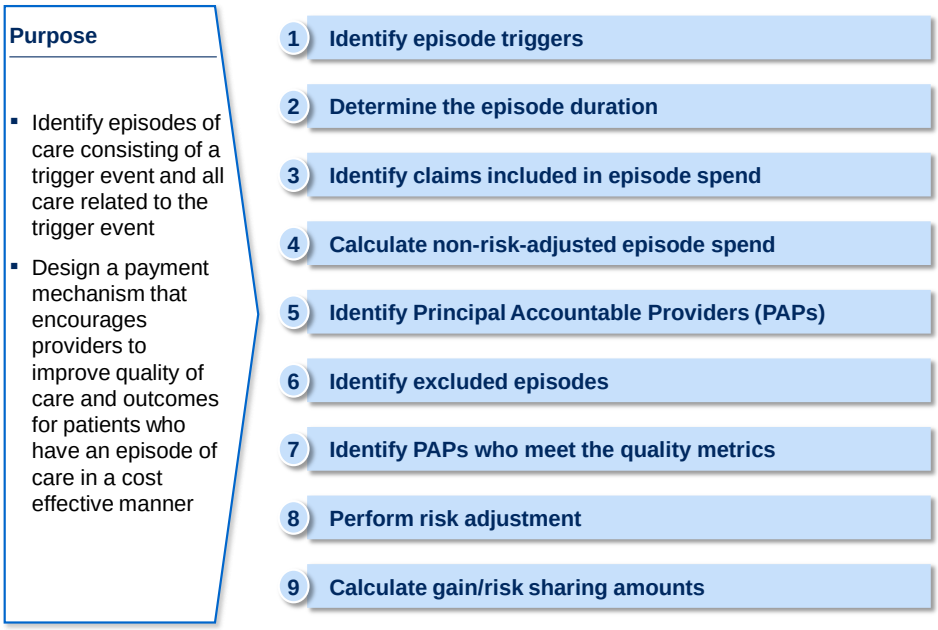
EXHIBIT 4 – SOURCES OF VALUE FOR THE CHOLECYSTECTOMY EPISODE



2.3 Design dimensions

Designing and building an appendectomy or cholecystectomy 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 appendectomy or cholecystectomy episode is a professional claim for the procedure. Potential triggers are identified based on a professional claim with a procedure code denoting an open or laparoscopic procedure, including procedures which encompass intraoperative imaging (i.e. laparoscopic cholecystectomy with cholangiography). No associated facility claim or confirmatory diagnosis is required to trigger an episode; however, if an associated facility claim exists, it will be used in the calculation of the potential trigger's duration. The configuration file lists the trigger procedure codes under "Trigger Procedure Codes".

A potential trigger extends for the entire duration of the professional claim, plus the duration of the associated hospitalization or outpatient claim, if one exists. Hospitalizations denote periods of time when a patient was continuously hospitalized in an inpatient facility. They may consist of one or more inpatient claims. Hospitalizations and the claim types referenced throughout the DBR are defined in the glossary.

2.3.2 Episode duration

The duration of the appendectomy and cholecystectomy episodes has three components: the pre-trigger window, trigger window, and post-trigger window. Overall, the duration of the episode is referred to as the episode window. Additionally, a clean period following each episode trigger is defined to prevent overlapping episode windows.

- **Pre-trigger window**:
  - **Appendectomy**: The pre-trigger window for an appendectomy episode begins 2 days before the start of the trigger window and ends one day before the start of the trigger window.
  - **Cholecystectomy**: A cholecystectomy episode has a pre-trigger window that begins on the date of the earliest PAP involvement within 90 days before the start of the trigger window and ends one day before the start of the trigger window. If there is no evidence in the data that the PAP saw the patient within 90 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 constitutes an episode and ends on the last day of a potential trigger that constitutes 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 30thday (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.
- **Clean period:** For appendectomy episodes, the clean period starts on the potential trigger start date and extends for 32 days from the potential trigger end date. For cholecystectomy episodes, the clean period starts on the potential trigger start date and extends for 120 days from the potential trigger end date. The clean period is defined as the period during which, if the potential trigger triggers an episode, no new episode of the same type can be triggered. Note that the clean period is not part of the episode duration.

Based on the definitions of the clean period and the pre-trigger, trigger, and post-trigger windows, potential triggers are divided into trigger procedures and repeat procedures:

- **Trigger procedures**: Potential triggers that do not occur during another episode constitute the trigger window of a new episode.
- **Repeat procedures**: Potential triggers that occur during the clean period of an episode do not constitute the trigger window for a new episode.

Repeat procedures and multiple episodes for the same patient should rarely occur for appendectomy and cholecystectomy episodes, but are included in the episode logic for completeness.

2.3.3 Claims included in episode spend

Episode spend is calculated on the basis of claims directly related to or stemming from the appendectomy or cholecystectomy procedure. 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 appendectomy episodes and cholecystectomy episodes with a pre-trigger window, inpatient, outpatient, professional, and pharmacy claims during the pre-trigger window that are related to the triggering procedure are included claims. Included claims during the pre-trigger window fall into the following groups:
  - Included diagnoses: Inpatient, outpatient, and professional claims with an included diagnosis code in any diagnosis field are included claims.
  - Included pre-operative procedures (for appendectomy only): Outpatient and professional claim detail lines with an included pre-operative procedure code and a relevant diagnosis code are included claim detail lines.
  - Included evaluation and management (E&M) care: Outpatient and professional claim detail lines with both an included procedure code indicating an E&M visit and a relevant diagnosis code are included claim detail lines.

- Included imaging and testing procedures: Outpatient and professional claim detail lines with an included imaging or testing procedure code are included claim detail lines.
- Included medications: Pharmacy claims with an included medication code are included claims.

- **Trigger window**: All inpatient, outpatient, long-term care, and professional claims assigned to the trigger window are included claims. Pharmacy claims assigned to the trigger window with an included medication code 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 appendectomy or cholecystectomy procedure 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 complications 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.
  - Included complication diagnoses: Outpatient, long-term care and professional claims with an included complication diagnosis code as the primary diagnosis.
  - Included E&M care: Outpatient, long-term care, and professional claim detail lines with an included procedure code indicating an E&M visit and a relevant diagnosis code.
  - Included testing, rehabilitation, and post-operative procedures: Outpatient, long-term care, and professional claim detail lines with an included testing, rehabilitation, or post-operative procedure code and a relevant diagnosis code.

- Included imaging and testing procedures: Outpatient, long-term care, and professional claim detail lines with an included imaging or testing procedure code.
- Included medications: Pharmacy claims with an included medication code.

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 pre-operative procedures (appendectomy only), included E&M procedures, relevant diagnoses, included pathology, rehabilitation, and post-operative procedures, included imaging and testing procedures, included medications, and excluded transportation are listed in the configuration file under "Excluded APR-DRG", "Included Diagnoses", "Included Complication Diagnoses", "Included Pre-Operative Procedures" (appendectomy only), "Included Evaluation And Management", "Relevant Diagnoses", "Included Pathology Rehabilitation And Post-Operative Procedures", "Included Imaging And Testing Procedures", "Included Medications", and "Excluded Transportation Procedures", respectively.

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, is 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 an appendectomy or cholecystectomy. The PAP is the physician entity performing the appendectomy or cholecystectomy procedure. The PAP is identified using the billing provider ID on the professional claim with the appendectomy or cholecystectomy procedure which triggered the episode.

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.
  - 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 prior to the procedure, as identified by long-term care claims occurring in the pre-trigger or trigger windows of the episode, with the exception of the last day of the trigger window.
  - Missing APR-DRG: An episode is excluded if a DRG-paid inpatient claim during the episode window 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 appendectomy episode is excluded if the patient is younger than two (<2) or older than sixty-four (>64) years of age. A cholecystectomy 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.
  - Excluded Procedures: An episode is excluded if the patient receives an excluded procedure during the trigger window. The configuration file lists the procedure codes and time windows under "Clinical Exclusions <Procedure Name> - Procedures". The excluded procedures are:
    - Incidental appendectomy (appendectomy only)
    - Open (non-laparoscopic) cholecystectomy (cholecystectomy only)
    - Laparotomy (cholecystectomy only)
  - 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> - <Procedures or Diagnoses>". Comorbidity codes are searched for on inpatient, outpatient, and professional claims.

    The comorbidity exclusions for **both appendectomy and cholecystectomy episodes** are:
    - Cancer under active management during the episode window or during the 90 days before the episode window
    - Coma or brain damage during the episode window or during the 365 days before the episode window

- Cystic fibrosis during the episode window or during the 365 days before the episode window
- Encephalitis during the episode window or during the 365 days before the episode window
- End stage renal disease (ESRD) 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
- Meningitis 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
- Organ transplant 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
- Specific CNS infections and poliomyelitis
- Tuberculosis during the episode window or during the 365 days before the episode window

The comorbidity exclusions for **appendectomy episodes only** are:

- Dementia

The comorbidity exclusions for **cholecystectomy episodes only** are:

- Acute pancreatitis during the trigger window
- Cholangitis during the trigger 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 April 2013 and March 2015, 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".

2.3.7 Quality metrics

A PAP must pass all quality metrics tied to gain sharing to be eligible for gain sharing. PAPs also 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 metrics tied to gain sharing for both appendectomy and cholecystectomy**:
  - Quality metric 1: Percent of episodes with a surgical site infection during the trigger window or the post-trigger window. The codes used to identify a surgical site infection are listed in the configuration file under "Quality Metric 01 Surgical Site Infection".
  - Quality metric 2: Percent of episodes with a severe surgical adverse outcome during the trigger window or the post-trigger window not covered by quality metric 1. Severe or surgical adverse outcomes include a broad range of possible complications, including complications of surgical procedures or medical care, adverse effects of anesthesia, and non-surgical site infection. The codes used to identify adverse outcomes are listed in the configuration file under "Quality Metric 02 Severe Or Surgical Adverse Outcomes".
- **Quality metrics not tied to gain sharing for both appendectomy and cholecystectomy** (i.e., included for information only)**:**

- Quality metric 3: Percent of episodes where an included hospitalization occurs during the post-trigger window.
- Quality metric 4: Percent of episodes where the associated facility for the triggering appendectomy or cholecystectomy procedure exists and is a hospitalization. The definition of an associated facility can be found in section 2.3.1.
- Quality metric 5: Percent of episodes that contain an included claim for a CT scan within the trigger or pre-trigger windows. The configuration file lists procedure codes that define CT in "Quality Metric 05 CT Scan Procedures" and revenue codes that define CT in "Quality Metric 05 CT Scan Revenue Codes".
- Quality metric 6: The average length of stay for all episodes for which an associated facility claim exists and is an inpatient claim. Logic for the assignment of associated facility claims can be found in section 2.3.1.

- **Quality metrics not tied to gain sharing for appendectomy only** (i.e., included for information only):
  - Quality metric 7: Percent of episodes where the procedure type of the triggering appendectomy claim is an open appendectomy procedure (not a laparoscopic procedure). The configuration file lists the CPT codes that define an open appendectomy procedure in "Quality Metric 07 Open Appendectomy".
  - Quality metric 8: Percent of episodes where the primary diagnosis on the triggering professional claim is not appendicitis. The configuration files lists the ICD-9 diagnosis codes that define appendicitis in "Quality Metric 08 Negative Appendectomy".
- **Quality metrics not tied to gain sharing for cholecystectomy only** (i.e., included for information only)**:**
  - Quality metric 7: Average relevant spend per episode that occurs between 90 days prior to the trigger start date and the episode start date.

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 for the Ohio Medicaid population.

Different risk factors apply for the appendectomy and cholecystectomy episodes:

- Appendectomy risk factors are:
  - Acute and unspecified renal failure

- Age fifty older
- Age six and under
- Bacterial infection
- Coagulation and hemorrhagic disorders
- Diabetes mellitus with complications
- Fever of unknown origin
- Fluid and electrolyte disorders
- Heart disease
- Intestinal obstruction without hernia
- Obesity
- Peritonitis and intestinal abscess
- Pleurisy; pneumothorax; pulmonary collapse
- Respiratory failure; insufficiency; arrest (adult)
- Sexually transmitted infections (not HIV or hepatitis)

■ Cholecystectomy risk factors are:

- Abdominal hernia
- Acute and unspecified renal failure
- Anemia
- Artery disease
- Bacterial infections
- Cardiac arrest and ventricular fibrillation
- Digestive congenital anomalies
- Fluid and electrolyte disorders
- Heart disease
- Hepatitis
- Intestinal obstruction without hernia
- Nervous system conditions
- Non-anemia blood conditions

- Obesity
- Pancreatic disorders (not diabetes)
- Pleurisy; pneumothorax; pulmonary collapse
- Respiratory failure; insufficiency; arrest

Except for the age ranges, risk factors have to be present during the episode window or during the 365 days before the episode window. Member age is defined in the glossary. 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.

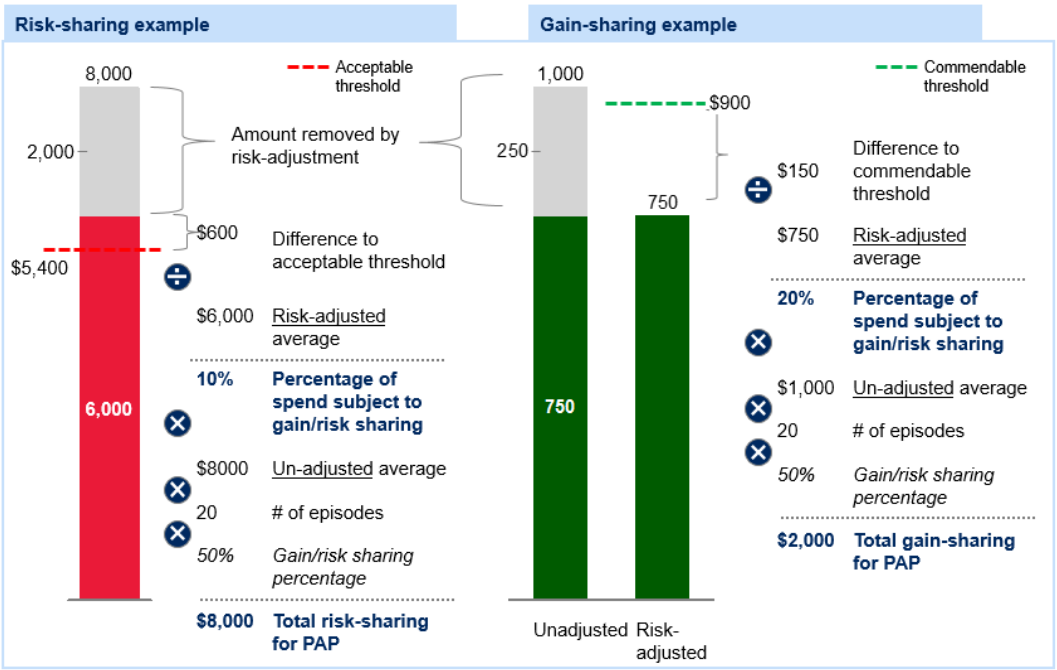
PAPs with average risk-adjusted episode spend between the acceptable and commendable thresholds may neither owe a risk sharing payment nor receive a gain sharing payment.

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



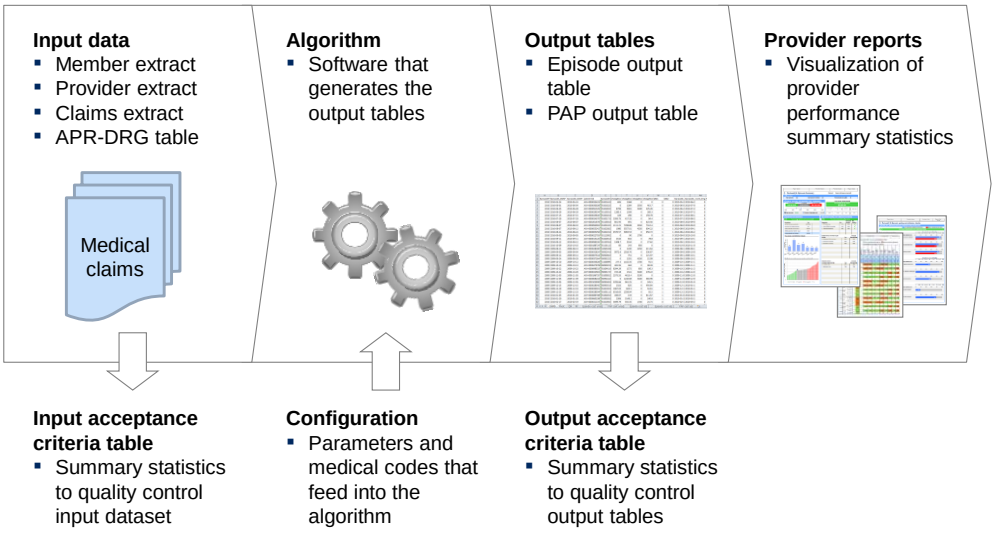
3. EPISODE DATA FLOW

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 input field *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. There is one configuration file for the appendectomy episode and a second configuration file for the cholecystectomy episode. 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
Excluded episodes	
Any Exclusion	EEAny
Exclusion Inconsistent Enrollment	EEEnrollment

Output field name	Output field abbreviation
Exclusion Multiple Payers	EEMultiPayer
Exclusion Third-party Liability	EETPL
Exclusion Dual Eligibility	EEDual
Exclusion PAP Out Of State	EEOutOfState
Exclusion No PAP	EENoPAP
Exclusion Long Hospitalization	EELongAdmission
Exclusion Long-term Care	EELTC
Exclusion Missing DRG	EENoDRG
Exclusion Incomplete Episode	EEIncomplete
Exclusion Age	EEAge
Exclusion Left Against Medical Advice	EEAMA
Exclusion Death	EEDeath
Exclusion <Comorbidity Name>	EE<ComorbidityName>
Number of comorbidities depends on episode	
Exclusion Multiple Other Comorbidities	EEMultiCF
Exclusion High Outlier	EEHighOutlier
Count Of Included Claims	
Count Of Included Claims	EpiClaimsIncluded
By Pre-trigger Window	EpiClaimsIncludedPreTrig
By Trigger Window	EpiClaimsIncludedTrig
By Post-trigger Window	EpiClaimsIncludedPostTrig
By Inpatient	EpiClaimsIncludedIP
By Outpatient	EpiClaimsIncludedOP
By Long-term Care	EpiClaimsIncludedLTC
By Professional	EpiClaimsIncludedProf
By Pharmacy	EpiClaimsIncludedPharma
By Pre-trigger Window And Inpatient	EpiClaimsIncludedPreTrigIP
By Pre-trigger Window And Outpatient	EpiClaimsIncludedPreTrigOP
By Pre-trigger Window And Long-term Care	EpiClaimsIncludedPreTrigLTC
By Pre-trigger Window And Professional	EpiClaimsIncludedPreTrigProf
By Pre-trigger Window And Pharmacy	EpiClaimsIncludedPreTrigPharma
By Trigger Window And Inpatient	EpiClaimsIncludedTrigIP
By Trigger Window And Outpatient	EpiClaimsIncludedTrigOP
By Trigger Window And Long-term Care	EpiClaimsIncludedTrigLTC
By Trigger Window And Professional	EpiClaimsIncludedTrigProf
By Trigger Window And Pharmacy	EpiClaimsIncludedTrigPharma
By Post-trigger Window And Inpatient	EpiClaimsIncludedPostTrigIP
By Post-trigger Window And Outpatient	EpiClaimsIncludedPostTrigOP
By Post-trigger Window And Long-term Care	EpiClaimsIncludedPostTrigLTC

Output field name	Output field abbreviation
By Post-trigger Window And Professional	EpiClaimsIncludedPostTrigProf
By Post-trigger Window And Pharmacy	EpiClaimsIncludedPostTrigPharma
Episode spend	
Non-risk-adjusted Episode Spend	EpiSpendNonadjPerformance
Same breakouts as for claim counts	
Normalized-non-risk-adjusted Episode Spend	EpiSpendNonAdjNorm
Risk-adjusted Episode Spend	EpiSpendAdjPerformance
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	PAPSpendNonadjPerformanceAvg
Inpatient A/B	PAPSpendNonadjPerformanceAvgIP A/B
Outpatient A/B	PAPSpendNonadjPerformanceAvgOP A/B
Long-term Care A/B	PAPSpendNonadjPerformanceAvgLTC A/B
Professional A/B	PAPSpendNonadjPerformanceAvgProf A/B
Pharmacy A/B	PAPSpendNonadjPerformanceAvgPharma A/B
Total Non-risk-adjusted PAP Spend	PAPSpendNonadjPerformanceTotal
PAP Risk Adjustment Ratio	PAPRiskAdjRatioPerformance
Average Risk-adjusted PAP Spend	PAPSpendAdjPerformanceAvg
Total Risk-adjusted PAP Spend	PAPSpendAdjPerformanceTotal
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 appendectomy or cholecystectomy 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 appendectomy or cholecystectomy episodes, a potential trigger is defined as a professional claim with a procedure code for an appendectomy or cholecystectomy. Claim types (inpatient, outpatient, long-term care, professional, and pharmacy) are identified based on the input field *Claim Type*. For the definition of each claim type see the glossary.

To be a potential trigger, a professional claim must meet all of the following conditions:

- The claim has a procedure code for an appendectomy (for appendectomy episodes) or cholecystectomy (for cholecystectomy episodes) procedure in the input field *Detail Procedure Code* on one or more of its claim detail lines. The configuration file lists the relevant procedure codes under "Trigger Procedure Codes".
- At least one of the claim detail lines with an appendectomy or cholecystectomy 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".

Though not necessary to identify a potential trigger itself, a facility claim that occurs within two days of a potential trigger is considered an associated facility claim. When present, facility claims associated with the potential trigger are

used to set the duration of the potential trigger. Associated facility claims are identified if either:

- An outpatient claim has 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 trigger procedure.
- An inpatient claim is identified if it has a minimum *Header 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 trigger procedure.

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 trigger procedure, the minimum *Detail From Date Of Service* of the associated outpatient claim (if the professional claim is associated with an outpatient claim), and the input field *Header From Date Of Service* of the associated inpatient claim (if the professional claim is associated with an inpatient 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 trigger procedure, the maximum *Detail To Date Of Service* of the associated outpatient claim (if the professional claim is associated with an outpatient claim), and the input field *Discharge Date* of the associated inpatient claim (if the professional claim is associated with an inpatient claim).

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

To address cases where a professional claim has more than one potential associated facility claim, the following hierarchy is used such that each professional claim is unambiguously associated with one inpatient or outpatient claim. 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 facility claim.

- First, any potential associated facility claim with a confirming procedure code is given priority. A confirming procedure code is identified based on the presence of a triggering procedure code in the input field(s), for inpatient claims, *Surgical Procedure Code Primary* or *Surgical Procedure Code 2-28*, or, for outpatient claims, any *Detail Procedure Code*. Confirming procedure codes are listed in the configuration file under "Confirming Trigger Codes – Procedures".
- Next, if multiple associated facility claims are tied for top priority (either because multiple facility claims have confirming procedure codes or because none do), the tie is broken by giving inpatient claims the higher priority.
- If a tie still exists, it is broken by giving the claim with the earliest *Header From Date of Service* the higher priority.
- If a tie still exists, it is broken by giving the claim with the latest *Header To Date of Service* the higher priority.
- Finally, if a tie still exists, it is broken by giving the claim with the lowest *Internal Control Number* the higher priority.
- If an associated facility claim does not exist, the start date of a potential trigger is the earliest *Detail From Date Of Service* of the professional claim detail line(s) with the trigger procedure and the end date of a potential trigger is the latest of the *Detail To Date Of Service* of the professional claim detail line(s) with the trigger procedure.

4.2 Determine the episode duration

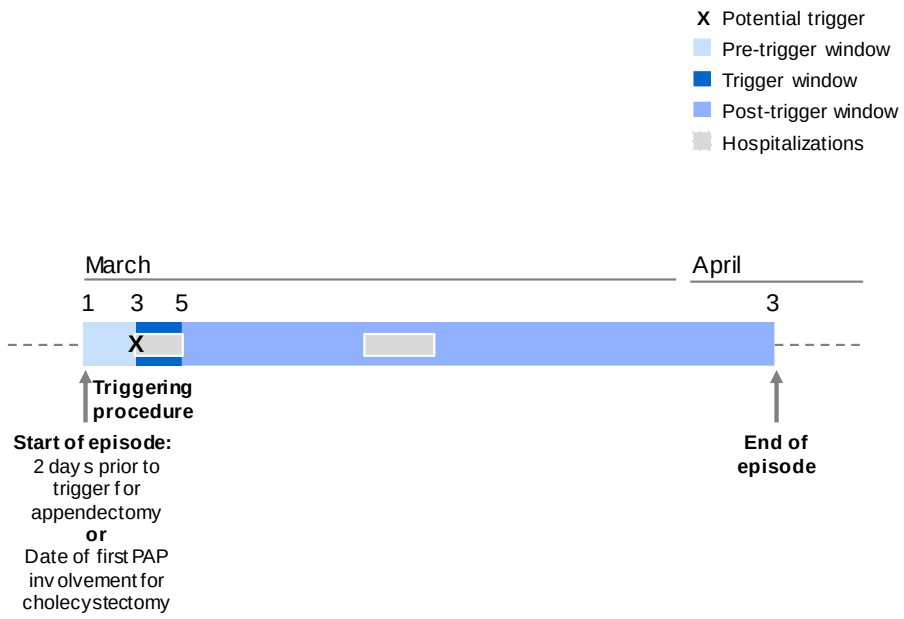
The second design dimension of building an appendectomy or cholecystectomy episode is to define the duration of the episode and to assign claims and claim detail lines to each episode.

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

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

EXHIBIT 8 – EPISODE DURATION



- **Pre-trigger window**:
  - Appendectomy: Appendectomy episodes have a fixed pre-trigger window of two (2) days. The output field *Pre-trigger Window Start Date* is set to 2 days before the output field *Trigger Window Start Date*. The output field *Pre-trigger Window End Date* is set to the day before the output field *Trigger Window Start Date*. The output field *Pre-trigger Window Start Date* is also the output field *Episode Start Date*.
  - Cholecystectomy: Cholecystectomy episodes have a variable pre-trigger window starting with the first PAP involvement, up to 90 days before the trigger window begins. The output field *Pre-trigger Window Start Date* is set to the input field *Detail From Date Of Service* of the earliest professional claim detail line within the 90 days prior to the output field *Trigger Window Start Date* that also has the same input field *Billing*

Provider ID as the triggering professional claim for the cholecystectomy episode. The claim that identifies first PAP involvement may or may not be included in episode spend. The output field *Pre-trigger Window End Date* is set to the day before the output field *Trigger Window Start Date*. The output field *Pre-trigger Window Start Date* is also the output field *Episode Start Date*. If no claims where the input field *Billing Provider ID* matches that of the triggering claim appear in the 90 days prior to the triggering procedure, then that episode has no pre-trigger window and the output field *Episode Start Date* is set to the output field *Trigger Window Start Date*.

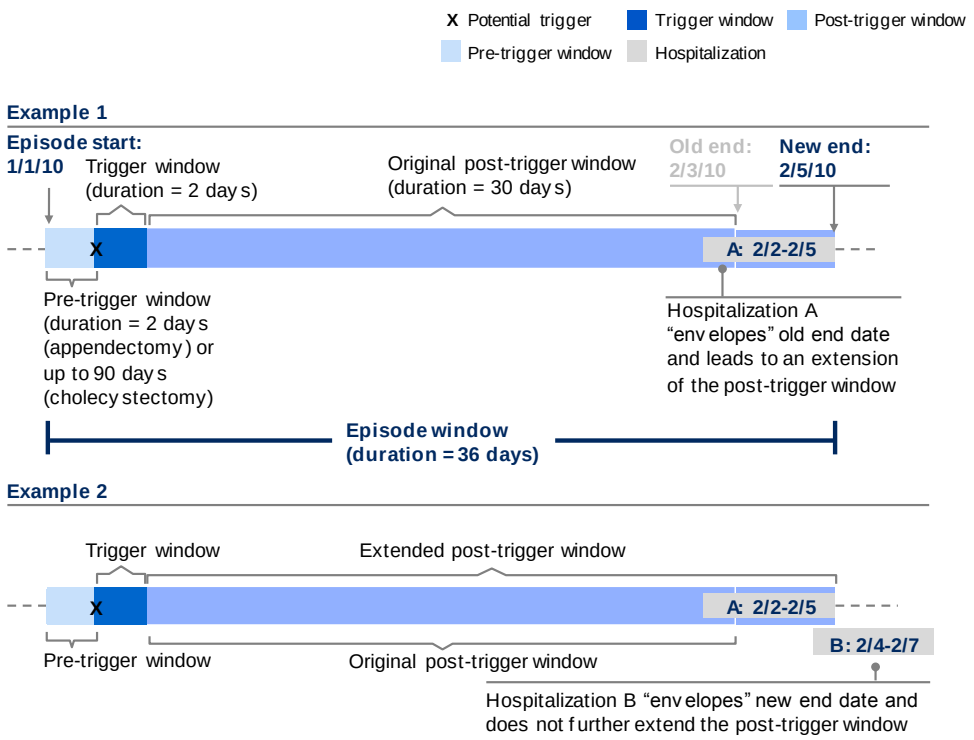
- **Trigger window**: The output fields *Trigger Window Start Date* and *Trigger Window End Date* are set using the potential trigger start and end dates which are defined in section 4.1. Only potential triggers that constitute a trigger appendectomy or cholecystectomy can set the duration of a trigger window. The approach to determine whether a potential trigger is a trigger appendectomy or cholecystectomy is described below.
- **Post-trigger window**: The output field *Post-trigger Window Start Date* is set to the day after the output field *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 input field *Discharge Date* of the hospitalization. A hospitalization is ongoing on the 30th day of the post-trigger window if the hospitalization has an input field *Header From Date Of Service* during the trigger window or during the 30-day post-trigger window and an input field *Discharge Date* beyond the 30-day 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 output field *Post-trigger Window End Date*. Hospitalizations are defined in the glossary.

  The extension of an episode due to a hospitalization may not lead to further extensions of the episode, i.e., if the output field *Post-trigger Window End Date* is set based on the input field *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).

  The output field *Post-trigger Window End Date* is also the output field *Episode End Date*.

- **Clean period**: For appendectomy episodes, the clean period starts on the potential trigger start date and extends for 32 days from the potential trigger end date. For cholecystectomy episodes, the clean period starts on the potential trigger start date and extends for 120 days from the potential trigger end date. The clean period is defined as the period during which, if the potential trigger triggers an episode, no new episode of the same type can be triggered. Note that the clean period is not part of the episode duration. The episode window ends with the post-trigger window, as defined above.

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 procedures**: Potential triggers that do not occur during another episode constitute the trigger window of a new episode.

- **Repeat procedures**: Potential triggers that occur during the clean period of an episode do not constitute the trigger window for a new episode.

To define episode windows for each patient, a chronological approach is taken. The first trigger appendectomy or trigger cholecystectomy 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 appendectomy or trigger cholecystectomy for a patient has been identified, the trigger window, the post-trigger window, the pre-trigger window, and the clean period are set. If another potential trigger has a potential trigger start date that falls in the clean period, it is classified as a repeat procedure. The next potential trigger that starts outside of the clean period constitutes a new trigger procedure for the 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 appendectomies or cholecystectomies, and thus not trigger an appendectomy or cholecystectomy episode due to an appendectomy or cholecystectomy that occurred prior to the reporting period.

Note that appendectomy and cholecystectomy are separate episodes that share similar logic and structure. As such, episodes windows are defined separately for appendectomy and cholecystectomy. A cholecystectomy potential trigger will never become a repeat cholecystectomy because it occurs during the post trigger window of an appendectomy episode, neither will an appendectomy potential trigger ever become a repeat appendectomy because it occurs in the post trigger window of a cholecystectomy. The two episodes do not impact each other.

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 procedure or repeat procedure. The other overlapping potential triggers do not count as trigger procedures or repeat procedures, 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 selected as a trigger procedure or repeat procedure:

- The potential trigger with the earliest *Detail From Date Of Service* for the professional claim detail line with the appendectomy or cholecystectomy procedure is selected.
- If there is a tie, the tie is broken by selecting the potential trigger with the latest end date.
- If there is still a tie, the tie is broken by selecting the potential trigger with the lowest *Trigger Claim ID*.

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 input field *Header From Date Of Service* and the input field *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 input field *Header From Date Of Service* and the input field *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 input field *Detail From Date Of Service* and the input field *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 output field *Episode Start Date*, 90 days to 1 day before the output field *Episode Start Date*) if the input field *Header From Date Of Service* of the hospitalization occurs during the specified time window before the output field *Episode Start Date*.

- Pharmacy claims and all their claim detail lines are assigned to a window before the episode if the input field *Header From Date Of Service* occurs during the specified time window before the output field *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 input field *Detail From Date Of Service* occurs during the specified time window before the output field *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 input field *Header From Date Of Service* and the input field *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 input field *Header From Date Of Service* and the input field *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 input field *Detail From Date Of Service* and the input field *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 an input field *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 an input field *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 an input field *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 an input field *Header From Date Of Service* during the pre-trigger window and an input field *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 an input field *Header To Date Of Service* during the post-trigger window. For claims with an input field *Header From Date Of Service* during the pre-trigger window and an input field *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 an input field *Detail To Date Of Service* during the post-trigger window. For claim detail lines with an input field *Detail From Date Of Service* during the pre-trigger window and an input field *Detail To Date Of Service* during the post-trigger window assignment to the pre-trigger window takes precedence.

4.3 Identify claims included in episode spend

The third design dimension of building an appendectomy or cholecystectomy 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**: For claims and claim detail lines assigned to the pre-trigger window, a set of rules are applied to identify included claims and included claim detail lines:
  - Included diagnoses: If an inpatient claim assigned to the pre-trigger window contains an included diagnosis code in any of the input fields *Header Diagnosis Code Primary* or *Header Diagnosis Code 2-28*, then the claim is an included claim. If a professional or outpatient claim that is assigned to the pre-trigger window contains an included diagnosis code in any of the input fields *Header Diagnosis Code Primary* or *Header Diagnosis Code 2-28*, then the claim is an included claim. The configuration file lists included diagnosis codes under "Included Diagnoses".
  - Included pre-operative procedures (for appendectomy only): If an outpatient or professional claim detail line that is assigned to the pre-trigger window contains an included pre-operative procedure code in the input field *Detail Procedure Code* and a relevant diagnosis code in any of the input fields *Header Diagnosis Code Primary* or *Header Diagnosis Code 2-28*, then the claim detail line is an included claim detail line. The configuration file lists included pre-operative procedure codes and confirming diagnosis codes under "Included Pre-Operative Procedures" and "Relevant Diagnoses", respectively. 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.
  - Included evaluation and management (E&M) care: If an outpatient or professional claim detail line that is assigned to the pre-trigger window contains an included evaluation and management procedure code in the input field *Detail Procedure Code* and a relevant diagnosis code in any of the input fields *Header Diagnosis Code Primary* or *Header Diagnosis*

Code 2-28, then the claim detail line is an included claim detail line. The configuration file lists included E&M codes and relevant diagnosis codes under "Included Evaluation And Management" and "Relevant Diagnoses", respectively. 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.

- Included imaging and testing procedures: If an outpatient or professional claim detail line that is assigned to the pre-trigger window contains an included imaging and testing procedure code in the input field *Detail Procedure Code*, then the claim detail line is an included claim detail line. The configuration file lists included imaging and testing procedure codes under "Included Imaging And Testing Procedures". 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.
- Included medications: If a pharmacy claim that is assigned to the pre-trigger window 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. The configuration file lists the relevant codes under "Included Medications".

- **Trigger window**: All inpatient claims that are contained within a hospitalization that is assigned to the trigger window are included claims. All outpatient, long-term care, and professional claim detail lines that are assigned to the trigger window are included claims. Pharmacy claims assigned to the trigger window that contain an included medication in the input field *National Drug Code* are included claims. 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. The configuration file lists the relevant codes under "Included Medications".

- **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 input field *Header Or Detail Indicator* is used to determine if an inpatient claim is header-paid ('H') or detail-paid ('D').
    - Header-paid hospitalizations: If a hospitalization assigned to the post-trigger window 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*. 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. The configuration file lists excluded APR-DRG codes under "Excluded APR-DRG".
    - Detail-paid hospitalizations: If a hospitalization assigned to the post-trigger window contains only detail-paid inpatient claims then all the inpatient claims are searched for included complication diagnoses in the input field *Header Diagnosis Code Primary*. If all the inpatient claims that are part of the hospitalization contain an included complication 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 complication 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. The configuration file lists included complication diagnosis codes under "Included Complication Diagnoses".

- Second, pharmacy claims as well as outpatient, long-term care, and professional claim detail lines that are assigned to the post-trigger window are checked for included diagnoses, included complication diagnoses, included procedures, or included medications.
  - Included complications: If an outpatient, long-term care, or professional claim that is assigned to the post-trigger window contains an included complication diagnosis code in any of the input fields *Header Diagnosis Code Primary* or *Header Diagnosis Code 2-28*, then all claim detail lines of the claim that are assigned to the post-trigger window are included claim detail lines. The configuration file lists included complication diagnosis codes under "Included Complication Diagnoses".
  - Included E&M care: If an outpatient, long-term care, or professional claim detail line that is assigned to the post-trigger window contains an included evaluation and management procedure code in the input field *Detail Procedure Code* and a confirming diagnosis code in any of the input fields *Header Diagnosis Code Primary* or *Header Diagnosis Code 2-28*, then the claim detail line is an included claim detail line. The configuration file lists included E&M codes and relevant diagnosis codes under "Included Evaluation And Management" and "Relevant Diagnoses", respectively. 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.
  - Included testing, rehabilitation, and post-operative procedures: If an outpatient, long-term care, or professional claim detail line that is assigned to the post-trigger window contains an included post-operative procedure code in the input field *Detail Procedure Code* and a confirming diagnosis code in any of the input fields *Header Diagnosis Code Primary* or *Header Diagnosis Code 2-28*, then the claim detail line is an included claim detail line. The configuration file lists included post-operative procedure codes and confirming diagnosis codes under "Included Pathology Rehabilitation And Post-Operative Procedures" and "Relevant Diagnoses", respectively. 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.

- Included imaging and testing procedures: If an outpatient or professional claim detail line that is assigned to the post-trigger window contains an included imaging and testing procedure code in the input field *Detail Procedure Code*, then the claim detail line is an included claim detail line. The configuration file lists included imaging and testing procedure codes under "Included Imaging And Testing Procedures". 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.
- Included medications: If a pharmacy claim that is assigned to the post-trigger window 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. The configuration file lists the relevant codes under "Included Medications".

- **Episode window**: Professional claim detail lines that are assigned to the episode window are checked for excluded procedures. These exclusions supersede any other reason a claim detail line might be included.
  - Excluded transportation: If an outpatient or professional claim detail line that is assigned to the episode window contains an excluded transportation procedure code in the input field *Detail Procedure Code*, then the claim detail line is an excluded claim detail line. The configuration file lists excluded transportation procedure codes under "Excluded Transportation Procedures". This exclusion of claim detail lines takes precedence over any other inclusion logic.
  - Not included claims: Any claim or claim detail line not explicitly included during the episode window is an excluded claim or excluded claim detail line.

The output field *Count Of Included Claims* is defined as the number of unique claims that contribute to episode spend. For the purpose of calculating counts of claims, 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 appendectomy or cholecystectomy 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 an input field *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 an input field *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 input field *Detail Allowed Amount* or *Detail Paid Amount* counts only once towards the output field *Non-risk-adjusted Episode Spend* or the *Normalized-non-risk-adjusted Episode Spend*.

For the provider reports, the output fields *Average Non-risk-adjusted PAP Spend* and *Total Non-risk-adjusted PAP Spend* are added to the PAP output table. The output field *Average Non-risk-adjusted PAP Spend* is calculated as the average

of the output field *Non-risk-adjusted Episode Spend* across valid episodes for a given PAP. The output field *Total Non-risk-adjusted PAP Spend* is calculated as the sum of the output field *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 output field *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 output field *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 appendectomy or cholecystectomy 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 output field *PAP ID* is set using the input field *Billing Provider ID* on the professional claim that is used to set the output field *Trigger Claim ID*.

The output field *Rendering Provider ID* is set using the input field *Rendering Provider ID* of the claim that is used to set the output field *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 appendectomy or cholecystectomy 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 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 Name>, 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 between the start date of the earliest included claim in the episode paid for by the reporting payer through to the end of the episode, inclusive. The start date of the earliest included claim paid for by the payer of the episode start is the input field *Header From Date Of Service* for an inpatient claim or pharmacy claim, or the minimum of the *Detail From Date Of Service* for outpatient or professional claim detail lines.

Enrollment is verified using the *Eligibility Start Date* and *Eligibility End Date* from the Member Extract where the input field *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 start date of the earliest included claim 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 in input fields *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 prior to or after the episode window, but was continuously enrolled between the time of their first included claim in the episode through to the end of 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 an input field *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 input fields *TPL Effective Date* and *TPL End Date* from the Member Extract where the *Coverage Type* indicates relevant TPL coverage. Input field *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 input fields *Eligibility Start Date* and *Eligibility End Date* from the Member Extract where the input field *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.

- **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*. The code used to identify the state of 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 input field *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 detail line 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 an input field *Header Or Detail Indicator* of 'H'.

- **Incomplete episodes**: An episode is excluded if the output field *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 ranges for the appendectomy and cholecystectomy episodes are listed as parameters in the configuration file under "Excluded Episodes".
- **Left against medical advice**: An episode is excluded if the patient has an input field *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 an input field *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 output field *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. Each comorbidity exclusion listed in the configuration file sets a separate output field named *Exclusion <Name Of Comorbidity>*. For example, the HIV comorbidity exclusion sets the output field *Exclusion HIV* for all those episodes with evidence of HIV during the

specified time period. 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> – Procedures".
- 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> – Procedures".
- Comorbidity contingent cancer 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. The following approaches are taken to identify active cancer treatment:
  - 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 – Procedures".
  - 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 – Procedures".

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 output field *Risk-adjusted Episode Spend* (not the *Non-risk-adjusted Episode Spend*) is above (>) the high outlier threshold. The high outlier threshold for the appendectomy and cholecystectomy 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 appendectomy 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 Indicator, Quality Metric 02 Indicator, Quality Metric 03 Indicator, Quality Metric 04 Indicator, Quality Metric 05 Indicator, Quality Metric 07 Indicator, Quality Metric 08 Indicator* (appendectomy only)

PAP output fields created: *PAP Quality Metric 01 Performance, PAP Quality Metric 02 Performance, PAP Quality Metric 03 Performance, PAP Quality Metric 04 Performance, PAP Quality Metric 05 Performance, PAP Quality Metric 06 Performance, PAP Quality Metric 07 Performance, PAP Quality Metric 08 Performance* (appendectomy only)

The appendectomy and cholecystectomy episodes have three quality metrics that are tied to gain sharing. Additionally, the appendectomy episode has five informational quality metrics and the cholecystectomy episode has four informational quality metrics. Informational quality metrics are not tied to gain sharing.

Quality metrics tied to gain sharing for both appendectomy and cholecystectomy episodes:

- **Quality Metric 1: Surgical site infections**
  - The output field *Quality Metric 01 Indicator* marks episodes with surgical site infections during the trigger or post-trigger windows. Surgical site infection is identified based on a professional, inpatient, outpatient, or long-term care claim that is assigned to either the trigger or the post-trigger window that contains one of the diagnosis codes listed in the

configuration file under "Quality Metric 01 Surgical Site Infection" in the input field *Header Diagnosis Code Primary* or *Header Diagnosis Code 2-28*.

- The output field *PAP Quality Metric 01 Performance* is expressed as a percentage for each PAP based on the following ratio:
  - Numerator: Number of valid episodes of the PAP with a surgical site infection in the trigger or post-trigger window, as indicated by the *Quality Metric 01 Indicator*
  - Denominator: Number of valid episodes of the PAP

- **Quality metric 2: Severe or surgical adverse outcomes**
  - The output field *Quality Metric 02 Indicator* marks episodes with severe or surgical adverse outcomes during the trigger or post-trigger windows other than a surgical site infection. Severe or surgical adverse outcomes are identified based on a professional, inpatient, outpatient, or long-term care claim that is assigned to either the trigger or the post-trigger window that contains one of the diagnosis codes listed in the configuration file under "Quality Metric 02 Severe Or Surgical Adverse Outcomes" in the input field *Header Diagnosis Code Primary* or *Header Diagnosis Code 2-28*.
  - The output field *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 with a severe or surgical adverse outcome in the trigger or post-trigger window, as indicated by the *Quality Metric 02 Indicator*
    - Denominator: Number of valid episodes of the PAP

Quality metrics not tied to gain sharing for both appendectomy and cholecystectomy episodes (i.e., included for information only):

- **Quality metric 3: Readmission**
  - The output field *Quality Metric 03 Indicator* marks episodes where there is an included hospitalization that is assigned to the post-trigger window. Included hospitalizations are defined in section 4.3.
  - The output field *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 where the episode contains an included hospitalization in the post-trigger window, as indicated by the output field *Quality Metric 03 Indicator*
    - Denominator: Number of valid episodes of the PAP

- **Quality metric 4: Initial admission**
  - The output field *Quality Metric 04 Indicator* marks episodes where the associated facility claim for the triggering procedure both exists and is an inpatient claim. Associated facility claims are defined in section 4.1.
  - The output field *PAP Quality Metric 04 Performance* is expressed as a percentage for each PAP based on the following ratio:
    - Numerator: Number of valid episodes of the PAP where the associated facility claim for the triggering procedure is an inpatient claim, as indicated by the output field *Quality Metric 04 Indicator*
    - Denominator: Number of valid episodes of the PAP

- **Quality metric 5: CT scan use**
  - The output field *Quality Metric 05 Indicator* marks episodes where any included claim in the pre-trigger or trigger windows contains a CT scan. Claims containing a CT scan are identified in three ways:
    - A professional, outpatient claim that contains any procedure code listed in the configuration file under "Quality Metric 05 CT Scan Procedures" in the input field *Detail Procedure Code*
    - An outpatient or inpatient claim that contains any revenue code listed in the configuration file under "Quality Metric 05 CT Scan Revenue Codes" in the input field *Revenue Code*
  - The output field *PAP Quality Metric 05 Performance* is expressed as a percentage for each PAP based on the following ratio:
    - Numerator: Number of valid episodes of the PAP where an included claim for a CT scan exists in the pre-trigger or trigger windows, as indicated by the *Quality Metric 05 Indicator*
    - Denominator: Number of valid episodes of the PAP

- **Quality metric 6: Average length of stay**
  - The output field *PAP Quality Metric 06 Performance* is expressed as an average duration for each PAP based on the following ratio:

- Numerator: Sum of the lengths of stay of inpatient associated facility claim hospitalizations across all valid episodes of a PAP. Episodes with an inpatient associated facility are also indicated by the output field *Quality Metric 04 Indicator*
- Denominator: Number of valid episodes of the PAP where the associated facility claim for the triggering procedure is an inpatient claim, as indicated by the output field *Quality Metric 04 Indicator*

Quality metrics not tied to gain sharing for appendectomy episodes only (i.e., included for information only):

- **Quality metric 7: Open appendectomy**
  - The output field *Quality Metric 07 Indicator* marks episodes where the triggering professional claim represents an open appendectomy. Open appendectomy is defined as a triggering professional claim that contains a procedure code listed in the configuration file under "Quality Metric 07 Open Appendectomy" in any input field *Detail Procedure Code*.
  - The output field *PAP Quality Metric 07 Performance* is expressed as a percentage for each PAP based on the following ratio:
    - Numerator: Number of valid episodes of the PAP where the triggering professional claim represents an open appendectomy, as indicated by the *Quality Metric 07 Indicator*
    - Denominator: Number of valid episodes of the PAP
- **Quality metric 8: Negative appendectomy**
  - The output field *Quality Metric 08 Indicator* marks episodes where the primary diagnosis of the triggering professional claim indicates a negative appendectomy, as represented by a diagnosis other than appendicitis. An indication of a negative appendectomy is defined as a triggering professional claim that ***does not*** contain a diagnosis listed in the configuration file under "Quality Metric 08 Negative Appendectomy" in the input field *Header Diagnosis Code Primary*.
  - The output field *PAP Quality Metric 08 Performance* is expressed as a percentage for each PAP based on the following ratio:
    - Numerator: Number of valid episodes of the PAP the primary diagnosis for the triggering professional claim is *not* appendicitis, as indicated by the *Quality Metric 08 Indicator*

- Denominator: Number of valid episodes of the PAP

Quality metric not tied to gain sharing for cholecystectomy episodes only (i.e., included for information only):

- **Quality metric 7: Pre-PAP involvement spend**
  - The output field *PAP Quality Metric 07 Performance* is expressed as an average spend value for each PAP based on the following ratio:
    - Numerator: Total dollars of relevant spend that occurs between 90 days prior to the *Trigger Start Date* and the *Episode Start Date* for valid episodes of the PAP. Total relevant spend that occurs between 90 days prior to the *Trigger Start Date* and the *Episode Start Date* for each episode is defined as the difference between:
      - The value the output field *Non-risk-adjusted Episode Spend* would have been set to, had the output field *Pre-Trigger Window Start* Date and *Episode Start Date* been set to 90 days prior to the output field *Trigger Start Date* for that episode
      - The actual value of the output field *Non-risk-adjusted Episode Spend*
    - The logic for setting *Non-risk-adjusted Episode Spend* is covered in sections 4.2 through 4.4.
    - Denominator: Number of valid episodes of the PAP

4.8 Perform risk adjustment

The eighth design dimension of building an appendectomy 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:

- Age-based risk factors: The output fields *Risk Factor <risk factor number>* for age-based risk factors indicate whether the *Member Age* of the patient falls into the age range specified for the risk factor. The relevant age ranges are listed as parameters in the configuration file under "Risk Adjustment". For the definition of *Member Age* see the glossary.
- 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(s) 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 single/multi-level CCS categories (as indicated in the configuration file) 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 Factors <risk factor number and name> – CCS".
- CCS category, Diagnosis, and age-based risk factors: The output fields *Risk Factor <risk factor number>* for CCS category, diagnosis, and age-based risk factors indicate whether both of the following are true:
  - The Member Age of the patient falls into the age range specified for the risk factor. The relevant age ranges are listed as parameters in the configuration file under "Risk Adjustment". For the definition of Member Age see the glossary.
  - There is evidence for the risk factor diagnosis in the specified time window, as identified by either:

- An inpatient, outpatient, or professional claim that is assigned to the specified time window and contains a risk factor diagnosis code associated with the CCS code(s) 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 as described above. The configuration file lists the codes and time windows used under "Risk Factors <risk factor number and name> – CCS".
- An inpatient, outpatient, or professional claim that is assigned to the specified time window and 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".

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". The sum of all the risk coefficients for factors present in a given episode plus the *Average Risk Neutral Episode Spend* is the predicted spend of the episode. The configuration file lists the *Average Risk Neutral Episode Spend* as a parameter under "Risk Adjustment". For the perinatal episode, the *Episode Risk Score* for an episode is the ratio of the *Average Risk Neutral Episode Spend* to the predicted spend of 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:

$$Episode\ Risk\ Score\ = \frac{Average\ Risk\ Neutral\ Episode\ Spend}{Average\ Risk\ Neutral\ Episode\ Spend\ +\ Risk\ Coefficient\ 001\ +\ Risk\ Coefficient\ 002}$$

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 appendectomy or cholecystectomy 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* and have an *Average Risk-adjusted PAP Spend above or equal to* (>=) the *Gain sharing limit*.

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 or equal to (>=) 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

- **Claim types:** The claim types used in the appendectomy and cholecystectomy 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.
- **Clean period:** See section 2.3.1
- **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.
- **ED:** Emergency department
- **Episode window:** See section 4.2
- **E&M:** Evaluation and management

- **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 inpatient facility. A hospitalization may include more than one inpatient claim because the inpatient facility may file interim inpatient claims. 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
  - If the second inpatient claim (and potentially third, fourth, etc.) also has a *Patient Status Indicator* indicating interim billing, reserved, or missing the hospitalization is extended further until an inpatient claim with a discharge status other than interim billing, reserved, or missing occurs, or

until the inpatient claim that follows does not satisfy the required conditions.

- Transfer: An inpatient claim with a *Patient Status Indicator* indicating a transfer (see the configuration file under "Hospitalization – Transfer" for the codes used) is not linked with the second inpatient claim. The second inpatient claim yields a separate hospitalization with a *Header From Date Of Service* on the same day as or the day after the *Discharge Date* of the first inpatient claim.

- **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
- **PAP:** Principal Accountable Provider
- **Patient:** An individual with a cholecystectomy or appendectomy 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*.

- **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