Overview of the valve repair and replacement episode of care

State of Ohio

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Overview of the valve procedure episode of care

1. CLINICAL OVERVIEW AND RATIONALE FOR DEVELOPMENT OF THE VALVE EPISODE

1.1 Rationale for development of the valve procedure episode of care

Valve repair and replacement procedures (hereinafter referred to as VALVE) are used to treat patients with valvular heart disease (VHD) and comprise over 20 percent of all cardiac surgeries.[1] Globally, VHD (especially aortic stenosis and mitral regurgitation) remains common because of two major trends: prevalence of rheumatic heart disease in developing countries due to poor hygiene and lack of antibiotics and increasing rates of degenerative valve disease in developed countries due to higher life expectancies.[2] In the United States, there are five million people[3] diagnosed with VHD and a total of 177,000 VALVE procedures each year.[4] Due to the aging population, VALVE procedures are projected to increase at a rate of 2.5 percent over the next five years.[5] New approaches, like transcatheter aortic valve replacement (TAVR) and transcatheter aortic valve implantation (TAVI), have broadened the procedural options for patients.[6] Percutaneous valve repair is projected to grow by 74.6 percent between 2014 and 2020 relative to open heart valve repair, which is projected to increase by 3.6 percent.[7] In Ohio, there were over 500 VALVE procedures among Medicaid beneficiaries in 2015. This accounts for approximately $30 million in spend, or a median cost of $45,000 per VALVE episode.[8]

1 Lung B. & Vahanian A. Epidemiology of valvular heart disease in the adult. Nat. Rev. Cardiol. 2011.

2 Ibid.

3 Nkomo VT, Gardin JM, Skelton TN, et al. Burden of valvular diseases: a population-based study. The Lancet Online. August 18, 2006; Vol 368; pp 1005-1011

4 Surgical procedure volumes book. Medtech Insight. 2015.

5 Ibid.

6 Hamm CW et al. The future of transcatheter aortic valve implantation. European Heart Journal. (2015)

7 Surgical procedure volumes book. Medtech Insight. 2015.

8 Analysis of Ohio Medicaid claims data for dates between October 1, 2014 and September 30, 2015.

Evidence-based guidelines from the American College of Cardiology (ACC) and the American Heart Association (AHA) establish several best practices for clinicians to improve quality of care and outcomes for patients.[9] During the management of valvular heart disease prior to consideration of VALVE procedures, use of guideline-concordant medical therapy to mitigate risk factors for cardiac disease (e.g., diabetes, hyperlipidemia) is recommended. In addition, guidelines recommend use transthoracic echocardiography to confirm diagnoses of potential indications for a VALVE procedure.[10] Post-operatively, guidelines indicate the use of beta-blockers to reduce incidence of arrhythmias, and physical therapy and rehabilitation to optimize long-term outcomes.[11] Research has shown that adherence to guidelines yields clinical improvements when implemented in practice. For example, administration of beta blockers reduce the incidence of post-operative atrial fibrillation from a range of 37-50 percent to 15-20 percent.[12]

Despite these guidelines, surgical and treatment practices during the perioperative periods of a VALVE procedure may vary widely from one provider to another. Unique patient needs will necessitate variation in surgical and treatment practice; however, practice variation due to reasons not related to the patient may lead to sub-optimal patient outcomes, higher than necessary costs, or both.

Implementing the VALVE procedure episode of care will incentivize evidence-based, guideline concordant care through an outcomes-based payment model. As part of a concerted effort aimed at improving overall cardiac care for Ohio Medicaid patients, the VALVE episode is being deployed together with a suite of cardiovascular episodes (including episodes for percutaneous coronary intervention, coronary artery bypass graft, and congestive heart failure). Alongside these and other episodes of care and patient centered medical homes, the VALVE episode will contribute to a model of care delivery that benefits patients through improved care quality and clinical outcomes, and a lower overall cost of care.

9 Nishimura RA et al. 2014 AHA/ACC Guideline for the Management of Patients With Valvular Heart Disease. J Am Coll Cardiol. (2014)

10 Ibid.

11 Ibid.

12 E. Crystal, M. S. Garfinkle, S. S. Connolly, T. T. Ginger, K. Sleik, and S. S. Yusuf, “Interventions for preventing post-operative atrial fibrillation in patients undergoing heart surgery,” Cochrane Database of Systematic Reviews, no. 4, Article ID CD003611, 2004.

1.2 Clinical overview and typical patient journey for a VALVE procedure

The VALVE procedure includes both repair and replacement of any of the four major valves (aortic, mitral, pulmonic and tricuspid) and can be performed using the traditional invasive method or by more minimally invasive methods (e.g. transcatheter aortic valve replacement/implantation, or TAVR/TAVI).[13] This episode does not include TAVRs/TAVIs and other minimally invasive methods because, to date, there is insufficient historical data to inform episode design around these newer methods. Generally, a VALVE procedure is indicated for two types of patients: 1) those with one or more valves with valvular stenosis, typically due to infection, aging, etc., or 2) those with one or more valves with valvular regurgitation.[14]

As depicted in Exhibit 1, a VALVE episode is triggered by a non-emergent inpatient (non-emergency department) VALVE procedure that involves repair or replacement of any combination of up to four major valves. Up to a month before the planned procedure, patients who are candidates for the VALVE procedures may experience one or more of the following symptoms: reduced ability for normal activities, breathlessness, heart failure, angina, syncope.[15] The VALVE procedure is planned after the patient's history is taken and the patient receives appropriate diagnostic testing. After the cardiologist works with the surgeon to schedule the surgery, the VALVE episode is primarily under the responsibility of the operating cardiothoracic surgeon. The procedure is performed in an inpatient setting and, once complete, the patient receives follow-up inpatient care during a recovery period before being discharged. Some patients may develop complications (e.g., post-operative bleeding, thromboembolism, arrhythmias, myocardial infarction, stroke, infection and pneumonia), require post-procedure admission, and require follow-up clinician visits.[16] Others may require only outpatient follow-up care after the VALVE procedure.

The VALVE episode will be complemented by a patient-centered medical home (PCMH) in Ohio to cover a broad spectrum of care delivery for Medicaid beneficiaries with valvular heart disease who require a VALVE procedure. PCMHs will focus on chronic management of valvular heart disease and other patient comorbidities before and after the VALVE procedure and will handle patient referrals to cardiologists and other specialists as appropriate. To complement

[13] American Heart Association. Options for Heart Valve Replacement. 2016.

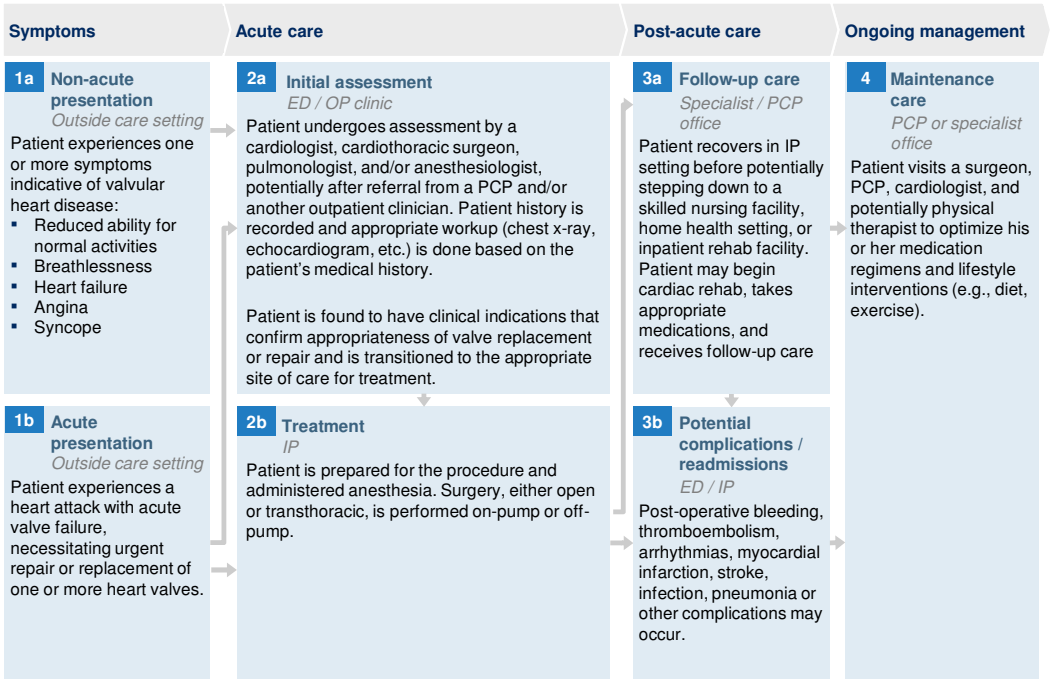
[14] Ibid.

[15] Ibid.

[16] Van Dyck et al. Complications after aortic valve repair and valve-sparing procedures. Annals of Cardiothoracic Surgery. 2013

PCMHs, the VALVE episode will focus on improving outcomes directly related to the 60-day window surrounding the VALVE procedure.

EXHIBIT 1 – VALVE PATIENT JOURNEY



SOURCE: Clinical expert interviews; team analysis; main patient flows shown only

1.3 Potential sources of value within the VALVE procedure patient journey

Within the VALVE episode, providers have several opportunities to improve quality of care and reduce unnecessary spend associated with the episode (see Exhibit 2). For example, providers can follow best practice clinical guidelines to reduce unnecessary variation and unnecessary diagnostics during the diagnosis and pre-operative stages. This may require appropriate coordination between the primary care clinician, cardiologist, and/or cardiothoracic surgeon.[17] Additionally, providers can appropriately decide between a repair versus a replacement and on whether or not to do an add-on VALVE or CABG procedure in addition to the originally intended procedure.[18] Post-procedurally, providers can ensure that the length of stay and

[17] Weinberg et al. Beyond Our Walls: Impact of Patient and Provider Coordination across the Continuum on Outcomes for Surgical Patients. Heat Serv Res. 2007.

[18] Icahn School of Medicine at Mount Sinai report. Combination Mitral Valve Surgery with Surgical Ablation Frees Patients of Atrial Fibrillation. 2015.

intensity of care during the admission is optimized and that follow-ups occur at a timely interval following discharge from the hospital.[19] Specifically, evidence suggests use of post-operative echocardiograms and stress tests may be unnecessary.[20] Finally, clinicians can encourage appropriate lifestyle management through exercise, diet, and smoking cessation consultations. In general, regular implementation of these best practices can improve quality by reducing the likelihood of complications and post-procedure admissions, as well as reducing the overall spend for a VALVE episode.

EXHIBIT 2 – VALVE SOURCES OF VALUE

[19] Goldsmith I et al. Hospital morbidity and mortality and changes in quality of life following mitral valve surgery in the elderly. J Heart Valve Dis. 1999.

[20] Marwick TH. Stress echocardiography. Heart. 2003.

2. OVERVIEW OF THE VALVE PROCEDURE EPISODE DESIGN

2.1 Episode Trigger

The VALVE episode is triggered by a planned (i.e. non-emergent) VALVE procedure that occurs in an inpatient setting. Emergent VALVEs are excluded because they represent a different patient journey. TAVRs/TAVIs and other minimally invasive methods are also excluded because, to date, there is insufficient historical data to inform episode design around these newer methods. The range of procedure codes that trigger an episode include CPT codes for both repair and replacement of the aortic, pulmonary, mitral, and/or tricuspid VALVE procedures. A complete list of trigger procedure codes is included in Table 1 in the Appendix.

2.2 Principal Accountable Provider

The principal accountable provider (PAP) is the person or entity best positioned to influence the patient journey and the clinical decisions made throughout the course of the episode. For the VALVE episode the PAP is the surgeon who performs the VALVE procedure. This is because the decisions on planning, execution, and follow-up of a VALVE procedure should be under the primary purview of the surgeon.

2.3 Episode Duration

The VALVE episode begins 30 days prior to the triggering procedure (called the "pre-trigger window"), includes the admission for the procedure itself and the recovery in an inpatient setting (called the "trigger window"), and ends 30 days after discharge (called the "post-trigger window"). The 30-day pre-trigger window was deemed an appropriate period of time to capture the majority of pre-operative diagnostics, workup, and management. Similarly, the 30-day post-trigger window was an adequate time to capture readmissions, complications, follow-up care and other relevant included claims. The claims included in each window are described in more detail in section 2.4.

2.4 Included Services

The episode model is designed to address spend for care and services directly related to the diagnosis, treatment, and immediate recovery phase of the patient journey. Each period of the patient journey, or episode "window," has a distinct claim inclusion logic derived from two major criteria: 1) that the type of included care and services must correspond to that period of the patient journey and 2) that the included

care and services are understood to be directly or indirectly influenced by the PAP during that period.

The VALVE episode is comprised of three distinct windows, for the purpose of spend inclusions: a pre-trigger window, a trigger window, and a post-trigger window. During the pre-trigger window all diagnostic work-up (e.g., echocardiography, lab tests, coronary angiography) is included. During the trigger window—when the procedure and associated admission occurs—all spend is included (including medical and drug spend). During the post-trigger window (one through thirty days following discharge from the hospital), immediate post-operative complications (e.g. AMI, stroke, endocarditis, pneumonia, arrhythmias) and related follow up care (wound care, medication management, physical therapy) are included.

Throughout the episode window spend for transportation and vaccinations are excluded. Vaccination spend is excluded to prevent doctors from withholding procedures deemed beneficial for patients and transportation spend is excluded since there is variability in transportation costs among patients that falls outside of the purview of the PAP.

The total episode spend is calculated by adding up the spend amounts on all of the individual claims that were included in each of the episode windows.

2.5 Episode Exclusions and Risk Factors

To ensure that episodes are comparable across patient panels select risk factors and exclusions are applied before assessing PAP performance. Risk factors are applied to episodes to make spend more comparable across different patient severities, while episode exclusions are applied a clinical factor deems the patient too severe (and too high spend) for risk adjustment to be possible.

In the context of episode design, risk factors are attributes (e.g., age) or underlying clinical conditions (e.g., diabetes, conduction disorders) that are likely to impact a patient's course of care and the spend associated with a given episode. Risk factors are selected via a standardized and iterative risk-adjustment process which gives due consideration to clinical relevance, statistical significance, and other contextual factors.[21] Based on the selected risk factors, each episode is assigned a risk score. The total episode spend and the risk score are used to arrive at an adjusted episode

21 For a detailed description of the principles and process of risk adjustment for the episode-based payment model see the document, "Supporting documentation on episode risk adjustment." A current version of this document is available here: http://medicaid.ohio.gov/Portals/0/Providers/PaymentInnovation/Episode-Risk-Adjustment.pdf

spend, which is the spend by which providers are compared to each other. The final list of risk factors is detailed in Table 2 of the Appendix. Other risk factors were inputted into the model because they were clinically relevant to the VALVE episode but did not come out of the model as statistically significant.[22]

By contrast, an episode is excluded from a patient panel with the patient has clinical factors that suggest she has experienced a distinct or different journey (e.g., heart transplant) and/or which drive significant increases in spend relative to the average patient (e.g., select cancers and HIV). In addition, there are several "business-related" exclusions. These exclusions are factors relating to reimbursement policy (e.g., whether a patient sought care out of state), the completeness of spend data for that patient (e.g., third party liability or dual eligibility), and other topics relating to episode design and implementation (e.g. overlapping episodes) during the comparison period. Episodes that have no exclusions are known as "valid" episodes and are the episodes that are used for provider comparisons. In contrast, episodes with one or more exclusions are "invalid" episodes.

For the VALVE episode, both clinical and business exclusions apply. Several of the business and clinical exclusions (e.g., dual Medicare and Medicaid eligibility, patient left against medical advice, cancer diagnoses and treatment) are standard across most episodes while others relate to the scope of the episode design. As the episode is intended to capture non-emergent VALVE procedures, some of the episode-specific clinical exclusions (which are in addition to clinical exclusions that are standard across most episodes) include claims with procedures or diagnoses indicating 1) pre-existing pneumonia, 2) ventricular assistance device, and 3) diabetic ketoacidosis.

In order to account for nesting and double counting of spend across implemented episodes, CHF, PCI and CABG episodes containing a trigger procedure for the VALVE episode are excluded episodes and will not be considered for the calculation of positive incentive payments. By contrast, VALVE episodes for which the patient has a PCI and/or CABG procedure, or for which the patient has a diagnosis of CHF, during the episode are included episodes (and may be considered in the calculation of positive incentive payments for the VALVE episode). A detailed list of business and clinical exclusions is included in Table 3 in the Appendix.

2.6 Quality Metrics

To ensure the episode model incentivizes quality care, the VALVE episode has select quality metrics. Quality metrics are calculated for each PAP meeting the minimum

[22] Some of these factors include diabetes, hypertension, age, atrial fibrillation, and hyperlipidemia

threshold for valid episodes. The VALVE episode has six quality metrics. Three are linked to performance assessment, meaning that performance thresholds on these must be met in order for episodes to be eligible for positive incentive. The specific threshold amount will be determined during the informational reporting period. Three of the quality metrics are for informational purposes only.

The metrics tied to positive incentive payments are the 30-day follow-up care rate in the post-trigger window, beta blocker prescription fill rate, and ACE inhibitor prescription fill rate. Informational metrics include the 30-day readmission rate (excluding inpatient rehab) in the post-trigger window, rehabilitation initiation rate during the trigger and post-trigger windows, and major morbidity rate during the episode window. A complete list of quality metrics is provided in Table 4 in the Appendix.

3. APPENDIX: SUPPORTING INFORMATION AND ANALYSES

Table 1 – VALVE episode triggers

Trigger group	Trigger codes (CPT codes)	Description
Aortic valve repair/replacement	33400	Valvuloplasty, aortic valve; open, with cardiopulmonary bypass
	33401	Valvuloplasty, aortic valve; open, with inflow occlusion
	33403	Valvuloplasty, aortic valve; using transventricular dilation, with cardiopulmonary bypass
	33404	Construction of apical-aortic conduit
	33405	Replacement, aortic valve, with cardiopulmonary bypass; with prosthetic valve other than homograft or stentless valve
	33406	Replacement, aortic valve, with cardiopulmonary bypass; with allograft valve (freehand)
	33410	Replacement, aortic valve, with cardiopulmonary bypass; with stentless tissue valve
	33411	Replacement, aortic valve; with aortic annulus enlargement, noncoronary sinus
	33412	Replacement, aortic valve; with transventricular aortic annulus enlargement (Konno procedure)
	33417	Aortoplasty (gusset) for supravalvular stenosis
Mitral valve repair/replacement	33422	Valvotomy, mitral valve; open heart, with cardiopulmonary bypass
	33425	Valvuloplasty, mitral valve, with cardiopulmonary bypass;
	33426	Valvuloplasty, mitral valve, with cardiopulmonary bypass; with prosthetic ring
	33427	Valvuloplasty, mitral valve, with cardiopulmonary bypass; radical reconstruction, with or without ring
	33430	Replacement, mitral valve, with cardiopulmonary bypass
Pulmonic valve repair/replacement	33472	Valvotomy, pulmonary valve, open heart; with inflow occlusion
	33474	Valvotomy, pulmonary valve, open heart, with cardiopulmonary bypass
Pulmonic valve repair/replacement	33475	Replacement, pulmonary valve

Trigger group	Trigger codes (CPT codes)	Description
Tricuspid valve repair/replacement	33460	Valvectomy, tricuspid valve, with cardiopulmonary bypass
	33463	Valvuloplasty, tricuspid valve; without ring insertion
	33464	Valvuloplasty, tricuspid valve; with ring insertion
	33465	Replacement, tricuspid valve, with cardiopulmonary bypass
Other valve or ventricular repair	33414	Repair of left ventricular outflow tract obstruction by patch enlargement of the outflow tract
	33415	Resection or incision of subvalvular tissue for discrete subvalvular aortic stenosis
	33496	Repair of non-structural prosthetic valve dysfunction with cardiopulmonary bypass (separate procedure)
	33600	Closure of atrioventricular valve (mitral or tricuspid) by suture or patch

Table 2 –VALVE episode risk factors

Risk factor	Description	Relevant time period
Acute cerebrovascular disease	Patient has diagnosis of acute cerebrovascular disease	During the episode window or during the 365 days before the episode window
Acute kidney injury	Patient has diagnosis of acute kidney injury	365 days before the episode window
Anemia	Patient has diagnosis of anemia	During the episode window or during the 365 days before the episode window
Asthma	Patient has diagnosis of asthma	During the episode window or during the 365 days before the episode window
Bacterial Infection	Patient has diagnosis of bacterial Infection	365 days before the episode window
CABG	Patient has diagnosis of CABG	During the episode window or during the 365 days before the episode window
Coagulation and hemorrhagic disorders	Patient has diagnosis of coagulation and hemorrhagic disorders	During the episode window or during the 365 days before the episode window
Conduction disorders	Patient has diagnosis of conduction disorders	During the episode window or during the 365 days before the episode window
Diabetes	Patient has diagnosis of diabetes	During the episode window or during the 365 days before the episode window
Mycoses	Patient has diagnosis of mycoses	During the episode window or during the 365 days before the episode window
Nutritional deficiency	Patient has diagnosis of nutritional deficiency	During the episode window or during the 365 days before the episode window
Pacemaker and defibrillator	Patient has diagnosis of pacemaker and defibrillator	During the episode window or during the 365 days before the episode window
Acute kidney injury X Nutritional deficiency	Patient has diagnoses of acute kidney injury and nutritional deficiency	During the episode window or during the 365 days before the episode window

Table 3 –VALVE episode exclusions

Exclusion type	Episode exclusion	Description	Relevant time period
Business Exclusions	Dual	Patient had dual coverage by Medicare and Medicaid	During the episode window
	FQHC/RHC	PAP is classified as a federally qualified health center (FQHC) or a rural health clinic (RHC)	During the episode window
	Incomplete episode	Non-risk-adjusted episode spend is less than the incomplete episode threshold	During the episode window
	Inconsistent enrollment	Patient has gaps in full Medicaid coverage	During the episode window
	Long hospitalization	Hospitalization is longer than (>) 30 days	During the episode window
	Long-term care	Patient has one or more long-term care claim detail lines	During the episode window
	Missing APR-DRG	A DRG-paid inpatient claim is missing the APR-DRG and severity of illness	During the episode window
	Multiple payers	Patient changes enrollment between FFS and an MCP or between MCPs	During the episode window
	PAP out of state	The principle accountable provider operates out of state	During the episode window
	No PAP	An episode's billing provider number is not available	During the episode window
	Third-party liability	Third-party liability charges are present on any claim or claim detail line, or the patient has relevant third-party coverage at any time	During the episode window

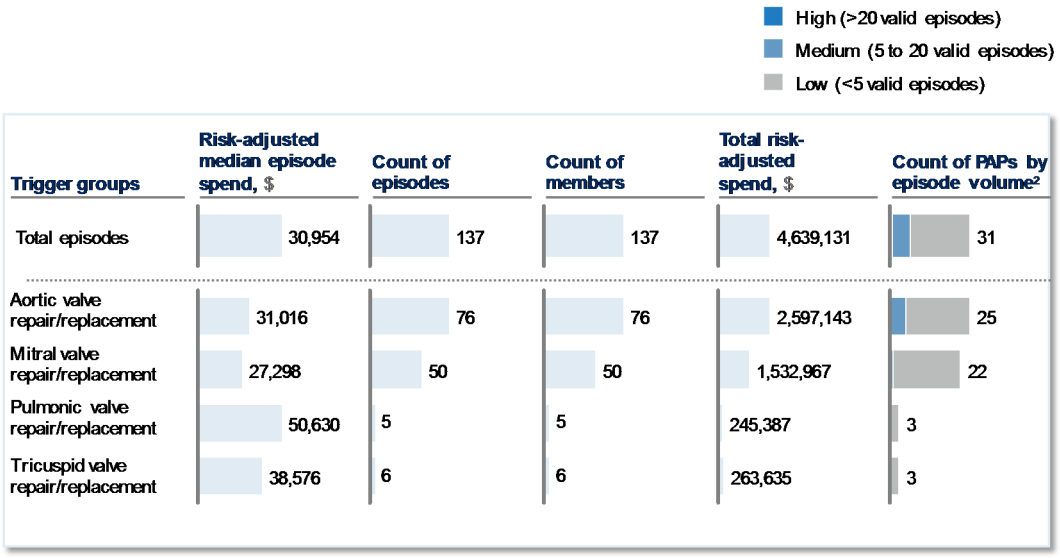
Exclusion type	Episode exclusion	Description	Relevant time period
Standard clinical exclusion	Cancer diagnoses and treatment	Patient is diagnosed with or received treatment for active cancer	During the episode or up to 90 days before the start of the episode
	Coma	Patient is diagnosed with coma	During the episode or up to 365 days before the start of the episode
	Cystic fibrosis	Patient is diagnosed with cystic fibrosis	During the episode or up to 365 days before the start of the episode
	Death	Patient had 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	During the episode window
	End stage renal disease	Patient has diagnosis or procedure for end stage renal disease	During the episode or up to 365 days before the start of the episode
	HIV	Patient is diagnosed with HIV	During the episode or up to 365 days before the start of the episode
	Left against medical advice	Patient has a discharge status of “left against medical advice or discontinued care”	During the episode window
	Multiple other comorbidities	Patient has too many risk factors to reliably risk adjust the episode spend	During the episode window
	Multiple sclerosis	Patient is diagnosed with multiple sclerosis	During the episode window or during the 365 days
	Paralysis	Patient has diagnosis of paralysis	During the episode or up to 365 days before the start of the episode
	Transplant	Patient has an organ transplant	During the episode or up to 365 days before the start of the episode

Exclusion type	Episode exclusion	Description	Relevant time period
Episode-specific clinical exclusion	Age	Patient is younger than eighteen (<18) or older than sixty-four (>64) years of age	During the episode window
	DKA or Hyperosmolarity	Patient is diagnosed with diabetes with ketoacidosis or hyperosmolarity	During the episode or up to 365 days before the start of the episode
	Emergent valve procedure	Valve procedure happens in an emergent setting	During the trigger window
	High-outlier exclusion	Risk-adjusted episode spend is greater than the higher outlier threshold	During the episode window
	Low-outlier exclusion	Non-risk-adjusted episode spend is less than the low outlier threshold	During the episode
	Pneumonia	Patient is diagnosed with pre-existing pneumonia	During the first day of the trigger window
	Pregnancy and/or Delivery	Patient is pregnant or delivers	During the episode or up to 90 days before the start of the episode
	Resuscitation	Patient receives a resuscitation procedure	During the trigger window
	Ventricular Assistance Device	Patient receives a ventricular assistance device procedure	During the episode or up to 365 days before the start of the episode

Table 4 – VALVE episode quality metrics (PAP level)

Metric type	Field name	Description	Relevant time period
Tied to incentive payments	Follow-up care rate within 30 days	Percent of valid episodes where patient receives relevant follow-up care	During the post-trigger window (30-days)
	Beta blocker prescription fill rate	Percent of valid episodes where patient fills a beta blocker prescription	During the episode window
	ACE inhibitor prescription fill rate	Percent of valid episodes where patient fills an ACE inhibitor prescription	During the episode window
Informational	Major morbidity rate	Percent of valid episodes where the patient has a major morbidity	During the episode window
	Readmission rate within 30 days	Percent of valid episodes with an included admission or relevant observation care (excluding inpatient rehab facilities)	During the post-trigger window (30-days)
	Rehabilitation rate post-procedure	Percent of episodes with initiation of rehabilitation	During the trigger and post-trigger windows

EXHIBIT 3 – VALVE EPISODE TRIGGER GROUPS[1]

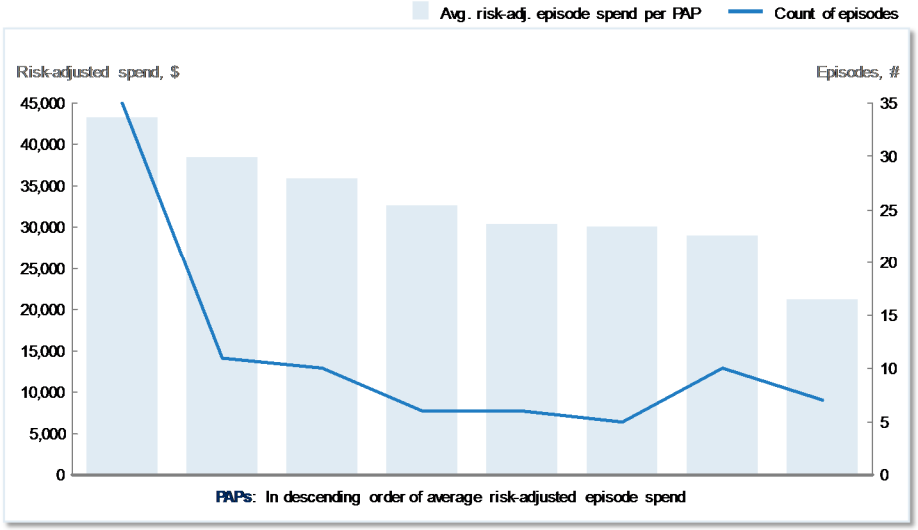


Trigger groups	Risk-adjusted median episode spend, $	Count of episodes	Count of members	Total risk-adjusted spend, $	Count of PAPs by episode volume[2]
Total episodes	30,954	137	137	4,639,131	31
Aortic valve repair/replacement	31,016	76	76	2,597,143	25
Mitral valve repair/replacement	27,298	50	50	1,532,967	22
Pulmonic valve repair/replacement	50,630	5	5	245,387	3
Tricuspid valve repair/replacement	38,576	6	6	263,635	3

1. For valid episodes (137 episodes) across 31 PAPs; valid episodes do not include episodes with business (e.g., third-party liability, dual eligibility) or clinical exclusions (e.g., cancer, ESRD); count of PAPs includes valid PAPs (e.g. ≥ 5 valid episodes) and invalid PAPs (e.g. < 5 valid episodes)
2. Risk-adjusted episode spend
3. Low volume is defined as PAPs with less than five valid episodes, Medium volume as PAPs with five to 20 valid episodes and High volume as PAPs with more than 20 valid episodes

SOURCE: OH claims data, episodes ending between 10/1/2014 and 9/30/2015

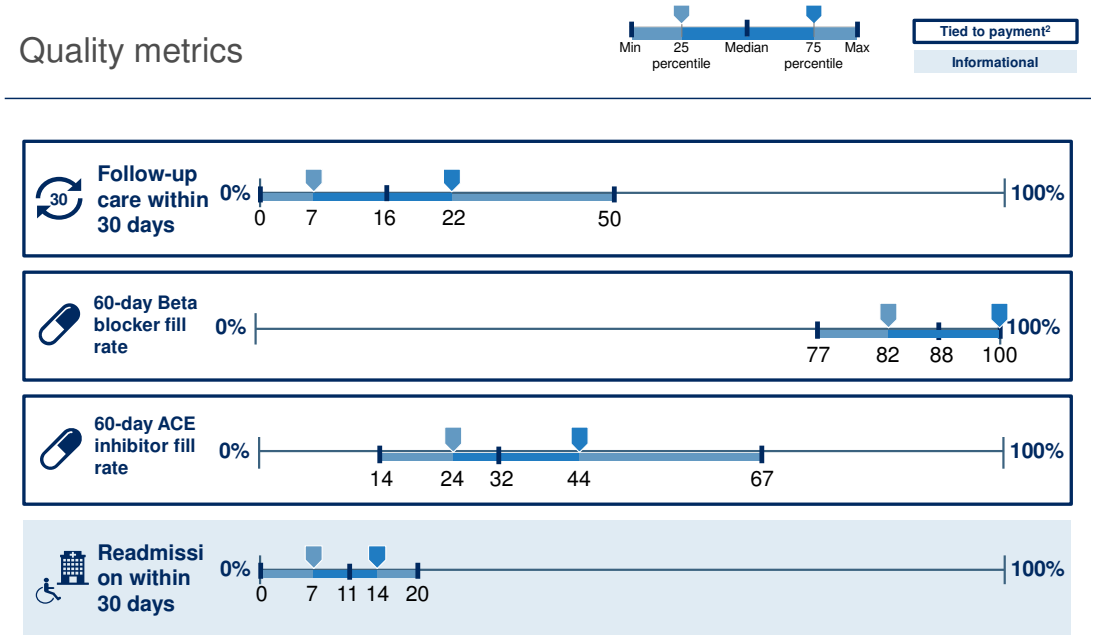
EXHIBIT 4 - DISTRIBUTION OF AVERAGE RISK-ADJUSTED EPISODE SPEND AND COUNT BY PAP[1]



1. For valid episodes (137) across valid PAPs (8); valid episodes do not include episodes with business (e.g., third-party liability, dual eligibility) or clinical exclusions (e.g., cancer, ESRD); valid PAPs are physicians with five or more.

SOURCE: OH claims data, episodes ending between 10/1/2014 and 9/30/2015

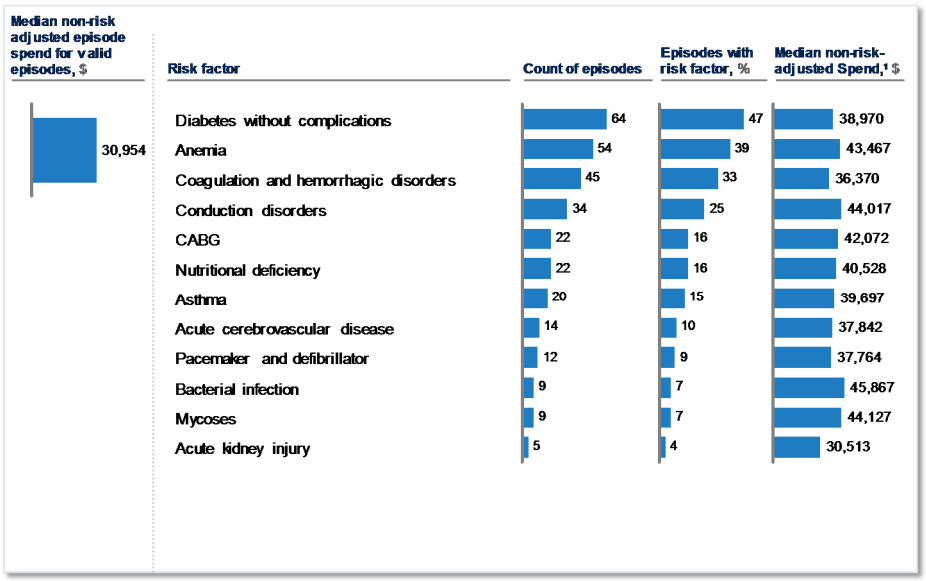
EXHIBIT 4 - PAP PERFORMANCE ON EPISODE QUALITY METRICS[1]



1. For valid episodes (137) across valid PAPs (8); valid episodes do not include episodes with business (e.g., third-party liability, dual eligibility) or clinical exclusions (e.g., cancer, ESRD); valid PAPs are physicians with five or more. Valid episodes for invalid PAPs (those with less than five valid episodes) are not included in this analysis.
2. Metric is tied to positive incentive payments

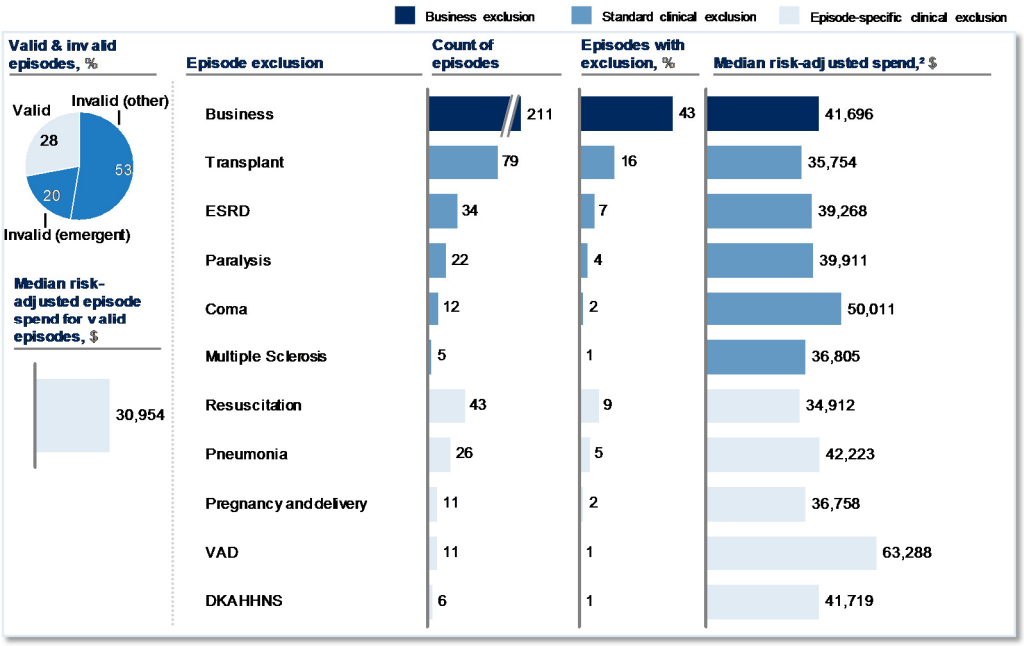
SOURCE: OH claims data, episodes ending between 10/1/2014 and 9/30/2015

EXHIBIT 5 - EPISODE COUNT AND SPEND BY RISK FACTORS



1. For episodes with this risk factor; one episode can have multiple risk factors
SOURCE: OH claims data, episodes ending between 10/1/2014 and 9/30/2015

EXHIBIT 6 - EPISODE COUNT AND SPEND BY EXCLUSIONS[1]



1. Showing top five (by volume) episode exclusions only for standard clinical and episode-specific exclusions
2. For episodes with this exclusion; one episode can have multiple exclusions

SOURCE: OH claims data, episodes ending between 10/1/2014 and 9/30/2015