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CMS Bundled Payments for Care Improvement Advanced Model: Year 2 Evaluation Report - Appendices

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The Lewin Group, Inc. with our partners Abt Associates, GDIT, and Telligen

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CMS Bundled Payments for Care Improvement Advanced Model: Year 2 Evaluation Annual Report

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Appendix A: Glossary of Terms and Acronyms List of Terms and Acronyms List

Exhibit A.1: Glossary of Terms

Name	Definition
90-day Post-Discharge Period (PDP)	The 90 days following discharge from the anchor hospitalization or procedure.
Advanced Alternative Payment Model (APM)	A component of the Quality Payment Program (QPP) in which eligible clinicians may be excluded from Merit-based Incentive Payment System (MIPS) reporting requirements and payment adjustments, and receive a 5% bonus incentive for achieving threshold levels of patient volumes or payment amounts.
Anchor Procedure	The hospital outpatient procedure that triggers the start of an outpatient episode.
Anchor Stay	The hospital inpatient stay that triggers the start of an inpatient episode.
Applicant	An organization that completed and submitted a BPCI Advanced application to the Centers for Medicare & Medicaid Services (CMS).
BPCI Advanced Database	A database where CMS stores secure, frequently-updated data about BPCI Advanced participants and episodes, from which the evaluation team can process various reports at any time.
Beneficiary Incentive	One of the waivers of fraud and abuse a participant may utilize. It allows participants to offer patients certain incentives not tied to standard provision of health care, if it supports a clinical goal.
Clinical Episode	For Model Years 1 and 2, one of the 32 episodes and for Model Year 3, one of the 34 episodes of BPCI Advanced related to a specific set of Healthcare Common Procedure Coding System (HCPCS) codes or Medicare Severity Diagnosis Related Group (MS-DRGs) that begins with an anchor stay or anchor procedure and extends for 90 days post-discharge or procedure.
CMS Discount	A three percent discount CMS applies to the benchmark price to calculate a target price.
Composite Quality Score (CQS)	An aggregate quality score determined by calculating a score for each quality measure at the clinical episode level. Scores are scaled across the clinical episodes attributed to a specific EI and weighted based on clinical episode volume. The CQS is used to adjust positive or negative total reconciliation amounts.
Convener Participant	A type of participant that brings together at least one downstream EI to participate in BPCI Advanced, facilitate coordination among them, and bear and apportion financial risk. A convener participant may or may not be a Medicare provider or initiate episodes.
Downstream Episode Initiator (EI)	Hospitals or physician group practice (PGPs) that are associated with a convener participant and initiate episodes. Downstream EIs do not bear financial risk directly with CMS.
Episode Initiator (EI)	The hospital or PGP participating in the model as a participant or a downstream EI that can trigger clinical episodes.
Episode	An episode represents the anchor stay or procedure plus the 90-day post-discharge period.
Financial Arrangements	An arrangement entered into between the participant and Net Payment Reconciliation Amount (NPRA) sharing partner or between a PGP NPRA sharing partner and a NPRA sharing group practice practitioner for purposes of sharing NPRA with organizations or individuals or for the contribution of shared repayment amounts or internal cost savings.
First Cohort	Participants and EIs who began participation in the model on October 1, 2018 and remained in the model past the retroactive withdrawal period.

Name	Definition
Historical Payments Baseline Period	The period of time used for calculation of historical payments used for target prices. For Model Years 1 and 2, the baseline period spans 4 years from January 1, 2013 through December 31, 2016. For Model Year 3, the baseline period spans 4 years from October 1, 2014 through September 30, 2018.
Impact Analysis Baseline Period	The period of time used prior to the BPCI Advanced intervention period used in the impact analyses. The baseline period spans nearly five years from April 1, 2013 to December 31, 2017.
Net Payment Reconciliation Amount (NPRA)	The amount paid to a participant when aggregate Medicare allowed amounts for clinical episodes which the participant has selected, including an adjustment from the CQS, are lower than the target price for such clinical episodes.
Non-convener Participant	An individual hospital or PGP that assumes financial risk for clinical episodes. Non-convener participants are also EIs.
NPRA Sharing Arrangement	An arrangement between a participant and an NPRA sharing partner that outlines, in writing, the terms of sharing NPRA, the contribution of internal cost savings to the BPCI Advanced savings pool, and the apportionment to the NPRA sharing partner of any repayment amount owed by the participant.
Post-acute care (PAC)	All care services received by the beneficiary after discharge from the qualifying hospital stay or procedure. Includes care from the PAC provider (SNF, IRF, LTCH, HHA), as well as any potential inpatient hospitalization (readmissions), professional services, or outpatient care.
Performance Period	A defined period of time during which episodes may initiate and all Medicare FFS payments are aggregated for a specific clinical episode are attributed to a participant. The performance periods are used to determine reconciliation for clinical episodes. Apart from the first performance period, performance periods will run from January 1 – June 30th and July 1st – December 31st. The BPCI Advanced Model includes 10 performance periods, running through December 31, 2023.
Risk Adjustment	Risk adjustment controls for observable beneficiary indicators that may also impact the outcome of interest. Without adequate risk adjustment, providers with a sicker or more service intensive patient mix would likely have worse outcomes and providers with healthier patients would like have better outcomes even if nothing else differed. All measures were risk adjusted for service mix; demographic factors, prior health conditions based on Hierarchical Chronic Conditions (HCC) indicators, measures of prior care use, and provider characteristics.
Reconciliation	The semi-annual process where CMS compares the aggregate Medicare FFS allowed amounts for all items and services included in clinical episodes attributed to a participant against the target price for those clinical episodes in order to determine whether the participant is eligible to receive a NPRA payment from CMS or is required to pay a repayment amount to CMS.
Retroactive Withdrawal	A one-time opportunity for participants to withdraw some or all of their EIs and/or clinical episodes without being held financially accountable for clinical episodes initiated between October 1, 2018 and March 1, 2019.
Second Cohort	Participants and EIs who began participation in the model on January 1, 2020.
Target Price	The benchmark price for each EI-clinical episode combination with the CMS discount applied.
Three-day Hospital Stay Waiver	One of the payment policy waivers offered under the model that waives the three-day inpatient hospital stay requirement for coverage of SNF services furnished to a BPCI Advanced beneficiary.

Exhibit A.2: Acronym List

Acronym	Definition
ACO	Accountable Care Organization
AHRF	Area Health Resource File
AHRQ	Agency for Healthcare Research and Quality
AMI	Acute myocardial infarction
APM	Alternative Payment Model
BPCI	Bundled Payments for Care Improvement
CBSA	Core-Based Statistical Area
CHF	Congestive heart failure
CJR	Comprehensive Care for Joint Replacement
CMMI	Center for Medicare & Medicaid Innovation
CMS	Centers for Medicare & Medicaid Services
COPD	Chronic obstructive pulmonary disease
CQS	Composite Quality Score
DiD	Difference-in-differences
DJRLE	Double joint replacement of the lower extremity
ED	Emergency department
EI	Episode initiator
ESRD	End-stage Renal Disease
FFS	Fee-for-service
GI	Gastrointestinal
HCC	Hierarchical Condition Category
HCPCS	Healthcare Common Procedure Coding System
HH	Home health
HHA	Home health agency
HOPD	Hospital Outpatient Department
IP	Inpatient
IPPS	Inpatient Prospective Payment System
IRF	Inpatient rehabilitation facility
IQR	Inpatient Quality Reporting
LASSO	Least absolute shrinkage and selection operator
LTCH	Long term care hospital
MDM	Master Data Management
MD-PPAS	Medicare Data on Provider Practice and Specialty
MIPS	Merit-based Incentive Payment System
MS-DRG	Medicare Severity Diagnosis Related Group
MSSP	Medicare Shared Savings Program
MJRLE	Major joint replacement of the lower extremity
MJRUE	Major joint replacement of the upper extremity
NPI	National Provider Identifier

Acronym	Definition
NPRA	Net Payment Reconciliation Amount
OP	Outpatient
PAC	Post-acute care
PCI	Percutaneous coronary intervention
PECOS	Provider Enrollment, Chain, and Ownership System
PGP	Physician group practice
POS	Provider of Service
PP	Percentage point
QP	Qualifying APM Participant
QPP	Quality Payment Program
SNF	Skilled nursing facility
SPRI	Simple pneumonia and respiratory infections
TIN	Taxpayer Identification Number
UTI	Urinary tract infection

Appendix B: BPCI Advanced Clinical Episode Definitions

Exhibit B.1: BPCI Advanced Inpatient Clinical Episodes and Medicare Severity Diagnosis Related Groups (MS-DRGs), Model Year 3

Clinical Episode	MS-DRGs Trigger Codes							
	1	2	3	4	5	6	7	8
Acute Myocardial Infarction	280	281	282					
Back and Neck Except Spinal Fusion	518	519	520					
Bariatric Surgery*	619	620	621					
Cardiac Arrhythmia	308	309	310					
Cardiac Defibrillator	222	223	224	225	226	227		
Cardiac Valve	216	217	218	219	220	221		
Cellulitis	602	603						
Chronic Obstructive Pulmonary Disease, Bronchitis, Asthma	190	191	192	202	203			
Congestive Heart Failure	291	292	293					
Coronary Artery Bypass Graft	231	232	233	234	235	236		
Disorders of Liver Except Malignancy, Cirrhosis or Alcoholic Hepatitis	441	442	443					
Double Joint Replacement of the Lower Extremity	461	462						
Fractures of the Femur and Hip or Pelvis	533	534	535	536				
Gastrointestinal Hemorrhage	377	378	379					
Gastrointestinal Obstruction	388	389	390					
Hip and Femur Procedures Except Major Joint	480	481	482					
Inflammatory Bowel Disease*	385	386	387					
Lower Extremity and Humerus Procedure Except Hip, Foot, Femur	492	493	494					
Major Bowel Procedure	329	330	331					
Major Joint Replacement of the Lower Extremity**	469	470	521	522				
Major Joint Replacement of the Upper Extremity	483							
Pacemaker	242	243	244					
Percutaneous Coronary Intervention	246	247	248	249	250	251		
Renal Failure	682	683	684					
Seizures*	100	101						
Sepsis	870	871	872					
Simple Pneumonia and Respiratory Infections	177	178	179	193	194	195		
Spinal Fusion*	471	472	473	453	454	455	459	460
Stroke	061	062	063	064	065	066		
Transcatheter Aortic Valve Replacement*	266	267						
Urinary Tract Infection	689	690						

Note: * Bariatric surgery, inflammatory bowel disease, seizures, spinal fusion, and transcatheter aortic valve replacement clinical episodes were new for Model Year 3. The spinal fusion clinical episode merges together and replaces three clinical episodes from Model Years 1 and 2 - cervical spinal fusion, combined anterior posterior spinal fusion, and spinal fusion (non-cervical). Additionally, transcatheter aortic valve replacement clinical episodes are triggered by the corresponding MS-DRG codes and at least one procedure code from Exhibit B.3. ** Major joint replacement of the lower extremity is a multi-setting clinical episode, starting in Model Year 3. The clinical episodes under this category are triggered in both inpatient and outpatient settings. DRGs 521 and 522 became active October1, 2020. For a list of trigger Healthcare Common Procedure Coding System (HCPCS) Codes, see Exhibit B.2.

Source: Centers for Medicare & Medicaid Services (2020, May 14). BPCI Advanced. Retrieved from https://innovation.cms.gov/initiatives/bpci-advanced.

Exhibit B.2: BPCI Advanced Outpatient Clinical Episodes and Healthcare Common Procedure Coding System (HCPCS) Codes, Model Year 3

Clinical Episode	HCPCS Trigger Codes												
	1	2	3	4	5	6	7	8	9	10	11	12	13
Back and Neck Except Spinal Fusion	62287	63005	63011	63012	63017	63030	63040	63042	63045	63046	63047	63056	63075
Cardiac Defibrillator	33249	33262	33263	33264	33270								
Percutaneous Coronary Intervention	92920	92924	92928	92933	92937	92943	C9600	C9602	C9604	C9607			
Major Joint Replacement of the Lower Extremity**	27447												

Note: ** Major joint replacement of the lower extremity is a multi-setting clinical episode, starting in Model Year 3. The clinical episodes under this category are triggered in both inpatient and outpatient settings. For a list of trigger Medicare Severity Diagnosis Related Groups (MS-DRGs), see Exhibit B.1.

Source: Centers for Medicare & Medicaid Services (2020, May 14). BPCI Advanced. Retrieved from https://innovation.cms.gov/initiatives/bpci-advanced.

Exhibit B.3: Procedure Codes for Transcatheter Aortic Valve Replacement, Model Year 3

Procedure Code	ICD-9/ICD-10
35.05	ICD-9
35.06	ICD-9
02RF37H	ICD-10
02RF37Z	ICD-10
02RF38H	ICD-10
02RF38Z	ICD-10
02RF3JH	ICD-10
02RF3JZ	ICD-10
02RF3KH	ICD-10
02RF3KZ	ICD-10
X2RF332	ICD-10

Note: Transcatheter aortic valve replacement clinical episodes are triggered by a MS-DRG code from Exhibit B.1 and at least one procedure code.

Source: Centers for Medicare & Medicaid Services (2020, May 14). BPCI Advanced. Retrieved from https://innovation.cms.gov/initiatives/bpci-advanced.

Appendix C: Methods

This appendix includes the details on the methods used for the analyses included in the Year 2 report.

A. Data Sources (Primary & Secondary)

Exhibit C.1 lists the data sources and their uses for this study. We used provider-level data sources to identify and describe Bundled Payments for Care Improvement Advanced (BPCI Advanced) participant providers and select comparison providers. We used Medicare claims and enrollment data to construct episodes of care for BPCI Advanced patients and at matched comparison providers. We also used claims to create outcome measures and beneficiary risk factors associated with the outcomes. We collected and analyzed beneficiary survey data to explore differences in patient care experiences and functional outcomes between Medicare beneficiaries cared for by BPCI Advanced providers and similar beneficiaries whose providers did not participate in BPCI Advanced. We used primary data sources to describe BPCI Advanced patient and participant experiences in the model. We also convened clinical expert network (CEN) meetings to provide clinician insights into model features that are difficult to obtain through other data collection methods.

Exhibit C.1: Data Sources Used in the BPCI Advanced Evaluation

	Dataset Name	Date Range	Dataset Contents	Use
Provider-level Secondary Data Sources	Academic Medical Center Indicator Dataset	2013-2017	Dataset from the BPCI Advanced payment reconciliation contract that indicated if the Inpatient Prospective Payment System (IPPS) hospital is an academic medical center.	Used to identify which hospitals are academic medical centers.
	Agency for Healthcare Research and Quality (AHRQ) Hospital Linkage File	2016	Data linking hospitals to Compendium Health Systems.	Used to identify whether a hospital is part of a health system.
	Area Health Resource File (AHRF)	2013-2017	County-level data on population, environment, geography, health care facilities, and health care professionals.	Used within descriptive analysis of market characteristics for BPCI Advanced hospitals, BPCI hospitals, and non-participating hospitals.
	BPCI Advanced Hospital Target Pricing File	2013-2018	The clinical episode-specific Model Years 1 and 2 preliminary target prices, historical payments, and historical volume for all BPCI Advanced-eligible hospitals.	We use the hospital efficiency measure, a component of the target price, in our matching model as well as an indicator of whether historical hospital volume meets the threshold for target price creation. In addition, we use this file as an input to calculate Net Medicare Savings.
	Centers for Medicare and Medicaid Services (CMS) BPCI Advanced Database	2018-2020	Information compiled by CMS on BPCI Advanced participants and their clinical episodes, including participant name, CMS Certification Number (CCN), Taxpayer Identification Number (TIN), location, type (hospital, PGP, other), BPCI Advanced "role," clinical episode(s), BPCI Advanced participation start and end dates, and contact information.	Used to identify participants, hospital episode initiators (EIs), and PGP EIs participating in BPCI Advanced and the clinical episodes in which they are participating. Also used to identify participants that retroactively withdrew or applied but did not become a participant or EI.
	CMS CJR Database	2017, 2018	List of providers that have ever participated in CJR as of 12/1/2017 and list of participants in CJR as of 10/1/2018.	Used to identify hospitals that participated in the CJR Model.

	Dataset Name	Date Range	Dataset Contents	Use
Provider-level Secondary Data Sources, Continued	CMS BPCI Database	2013-2018	Information compiled by CMS on BPCI awardees and their clinical episodes, including awardee name, CCN, TIN, location, type, clinical episode(s), BPCI participation start and end dates, and contact information.	Used to identify hospitals and PGPs that participated in the BPCI Initiative.
	CMS Inpatient Prospective Payment System (IPPS) Files	2013-2017, 2019	Hospital-level file containing provider characteristics such as Medicare days percent, resident-bed ratio, and disproportionate share percent.	Used within descriptive analysis of BPCI Advanced participating hospitals and non-participating hospitals.
	CMS Provider of Services (POS) File	2013-2017, 2019	Information on Medicare-approved institutional providers, including provider number, size, ownership, and staffing.	Used within descriptive analysis of BPCI Advanced participating hospitals and non-participating hospitals.
	Dartmouth Atlas Project Crosswalk Files	2015	Crosswalk files from the ZIP code level to the Hospital Service Area (HSA) and the Hospital Referral Region (HRR).	Used to assign a core-based statistical area(CBSA) code to hospitals that are not located within a CBSA code by using the largest CBSA that overlaps the HRR.
	Episode Files	2018-2019	Episode-level net payment reconciliation amount (NPRA) from the implementation contractor.	Used as input to calculate Net Medicare Savings due to BPCI Advanced.
	Master Data Management (MDM)	2013-2020	Provider-level information on participation in Center for Medicare and Medicaid Innovation (CMMI) payment demonstration programs.	Used to identify providers who were involved in a Medicare Shared Savings Program (MSSP), Next Generation (Next Gen), or Pioneer Accountable Care Organization (ACO) Model.
	Medicare Data on Provider Practice and Specialty (MD-PPAS) User Documentation version 2.3	N/A	Mapping of Provider Enrollment and Chain/Ownership System (PECOS) codes to six broad physician specialties, other physician, and non-physician categories.	Used to map clinician specialty codes on Medicare claims to broad specialty categories and provide guidance on how to assign a category to physicians that can be assigned to more than one category.
	Medicare Provider Enrollment, Chain, and Ownership System (PECOS)	2013-2017	Information on Medicare providers, including specialty.	Provides clinician specialty codes on Medicare claims which we map to broad specialty categories using MD-PPAS.

	Dataset Name	Date Range	Dataset Contents	Use
Transaction-level Secondary Data Sources	Medicare Fee-for-services (FFS) Claims	Jan 2013-Oct 2019	Medicare Part A and B claims.	Used to create all claims-based outcome measures, claims-based matching measures, and prior use risk adjusting covariates. We calculate the number of discharges and procedures by BPCI Advanced, BPCI and non-participating hospitals, BPCI Advanced and BPCI PGPs, and by CBSAs. Also used to identify clinicians, clinician specialties, and hospitals where PGPs had discharges or procedures associated with BPCI Advanced and BPCI PGP EIs.
	Medicare Standardized Payments	2013-2019	Medicare standardized payments for 100% Part A and B claims received via the Integrated Data Repository (IDR) from the implementation contractor.	Used to create Medicare standardize payment amounts (Part A and B) and allowed standardized payment outcomes.
	The Master Beneficiary Summary File (MBSF)	2013-2019	Beneficiary and enrollment information, including beneficiary unique identifier, address, date of birth/ death, sex, race, age and Medicare enrollment status.	Used to identify eligibility for episodes of care, beneficiary demographic characteristics, and beneficiary eligibility for inclusion in the denominator for each of the outcome measures.
Primary Data Sources	Beneficiary Survey	Jul-Aug 2019	Surveys completed by Medicare beneficiaries or their proxies. Beneficiaries received surveys approximately 90 days after leaving the hospital.	Used to create patient-reported outcomes measures such as self-reported change in functional status, care experience, satisfaction with recovery and care received.

	Dataset Name	Date Range	Dataset Contents	Use
Primary Data Sources, Continued	Site Visits	2019-2020	Site visit interview notes and transcripts that include findings from multi-day site visits and cover a wide range of subjects related to an EI's or convener's experience in BPCI Advanced.	Site visits included interviews with key individuals responsible for different aspects of BPCI Advanced implementation and management, including executive and financial leaders, data and quality management staff, care redesign leaders, care coordination staff, nurses, physicians and other direct patient care staff, and representatives from conveners (when applicable). During site visits, we focused on why organizations chose to participate, how they selected clinical episodes and partners, their approach to care redesign, the level of clinician and beneficiary awareness of the model, the overall impact of the model, and both the perceived challenges and successes.
	Key Informant Interviews (KIIs)	2020	Notes from semi-structured telephone interviews conducted with a sample of PGP and hospital EIs. Interviews focused on how participation in multiple Medicare payment initiatives influenced BPCI Advanced participation.	Designed with input from CMS, the KIIs elicited information on how participation in multiple Medicare payment initiatives, such as the Comprehensive Care for Joint Replacement (CJR) model and Medicare Accountable Care Organizations (ACOs), influenced aspects of BPCI Advanced participation, such as BPCI Advanced entry, partnering, care redesign approach and performance.
	Clinical Expert Network (CEN)	2019-2020	Notes from meetings and emails with clinical experts who provide insights into the positive and negative unintended consequences of the model; potential impacts on patterns of care and/or changes in care; and who assist in interpretation of quantitative data and corroboration of qualitative findings.	Used to further understand evaluation findings: first annual report results (e.g., clinical billing practices, clinical episode selection, model reach, and unintended consequences); potential implications of Model Year 3 changes; and options for aggregating Healthcare Common Procedure Coding System (HCPCS) codes for the percutaneous coronary intervention (PCI) outpatient episode analysis.

B. Primary Data Source Description, Sample, and Methods

In this section we describe the sample included in each of the primary qualitative data collection activities and the data collected, as well as the methods used to analyze the data in Section B.4. Qualitative Analysis.

1. Clinical Expert Network

The CEN provides clinician insights into and interpretation of quantitative data and corroboration of qualitative findings for this evaluation. Under the leadership of Dr. Christine LaRocca, geriatric medicine physician and medical director at Telligen, six clinical experts were vetted based on their area of expertise and under the condition that their organization not be a model participant; candidates were then recruited to participate in the CEN. CMS reviewed and approved this roster.

CEN members were consulted on an as-needed basis (through emails, meetings, or phone calls) as inquiries arose from the evaluation teams. The objectives of the CEN were to:

- Report on changes in clinical practice that may affect BPCI Advanced;
- Present medical or provider community feedback on BPCI Advanced;
- Raise questions for further analysis;
- Corroborate qualitative findings;
- Provide additional insight into utilization and quality patterns we might expect given the incentives of the model;
- Identify practice pattern changes that may differentially impact subpopulations of Medicare patients;
- Aid in the identification of promising practices and unintended consequences; and
- Assist in the detection of the overlap of BPCI Advanced with other CMMI initiatives.

To provide the CEN members with a strong understanding of the BPCI Advanced model and their role in the evaluation, Dr. LaRocca convened a kick-off session via webinar on May 16, 2019 so all CEN members would have a common understanding of the model and the data they would be reviewing and commenting upon. For this meeting, Telligen developed an introductory packet consisting of an agenda and presentation slides that included BPCI Advanced background information, member biographies, and general expectations of CEN members.

On February 7, 2020, Dr. LaRocca led a meeting with the CEN to review select results from the first annual report and Model Year 3 updates. For this webinar, Telligen developed a packet consisting of an agenda and presentation slides that included select results from the first annual report, Model Year 3 updates, and probing questions. Key takeaways from this meeting were presented to CMS on April 8, 2020 and included an in-depth discussion and question and answer session.

Both CEN meetings were administered in the same manner and convened via webinar. Dr. LaRocca facilitated each meeting; the second CEN meeting was analyzed for learnings and takeaways. CMS approved the materials prior to distribution to the CEN.

Additionally, in April 2020, a member of the CEN responded to an ad hoc request regarding the evaluation team's interest in aggregating HCPCS codes for the outpatient PCI episode analysis.

See **Appendix M** for takeaways from the February 7, 2020 call, and information shared via email for the ad hoc request.

2. Site Visits

To inform the evaluation in Year 2, we conducted site visits with eight episode initiators (EIs), including four visits to hospital EIs and four visits to PGP EIs. Site visits consisted of interviews with key informants at each site such as executive leaders, financial leaders, data and quality management managers, care redesign leaders, care coordination leaders, nurses, physicians and representatives from convener participants (conveners). All site visits were conducted in-person. Some follow-up interviews were conducted via telephone with interviewees who were not available during the in-person site visits. The focus of the site visits was to explore why organizations chose to participate in the BPCI Advanced Model, how they selected clinical episodes and partners, and their approach to care redesign. We also asked about NPRA sharing arrangements and the level of clinician and beneficiary awareness of the model. Each of the site visits had some questions focused on specific clinical episodes of interest including congestive heart failure (CHF), sepsis, acute myocardial infarction, percutaneous coronary intervention (inpatient and outpatient) and back & neck (outpatient).

a. Sampling Approach

The site visit sample was purposive, to ensure a diverse sample, and not intended to represent the broader BPCI Advanced EI population (Exhibit C.2.). EI site visit selection criteria included: hospitals and PGP EIs participating with a variety of convener types, and those participating without conveners; and EIs that are also participating in other Medicare payment initiatives such as Medicare ACOs and CJR. In addition, we selected EIs in a variety of geographic areas and markets, and participating in a variety of clinical episodes. We also selected EIs with a mix of preliminary financial results or Net Payment Reconciliation Amounts (NPRA).

Exhibit C.2: Site Visit EI Characteristics, Year 2

Hospital / PGP EI	EI's Convener Participant Type (if applicable)	Participation in other Medicare Payment Initiatives	Geographic Region	Total Preliminary NPRA/Repayment Amount
Hospital EI	N/A, Non-convener participant	Medicare bundled payment	South	+
Hospital EI	N/A, non-convener participant	Medicare bundled payment, Medicare ACO	Midwest	+
Hospital EI	N/A, non-convener participant	Medicare bundled payment	Northeast	+
Hospital EI	For-profit convener	Medicare bundled payment	West	-
PGP EI	N/A, non-convener participant	Medicare ACO	Northeast	+
PGP EI	For-profit convener	Medicare ACO	South	+
PGP EI	For-profit convener	None	West	+

Hospital / PGP EI	EI's Convener Participant Type (if applicable)	Participation in other Medicare Payment Initiatives	Geographic Region	Total Preliminary NPRA/Repayment Amount
PGP EI	For-profit convener	Medicare ACO	Northeast	-

Note: EI = episode initiator; PGP = physician group practice; + = positive preliminary NPRA; - = negative preliminary NPRA. Total preliminary NPRA/repayment amounts are summed across all clinical episodes and are not adjusted for quality scores nor do they have the 20% stop-loss gain provision applied. Medicare bundled payment initiatives include Comprehensive Care for Joint Replacement (CJR) Model and Bundled Payments for Care Improvement (BPCI) Initiative. Medicare ACOs include Pioneer, Next Gen, and Medicare Shared Savings Program (MSSP).

Source: The BPCI Advanced evaluation team's analysis of the CMS BPCI Database and the CMS BPCI Advanced Database as of October 30, 2019.

b. Interview Protocols

The site visit interview protocols were designed to capture information about: entry decisions, clinical episode selection, partner selection, convener choice, NPRA sharing arrangements, care redesign and care coordination, data and quality monitoring, waiver use, successes and challenges, clinician and beneficiary awareness of the model, and model impact. Interview protocols were tailored to each type of respondent. For example, care redesign leaders were asked targeted questions about care redesign, while financial and executive leaders were asked about entry decisions and partner selection (Exhibit C.3).

Exhibit C.3: Site Visit Interview Topics by Interviewee Type

Topics	Convener[1]	Executive	Finance	Data & Quality	Care Redesign	Care Coordination	Physician	Nurses & Direct Care Staff
Entry Decision	X	X	X					
EI Selection	X							
Convener Selection		X	X					
Clinical Episode Selection	X	X	X					
Waivers	X	X						
NPRA Sharing	X	X	X				X	
Partner Selection	X		X					
Convener Role	X	X						
Monitoring Cost and Quality			X	X			X	
Data Sharing (Internal & External)	X			X				

[1] Convener protocol questions were asked when applicable.

Topics	Convener[1]	Executive	Finance	Data & Quality	Care Redesign	Care Coordination	Physician	Nurses & Direct Care Staff
Care Redesign					X	X	X	X
Care Coordination					X	X	X	X
Clinician Awareness of Model					X	X	X	X
Beneficiary Awareness of Model					X	X	X	X
Successes & Challenges	X	X	X	X	X	X	X	X
Model Results/ Impact		X	X	X			X	X

3. Key Informant Interviews (KIIs)

During site visits, we learned that participation in multiple Medicare initiatives (including the BPCI Initiative) influenced many aspects of BPCI Advanced entry, partnering, care redesign approach and performance. To explore this issue in more detail, we held semi-structured telephone interviews with a sample of PGP EIs and hospital EIs to learn how participation in multiple Medicare payment initiatives, such as the Comprehensive Care for Joint Replacement (CJR) model and Medicare Accountable Care Organizations (ACOs), influenced BPCI Advanced participation. This was an efficient way to collect information from dozens of knowledgeable informants about a narrow but important topic. This information supplemented similar data collected during site visits.

We selected EIs for KIIs based on: participation in various other Medicare initiatives (e.g., Medicare ACOs, BPCI, and CJR), both hospital and PGP EIs, and those participating with conveners and without. We anticipated that some of the Medicare ACO models that involve greater risk sharing for participants, such as the Pioneer, NextGen and Advanced Payment ACO models, could have a greater influence than CJR and MSSP, and selected several BPCI Advanced EIs that were also participating in those Medicare ACO models. We excluded EIs that participated in data collection earlier in our evaluation.

We selected 30 EIs for KIIs, and 25 (83%) agreed to participate. Interviews were conducted with executive or financial leaders at each EI. Convener representatives and health system leadership often joined these interviews. Interviewee characteristics (Exhibit C.4) are shown below.

Exhibit C.4: Characteristics of Key Informant Interview Participants, Year 2

Domain	Characteristic	Key Informant Interviews (N = 25)	Key Informant Interviews (%)
Participant Type	Non-convener Participant	4	16%
	Downstream EI	21	70%
Organization Type	Hospital EI	18	72%
	PGP EI	7	28%
Census Region	Midwest	10	40%
	Northeast	7	28%
	South	4	16%
	West	4	16%
Experience with Other Medicare Initiatives	BPCI	9	36%
	CJR	9	36%
	MSSP	9	36%
	Pioneer ACOs	4	16%
	NextGen ACOs	5	20%
	CPC+	6	24%
	Other	6	24%

Note: EI = episode initiator; PGP = physician group practice; BPCI = Bundled Payments for Care Improvement Initiative; CJR = Comprehensive Care for Joint Replacement Model; MSSP = Medicare Shared Savings Program; ACO = Accountable Care Organization Model; CPC+ = Comprehensive Primary Care Plus

***Source*:** The BPCI Advanced evaluation team's analysis of the MDM Program participation database, the CMS public model participation files, the CMS BPCI Database, and the CMS BPCI Advanced Database as of October 1, 2019 for the qualitative key informant interview sample for Year 2 data collection.

4. Qualitative Analysis

Interview notes from site visits and KIIs were organized and analyzed using ATLAS.ti (version 8.4; Scientific Software Development GmbH, Berlin, Germany), a qualitative data analysis software.

We modified the codebook used during the first year of the evaluation to incorporate improvements identified as a result of our data collection activities, and to reflect new topics explored. For each code, the codebook included a definition, an example of a response that belonged to that code, inclusion criteria, exclusion criteria, and code search expressions. All staff involved in coding or analysis were familiar with BPCI Advanced and participated in data gathering as interviewers or note-takers. Staff involved in coding or analysis were trained on the final codebook to promote a consistent approach and ensure a clear understanding of codes, and coding was reviewed to ensure inter-rater reliability.

Data were reviewed for commonalities and differences in responses by different convener and EI types, and summarized to capture congruence or dissimilarity. We used characteristics such as participation in other Medicare payment initiatives, EI type, and use of a convener (or not) and ran queries to explore differences in response by interviewee characteristics. During regular meetings, team members shared initial findings and synthesized results.

C. Quantitative Analysis

This section details the methods used for the quantitative analyses included in the Year 2 Evaluation report. It describes the approaches for analyzing participant characteristics, patient mix, impact of BPCI Advanced, beneficiary survey results, and net savings to Medicare.

1. Characteristics of the model and participants

We relied on secondary data to describe the BPCI Advanced participants and EIs through Model Year 3. To summarize characteristics of the model and participants in the baseline period and during the course of the model, we ran a series of descriptive analyses on the variables included in Exhibits C.5 through C.8.

a. Outcomes

Exhibit C.5: Participant Characteristics Variable Definitions

Variable Name	Definition	Eligible Sample
Convener Organization Type	Defines the type of organization for a convener, including an acute care hospital (ACH), PGP, ACO, health care system, health plan, integrated delivery health system, management services organization (MSO), clinically integrated network (CIN), or a non-provider convener.	Participants that, as of January 1, 2020, were: 1) actively participating; and 2) identified as a convener.
# Conveners (%)	The unique number of conveners that were identified within each convener organization type.	Participants that, as of January 1, 2020, were: 1) actively participating; and 2) identified as a convener.
Participant Type	Defines the type of BPCI Advanced participant, including the convener participant or non-convener participant.	Participants that, as of January 1, 2020, were: 1) actively participating; and 2) were identified as a convener or non-convener participant.
Number of Participants (%)	The number of unique entities that are participating as a convener participant or non-convener participant.	Participants that, as of January 1, 2020, were: 1) actively participating; and 2) identified as a convener or non-convener participant.
% that Participated in BPCI	The percentage of convener participants or non-convener participants that were identified as having prior experience in BPCI. BPCI experience was confirmed by matching the CCN, TIN, or the participant's legal name in the CMS BPCI and BPCI Advanced databases.	Participants that, as of January 1, 2020, were: 1) actively participating; 2) were identified as a convener or non-convener participant ; and 3) in Phase II of BPCI at any point in time since October 2013.
% For Profit	The percentage of all convener participants or non-convener participants that were identified as a for-profit organization.	Participants that, as of January 1, 2020, were: 1) actively participating; and 2) identified as a convener or non-convener participant.
Number of Episode Initiators (%)	The unique number of non-convener participants, downstream EIs under a convener participant, or episode-initiating convener participants.	EIs that were actively participating in at least one clinical episode as of January 1, 2020.

Variable Name	Definition	Eligible Sample
Average # of Distinct Clinical Episodes Selected	Of the 35 inpatient and outpatient clinical episodes, the mean value of the distinct clinical episodes selected by each convener participant for each of its downstream EIs and itself (if it is an episode-initiating convener participant), identified within each convener participant organization type.	Clinical episodes are uniquely counted for convener participants if the episode-initiating convener participants and the downstream EIs were actively participating in at least one clinical episode as of January 1, 2020.
Number of Hospital EIs (%)	The total unique number of hospital EIs associated with each convener participant type.	EIs that, as of January 1, 2020 were: 1) actively participating; and 2) identified as hospitals.
Number of PGP EIs (%)	The total unique number of PGP EIs associated with each convener participant type.	EIs that, as of January 1, 2020 were: 1) were actively participating; and 2) were identified as PGPs.

***Source*:** The BPCI Advanced evaluation team's analysis of the CMS BPCI Database and the CMS BPCI Advanced Database as of January 1, 2020.

Exhibit C.6: Hospital Characteristics Variable Definitions

Variable	Definition	Technical Definition	Source
Academic Medical Center	A binary variable indicating if a hospital is an academic medical center.		Academic Medical Center Indicator Dataset
Medicare Advantage Penetration	The Medicare Advantage (MA) penetration in the CBSA in which the hospital is located.	The percentage of total eligible Medicare enrollees in the CBSA that are enrolled in MA.	AHRF
Per Capita Personal Income	Per capita income of the CBSA code in which the hospital is located.	The total income in the CBSA divided by total population in the CBSA.	AHRF
Market Population	The total population of the CBSA code in which the hospital is located.	The population is summed for each Federal Information Processing Standards (FIPS) State/County Code in the CBSA.	AHRF
Skilled Nursing Facility (SNF) Beds per 10,000	The number of SNF beds per 10,000 inhabitants of the CBSA in which the hospital is located.	The SNF beds and population are summed for each FIPS State/County Code in the CBSA. SNF beds are divided by the population and then multiplied by 10,000.	AHRF
Part of a Health System	A binary variable indicating if a hospital is a part of a health system.	A health system includes at least one hospital and at least one group of physicians that provides comprehensive care (including primary and specialty care) that are connected with each other and with the hospital through common ownership or joint management.	AHRQ Compendium of US Health Systems
Disproportionate Share Percent	The sum of the percentage of Medicare inpatient days attributable to patients eligible for both Medicare Part A and Supplemental Security Income (SSI), and the percentage of total inpatient days attributable to patients eligible for Medicaid but not Medicare Part A.		CMS IPPS Files

Variable	Definition	Technical Definition	Source
Medicare Days Percent	The Medicare days as a percent of total inpatient days.		CMS IPPS Files
Resident to Bed Ratio	The average number of residents assigned per bed.		CMS IPPS Files
Safety Net Status	A binary variable indicating if the hospital is a safety net hospital based on disproportionate share percentage.	A hospital receives safety net status when the disproportionate share percentage is over 60%.	CMS IPPS Files
Bed Count	The total number of beds in a hospital.		CMS Provider of Service (POS) Files
Census Region	The census region in which the hospital is located (Midwest, Northeast, South, West).		CMS POS Files
Ownership	The ownership type of the hospital (government, non-profit, for-profit).		CMS POS Files
Urban/Rural	A binary variable indicating if the hospital is in an urban or rural market.		CMS POS Files
Experience in BPCI	A binary variable indicating if the hospital was an EI in Model 2 or 4 for at least one Phase II (i.e., at risk) calendar quarter during the BPCI Initiative.		CMS BPCI Database
Participation in MSSP, Next Gen, or Pioneer ACO Initiatives	A binary variable indicating providers who were involved in an MSSP, Next Generation, or Pioneer ACO initiative at any point up to May 1, 2020.		MDM Program Participation Data
Total Discharges for BPCI Advanced Medicare Severity-Diagnosis Related Groups (MS-DRGs)	The total annual volume of Medicare FFS discharges at the hospital that occurred in one of the 31 inpatient clinical episodes.		Part A Medicare Claims
Total Procedures for BPCI Advanced HCPCS	The total annual volume of Medicare FFS procedures at the hospital that occurred in one of the 4 outpatient clinical episodes.		Part A Medicare Claims
Herfindahl Index	The sum of the squared market share (in BPCI Advanced MS-DRGs) for all eligible hospitals in a CBSA.		Part A Medicare Claims
Hospital Market Share for BPCI Advanced MSDRGs and HCPCS	The percent of discharges in BPCI Advanced MS-DRGs in the CBSA that occur at the hospital.		Part A Medicare Claims

Note: Market characteristics were assigned to hospitals at the CBSA code level. Using the Area Health Resource File (AHRF), characteristics were aggregated from the FIPS State/County code level to the CBSA code level. Hospitals that were in a CBSA code were given the characteristics of that CBSA. Hospitals that were not in a CBSA code were assigned to a CBSA based on the Hospital

Referral Region (HRR) in which the hospital was located. They were assigned to the largest CBSA (based on population) that overlapped the HRR.

***Source*:** The BPCI Advanced evaluation team's analysis of the 2016 Agency for Healthcare Research and Quality (AHRQ) Hospital Linkage File, Area Health Resource File (AHRF) from 2013 to 2017, CMS Provider of Service (POS) files from 2013 to 2017, CMS Inpatient Prospective Payment System (IPPS) files from 2013 to 2017, 2020 Master Data Management (MDM) provider file, 2017 Medicare FFS Claims, the CMS BPCI and BPCI Advanced databases as of January 1, 2020.

Exhibit C.7: PGP Characteristic Variable Definitions

Variable	Definition	Technical Definition	Source
Number of unique clinicians associated with the PGP EI	Total number of National Provider Identifiers (NPIs) that had at least one Part B claim where the billing provider TIN was a BPCI Advanced PGP TIN.		2017 Medicare Part B claims
Annual discharges for BPCI Advanced MS-DRGs	The total annual volume of Medicare FFS discharges for the PGP that occurred in one of the 31 inpatient clinical episodes.	Discharges where the attending or operating NPI on the anchor stay matches the attending or operating NPI on the Part B claim with a BPCI Advanced PGP TIN.	2017 Medicare Part A & B claims
Annual procedures for BPCI Advanced HCPCS codes	The total annual volume of Medicare FFS procedures for the PGP that occurred in one of the 4 outpatient clinical episodes.	Procedures done at a hospital outpatient department (HOPD) where the operating NPI had a corresponding Part B claim with the BPCI Advanced PGP TIN.	2017 Medicare Part B claims
Number of hospitals where PGP EIs had discharges/procedures	Total number of unique hospitals where the PGP had discharges related to the 31 BPCI Advanced clinical episode MS-DRGs or procedures related to the 4 BPCI Advanced clinical episode HCPCS codes.	Unique hospitals where PGP EIs admitted patients for: • discharges where the attending or operating NPI on the anchor stay matches the attending or operating NPI on the Part B claim with a BPCI Advanced PGP TIN, or • procedures done at a hospital outpatient department (HOPD) where the operating NPI had a corresponding Part B claim with the BPCI Advanced PGP TIN.	2017 Medicare Part A & B claims

Source: The BPCI Advanced evaluation team's analysis of 2017 Medicare FFS Claims and the CMS BPCI and BPCI Advanced databases, as of January 1, 2020.

Exhibit C.8: Definition of Physician and Non-physician Specialty Categories Used to Define Average Composition of Clinicians within a PGP

Clinician Type	Specialty Category	Included Specialties
Physician	Psychiatry	Psychiatry, Geriatric Psychiatry, Neuropsychiatry
	Hospital-based	Hospitalist, Emergency Medicine, Physical Medicine And Rehabilitation, Critical Care (Intensivists), Diagnostic Radiology, Anesthesiology, Pathology, Pain Management, Interventional Pain Management, Radiation Oncology, Interventional Radiology, Nuclear Medicine
	Ob-Gyn	Obstetrics & Gynecology, Gynecological Oncology

Clinician Type	Specialty Category	Included Specialties
Physician Continued	Surgical	Orthopedic Surgery, General Surgery, Hand Surgery, Sports Medicine, Neurosurgery, Otolaryngology, Urology, Vascular Surgery, Ophthalmology, Plastic And Reconstructive Surgery, Thoracic Surgery, Cardiac Surgery, Colorectal Surgery, Surgical Oncology, Peripheral Vascular Disease
	Medical	Cardiovascular Disease, Pulmonary Disease, Nephrology, Gastroenterology, Infectious Disease, Neurology, Hematology-Oncology, Rheumatology, Endocrinology, Dermatology, Allergy/Immunology, Medical Oncology, Sleep Medicine, Addiction Medicine, Hematology, Interventional Cardiology
	Primary care	Internal Medicine, Family Practice, Pediatric Medicine, Geriatric Medicine, General Practice, Hospice And Palliative Care, Osteopathic Manipulative Medicine, Preventive Medicine
	Other physician	Clinic or Group Practice, Undefined Physician Type
Non-physician	Non-physician	Oral Surgery (Dentists Only), Chiropractic, Optometry, Podiatry, Maxillofacial Surgery, Speech Language Pathologist, Anesthesiology Assistant, Certified Nurse Midwife, Certified Registered Nurse Anesthetist, Nurse Practitioner, Psychologist Billing Independently, Audiologist, Physical Therapist, Occupational Therapist, Clinical Psychologist, Registered Dietitian or Nutrition Prof, Mass Immunization Roster Biller, Clinical Social Worker, Undefined Non-Physician Type, Clinical Nurse Specialist, Physician Assistant

Note: The specialty categories in this exhibit are the broad categories that related to physician and non-physician specialty codes. In the case that a physician could be in more than one listed broad specialty category, the precedence logic in the MD-PPAS was employed. The categories are listed in approximate descending precedence order; for example, psychiatry takes precedence over emergency medicine and internal medicine.

Source: Medicare Data on Provider Practice and Specialty (MD-PPAS) User Documentation Version 2.3

b. Study Samples

There were 3,248 hospitals eligible to initiate episodes in BPCI Advanced in Model Year 3. Eligible hospitals were Inpatient Prospective Payment System (IPPS) hospitals in 2019 that existed during the baseline period for at least one year. The sample excluded hospitals that met any of the following criteria: PPS-exempt cancer hospital, inpatient psychiatric hospital, critical access hospital, located in Maryland, participating in the Pennsylvania Rural Health Model or participating in the Rural Community Health Demonstration. We used BPCI Advanced databases to identify BPCI Advanced hospital EIs and PGP EIs, which were defined by a unique Tax Identification Number (TIN).

We defined eligible clinicians as attending and operating National Provider Identifier (NPIs) who treated Medicare beneficiaries who met the BPCI Advanced beneficiary inclusion criteria at a BPCI Advanced eligible hospital. Minimum hospital volume in the baseline period was not applied. We defined clinicians who participated in BPCI Advanced as 1) any attending or operating NPI at a BPCI Advanced hospital EI for a clinical episode in which the hospital was participating; or 2) any attending or operating NPI on the hospital claim when the beneficiary had a corresponding Part B claim during the anchor stay or anchor procedure (including one day prior) where the BPCI Advanced PGP TIN was the billing provider and the PGP was participating in the given clinical episode.

c. Analytic Methods

We used descriptive analyses to compare groups of participants and providers of interest. We analyzed the CMS BPCI Advanced database to explore the types of participants and number of EIs participating under a convener or as a non-convener participant. To understand the BPCI Advanced participants, as well as hospitals and PGPs participating in the model, the markets in which they are located, and overlap with other initiatives and models, the evaluation team conducted descriptive analyses using data from the CMS BPCI Advanced and BPCI databases, Provider of Service (POS) files, CMS IPPS annual files, Medicare claims, and the Area Health Resource File (AHRF). We used claims data to analyze the composition of clinician specialties in a PGP,[2] number of clinicians in a PGP, and the number of procedures and discharges attributed to hospitals and PGPs.[3]

To determine whether observed differences between groups were statistically significant, we used standard statistical tests, including t-tests for differences in means and chi-square tests for differences in proportions. These findings were triangulated with results of the qualitative analysis, as well as prior BPCI results, to develop our knowledge of the factors that most affect participation in BPCI Advanced.

2. Impact of BPCI Advanced on Claim-based Outcomes

The evaluation of the model relies on a non-experimental design, which uses a comparison group of non-BPCI Advanced hospitals to infer counterfactual outcomes for hospital participating in BPCI Advanced. In this section, we describe the BPCI Advanced population and the methodology for creating comparison groups for each clinical episode analyzed in this report. We also define the outcomes and the methodology used to estimate the impact of BPCI Advanced on payments, utilization and quality.

a. Outcomes

We used data from claims to create payments, utilization of health care services, and quality outcomes, as well as characteristics of the patient mix. The following exhibits define these outcomes and characteristics. Exhibit C.9 provides definitions of each outcome variable used in the episode descriptive analysis. Exhibit C.10 provides detailed information about each outcome measure used in our impact analyses, including the name, description, technical definition, and eligible sample, organized by outcome domain.

[2] We defined the composition of clinicians within a PGP by calculating the proportion of a PGP EI's clinicians that fell under one of eight broad specialty categories. In the case where a clinician had more than one specialty category assigned, the MD-PPAS precedence logic was used (see Exhibit C.8 for more information). Only PGP EIs that had clinicians that billed at least one Medicare Part B claim to the PGP's TIN were analyzed.

[3] Discharges and procedures attributed to BPCI Advanced hospital EIs occurred at a BPCI Advanced hospital participating in the clinical episode. Discharges or procedures attributed to BPCI Advanced PGP EIs required that the beneficiary had a corresponding Part B claim during the anchor stay or anchor procedure (including one day prior) where the BPCI Advanced PGP TIN was the billing provider and the PGP was participating in the given clinical episode. The PGP discharges and procedures include those at BPCI Advanced hospitals.

Exhibit C.9 Episode Characteristic Outcome Definitions, Descriptive Analyses

Variable	Definition
Age 80+ Years	Percent of episodes where the patient was 80 years or older
Count of Hierarchical Condition Category (HCC) Indicators	Average number of HCC comorbidity indicators per episode
Disabled, No ESRD	Percent of episodes where the patient was disabled but did not have ESRD
HCC Index	The HCC index was constructed using beneficiary demographics and diagnostic history. Each episode was assigned a HCC index based on the beneficiary's diagnosis information during the 6 months prior to the episode start date, using v22 of CMS's 2019 Risk Score software, and 2016 (ICD-9) and 2019 (ICD-10) diagnosis to chronic condition mappings. For example, the HCC index for an episode that started on July 1, 2017 was constructed using diagnoses from January 1, 2017–June 30, 2017 claims.
Medicaid Eligibility	Percent of episodes where the patient was dual eligible
Prior Home Health Use	Percent of episodes where the patient accessed home health services in the 180 days prior to the beginning of the episode
Prior Institutional Post-Acute Care (PAC) Use	Percent of episodes where the patient accessed institutional PAC services in the 180 days prior to the beginning of the episode

Exhibit C.10 Claims-based Outcome Definitions, Impact Analyses

Domain	Outcome Name	Description	Technical Definition	Eligible Sample[a]
Payment	Total Medicare Part A & B Standardized Allowed Payment Amount	Average total Medicare Part A & B standardized allowed amount, during the anchor stay/outpatient procedure + 90-day PDP	The sum of Medicare payment and beneficiary out-of-pocket amounts for all health care services. Payments in the lower/upper ends are winsorized.[b]	Beneficiaries who: 1) maintained FFS Parts A & B enrollment throughout the measurement period; 2) had a measurement period that ended on or before October 31, 2019; 3) had non-zero anchor hospitalization payments and total Part A and Part B payments
	Total Medicare Part A & B Standardized Paid Amount	Average total Part A & B amount paid by Medicare, during the anchor stay/outpatient procedure + 90-day PDP	The sum of Medicare payments for all health care services, without beneficiary cost sharing. Payments in the lower/upper ends are winsorized.[b]	Beneficiaries who: 1) maintained FFS Parts A & B enrollment throughout the measurement period; 2) had a measurement period that ended on or before October 31, 2019; 3) had non-zero anchor hospitalization payments and total Part A and Part B payments
	Medicare Part A SNF Standardized Allowed Amount	Average Medicare Part A standardize allowed amount, for SNF setting, totaled within the 90-day PDP	The sum of Medicare payment and beneficiary out-of-pocket amounts for Part A health care services provided for SNF during the 90-day PDP. Payments in the upper end are winsorized.[c]	Beneficiaries who: 1) maintained FFS Parts A and B enrollment throughout the measurement period; 2) had a measurement period that ended on or before October 31, 2019; 3) had non-zero anchor hospitalization payments and total Part A and Part B payments
	Medicare Part A IRF Standardized Allowed Amount	Average Medicare Part A standardize allowed amount, for IRF setting, totaled within the 90-day PDP	The sum of Medicare payment and beneficiary out-of-pocket amounts for Part A health care services provided for IRF during the 90-day PDP. Payments in the upper end are winsorized.[c]	Beneficiaries who: 1) maintained FFS Parts A & B enrollment throughout the measurement period; 2) had a measurement period that ended on or before October 31, 2019; 3) had non-zero anchor hospitalization payments and total Part A and Part B payments
	Medicare Part A HHA Standardized Allowed Amount	Average Medicare Part A standardize allowed amount, for HHA setting, totaled within the 90-day PDP	The sum of Medicare payment and beneficiary out-of-pocket amounts for Part A health care services provided for HHA during the 90-day PDP. Payments in the upper end are winsorized.[c]	Beneficiaries who: 1) maintained FFS Parts A & B enrollment throughout the measurement period; 2) had a measurement period that ended on or before October 31, 2019; 3) had non-zero anchor hospitalization payments and total Part A and Part B payments

Domain	Outcome Name	Description	Technical Definition	Eligible Sample[a]
Utilization	Discharged to Institutional Post-acute Care Setting	The proportion of episodes discharged from the hospital to an institutional PAC setting	The proportion of episodes where the first PAC setting was SNF, LTCH, or IRF.	Beneficiaries who: 1) maintained FFS Parts A & B enrollment throughout the measurement period; 2) had a measurement period that ends on or before October 31, 2019; 3) had a first PAC setting of SNF, LTCH, or IRF; 4) were admitted to SNF, LTCH, or IRF within 5 days of discharge from the hospital.
	Number of Days in a SNF	Number of SNF days of care during the 90-day PDP	The number of days of SNF care (not necessarily consecutive) during the 90-day PDP.	Beneficiaries who: 1) maintained FFS Parts A and B enrollment throughout the measurement period; 2) had a measurement period that ends on or before October 31, 2019; 3) were alive at the time of anchor hospital stay/outpatient procedure; 4) had at least one SNF day during the 90-day PDP.
Quality	Unplanned Readmission Rate	Episodes with one or more unplanned, all-cause readmissions for any condition 90 days after the anchor stay or outpatient procedure	Binary outcome (1= at least one readmission during measurement period; 0= no eligible readmission during measure period). Eligible readmissions are inpatient prospective payment system claims with an MS-DRG not on the list of excluded MS-DRGs for the given clinical episode.[d]	Beneficiaries who: 1) maintained FFS Parts A and B enrollment throughout the measurement period; 2) had a measurement period that ends on or before October 31, 2019; 3) were discharged from the anchor stay/outpatient procedure in accordance with medical advice
	All-cause Mortality	Death from any cause during the 90 days after discharge from the anchor hospital stay or outpatient procedure	If date of death occurred during the measurement period, then mortality outcome equals one.	Beneficiaries who: 1) maintained FFS Parts A & B enrollment throughout the measurement period or until death; 2) had not received hospice care in the six months prior to admission; 3) had a measurement period that ends on or before October 31, 2019; 4) were discharged from the anchor stay or outpatient procedure in accordance with medical advice; 5) were alive at the time of anchor hospital stay/outpatient procedure.

Notes: Payment amounts adjust for Medicare payment policies to ensure that any differences across time and providers reflect real differences in resource use rather than Medicare payment policies (e.g., teaching payments or differential payment updates).

PDP=post-discharge period; FFS=fee for service; HHA=home health agency; IRF=inpatient rehabilitation facility; LTCH=long term care hospital; PAC=post-acute care setting; SNF=skilled nursing facility.

[a] For all outcomes, the eligible sample was restricted to beneficiaries who: 1) had a complete FFS enrollment history six months prior to the anchor stay or procedure; and 2) had non-missing age and gender data.

[b] Total payments are winsorized by quarter and MS-DRG/HCPCS code at the 1st and 99th percentiles for total Part A and B episode payments.

[c] Post-acute care payments are winsorized by quarter and clinical episode at the 99th percentile.

[d] The outcome is based on specifications for the National Quality Forum (NQF) all-cause unplanned readmission measure (NQF measure 1789). Planned admissions are excluded based on the Agency for Healthcare Research and Quality (AHRQ) Clinical Classification System Procedure and Diagnoses codes.

b. Study Populations

BPCI Advanced Study Population

The BPCI Advanced treatment group was defined as hospital EIs participating in at least one clinical episode in Model Years 1 and 2. The impact analyses were limited to the following 13 clinical episodes with sufficient sample size:

- Acute myocardial infarction
- Cardiac arrhythmia
- Chronic obstructive pulmonary disease (COPD), bronchitis, asthma
- Congestive heart failure
- Gastrointestinal hemorrhage
- Hip and femur procedures except major joint
- Major joint replacement of the lower extremity
- Percutaneous coronary intervention (outpatient)
- Renal failure
- Sepsis
- Simple pneumonia and respiratory infections
- Stroke
- Urinary tract infection

Episodes of Care

We constructed 90-day episodes of care for all eligible discharges across the 13 clinical episodes included in the BPCI Advanced study population for this report. Episodes of care include payments for certain Part B services provided the day before an eligible anchor stay or procedure, and all services provided during the anchor stay or procedure and the 90-day post-discharge period.

Episodes of care overlap when a discharge or procedure occurs within an existing episode of care. BPCI Advanced reconciliation rules resolve overlapping episodes to identify which episode of care becomes a 'BPCI Advanced reconciliation episode.' When episodes of care from BPCI Advanced participating providers overlap, the first episode becomes the reconciliation episode. When episodes from a BPCI Advanced participant and non-participant overlap, the episode of care from the BPCI Advanced participant becomes the reconciliation episode, regardless of which one occurred first.[4] Applying these rules prioritizes the creation of BPCI Advanced reconciliation episodes, which creates asymmetry between the BPCI Advanced and comparison group episodes. Specifically, asymmetric construction of episodes leads to systematic differences in episode characteristics, including payments, between the BPCI Advanced and non-participating providers.

[4] There are two exceptions to these rules. First, in the case of multiple overlapping MJRLE episodes regardless of provider, the subsequent episode is included in reconciliation. Second, in cases where two episodes begin on the same day, which is only possible when one is inpatient and one is outpatient, the reconciliation rules are applied treating the inpatient episode as the initial clinical episode.

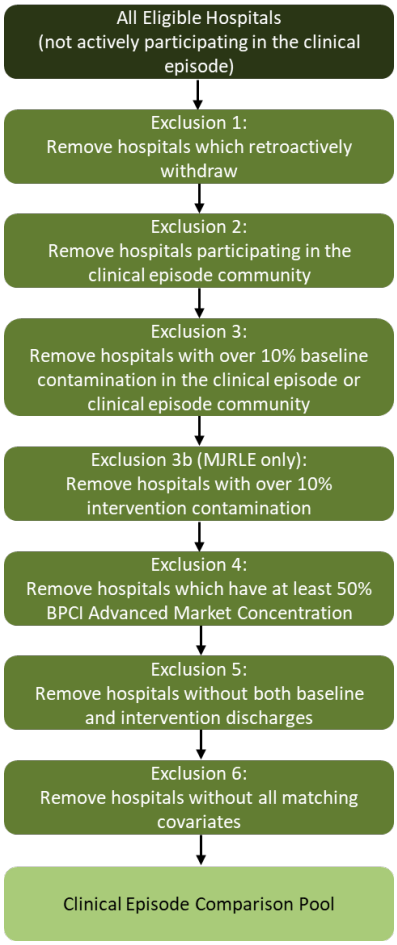
Our evaluation applies rules to resolve overlapping episodes with the goals of accurately capturing the reach of the BPCI Advanced model and developing a robust study design. We apply symmetric rules for episodes initiated by BPCI Advanced and comparison providers. We identify all eligible BPCI Advanced episodes of care in our analysis because participants may apply the same care to all eligible anchor stay or procedures before confirming it has become a reconciliation episode. The inclusion of all eligible episodes captures spillover effects within the same participating hospital and clinical episode. We avoid counting outcomes from overlapping time periods more than once in the calculation of average outcomes by only including the first episode in our analytic sample for a given clinical episode when a beneficiary has two overlapping eligible discharges or procedures for the same clinical episode (e.g., acute myocardial infarction). If a beneficiary has two overlapping discharges or procedures from different clinical episodes (e.g., sepsis and congestive heart failure) we retain both episodes in their respective analytic samples. The inclusion of the first discharge or procedure of a pair of overlapping episodes in the analytic sample, regardless of provider, prioritizes symmetry and eliminates overlap between BPCI Advanced and non-BPCI Advanced comparison samples.

Comparison Group

The difference-in-differences approach compares the change in outcomes for those treated by BPCI Advanced participants to those for a comparison population. This estimation strategy relies on the comparison group serving as a counterfactual of the change in outcomes absent the model. Therefore, a valid comparison sample is necessary to estimate the impact of BPCI Advanced on payments, utilization, and quality. We create a comparison group for each clinical episode.

Comparison hospitals were selected for each clinical episode in three steps (Exhibit C.11). First, we identified a sample of eligible hospitals from the universe of hospitals after applying exclusion criteria and constructing episodes for these hospitals. Second, we identified hospital and market characteristics that were used to assess balance of the matched comparison group. Third, each BPCI Advanced hospital was matched to an eligible comparison hospital using statistical matching techniques to minimize the differences in the distributions of characteristics between BPCI Advanced and comparison hospitals. A detailed description of these steps is provided below.

Exhibit C.11: Steps for Identifying Eligible Comparison Hospitals



Step 1: Create pool of potential comparison hospitals for each clinical episode

We identified a sample of eligible comparison hospitals by applying exclusion criteria[5] to the universe of hospitals:

- Excluded BPCI Advanced hospitals participating in the clinical episode and hospitals that were not eligible for BPCI Advanced (e.g., hospitals with low volume, CJR hospitals for major joint replacement of the lower extremity (MJRLE) clinical episode).
- Excluded BPCI Advanced and CJR hospitals participating in the same clinical episode community to limit within-hospital spillover effects.[6]
- Excluded non-participating hospitals if their contaminated share of episodes, within the clinical episode or clinical episode community, exceeds a 10% threshold during the baseline period, to limit within-hospital spillover effects. An episode is contaminated if:
  - The discharge itself was associated with a BPCI Advanced PGP, or
  - The beneficiary was admitted to a BPCI Advanced hospital or was associated with a BPCI Advanced PGP 90 days before or after admission.
- Excluded non-participating hospitals from the MJRLE comparison pool that exceeded a 10% threshold for the share of PGP attributed episodes in the intervention, to limit contamination from BPCI Advanced PGP EIs that created a Tax Identification Number (TIN) after the baseline period.
- Excluded non-participating hospitals that were located in markets with greater than 50% market share by BPCI Advanced hospitals for a given clinical episode, to limit market spillover effects.
- Excluded non-participating hospitals without discharges for the clinical episode in both the baseline and intervention periods, for sample balance and estimation.
- Excluded hospitals with missing information on matching characteristics.

For all exclusion steps and matching, we used a national dataset of episodes constructed from March 2013 through December 2017. The number of hospitals excluded in each step (sequentially) for each clinical episode is presented in Exhibit C.12.

[5] Exclusion criteria applied based on participation in clinical episodes in Model Years 1, 2, or 3.

[6] Clinical episode communities are clusters of clinical episodes that involve similar medical services or are performed by the same medical specialty. A table of clinical episode communities is provided in Section C.3.

Exhibit C.12: Number of Hospitals Excluded by Reason and Clinical Episode

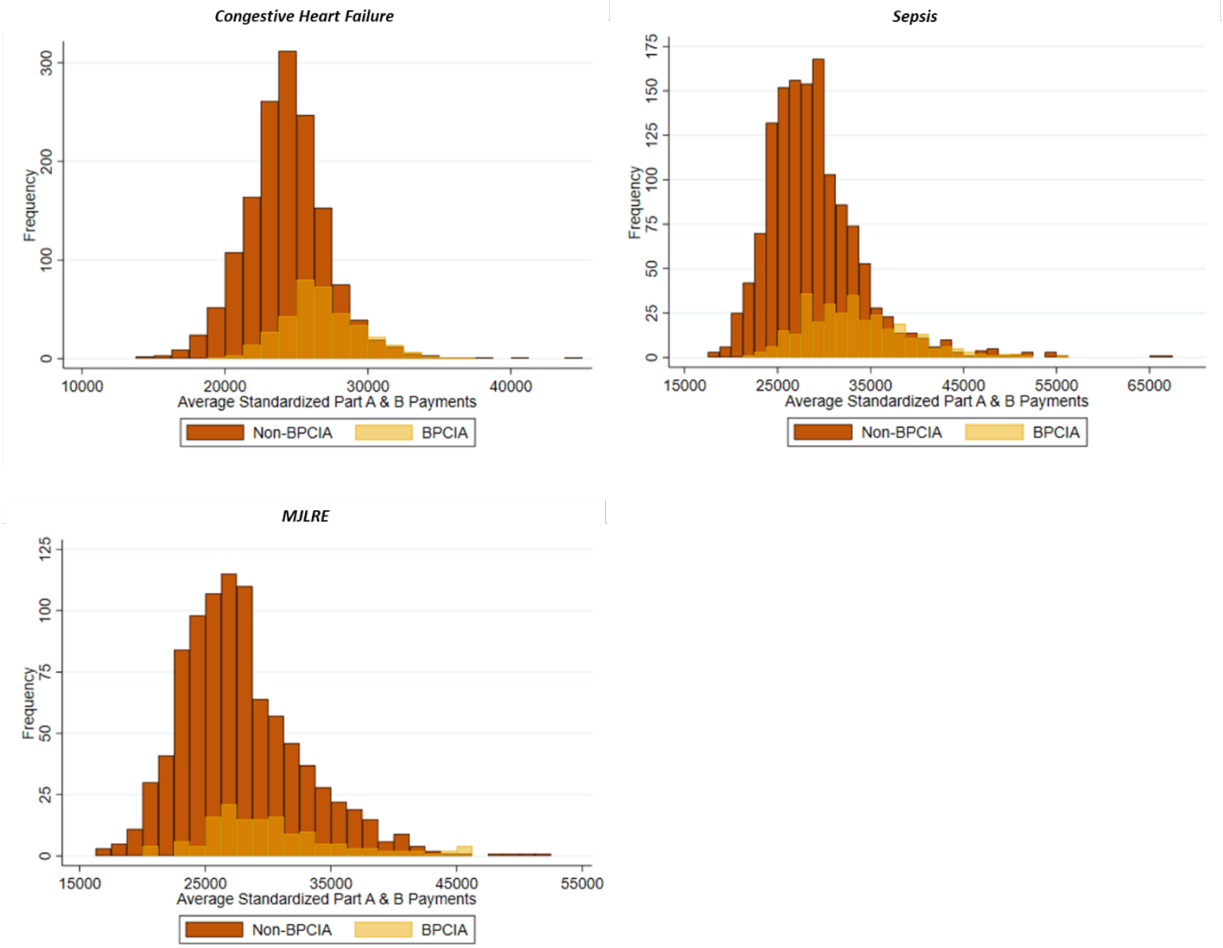
Clinical Episode	Eligible Hospitals Comparison Pool	Number of Hospitals Excluded							Remaining Comparison Pool
		Exclusion 1. Retroactive Withdrawal	Exclusion 2. Clinical Community	Exclusion 3. Baseline Contamination	Exclusion 3b. MJRLE Intervention Contamination	Exclusion 4. Market Concentration	Exclusion 5. Baseline & Intervention	Exclusion 6. Missing Covariates	
AMI	1,882	79	429	280		47	34	7	1,006
Cardiac Arrhythmia	2,308	103	407	316		100	64	9	1,309
COPD, Bronchitis, Asthma	2,699	111	602	256		90	129	18	1,493
CHF	2,561	138	325	409		72	120	13	1,484
GI Hemorrhage	2,391	81	693	225		39	67	6	1,280
Hip & Femur Procedures	2,110	109	663	490		32	27	4	785
MJRLE	2,037	98	320	522	79	91	73	8	846
PCI (Outpatient)	1,359	77	422	155		13	32	3	657
Renal failure	2,402	108	631	256		57	75	8	1,267
Sepsis	2,554	164	496	249		177	110	12	1,346
SPRI	2,744	127	573	255		80	150	18	1,541
Stroke	2,161	125	541	211		75	50	6	1,153
UTI	2,567	128	591	241		56	103	12	1,436

Note: AMI = acute myocardial infarction; COPD = chronic obstructive pulmonary disease; CHF = congestive heart failure; GI = gastrointestinal; Hip & Femur Procedures = hip and femur procedures except major joint; MJRLE = major joint replacement of the lower extremity; PCI = percutaneous coronary intervention; SPRI = simple pneumonia and respiratory infections; UTI = urinary tract infection.

Source: The BPCI Advanced evaluation team's analysis of Medicare claims and enrollment data for episodes with anchor stays/procedures that began April 1, 2013 and ended on or before December 31, 2017 (baseline period) and episodes with anchor stays/procedures that began October 1, 2018 and ended on or before August 3, 2019 (intervention period) for BPCI Advanced EIs and matched comparison providers.

Exhibit C.13 visually depicts the rationale for selecting a subset of providers from eligible non-participants to serve as the counterfactual for BPCI Advanced participants. Separately for BPCI Advanced and non-participating hospitals, it displays the frequency histograms of average standardized allowed payments in the baseline period (Q2 2013 through 2017) for the clinical episodes with the highest participation, CHF and sepsis, and the MJRLE clinical episode, which is the surgical clinical episode with the highest participation. For these clinical episodes, the distribution of average payments for BPCI Advanced participant hospitals is contained within the distribution for non-participating hospitals. However, the average payments for BPCI Advanced participants are not random within the larger non-participant distribution, but are instead more heavily weighted toward higher payments. This likely reflects the non-random selection of hospitals that chose to participate in the voluntary BPCI Advanced model. Our analysis indicates that BPCI Advanced hospitals and non-participating hospitals were drawn from hospitals with the same distribution of outcomes and that differences in outcome levels in the baseline are due to the self-selection of participants into the BPCI Advanced model. As a result, participants tend to have higher average payments in the baseline and, therefore, higher target prices, which generally makes it easier for them to earn reconciliation payments.

Exhibit C.13: Distribution of Average Payments per Episode among BPCI Advanced Hospitals and Eligible non-Participating Hospitals for CHF, Sepsis and MJRLE Clinical Episodes. 2013-2017



Note: The standardized allowed Part A and B payments are for the inpatient stay and 90 days post discharge. Average payments for each hospital were calculated for Q2 2013 – 2017 using the sample of beneficiary discharges meeting BPCI Advanced episode criteria.

Source: The BPCI Advanced evaluation team's analysis of Medicare claims and enrollment data for episodes with anchor stays/ procedures that began April 1, 2013 and ended on or before December 31, 2017 (baseline period)

Step 2: Select characteristics for balancing

We conducted descriptive analyses to identify characteristics to be considered for balancing the BPCI Advanced and the matched comparison group. The characteristics we considered are:

- Levels and trends for key outcomes—total payments, post-acute care (PAC) utilization, emergency department (ED) visits, readmissions, and mortality—for each BPCI Advanced clinical episode during the baseline (April 2013-December 2017).[7]
- The hospital efficiency measure from the BPCI Advanced target pricing methodology, which accounts for the clinical episode-specific spending of a hospital relative to the average hospital, adjusted for patient and peer group influences on spending.
- Characteristics defined for the peer group in the BPCI Advanced pricing methodology: urban or rural location, safety net status, census division, and bed count.
- Provider-level characteristics selected from public data sources or created from claims, for example: ownership type (for profit, not for profit, government), share of patients enrolled in Medicare, relative share of dual eligible patients, and episode volume.
- Market characteristics from the Area Health Resources Files or the American Community Survey; examples include county-level demographics (e.g., population), socioeconomic indicators (e.g., household income), and market variables of competition (e.g., Herfindahl index or PCPs per capita).

From this list of characteristics, we chose a subset of covariates for the matching procedure for each comparison group. The measures included in the matching models for all clinical episodes are listed in Exhibit C.14. We selected the subset of covariates for all clinical episodes that resulted in the minimum difference in baseline mean total payments while also satisfying a minimum threshold of match quality, measured as the standardized mean differences of key matching covariates.

[7] Select outcome measures were included as characteristics for matching because BPCI Advanced applicants received baseline data that was used to inform their decision to participate in the model.

Exhibit C.14: Variables used for all Matching Models

Measure	
Hospital	Ownership - Non-Profit, For-Profit, Government
	Urban/Rural Location
	Part of Health System
	Bed Count
	Resident-Bed Ratio
	Medicare Days Percent
	Disproportionate Share Percent
	Average Case Weight of Discharges (MS-DRGs)
	Hospital Market Share
	Herfindahl Index
	Episode Volume
	Efficiency Measure
Market	Population
	Median Household Income
	Medicare Advantage Penetration (%)
	PCPs per 10,000 in Market
	SNF Beds per 10,000 in Market
	IRF in Market
Baseline Outcomes	Standardized Part A&B Payment - Average
	Standardized Part A&B Payment – Trend
	Readmission Rate 30-Day – Average
	Readmission Rate 30-Day – Trend
	Mortality Rate 30-Day - Average
	Mortality Rate 30-Day - Trend
	ED Rate 30-Day - Average
	ED Rate 30-Day - Trend

Note: PCP = primary care physician; SNF = skilled nursing facility; IRF = inpatient rehabilitation facility ED = emergency department

Given the variation in use of PAC across clinical episodes, we allowed the matching models to vary in the measure of PAC by clinical episode. While most measures were appropriate for predicting participation in all clinical episodes, we found sensitivities based on measures of PAC. We considered the average and trend of two different groupings for first PAC setting: all institutional PAC use, and no PAC use.[8] For each clinical episode, we compared the variation and selected the measure with lower variation on average to include in the matching model (results in Exhibit C.15). Additionally, because outpatient percutaneous coronary intervention has such low use of PAC, we did not include any PAC measures in the matching model.

[8] A measure of no PAC use is equivalent to bundling institutional PAC with home health.

Exhibit C.15: Post-acute Care Variables used for Matching Models

PAC Measures included	Clinical Episodes
Rate of no PAC after Anchor Stay - Average & Trend	• Hip & femur procedures except major joint • Sepsis • Stroke
Rate of Institutional PAC after Anchor Stay – Average & Trend	• Acute myocardial infarction • Cardiac arrhythmia • COPD, bronchitis, asthma • Congestive heart failure • Gastrointestinal hemorrhage • Major joint replacement of the lower extremity • Renal failure • Simple pneumonia and respiratory infections • Urinary tract infection
No PAC Measures Included	• Percutaneous coronary intervention (outpatient)

By matching on key market and provider characteristics in the baseline, including outcome levels and outcome trends, we selected a subset of the eligible non-participating hospitals that is more similar to this non-random sample of BPCI Advanced hospitals. That is, we chose a sample of comparison hospitals that has a distribution of payments that is also more heavily weighted toward higher payments. Researchers have noted that matching on outcome levels in the pre-intervention period may mitigate or exacerbate bias ("regression to the means") depending on whether treatment and comparison providers are drawn from a pool of providers that have the same distribution of the outcome or different distributions of the outcome.[9,10,11] If treatment and comparison providers are drawn from providers with the same distribution of the outcome (i.e., cost) and differences in outcome levels in the pre-intervention period are due to the treatment assignment mechanism (i.e., more costly hospitals are more likely to participate because it will be generally easier to earn reconciliation payments), then matching on outcome levels in the pre-intervention period would mitigate this particular bias.[12,13] If, however, treatment and comparison providers are drawn from providers with different distributions of the outcome (i.e., the distribution for treatment providers has a higher mean than the distribution for comparison providers), the matching process would weight the analysis sample toward the left tail (least costly) of the treatment distribution and to the right tail (most costly) of the comparison distribution. Both groups would then likely revert to the long term distributions of the outcome means in the intervention period, creating a biased DiD estimate. This did not happen, however, because there are no clinical episodes where our treatment sample is limited to the left tail of a distribution within the universe

[9] Daw, J. R., & Hatfield, L. A. (2018). Matching and Regression to the Mean in Difference-in-Differences Analysis. *Health services research*, *53*(6), 4138–4156. https://doi.org/10.1111/1475-6773.12993

[10] Daw, J. R., & Hatfield, L. A. (2018). Matching in Difference-in-Differences: between a Rock and a Hard Place. *Health services research*, *53*(6), 4111–4117. https://doi.org/10.1111/1475-6773.13017

[11] Ryan A. M. (2018). Well-Balanced or too Matchy-Matchy? The Controversy over Matching in Difference-in-Differences. *Health services research*, *53*(6), 4111–4117. https://doi.org/10.1111/1475-6773.13015

[12] Daw, J. R., & Hatfield, L. A. (2018). Matching in Difference-in-Differences: between a Rock and a Hard Place. *Health services research*, *53*(6), 4111–4117.

[13] Ryan, A. M. (2018). Well-Balanced or too Matchy-Matchy? The Controversy over Matching in Difference-in-Differences. *Health services research*, *53*(6), 4111–4117.

of eligible non-participating hospitals in the United States.[14] In other words, among the universe of eligible non-participating hospitals, the right tail of the outcome distribution is not excluded from the analysis.

Note that BPCI was a national initiative with a large number of participants that spanned a wide range of geographies and provider types. Matches were found for nearly all BPCI Advanced participants within the specified calipers. Through matching, the BPCI Advanced participants and the matched comparison providers would be expected to similarly experience reversion to the mean, making the matched comparison providers the appropriate counterfactual for BPCI Advanced participants. This is particularly important given the emerging literature on the inadequacies of the conventional tests for parallel trends in the pre-intervention period.[15]

Step 3: Apply matching method

For each clinical episode, we implemented a one-to-one nearest neighbor matching procedure, without replacement, of potential comparison hospitals using a propensity score. A propensity score is defined as the predictive probability of receiving the "treatment" (BPCI Advanced participation), conditional on a set of characteristics. This probability was estimated using a logistic regression model that included the list of characteristics selected in Step 2.

For each clinical episode, each BPCI Advanced hospital was matched with one comparison hospital with a log-odds propensity score absolute difference below a selected caliper. Calipers were based on the standard deviation of the estimated log-odds propensity score, and assessed among various thresholds to determine the trade-offs between the improved quality of our matches and the number of BPCI Advanced hospitals removed from the sample. BPCI Advanced hospital EIs with no potential matches inside the caliper were excluded from the sample.

Each comparison group constructed was assessed by the differences between BPCI Advanced and comparison group hospitals for the following metrics: baseline total payments, estimated propensity scores, standardized mean differences (SMD) in matching covariates, and SMD in other covariates if applicable. We sought to minimize the number of matching covariates with a SMD exceeding 0.20 in absolute value and ensure the SMD values for total payments did not exceed that threshold (see Appendix F). Additionally, we performed a Kolmogorov-Smirnov test of the propensity score distributions to determine whether they were statistically different at the 10% level.

c. Analytic Methods

Descriptive Analyses Approach

We analyzed demographic and prior use outcomes to assess patient mix of BPCI Advanced and matched comparison group episodes in the baseline to the intervention period for the 13 clinical episodes evaluated (Exhibit C.16). We estimated an unadjusted difference-in-differences (DiD) regression for the observed differences in patient mix between BPCI Advanced and matched

[14] Note that the sum of distributions displayed in Exhibit C-13 forms the universe of BPCI Advanced-eligible hospitals in the United States.

[15] Bilinski, A & Hatfield, L. A. (2020). Nothing to see here? Non-inferiority approaches to parallel trends and other model assumptions, arXiv:1805.03273 [stat.ME].

comparison group episodes. While the impact analysis on payment, utilization, and quality controlled for changes in these patient characteristics, we also monitored changes in these characteristics separately to directly examine changes in patient mix.

Exhibit C.16: Measures of Patient Mix

Domain	Variables
Patient Mix	• Age: 80+ years • Dual Eligible • Disability (non-ESRD) • Count of HCC Indicators • HCC Index • Binary indicator for care in institutional PAC in the **six months** preceding the start of the episode • Binary indicator for use of home health in the **six months** preceding the start of the episode

Difference-in-Differences Approach

DiD is a statistical technique that quantifies the impact of an intervention by comparing changes in a treatment group (BPCI Advanced) to changes in a comparison group, between baseline and intervention periods. This approach eliminates biases from time invariant differences between the BPCI Advanced and comparison episodes and controls for trends that are common between the treatment and comparison populations.[16]

- The DiD baseline period was from April 2013 through December 2017.
- The BPCI Advanced intervention period began in October 2018, and included anchor stays/procedures through August 3, 2019.
- Since the request for applications for the BPCI Advanced model was released on January 9, 2018, we exclude the transition period of January through September 2018 from our analysis, to limit the influence of anticipatory changes before the official model start.

We applied the DiD technique at the episode level to estimate the impact of BPCI Advanced participating hospitals on the key claims-based outcomes while controlling for differences between the BPCI Advanced and comparison episodes on beneficiary, market, and hospital characteristics. Using episodes as observations, instead of aggregating to the participant level, allows us to directly control for the behavior of BPCI Advanced participants changing their patient mix in response to the model.

The DiD analyses in this report focus on the impacts of BPCI Advanced participating hospitals. The treatment samples therefore include episodes attributed to BPCI Advanced hospitals as well as episodes attributed to participating PGPs at those BPCI Advanced hospitals. We assume the

[16] While the DiD model controls for unobserved heterogeneity that is fixed over time, there is no guarantee that this unobserved heterogeneity is, in fact, fixed. It could be the case, for example, that providers with improving outcomes are relatively more likely to sign up for the model, introducing correlation between BPCI Advanced participation and outcomes, which could bias the results.

participants do not definitively know a priori which episodes will be included in their reconciliation calculation, so they are likely to treat all episodes similarly.

To illustrate our estimation strategy, consider the stylized equation,

$$(1) \qquad Y_{ikt} = \beta_0 + \beta_1 BPCIA_k + \beta_2 Post_t + \theta(BPCIA_k \cdot Post_t) + \boldsymbol{X_{ikt}'\beta} + e_{ikt},$$

where Y_{ikt} is the outcome of interest for episode i from provider k during period t. The variable, $BPCIA_k$ is an indicator that takes on the value 1 if provider k participated in the BPCI Advanced for the given clinical episode. $Post_t$ is an indicator that takes the value of 1 for every period in the intervention period, and $\boldsymbol{X}_{ikt}$ is set of impact risk factors at the beneficiary, provider, market, and temporal level for episode i with an anchor end in period t receiving care from provider k. In this linear example, the DiD estimate is the coefficient θ, which determines the differential in outcome Y experienced by beneficiaries receiving services from BPCI Advanced hospitals during the intervention period relative to beneficiaries receiving services from providers in the comparison group. Lastly, the error term is e_{ikt}.

We used multivariate regression models to control for differences in beneficiary demographics, clinical characteristics, and care use before the hospitalization, along with provider characteristics that might be correlated with the outcome. Regression models were selected depending on the type and characteristics of the outcome measure. For example, ordinary least squares (OLS) models were selected for continuous outcomes (e.g., payments, SNF days), and logistic models were estimated for the binary quality outcomes (e.g., mortality rate, institutional PAC rate, unplanned readmissions rate). In all specifications standard errors were clustered at the provider level.

Covariate Selection for Risk Adjustment

The DiD model adjusts for beneficiary, provider, market, and seasonal covariates to control for differences in beneficiaries, markets, and hospitals that are exogenous to the BPCI Advanced Model. While we require a core set of covariates in all models, additional, clinical episode- and outcome-specific covariates were selected for each model using a least absolute shrinkage and selection operator (LASSO).

We required all DiD models to include a required set of risk-adjusting covariates that was based on clinical knowledge and prior research (Exhibit C.17). For each clinical episode, we performed a LASSO regression to select additional covariates for given outcomes.[17] Specifically, we estimated a ten-fold cross-validated linear LASSO procedure on baseline episodes from all eligible hospitals and then used the optimized lambda value to select the set of optional covariates. Each LASSO regression included the core set of covariates as required and considered the full list of optional covariates for selection (Exhibit C.18). This data-driven approach to select optional covariates helps maximize model fit while constraining the complexity of the model.

[17] We ran the LASSO procedure for each clinical episode using the total allowed payments outcome, to optimize the selected covariate list for payment outcomes. For consistency, we used the selected covariates for each clinical episode for total allowed payments, total Medicare paid amounts, SNF payments, IRF payments, and HH payments. Covariates for all other (non-payment) outcome models were selected from separate outcome- and clinical episode-specific LASSO procedures.

Exhibit C.17: Required Predictive Risk Factors Used to Risk Adjust Claims Outcomes

Domain	Variables
Service Mix	• Anchor MS-DRG • Hip-fracture (MJRLE Only)
Patient Demographics & Enrollment	• Age • Sex • Race • Dual Eligible • OREC: Disability (non-ESRD) • Alignment to Medicare Shared Savings Program (MSSP) Track 3, MSSP Enhanced, Comprehensive ESRD Care Model, Next Generation ACO and Vermont ACO during the episode • Alignment to BPCI Classic for the episode
Prior health conditions	• HCC Index
Utilization measures preceding the start of the anchor stay/ qualifying inpatient stay	• Binary indicators for care in SNF, IRF, LTCH, Hospice, HHA, IPPS and OIP in the **six months** preceding the start of the episode
Geography	• Census Division Indicators
Seasonality	• Quarter indicators
Provider Characteristics	• Size (trinary indicators for number of beds) • Percent of Baseline Episodes Attributed to PGPs

Note: MS-DRG = Medicare severity diagnosis related group; ACO = accountable care organization; HCC = hierarchical condition category; NQF = National Quality Forum; ED = emergency department; SNF = skilled nursing facility; IRF = inpatient rehabilitation facility. HHA = home health agency; NF/SNF = institutional nursing facility.

Exhibit C.18: Optional Predictive Risk Factors Used to Risk Adjust Claims Outcomes

Domain	Variables
Patient Demographics & Enrollment	• Age squared
Prior health conditions	• Individual HCC flags
Utilization measures preceding the start of the anchor stay/ qualifying inpatient stay	• Binary indicators ED visit and psychiatric visit in the six months preceding the start of the episode
Market	• Urban Indicator
Provider Characteristics	• Ownership Indicators • Academic Medical Center • Safety Net Hospital

Parallel Trends Tests

Our ability to interpret the DiD estimates as the unbiased impacts of the BPCI Advanced model hinges on the assumption that both BPCI Advanced and the comparison group have the same trend in outcomes prior to the intervention. We constructed a comparison group of hospitals that closely matched BPCI Advanced hospital EIs on key characteristics, but, at the more granular level of analysis, we could not guarantee that the episodes at these BPCI Advanced and comparison hospitals would display parallel trends during the baseline period for every outcome.

We tested the null hypothesis that BPCI Advanced participants and comparison hospitals had parallel trends during the baseline. To do so, we ran a regression of the outcome on a time and treatment dummy interaction term in addition the full set of patient, facility, and market risk adjusters that are included in the DiD specification on baseline data, for each clinical episode and outcome. If there is no differential between the trends of the treatment and comparison group prior to intervention, the interaction coefficient should be near zero and not statistically significant. We rejected the null hypothesis that there were parallel trends in the baseline at the 10% level of significance. We also visually inspected baseline trends to assess the size and direction of any potential bias. We report all DiD estimates, but we note for which outcomes we rejected the null hypothesis that there were parallel trends in baseline.

Sensitivity Analyses

In order to test the robustness of our impact estimates, we conducted sensitivity analyses on key outcomes, the results of which are presented in **Appendix H**. The sensitivity analyses tested the model specifications, comparison sample, baseline definition, and inclusion of specific episodes in our sample. These tests included the following specification and sample adjustments.

- BPCI EIs often continued to participate in the BPCI Advanced model which could lead to relative difference in outcome values during the BPCI model (part of the BPCI Advanced baseline period). We test the sensitivity of the impact estimate to the overlap of participants in both models and the impact of the BPCI model by excluding episodes that were initiated by a BPCI participant.
- We assume that, a priori, hospital EIs do not know which discharges within a clinical episode will become reconciliation episodes. To determine if the model is robust to this assumption, we test the following.
    - We exclude episodes that were eventually attributed to BPCI Advanced PGPs. In addition, this serves as a check for sensitivity due to any imbalance of PGP attributed episodes in our comparison and treatment groups stemming from the PGP contamination restriction that was applied only to the potential comparison pool.
    - We exclude episodes aligned with Medicare Shared Savings Program (MSSP) Track 3, MSSP Enhanced, Comprehensive End Stage Renal Disease Care Model, Next Generation Accountable Care Organization (ACO), and Vermont ACO.
- To determine whether the results are generalizable to all BPCI Advanced hospital EIs, we use the analytic sample selected under the propensity score model with no caliper applied, and all BPCI Advanced hospital EIs.

3. Impact of BPCI Advanced on Beneficiary Functional Status, Health Status, and Health Care Experience

The BPCI Advanced beneficiary survey explored differences in patient care experiences and functional outcomes between Medicare beneficiaries cared for by BPCI Advanced providers and similar beneficiaries whose providers did not participate in BPCI Advanced. The beneficiary survey collected information on a set of patient outcomes related to functional status, health care

experience, and satisfaction with care and recovery. This section describes the instrument, sampling, administration, outcomes, and analysis of the beneficiary survey.

a. Beneficiary Survey Instrument

The survey instrument (included in **Appendix L)** was a revised version of the survey instrument used in the original BPCI evaluation,[18,19] which was based on items adapted from validated survey instruments, such as the CARE Tool,[20] National Health Interview Survey,[21] and Short Form 36 Health Survey.[22] Based on input from clinical experts at CMS and the evaluation team, four new questions were added to better measure care experience and satisfaction with care. New questions were adapted from the Hospital CAHPS,[23] Care Coordination Quality Measure for Primary Care,[24] and B-Prepared Instrument,[25] and replaced five original questions on discharge timing and level of post-acute care received. The revised instrument underwent cognitive testing with a convenience sample of seven Medicare beneficiaries with recent inpatient and outpatient hospital experience.

The beneficiary survey contained 29 multiple-choice, closed-ended questions and was designed to take an average of 25 minutes to complete. Survey questions covered a range of domains including functional status, health care experience, and satisfaction with care and recovery (Exhibit C.19). For each of seven functional areas, respondents were asked to recall their functional status before the anchor hospital visit (inpatient or outpatient) and also to report their current functional status at the time they were completing the survey, which was at least three months after the anchor hospital visit.

[18] Centers for Medicare & Medicaid Services (2018). CMS Bundled Payments for Care Improvement Initiative Models 2-4: Year 5 Evaluation & Monitoring Annual Report. Prepared by The Lewin Group. https://downloads.cms.gov/files/cmmi/bpci-models2-4-yr5evalrpt.pdf

[19] Trombley MJ, McClellan SR, Kahvecioglu DC, Gu Q, Hassol A, Creel AH, Joy SM, Waldersen BW, and Ogbue C (2019). Association of Medicare's Bundled Payments for Care Improvement Initiative with Patient-Reported Outcomes. *Health Services Research*, Vol. 54(4).

[20] Gage et al. (2012). The Development and Testing of the Continuity Assessment Record and Evaluation (CARE) Item Set.

[21] Centers for Disease Control and Prevention. (2012). National Health Interview Survey.

[22] Brazier et al. (1992). Validating the SF-36 health survey questionnaire: new outcome measure for primary care, *BMJ*, 305(6846), 160-164.

[23] Agency for Healthcare Research and Quality, Rockville, MD. CAHPS Hospital Survey. Content last reviewed October 2018. https://www.ahrq.gov/cahps/surveys-guidance/hospital/index.html.

[24] Agency for Healthcare Research and Quality, Rockville, MD. Care Coordination Quality Measure for Primary Care (CCQM-PC). https://www.ahrq.gov/ncepcr/care/coordination/quality/index.html.

[25] Graumlich JF, Novotny NL, and Aldag JC. (2008). Brief Scale Measuring Patient Preparedness for Hospital Discharge to Home: Psychometric Properties. *J Hosp Medc.* Vol 3(6). pp-446-454.

Exhibit C.19: Domain and Survey Items for Beneficiary Survey

Domain	Description
Functional Status[a]	1) Bathing/dressing/toileting/eating 2) Planning regular tasks 3) Use of a mobility device 4) Walking by self without resting 5) Walking up or down 12 stairs 6) Physical or emotional problems that interfere with social activities 7) Pain that interferes with normal activities
Health care experience	1) Respondent felt prepared to leave the hospital 2) Medical staff took patient preferences into account when arranging for health care services after leaving the hospital 3) Respondent had a good understanding of how to take care of herself or himself prior to leaving the hospital 4) Medical staff clearly explained how to take medications 5) Medical staff clearly explained needed follow-up appointments 6) Respondent and caregiver's ability to manage their health care needs 7) Medical staff discussed whether patient would have the help they needed when they got home 8) If help needed at home, medical staff arranged for services at home to help patient mange health
Satisfaction	1) Overall satisfaction with recovery 2) Rating of all post-hospital care from 0-10
Personal characteristics	1) Highest level of education 2) Permission to follow up with respondent

[a] For each of the seven functional areas, respondents were asked to recall their functional status before the anchor hospital visit (inpatient or outpatient) and also to report their current functional status at the time they were completing the survey, which was at least three months after the anchor hospital visit.

b. Beneficiary Survey Sample

Timing of Survey Wave

The beneficiary survey used a stratified random sampling method to obtain a representative sample of the BPCI Advanced population and a matched comparison group. We created the sampling frame using Medicare FFS claims from two "rolling" one month samples; the beneficiaries in the two rolling one month samples received their surveys one month apart.[26] For the first month of Wave 1, claims for July 2019 were pulled in early August 2019 and surveys were mailed in the first week of October 2019. For the second month of Wave 1, claims for August 2019 were pulled in early September 2019 and surveys were mailed the first week of November 2019. This rapid sampling process was employed to reduce recall bias. This process also had the effect of limiting the sample

[26] One month of claims was not adequate to reach the necessary sample size at the levels of clinical precision used to define the strata.

to patients whose claims were filed relatively quickly, within one month of discharge or outpatient procedure.[27]

Survey strata were defined separately for hospital and PGP EIs. We defined strata to ensure representation of all clinical episodes, and to support the most clinically-precise analyses possible. We included strata in the survey sample that we projected would have at least 400 BPCI Advanced responses and 400 comparison responses given expected response rates.[28,29] Strata were based on seven categories of medically similar clinical episodes defined by CMS,[30] and where there was sufficient volume, strata were defined at the clinical episode-level. One stratum, gastrointestinal episodes with PGP EIs, did not have sufficient volume to target 400 completed surveys. We included this as a sampling stratum to enable pooled estimates across all PGP episodes, but did not separately analyze that stratum. The sampling strata, and the clinical episodes comprising each stratum, are listed in Exhibit C.20 below.

Exhibit C.20 – Wave 1 Strata by Clinical Episode

	Stratum	Clinical Episodes
Hospital	Major joint replacement of the lower extremity (MJRLE)	MJRLE
	Spine, bone, and joint (excluding MJRLE)	Back and neck except spinal fusion (inpatient); back and neck except spinal fusion (outpatient); spinal fusion (non-cervical); cervical spinal fusion; combined anterior poster spinal fusion; fractures of the femur and hip or pelvis; hip and femur procedures except major joint; lower extremity and humerus procedure; major joint replacement of the upper extremity; double joint replacement of the lower extremity.
	Congestive heart failure (CHF)	CHF
	Percutaneous coronary intervention (PCI)	PCI (Inpatient); PCI (Outpatient)
	Cardiac (excluding CHF and PCI)	Acute myocardial infarction; cardiac arrhythmia; cardiac defibrillator (Outpatient); cardiac defibrillator (Inpatient); cardiac valve; pacemaker; coronary artery bypass graft
	Stroke	Stroke
	Simple Pneumonia (SPRI)	SPRI
	Chronic obstructive pulmonary disease (COPD)	COPD

[27] Although claims submitted within one month may not represent the entire Medicare population within a stratum due to provider delays in submitting claims, this issue should affect BPCI Advanced and comparison samples equally, and not bias our estimates.

[28] We used estimated response rates from the BPCI evaluation to determine the size of the initial sample required to yield 400 completed surveys in each group. Estimated response rates used to determine the initial sample size were calculated as the actual observed response rate minus the margin of error. For example, if ACH MJRLE respondents had a response rate of 74%, with a 5% margin of error, we estimated a 69% response.

[29] Power analyses indicated that a combined target sample size of 800 completed surveys (400 each for the BPCI Advanced and comparison groups, per stratum per wave) would enable us to reject the hypothesis of no difference in population percentages of our outcomes of interest with power of 0.8 when there is a true underlying difference of 8.8 percentage points in a binary variable with a baseline value of 50%.

[30] Centers for Medicare & Medicare Services. (2018). Quality Payment Program Overview: BPCI Advanced Conceptual Overview. https://innovation.cms.gov/files/slides/bpciadvanced-wc-conceptualoverview-slides.pdf

	Stratum	Clinical Episodes
Hospital Continued	Sepsis	Sepsis
	Kidney & Infectious Disease (excluding Sepsis)	Renal failure; cellulitis, urinary tract infection
	Gastrointestinal	Major bowel procedure; gastrointestinal hemorrhage; gastrointestinal obstruction; disorders of the liver
PGP	MJRLE	MJRLE
	Spine, bone, and joint (excluding MJRLE)	Back and neck except spinal fusion (inpatient); back and neck except spinal fusion (outpatient); spinal fusion (non-cervical); cervical spinal fusion; combined anterior poster spinal fusion; fractures of the femur and hip or pelvis; hip and femur procedures except major joint; lower extremity and humerus procedure; major joint replacement of the upper extremity; double joint replacement of the lower extremity.
	Congestive heart failure (CHF)	CHF
	Cardiovascular episodes (excluding CHF)	Acute myocardial infarction; arrhythmia; cardiac defibrillator (Outpatient); cardiac defibrillator (Inpatient); cardiac valve; pacemaker; coronary artery bypass graft; PCI (Inpatient); PCI (Outpatient); Stroke
	Pulmonary	SPRI; COPD
	Kidney & Infectious Disease (including Sepsis)	Renal failure; sepsis; cellulitis, urinary tract infection
	Gastrointestinal	Major bowel procedure; gastrointestinal hemorrhage; gastrointestinal obstruction; disorders of the liver

Sample Construction

The goals of sample construction were to select a representative sample of BPCI Advanced hospital discharges and outpatient procedures and to identify and select an appropriate comparison group of hospital discharges and procedures. We start with the universe of BPCI Advanced hospitals and nonparticipating comparison group hospitals. We then excluded hospitals if they were not eligible for BPCI Advanced and additionally excluded hospitals in various ways to limit exposure of the comparison group to the BPCI Advanced Model and the CJR Model.

Our sampling universe comprised all hospital discharges or outpatient procedures that met model rules (e.g., no beneficiaries assigned to NextGen ACOs; no beneficiaries with discharges or procedures at hospitals in the Maryland All-Payer model). We followed identical steps to construct the hospital and PGP samples from within the sampling universe, because the PGP comparison group was based on all eligible hospital visits, not visits attributed to comparison PGPs (i.e., we did not identify comparison PGPs from which to sample beneficiaries with episodes). We constructed the hospital and PGP survey samples in four steps.

Step 1 – Excluding hospitals: All BPCI Advanced EIs active in Model Year 2 were eligible for our sample. We generated a comparison group pool specific to each clinical episode by applying four different types of exclusions by clinical episode and "clinical community" (see Exhibit C.21 below). Four "clinical communities" were defined to identify clinically similar episodes across

which care involves a similar group of health care practitioners. Hospitals were excluded from the clinical episode comparison group pool if:

- They were ineligible to participate in BPCI Advanced due to low baseline volume for a given clinical episode. For example, a comparison group hospital with low baseline volume MJRLE surgeries was excluded from the MJRLE comparison group but would be eligible for inclusion in the sepsis comparison group if this hospital had sufficient sepsis discharges.
- They participated in at least one clinical episode in the same "clinical community". This exclusion was applied to minimize the risk of contamination of the comparison group from BPCI Advanced. For example, both MJRLE procedures and hip and femur procedures excluding major joint are in the same clinical community because procedures may be conducted by the same surgeons at a hospital. If a hospital was participating in BPCI Advanced for MJRLE, we excluded that hospital from the hip and femur procedures excluding major joint comparison group and for all other clinical episodes in that clinical community.
- BPCI Advanced PGPs generated more than one percent of this hospital's discharges or outpatient procedures across the related clinical episode community in the prior 90 days.
- Finally, CJR hospitals were excluded from the comparison group pool for all clinical episodes in the clinical community "Surgical and Non-Surgical Orthopedic Excluding Spine." This clinical community includes MJRLE, the clinical episode corresponding to CJR.

Step 2 – Excluding individual hospital visits: We excluded individual discharges or outpatient procedures from the comparison group to further reduce the risk of contamination from other bundled payment episodes. Specifically, we applied the following exclusions:

- Excluded discharge or procedure where the attending physician or surgeon belonged to a BPCI Advanced PGP, but which was not attributed to BPCI Advanced.
- Excluded discharges or procedures where the beneficiary was in a BPCI Advanced or CJR episode at the time of the discharge or procedure (i.e., the visit occurred within 90 days after the start of a BPCI Advanced or CJR episode).
- Excluded hospital visits where the beneficiary was treated in any hospital by a physician belonging to a BPCI Advanced PGP in the prior 90 days.
- Excluded initial hospital discharge or procedure if a beneficiary had more than one discharge or procedure in the month of our data. This exclusion ensured that a beneficiary could only be selected into the sample one time, and that the survey we mailed to them referenced their most recent hospitalization. In that case only the most recent discharge or procedure was eligible for selection into our sample.

We applied the last two exclusions to the BPCI Advanced group as well to ensure that the characteristics of the beneficiaries would be similar between the two groups.

Step 3 – Selecting BPCI Advanced beneficiaries: We created sampling cells of unique combinations of clinical episodes based on age category (< 65, 65-74, 75-84, 85+) and the

presence of a major complication or comorbidity (MCC) for each stratum. We selected a random proportional sample of BPCI Advanced beneficiaries within each sampling cell.

Step 4 – Selecting matched comparison hospital visits: Lastly, each selected BPCI Advanced beneficiary was matched one-to-one with a comparison beneficiary from the same sampling cell. Within sampling cells, comparison beneficiaries were selected if they had a propensity score nearest to a given BPCI Advanced beneficiary. Propensity scores were estimated based on the beneficiary-, hospital-, and market-level factors described in Exhibit C.22 below.

Exhibit C.21: Clinical Communities

Clinical Community	Clinical Episode
Surgical, Non-surgical: Orthopedic Excluding Spine	• Double joint replacement of the lower extremity • Hip and femur procedures except major joint • Lower extremity and humerus procedure except hip, foot, femur • Major joint replacement of the lower extremity • Major joint replacement of the upper extremity • Fractures of the femur and hip or pelvis
Surgical, Non-surgical: Cardiovascular	• Acute myocardial infarction • Cardiac arrhythmia • Cardiac defibrillator (inpatient) • Cardiac defibrillator (outpatient) • Cardiac valve • Congestive heart failure • Coronary artery bypass graft • Pacemaker • Percutaneous coronary intervention (inpatient) • Percutaneous coronary intervention (outpatient)
Surgical: Other	• Back and neck except spinal fusion (inpatient) • Back and neck except spinal fusion (outpatient) • Cervical spinal fusion • Combined anterior posterior spinal fusion • Major bowel procedure • Spinal fusion (non-cervical)
Non-surgical Other	• Cellulitis • Chronic obstructive pulmonary disease, bronchitis, asthma • Disorders of liver except for malignancy • Gastrointestinal hemorrhage • Gastrointestinal obstruction • Renal failure • Sepsis • Simple pneumonia and respiratory infections • Stroke • Urinary tract infection

Exhibit C.22: Predictive Risk Factors Used to Match BPCI Advanced and Comparison Beneficiaries

Domain	Variables
Service Mix[a]	• Clinical episode or MS-DRG[b] • Lower body fracture (MJRLE and spine, bone, and joint strata only) • Knee procedure (MJRLE episode only) • Large vessel ischemic stroke (stroke episodes only) • Intracerebral hemorrhage (stroke episodes only) • Major complication or comorbidity
Patient Demographics and Enrollment	• Age (under 65, 65-74, 75-84, 85+) • Sex • Race/ethnicity • Dual eligibility status
Prior Utilization Measures	• Any inpatient admission in the prior 90 days
Discharging Hospital Characteristics	• 2017 linear HCAHPS score[c] • Academic medical center • Bed size (≤250; 251-500; 500-850; >850) • Safety-net status • Census region (Northeast, Midwest, South, West) • Urban
Neighborhood and Market Characteristics	• Area Deprivation Index[d] • Median household income (county level) • Percent of population older than 65 (county level)

[a] Additional variables for MJRLE, spine, bone, and joint, and stroke episodes control for clinical heterogeneity that is not accounted for by MS-DRGs, and which is easily identifiable from ICD-9 and ICD-10 codes.

[b] For strata defined at the clinical episode level, we used MS-DRG in the propensity score model. For strata comprised of multiple clinical we included clinical episodes, but not MS-DRGs, in the propensity score model.

[c] HCAHPS = Hospital Consumer Assessment of Healthcare Providers and Systems. The linear HCAHPS score captures patient ratings of their overall experience with a hospital from 0-100, adjusted for patient mix and HCAHPS survey mode. We use 2017 data to avoid possible contamination of HCAHPS responses attributable to BPCI Advanced. This is the only hospital-level factor we included in our propensity score model that was not used by CMS to define the hospital-level target price peer groups.

[d] The Area Deprivation Index (ADI) is a measure of socioeconomic status developed by researchers at the University of Wisconsin.[31]

c. Administration of the Beneficiary Survey and Response Rates

We mailed each sampled beneficiary a paper survey, a postcard reminder, and, for beneficiaries who did not respond to the initial mailings, a second paper survey using priority mail. The first survey was mailed to beneficiaries within about 90 days after leaving the hospital. Beneficiaries who did not respond to the paper survey were contacted via telephone between 112 and 143 days after leaving the hospital.

Most strata did not achieve the target sample size of 400 BPCI Advanced and 400 comparison respondents. However, all strata analyzed for Wave 1 achieved a minimum detectable differences of at least 10.0 percentage points. Stratum-level response sample sizes, response rates, and minimum detectable differences, are listed in Exhibit C.23 below.

[31] University of Wisconsin School of Medicine and Public Health. 2015 Area Deprivation Index Version 2.0. Downloaded from https://www.neighborhoodatlas.medicine.wisc.edu/ on 8/1/2019.

Exhibit C.23: Survey Strata Sampled in Wave 1, Sample Size, and Minimum Detectable Effect

	Stratum	BPCI Advanced Survey Responses (N)	Comparison Survey Responses (N)	Response Rate (BPCI Advanced Group Only)	Minimum Detectable Difference[a]
Hospital	Major joint replacement of the lower extremity (MJRLE)	345	364	55.6	9.4
	Spine, bone, and joint (excluding MJRLE)	418	404	46.9	8.7
	Congestive heart failure (CHF)	310	310	30.4	10.0
	Percutaneous coronary intervention (PCI)	406	469	48.2	8.4
	Cardiac (excluding CHF and PCI)	325	373	35.6	9.4
	Stroke	340	346	34.5	9.5
	Simple Pneumonia (SPRI)	295	341	29.7	9.9
	Chronic obstructive pulmonary disease (COPD)	318	320	35.6	9.9
	Sepsis	309	336	27.3	9.8
	Kidney & Infectious Disease (excluding Sepsis)	326	331	28.8	9.7
	Gastrointestinal	353	335	37.1	9.5
PGP	MJRLE	395	385	63.6	8.9
	Spine, bone, and joint (excluding MJRLE)	417	417	49.7	8.6
	CHF	336	319	33.0	9.7
	Cardiovascular episodes (excluding CHF)	374	382	40.3	9.1
	Pulmonary	343	335	35.9	9.6
	Kidney & Infectious Disease (including Sepsis)	381	390	33.8	9.0
	Gastrointestinal[b]	278	274	40.1	10.6

[a] The minimum detectable difference refers to the difference between BPCI Advanced and comparison respondents (in percentage points) at which we achieve 80% power, assuming a mean outcome of 50%, at a significance level of 10%.

[b] The gastrointestinal stratum was not intended to be analyzed separately in Wave 1 given the available volume of episodes. However, we sampled all available gastrointestinal episodes to facilitate the model-level analyses for the PGP group.

Source: The BPCI Advanced Evaluation Team's analysis of beneficiary survey data based on episodes that began in July and August 2019.

d. Outcome Measures

The BPCI Advanced beneficiary survey instrument asked about seven measures of physical function and for each, respondents were asked to recall their status before the anchor hospitalization (question 2 through question 8), and to report their current functional status at the time of the survey (question 9 through question 15). The seven functional status measures included: (1) bathing, dressing, toileting, and eating; (2) planning regular tasks; (3) moving using a mobility device; (4) walking without resting; (5) going up or down stairs; (6) the frequency with which physical or emotional health interferes with regular social activities; and (7) the frequency with which pain interferes with normal activities.

For each functional status measure, we created trinary measures for improvement, maintenance or decline in initial function. The outcome is marked as improved if a patient moved to a better functional status level after the episode (e.g., from "complete help needed" before the episode to "no help needed" after the episode) or if the patient recalled having the highest functional status prior to hospitalization and remained in that high status at the time of survey response (e.g., "no help needed" both before hospitalization and after the episode). The outcome is marked as maintained function if the patient did not recall the highest or lowest function prior to hospitalization, and reported that their function was the same before the episode and at the time of the survey. The outcome is marked as declined if the patient moved to a worse functional status level after the episode, or if the patient recalled having the lowest functional status prior to hospitalization and remained in that low status at the time of the survey.

The BPCI Advanced survey asked eight questions regarding care experience, and two regarding satisfaction with recovery and care received. All these questions were binary except for a trinary rating of all post-hospital care. More detail on measure specifications for these two domains are shown in Exhibit C.24. All questions and possible responses to each question are available in **Appendix L**.

Exhibit C.24: Definitions for Measures of Care Experience and Satisfaction

	Outcome Measure	Response if Indicator=1
Care Experience	Felt "very" or "somewhat" prepared to leave the hospital	Yes
	Medical staff took your preferences into account in deciding what health care services you should have after you left the hospital	Agree/strongly agree
	Good understanding of how to take care of self before going home	Agree/strongly agree
	Medical staff clearly explained how to take medications before going home	Agree/strongly agree
	Medical staff clearly explained what follow-up appointments or treatments would be needed before going home	Agree/strongly agree
	Able to manage your health needs since returning home	Agree/strongly agree
	Medical staff talked with you about whether you would have the help you needed when you got home	Yes
	Medical staff arranged services for you at home to help manage your health, if you needed it	Yes
Satisfaction with Care and Recovery	Overall satisfaction with recovery since leaving hospital	Extremely satisfied/ quite a bit satisfied
	Rating of all post-hospital care from 0-10[a]	High (Rating 9-10), middle (7-8), low (0-6)

[a] The rating of post-hospital care was a trinary measure.

e. Analysis of the Beneficiary Survey

Analytic Approach

We separately analyzed data from respondents whose episodes were initiated by hospitals and PGPs, to obtain estimated differences between BPCI Advanced and comparison beneficiaries averaged across all 32 clinical episodes within each group. We used logistic regression to estimate risk-adjusted differences in binary survey outcomes between the BPCI Advanced and comparison respondents. We used multinomial logistic regression to estimate differences for the trinary survey outcomes, and estimated the joint significance of differences across all three categories. Standard errors were clustered at the hospital level. Results for individual strata are presented in **Appendix J**.

Weighting

For each of the strata we calculated entropy-balanced weights representative of the BPCI Advanced respondents in order to improve the generalizability of results. The weights account for the possibility that BPCI Advanced yields different outcomes for different types of beneficiaries. For example, if BPCI Advanced leads to improved functional status for beneficiaries who are dually eligible for Medicaid, but not for those without dual eligibility, and dually eligible beneficiaries are under-represented among respondents, then our estimates would understate the true impact of BPCI Advanced. Weighting the respondents to reflect the overall population mitigates the potential for this problem.

The purpose of weighting the comparison group to reflect the BPCI Advanced group is to obtain "doubly robust" estimates of the difference between BPCI Advanced and comparison

respondents.[32] This means that our estimates will be unbiased if either the regression or weights are correctly specified; they do not both need to be correctly specified.

Within each stratum, we weighted the analytic data in two stages. First, we calculated entropy-balancing weights[33,34] that made the BPCI Advanced respondents representative of the BPCI Advanced population (that is, the sampling frame) based on the characteristics described in Exhibit C.23 below. Second, we calculated entropy-balancing weights that made the comparison respondents representative of the (weighted) BPCI Advanced respondents, such that both groups reflected the BCPI Advanced population after applying the survey weights.

Controlling for Differences in Patient Mix

We performed regression-based risk adjustment to ensure comparability between the BPCI Advanced and comparison groups, which included the factors listed in Exhibit C.25.

Exhibit C.25: Predictive Risk Factors Used to Risk Adjust Survey Outcomes

Domain	Variables
Service Mix[a]	• Clinical episode type[b] • Major complication or comorbidity • Lower body fracture (MJRLE and spine, bone, and joint strata only) • Knee procedure (MJRLE episode only) • Large vessel ischemic stroke (stroke episodes only) • Intracerebral hemorrhage (stroke episodes only)
Patient Demographics and Enrollment	• Age (under 65, 65-74, 75-84, 85+) • Sex • Race/ethnicity • Dual eligibility status • Respondent obtained 4-year degree or higher
Prior health conditions	• HCC index: HCC indicators weighted by their relative weight in the CMS-HCC model • Squared HCC index • Functional status using three summary measures[c]
Prior utilization measures	• Any inpatient admission in the prior 6 months • Any other institutional care (SNF, IRF, or LTACH, or psychiatric hospital) in prior 6 months • Any nursing home care in the prior 6 months
Discharging Hospital Characteristics	• 2017 linear HCAHPS score[d]
Neighborhood Characteristics	• Area Deprivation Index[e]
Survey Dimensions	• Proxy status (beneficiary had help from someone else in responding to the survey) • Survey mode (response obtained via mail versus telephone) • Days elapsed between leaving the hospital and survey response

Notes: SNF = skilled nursing facility; IRF = inpatient rehabilitation facility; LTCH = long-term care hospital

[32] Robins JM, Rotnitzky A, Zhao LF. Estimation of regression coefficients when some regressors are not always observed." *Journal of the American Statistical Association* 1994; 89(427): 846-866.4.

[33] Hainmuller J. Entropy Balancing for Causal Effects: A Multivariate Reweighting Method to Produce Balanced Samples in Observational Studies, *Political Analysis* 2012; 20:25−46.

[34] Hainmueller J, Xu Y. ebalance: A Stata Package for Entropy Balancing," *Journal of Statistical Software* 2013, 54:7.

[a] Additional variables for MJRLE, spine, bone, and joint, and stroke episodes control for clinical heterogeneity that is not accounted for by MS-DRGs, and which is easily identifiable from ICD-9 and ICD-10 codes.

[b] For analyses that pool across clinical episode, we controlled for clinical episode type. For analyses that were at the clinical-episode level, we controlled for MS-DRG.

[c] Three of the functional status questions have only three possible responses, two functional status questions have four possible responses, and two have five. For each of the outcomes with less than five possible responses, the best functional status was coded as 1, the middle status (or two statuses) was coded as 2, and the worst functional status was coded as 3. We created a variable summing the number of functional measures with 2, the number with 3, and also a binary indicator for "missing functional status." For the two measures with five possible responses we created binary indicators for "all of the time/most of the time" and created a control variable summing the number of indicators equal to 1, as well as a binary indicator for "missing activity status." For functional status variables with four possible responses, we considered alternative cutoffs for coding responses as 1, 2, or 3; however, none of these alternative cutoffs altered the results in any meaningful way.

[d] HCAHPS = Hospital Consumer Assessment of Healthcare Providers and Systems. The linear HCAHPS score captures patient ratings of their overall experience with a hospital from 0-100, adjusted for patient mix and HCAHPS survey mode. We use 2017 data to avoid possible contamination of HCAHPS responses attributable to BPCI Advanced.

[e] The Area Deprivation Index (ADI) is a measure of socioeconomic status developed by researchers at the University of Wisconsin.

The risk-adjustment model accounts for certain factors that could not be incorporated into our matching algorithm applied at the time of sampling.[35] We also matched on five attributes of the discharging hospital, which were used by CMS to define target price peer groups, but were not included in our final risk-adjustment model.[36]

Our regression model for each outcome is expressed as:

$$Y_{ijk} = \delta_k BPCIAdvanced_{ij} * CG_{ijk} + \beta_k X_{ij} + CE_i + \varepsilon_{ijk}$$

Y_{ijk} is the outcome of interest for individual i, treated at provider j, in clinical episode k. X refers to the risk-adjustment variables (listed above), CE indicates individual indicators for each clinical episode,[37] BPCIAdvanced is an indicator for a beneficiary who was treated by a BPCI Advanced participating hospital or PGP, and CG is a set of indicator dummies for each of the seven clinical groupings developed by CMS, and upon which the sampling strata are based. The relationship between Y and BPCI Advanced (indicated by δ_k) represents the difference between BPCI Advanced and comparison respondents across all clinical episodes in clinical grouping k (e.g., BPCI Advanced may affect beneficiaries with infectious diseases different to those with orthopedic surgical episodes). The average difference between BPCI and comparison respondents across all hospital or PGP episodes can then be calculated as:

$$\Delta_{\text{BPCI Advanced}} = \sum_{k=1}^{K} w_k \delta_k$$

[35] For example, we did not have information about education and pre-hospital functional status at the time of sampling; those data come from the survey responses. Likewise, factors such as HCC index score and recent institutional care could not be reliably identified at the time of survey sampling because additional claims runout time would be required and waiting for the data could delay the survey and increase recall bias.

[36] Results from the original BPCI evaluation indicated that these hospital-level factors were not strongly correlated with survey outcomes. Matching on these factors allows us to ensure the BPCI Advanced and comparison groups are reasonably similar with regards to these factors, without the loss of statistical precision (i.e., larger standard errors) that would likely result from directly controlling for such measures that only weakly predict survey outcomes.

[37] Because clinical episodes are unique to a single clinical grouping they function as "group fixed effects" without the need for a separate, un-interacted CG term in the equation.

where w_k is equal to the proportion of BPCI Advanced episodes occurring in clinical grouping k relative to all BPCI Advanced episodes. Accordingly, each clinical group's estimate is weighted according to the volume of the clinical group relative to the entire hospital or PGP population covered by the survey.[38]

4. Net Savings to Medicare due to BPCI Advanced

Net savings to Medicare were defined as the difference between non-standardized paid amounts39 and reconciliation payments made to or received from BPCI participants following the formula below:

Medicare net savings = *change in aggregate non-standardized payments – reconciliation payments*[40]

The change in aggregate non-standardized payments is approximated by multiplying the estimates from the difference-in-difference (DiD) model, which estimates the change in per-episode standardized Medicare paid amounts during the inpatient stay and 90-day PDP, by a standardized to non-standardized conversion factor.[41] DiD impact estimates were extrapolated to the BPCI Advanced hospital EIs excluded from our impact analyses, because there was not an available comparison hospital inside the selected caliper in our propensity score matching. Sensitivity analyses suggests that this extrapolation was reasonable. For each clinical episode, the per-episode change in standardized payments was multiplied by the number of BPCI Advanced episodes with anchor end dates on or before August 3, 2019. To ensure we did not double-count the impact of the model across episodes, we weighted overlapping episodes, resulting in a prorated number of episodes for each clinical episode included in the analysis.[42]

Reconciliation payments are defined as payments made to BPCI Advanced participants for episodes attributed during the period analysis. We used aggregate reconciliation payments for episodes ending by December 31, 2019 to calculate per episode reconciliation payment. We then

[38] As a simple example, suppose there were two strata: pulmonary episodes and neurological (stroke) episodes. Suppose the pulmonary stratum had 1000 episodes occur during the period covered by the sampling frame, and the spine, bone, and joint stratum had 2000 episodes during the same time. The full BPCI Advanced population covered by the survey is then 3000. In such a case, the pulmonary weight would be equal to 1000/3000 = 1/3 and the spine, bone, and joint weight would be equal to 2000/3000 = 2/3.

[39] Non-standardized paid amounts vary from the standardized allowed amounts that we use in the DiD analyses. We use non-standardized paid amounts for this analysis, which approximate the actual payments made from Medicare to providers incorporating geographic and other payment adjustments and excluding beneficiary cost sharing. We use standardized allowed amounts in the DiD analyses—amounts that exclude payment adjustments and include beneficiary cost sharing—in order to isolate the impact of BPCI on Medicare payments.

[40] Net savings are reported such that a positive value indicates savings to Medicare and a negative value indicates losses to Medicare. Changes in non-standardized payments and reconciliation payments are reported in this same perspective for consistency.

[41] Non-standardized payments were calculated by applying a ratio of non-standardized to standardized Medicare paid amounts to our DiD impact estimates on standardized Medicare paid amounts. This was performed separately for each clinical episode.

[42] For example, suppose a beneficiary begins a COPD episode on April 1st which ends July 9th and has a CHF episode from May 1st through August 15th. The COPD episode shell lasts 100 days where the beneficiary is in that shell only for the first 30 days and in the two shells for the subsequent 70 days. The prorated value of the COPD episode shell is therefore 0.75 (i.e., 30/100 from the first 30 days + (70/2)/100 from the overlap days).

multiplied this per episode reconciliation payments by the number of reconciliation episodes with anchor dates on or before August 3, 2019.

Medicare savings for each of the 13 clinical episodes was summed to calculate the total model net savings to Medicare. This aggregation method was also used to calculate lower and upper bounds for model net savings to Medicare; as a result, the lower and upper bounds for model net savings represent a rather large range and potentially ignores the statistical relationships of Medicare savings components across clinical episodes.

We estimated model net savings per-episode by dividing model net savings by the number of reconciliation episodes. Net savings as a percent of payments was calculated by dividing per-episode model net savings by the historical payments used to calculate Model Years 1 and 2 target prices. Additional details about these measures and the net savings calculations can be found in Exhibit C.26.

Exhibit C.26: Definition of Measures Used in the Analysis of Net Savings to Medicare

Measure	Definition
DiD estimate of per-episode change in standardized payments	A per-episode estimate of the change in Medicare payments attributable to BPCI Advanced using the total payments DiD regression model for a given clinical episode. The payment outcome was the standardized Medicare paid amounts for services that were included and excluded from the bundle during the anchor stay and 90 days post-discharge. We used the 90% confidence interval from this DiD estimate to create upper and lower bound estimates, which we pass thru the rest of the net savings calculations. The DiD estimate and the bounds were multiplied by (-1) so that a positive estimate indicates a reduction in payments.
Standardized to non-standardized conversion factor	A ratio of non-standardized to standardized Medicare paid amounts based on BPCI Advanced intervention episodes; clinical episode specific.
DiD estimate of per-episode change in non-standardized payments	The DiD estimate of per-episode change in standardized payments multiplied by the conversion factor. Non-standardized Medicare paid amounts reflect actual Medicare payments because they include adjustments for wages, practice expenses, and other initiatives (e.g., medical education).
Clinical episode prorated number of episodes	For a given clinical episode, the prorated total number of intervention-period episodes from all first-cohort BPCI Advanced hospital EIs. The counts were calculated by weighting overlapping episodes in our analytic sample to account for when the same beneficiary is included in more than one episode (across clinical episodes) during the same day. Weights were designed to be proportional to the amount of overlap.
Clinical episode change in non-standardized payments	The DiD estimate of per-episode change in non-standardized payments multiplied by the prorated number of episodes for a given clinical episode.
Model change in non-standardized payments	The sum of all 13 clinical episode changes in non-standardized payments. Note this measure excludes clinical episodes not evaluated in the Year 2 report.

Measure	Definition
Clinical episode reconciliation payments	Reconciliation payments are defined as total amounts paid to BPCI Advanced participants by Medicare net of repayments from participants to Medicare. Negative values indicate that more funds have been paid by Medicare than recovered. For a given clinical, episodes from all first-cohort BPCI Advanced hospital EIs were included. For performance period 2, we calculated clinical episode reconciliation payments to only include reconciliation episodes that occurred with anchor end dates on or before August 3, 2019. Clinical episode reconciliation payments do not account for several model adjustments which are applied at the EI and convener level (i.e., the stop-loss/stop-gain provision, the Composite Quality Score adjustment, BPCI Advanced recoupment amount, and the post-episode spending repayment amount).
Model reconciliation payments	The sum of all 13 clinical episode reconciliation payments. Note this measure does not include reconciliation payments from clinical episodes not evaluated in the Year 2 report and does not include reconciliation payments from PGP EIs.
Clinical episode net savings to Medicare	For a given clinical episode, the change in non-standardized payments less reconciliation payments. A positive value indicates savings; a negative value indicates losses.
Model net savings to Medicare	The sum of all 13 clinical episode net savings to Medicare. Note this measure excludes net savings from clinical episodes not evaluated in the Year 2 report and does not include reconciliation payments from PGP EIs.
Number of reconciliation episodes	The total number of performance period 1 and 2 reconciliation episodes for the 13 evaluated clinical episodes. For each clinical episode, episodes from all first-cohort BPCI Advanced hospital EIs were counted. For performance period 2, we only included reconciliation episodes that occurred with anchor end dates on or before August 3, 2019.
Per-episode clinical episode net savings to Medicare	For a given clinical episode, the net savings to Medicare divided by the number of reconciliation episodes.
Per-episode model net savings to Medicare	The model net savings to Medicare divided by the total number of reconciliation episodes.
Clinical episode average historical payments	For a given clinical episode, the average episode total payment during the historical period used to calculate Model Year 1 and 2 target prices.
Model average historical payments	The average historical episode total payment for all 13 evaluated clinical episodes. Only historical episodes from first-cohort BPCI Advanced hospital EIs that had non-zero intervention volume were included in the calculation of this measure.
Clinical episode net savings as a percent of average historical payments	For a given clinical episode, the per-episode net savings divided by the average historical payment.
Model net savings as a percent of average historical payments	The per-episode model net savings divided by the model average historical payment.

Appendix D: Supplemental BPCI Advanced Reach Results

Exhibit D.1: Proportion of Eligible Clinicians Participating in BPCI Advanced, by Clinical Episode, October 1, 2018 – August 3, 2019

Clinical Episode	Number of Clinicians Participating in BPCI Advanced	Number of Clinicians Eligible for BPCI Advanced	Percent of Eligible Clinicians Participating in BPCI Advanced
Acute Myocardial Infarction	8,869	53,335	17%
Back and Neck Except Spinal Fusion (Inpatient)	547	6,973	8%
Back and Neck Except Spinal Fusion (Outpatient)	357	5,685	6%
Cardiac Arrhythmia	11,367	62,639	18%
Cardiac Defibrillator (Inpatient)	239	11,121	2%
Cardiac Defibrillator (Outpatient)	58	5,372	1%
Cardiac Valve	295	12,490	2%
Cellulitis	4,234	48,455	9%
Cervical Spinal Fusion	708	7,860	9%
Chronic Obstructive Pulmonary Disease, Bronchitis, Asthma	9,967	63,102	16%
Combined Anterior Posterior Spinal Fusion	159	6,130	3%
Congestive Heart Failure	19,255	90,542	21%
Coronary Artery Bypass Graft Surgery	1,176	13,803	9%
Disorders of Liver Except Malignancy, Cirrhosis or Alcoholic Hepatitis	1,055	23,757	4%
Double Joint Replacement of the Lower Extremity	95	1,912	5%
Fractures of the Femur and Hip or Pelvis	1,162	19,325	6%
Gastrointestinal Hemorrhage	6,822	66,179	10%
Gastrointestinal Obstruction	3,997	42,988	9%
Hip and Femur Procedures Except Major Joint	6,252	44,686	14%
Lower Extremity and Humerus Procedures Except Hip, Foot, Femur	1,946	21,389	9%
Major Bowel Procedure	1,120	29,683	4%
Major Joint Replacement of the Lower Extremity	6,717	39,604	17%
Major Joint Replacement of the Upper Extremity	1,076	8,716	12%
Pacemaker	2,518	29,054	9%
Percutaneous Coronary Intervention (Inpatient)	3,673	45,020	8%
Percutaneous Coronary Intervention (Outpatient)	1,183	17,503	7%
Renal Failure	8,866	66,492	13%
Sepsis	24,307	121,249	20%
Simple Pneumonia and Respiratory Infections	13,146	79,777	16%
Spinal Fusion (Non-cervical)	1,098	8,367	13%
Stroke	11,072	65,222	17%

Clinical Episode	Number of Clinicians Participating in BPCI Advanced	Number of Clinicians Eligible for BPCI Advanced	Percent of Eligible Clinicians Participating in BPCI Advanced
Urinary Tract Infection	8,943	57,247	16%

Note: Eligible clinicians include attending and operating NPIs who treated Medicare beneficiaries who met the BPCI Advanced beneficiary inclusion criteria at a BPCI Advanced eligible hospital. Minimum hospital volume in baseline period was not applied. We defined clinicians who participated in BPCI Advanced as 1) any attending or operating NPI at a BPCI Advanced hospital EI for a clinical episode in which the hospital was participating; or 2) any attending or operating NPI on the hospital claim when the beneficiary had a corresponding Part B claim during the anchor stay or anchor procedure where the BPCI Advanced PGP TIN was the billing provider and the PGP was participating in the given clinical episode. EI = episode initiator; NPI = National Provider Identifier; PGP = physician group practice; TIN = Taxpayer Identification Number.

Source: The BPCI Advanced evaluation team's analysis of and Medicare claims and enrollment data for episodes with anchor stay/procedure end dates from October 1, 2018 through August 3, 2019 for BPCI Advanced hospitals and the CMS BPCI Advanced Database, as of March 1, 2019.

Exhibit D.2: Proportion of Discharges at BPCI Advanced Eligible Hospitals Attributed to BPCI Advanced Hospital and PGP EIs, by Clinical Episode, October 1, 2018 – August 3, 2019

Clinical Episode	Number of Discharges and Procedures at BPCI Advanced Eligible Hospitals	BPCI Advanced Hospital EI Attributed Discharges and Procedures		BPCI Advanced PGP EI Attributed Discharges and Procedures	
		N	%	N	%
Acute Myocardial Infarction	95,938	17,176	18%	7,248	8%
Back and Neck Except Spinal Fusion (Inpatient)	12,653	1,337	11%	670	5%
Back and Neck Except Spinal Fusion (Outpatient)	43,041	1,311	3%	2,937	7%
Cardiac Arrhythmia	145,491	25,787	18%	10,644	7%
Cardiac Defibrillator (Inpatient)	10,456	392	4%	190	2%
Cardiac Defibrillator (Outpatient)	36,009	980	3%	606	2%
Cardiac Valve	56,953	4,126	7%	517	1%
Cellulitis	82,851	6,607	8%	4,706	6%
Cervical Spinal Fusion	22,390	2,346	10%	2,397	11%
Chronic Obstructive Pulmonary Disease, Bronchitis, Asthma	196,642	36,985	19%	13,108	7%
Combined Anterior Posterior Spinal Fusion	33,843	3,208	9%	4,031	12%
Congestive Heart Failure	325,026	56,894	18%	25,233	8%
Coronary Artery Bypass Graft Surgery	38,159	3,776	10%	992	3%
Disorders of Liver Except Malignancy, Cirrhosis or Alcoholic Hepatitis	24,065	1,144	5%	1,156	5%
Double Joint Replacement of the Lower Extremity	4,473	82	2%	404	9%

Clinical Episode	Number of Discharges and Procedures at BPCI Advanced Eligible Hospitals	BPCI Advanced Hospital EI Attributed Discharges and Procedures		BPCI Advanced PGP EI Attributed Discharges and Procedures	
		N	%	N	%
Fractures of the Femur and Hip or Pelvis	24,021	1,357	6%	748	3%
Gastrointestinal Hemorrhage	136,486	14,734	11%	9,656	7%
Gastrointestinal Obstruction	67,375	6,343	9%	4,246	6%
Hip and Femur Procedures Except Major Joint	93,753	7,532	8%	15,187	16%
Lower Extremity and Humerus Procedures Except Hip, Foot, Femur	26,382	1,674	6%	2,326	9%
Major Bowel Procedure	76,128	2,955	4%	1,044	1%
Major Joint Replacement of the Lower Extremity	323,200	16,124	5%	91,676	28%
Major Joint Replacement of the Upper Extremity	52,116	2,181	4%	10,127	19%
Pacemaker	42,047	2,987	7%	2,198	5%
Percutaneous Coronary Intervention (Inpatient)	123,053	8,299	7%	5,757	5%
Percutaneous Coronary Intervention (Outpatient)	107,793	10,699	10%	4,365	4%
Renal Failure	160,723	25,441	16%	12,177	8%
Sepsis	478,680	125,116	26%	42,298	9%
Simple Pneumonia and Respiratory Infections	274,504	42,653	16%	19,720	7%
Spinal Fusion (Non-cervical)	38,411	3,945	10%	5,649	15%
Stroke	150,721	25,219	17%	11,077	7%
Urinary Tract Infection	149,861	22,688	15%	9,757	7%

Note: Eligible discharges and procedures include Medicare beneficiaries who met the BPCI Advanced beneficiary inclusion criteria at a BPCI Advanced eligible hospital. Minimum hospital volume in baseline period was not applied. Discharges and procedures attributed to BPCI Advanced hospital EIs were at a BPCI Advanced hospital participating in the clinical episode. Discharges or procedures attributed to BPCI Advanced PGP EIs required the beneficiary had a corresponding Part B claim during the anchor stay or anchor procedure where the BPCI Advanced PGP TIN was the billing provider and the PGP was participating in the given clinical episode. The PGP discharges and procedures include those at BPCI Advanced hospitals. When accounting for the overlap of PGP discharges at BPCI Advanced hospitals, BPCI Advanced represents 23% of eligible discharges. EI = episode initiator; NPI = National Provider Identifier; PGP = physician group practice; TIN = Taxpayer Identification Number.

Source: The BPCI Advanced evaluation team's analysis of and Medicare claims and enrollment data for episodes with anchor stay/procedure end dates from October 1, 2018 through August 3, 2019 for BPCI Advanced hospitals and the CMS BPCI Advanced Database, as of March 1, 2019.

Appendix E: Supplemental Participant Characteristics

A. Participant Characteristics Results

Exhibit E.1: Clinical Episodes Selected by BPCI Advanced Hospital and PGP EIs, Model Year 3

Clinical Episode	Hospital EIs (N=1,010)		PGP EIs (N=1,031)	
	N	%	N	%
Acute Myocardial Infarction	299	30%	324	31%
Back and Neck Except Spinal Fusion	67	7%	243	24%
Bariatric Surgery*	11	1%	127	12%
Cardiac Arrhythmia	337	33%	351	34%
Cardiac Defibrillator	19	2%	214	21%
Cardiac Valve	51	5%	198	19%
Cellulitis	140	14%	210	20%
Chronic Obstructive Pulmonary Disease, Bronchitis, Asthma	359	36%	286	28%
Congestive Heart Failure	251	25%	277	27%
Coronary Artery Bypass Graft	85	8%	206	20%
Disorders of Liver Except Malignancy, Cirrhosis or Alcoholic Hepatitis	59	6%	169	16%
Double Joint Replacement of the Lower Extremity	5	0%	224	22%
Fractures of the Femur and Hip or Pelvis	65	6%	59	6%
Gastrointestinal Hemorrhage	195	19%	238	23%
Gastrointestinal Obstruction	169	17%	224	22%
Hip and Femur Procedures Except Major Joint	118	12%	164	16%
Inflammatory Bowel Disease*	11	1%	125	12%
Lower Extremity and Humerus Procedures Except Hip, Foot, Femur	66	7%	87	8%
Major Bowel Procedure	70	7%	130	13%
Major Joint Replacement of the Lower Extremity	84	8%	425	41%
Major Joint Replacement of the Upper Extremity	72	7%	321	31%
Pacemaker	87	9%	246	24%
Percutaneous Coronary Intervention	75	7%	249	24%
Renal Failure	285	28%	260	25%
Seizures*	163	16%	212	21%
Sepsis	587	58%	311	30%
Simple Pneumonia and Respiratory Infections	328	32%	294	29%
Spinal Fusion*	137	14%	294	29%
Stroke	273	27%	231	22%
Transcatheter Aortic Valve Replacement*	7	1%	118	11%
Urinary Tract Infection	243	24%	237	23%
Back and Neck Except Spinal Fusion (Outpatient)	33	3%	311	30%
Cardiac Defibrillator (Outpatient)	29	3%	219	21%
Percutaneous Coronary Intervention (Outpatient)	115	11%	237	23%

Note: EIs = episode initiators; PGPs = physician group practices. * Indicates new clinical episode in Model Year 3.

Source: The BPCI Advanced evaluation team's analysis of CMS BPCI Advanced Database, as of January 1, 2020.

B. Participating Hospital Results

Exhibit E.2a: Characteristics of BPCI Advanced Hospital EIs, by Cohort, Model Year 3

Domain	Characteristic	First Cohort (N=641)		Second Cohort (N=369)	
		N	%	N	%
Census Region***	Midwest	155	24%	90	24%
	Northeast	121	19%	30	8%
	South	235	37%	173	47%
	West	130	20%	76	21%
Urban/Rural	Urban	579	90%	323	88%
	Rural	62	10%	46	12%
Ownership***	For Profit	174	27%	82	22%
	Government	27	4%	35	9%
	Non-Profit	440	69%	252	68%
Academic Medical Center*	Yes	40	6%	14	4%
Part of Health System**	Yes	616	96%	341	92%
Experience in BPCI***	Yes	205	32%	64	17%
Participation in MSSP, Next Gen, or Pioneer ACO Initiatives ***	Yes	67	10%	20	5%

Note: Data from 641 BPCI Advanced hospital EIs that joined the model on October 1, 2018 (first cohort) and 369 BPCI Advanced hospital EIs that joined the model on January 1, 2020 (second cohort). Values for categorical variables were for the most recent year between 2013 and 2017 that data was available. Market characteristics were calculated for the Core-Based Statistical Area (CBSA) in which the hospital is located. Percentages for categorical variables with 3 or more possible values may not add to 100% due to rounding. ACO = Accountable Care Organization; EIs = episode initiators; IRF = Inpatient Rehabilitation Facility; MSSP = Medicare Shared Savings Program.

* Indicates significance at the 10% level for the chi-squared test of difference in proportions.

** Indicates significance at the 5% level for the chi-squared test of difference in proportions.

*** Indicates significance at the 1% level for the chi-squared test of difference in proportions.

***Source*:** The BPCI Advanced evaluation team's analysis of the 2017 Agency for Healthcare Research and Quality (AHRQ) Hospital Linkage File, Area Health Resource File (AHRF) from 2013 to 2017, CMS Provider of Service (POS) files from 2013 to 2017, CMS Inpatient Prospective Payment System (IPPS) files from 2013 to 2017, 2020 Master Data Management (MDM) provider file, and the CMS BPCI Advanced Database as of January 1, 2020.

Exhibit E.2b: Characteristics of BPCI Advanced Hospital EIs, by Cohort, Model Year 3

Characteristic	First Cohort (mean)	Second Cohort (mean)
Bed Count* **	347	283
Resident to Bed Ratio* **	0.09	0.06
Medicare Days Percent	39%	40%
Disproportionate Share Percent* **	30%	27%
Total Discharges for BPCI Advanced MS-DRGs* **	2,371	1,966
Total Procedures for BPCI Advanced HCPCS **	121	99
Market Population* **	4,073,582	3,120,653
Per Capita Personal Income*	$46,863	$45,639
SNF Beds per 10,000	52	51
Medicare Advantage Penetration	32%	32%
Hospital Market Share for BPCI Advanced MS-DRGs & HCPCS codes	20%	23%
Herfindahl Index **	0.22	0.26

Note: Data from 641 BPCI Advanced hospital EIs that joined the model on October 1, 2018 (first cohort) and 369 BPCI Advanced hospital EIs that joined the model on January 1, 2020 (second cohort). Unless otherwise specified, values for numeric variables were averaged for all years between 2013 and 2017 that data was available. Market characteristics were calculated for the Core-Based Statistical Area (CBSA) in which the hospital is located. EIs = episode initiators; HCPCS = Healthcare Common Procedure Coding System; MS-DRGs = Medicare Severity Diagnosis Related Groups; SNF = skilled nursing facility.

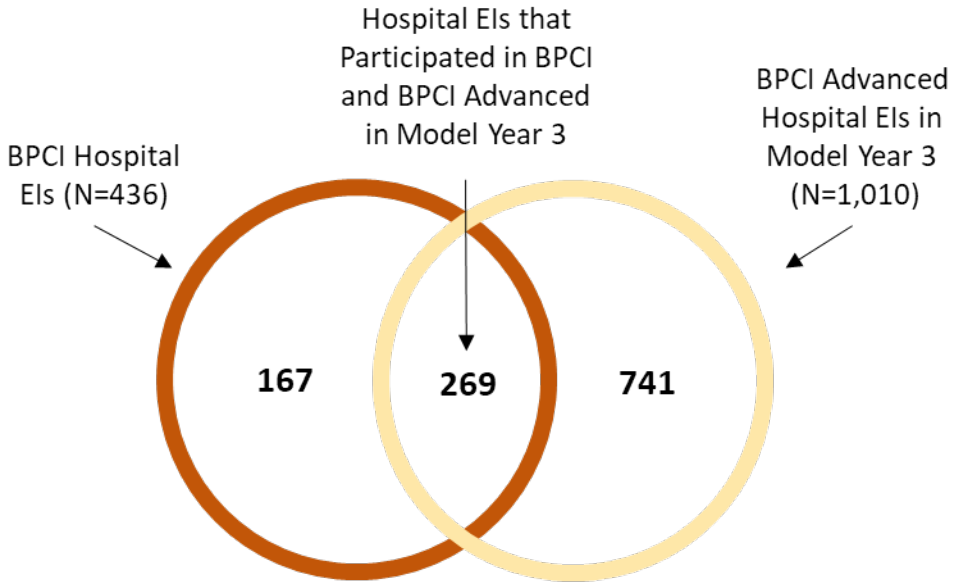
*Indicates significance at the 10% level for the pooled t-test of difference in means

**Indicates significance at the 5% level for the pooled t-test of difference in means

*** Indicates significance at the 1% level for the pooled t-test of difference in means

***Source*:** The BPCI Advanced evaluation team's analysis of the Area Health Resource File (AHRF) from 2013 to 2017, CMS Provider of Service (POS) files from 2013 to 2017, CMS Inpatient Prospective Payment System (IPPS) files from 2013 to 2017, Part A Medicare claims from 2013 to 2017, and the CMS BPCI Advanced Database as of January 1, 2020.

Exhibit E.3: Number of BPCI and BPCI Advanced Hospital EIs



Note: BPCI hospital EIs participated in Model 2 or 4 for at least one calendar quarter of BPCI. BPCI hospital EIs are limited to those that were also eligible for BPCI Advanced (7 hospital EIs were not eligible for BPCI Advanced and excluded from these counts). EIs = episode initiators.

Source: The BPCI Advanced evaluation team's analysis of the CMS BPCI Database and CMS BPCI Advanced Database as of January 1, 2020

Exhibit E.4a: Characteristics of BPCI Advanced Hospital EIs in Model Year 3, BPCI Hospital EIs, and All Eligible Hospitals

Domain	Characteristic	BPCI Advanced Hospital EIs (N=1,010)	BPCI Hospital EIs (N=436)	All Eligible Hospitals (N=3,248)
Census Region	Midwest	24%	20%	23%
	Northeast	15%	25%	15%
	South	40%	34%	41%
	West	20%	20%	19%
	Puerto Rico	0%	0%	2%
Urban/Rural	Urban	89%	95%	77%
	Rural	11%	5%	23%
Ownership	For Profit	25%	19%	24%
	Government	6%	5%	16%
	Non-Profit	69%	76%	60%
Academic Medical Center	Yes	5%	9%	4%
Part of Health System	Yes	95%	97%	76%
Participation in MSSP, Next Gen, or Pioneer ACO Programs	Yes	9%	15%	7%

Note: Data from 1,010 BPCI Advanced hospital EIs, 436 BPCI Hospital EIs, and 3,248 eligible hospitals. **Appendix C** contains the BPCI Advanced hospital eligibility criteria and variable definitions. Values for categorical variables were for the most recent year between 2013 and 2017 that data was available. BPCI Hospital EIs participated in Model 2 or 4 for at least one calendar quarter of BPCI. BPCI hospital EIs were limited to those that were also eligible for BPCI Advanced (7 BPCI hospitals were not eligible for BPCI Advanced and excluded from these counts). Market characteristics were calculated for the Core-Based Statistical Area (CBSA) in which the hospital is located. ACO = Accountable Care Organization; EIs = episode initiators; MSSP = Medicare Shared Savings Program.

Source: The BPCI Advanced evaluation team's analysis of the 2016 Agency for Healthcare Research and Quality (AHRQ) Hospital Linkage File, Area Health Resource File (AHRF) from 2013 to 2017, CMS Provider of Service (POS) files from 2013 to 2017, CMS Inpatient Prospective Payment System (IPPS) files from 2013 to 2017, 2020 Master Data Management (MDM) provider file, CMS BPCI Database, and the CMS BPCI Advanced Database as of January 1, 2020.

Exhibit E.4b: Characteristics of BPCI Advanced Hospital EIs in Model Year 3, BPCI Hospital EIs, and All Eligible Hospitals,

Characteristic	BPCI Advanced Hospital EIs (mean)	BPCI Hospital EIs (mean)	All Eligible Hospitals (mean)
Bed Count	324	379	241
Resident to Bed Ratio	0.08	0.12	0.06
Medicare Days Percent	40%	39%	44%
Disproportionate Share Percent	29%	28%	28%
Total Discharges for BPCI Advanced Episode MS-DRGs	2,223	2,669	1,538
Total Procedures for BPCI Advanced Episode HCPCS Codes	113	141	76
Market Population	3,725,432	3,923,224	2,904,735
Per Capita Personal Income	$46,417	$47,944	$45,285
SNF beds per 10,000	51	51	55
Medicare Advantage Penetration	32%	31%	31%
Hospital Market Share for BPCI Advanced MS-DRGs & HCPCS	21%	20%	25%
Herfindahl Index	0.23	0.21	0.32

Note: Data from 1,010 BPCI Advanced hospital EIs, 436 BPCI Hospital EIs, and 3,248 eligible hospitals. **Appendix C** contains the BPCI Advanced hospital eligibility criteria and hospital characteristic definitions. **Appendix B** contains the MS-DRGs and HCPCS codes that trigger each BPCI Advanced clinical episode. Unless otherwise specified, values for numeric variables were averaged for all years between 2013 and 2017 that data was available. Market characteristics were calculated for the Core-Based Statistical Area (CBSA) in which the hospital is located. BPCI Hospital EIs participated in Model 2 or 4 for at least one calendar quarter of BPCI. EIs = episode initiators; HCPCS = Healthcare Common Procedure Coding System; MS-DRGs = Medicare Severity-Diagnosis Related Groups; SNF = skilled nursing facility.

Source: The BPCI Advanced evaluation team's analysis of the Area Health Resource File (AHRF) from 2013 to 2017, CMS Provider of Service (POS) files from 2013 to 2017, CMS Inpatient Prospective Payment System (IPPS) files from 2013 to 2017, Part A Medicare claims from 2013 to 2017, and the CMS BPCI Advanced Database as of January 1, 2020.

Exhibit E.5: Characteristics of BPCI Advanced Hospital EIs in Model Year 3, BPCI Hospital EIs, and Non-participating Hospitals

Domain	Characteristic	BPCI Advanced Hospital EIs (N = 1,010)	BPCI Advanced Hospital EIs (%)	Non-participating Hospitals (N = 2,238)	Non-participating Hospitals (%)	Chi-Square	P-value
Census Region	Midwest	245	24%	499	22%	25.5	<0.01
	Northeast	151	15%	337	15%		
	South	408	40%	939	42%		
	West	206	20%	413	18%		
	Puerto Rico	0	0%	50	2%		
Urban/Rural	Urban	902	89%	1,583	71%	133.6	<0.01
	Rural	108	11%	655	29%		
Ownership	For Profit	256	25%	529	24%	103.4	<0.01
	Government	62	6%	448	20%		
	Non-Profit	692	69%	1,261	56%		
Academic Medical Center	Yes	54	5%	78	3%	6.2	0.01
Part of Health System	Yes	957	95%	1,498	67%	291.8	<0.01
Experience in BPCI	Yes	269	27%	167	7%	220.1	<0.01
Participation in MSSP, Next Gen, or Pioneer ACO Initiatives	Yes	87	9%	134	6%	7.6	<0.01

Note: Data from 1,010 BPCI Advanced hospital EIs and 2,238 non-participating hospitals. **Appendix C** contains the BPCI Advanced hospital eligibility criteria and definitions of each hospital characteristic. Values for categorical variables wee for the most recent year between 2013 and 2017 that data was available. Market characteristics were calculated for the Core Based Statistical Area (CBSA) in which the hospital is located. ACO = Accountable Care Organization; EIs = episode initiators; MSSP = Medicare Shared Savings Program.

***Source*:** The BPCI Advanced evaluation team's analysis of the 2016 Agency for Healthcare Research and Quality (AHRQ) Hospital Linkage File, Area Health Resource File (AHRF) from 2013 to 2017, CMS Provider of Service (POS) files from 2013 to 2017, CMS Inpatient Prospective Payment System (IPPS) files from 2013 to 2017, 2020 Master Data Management (MDM) provider file, CMS BPCI Database, and the CMS BPCI Advanced Database as of January 1, 2020.

Exhibit E.6: Characteristics of BPCI Advanced Hospital EIs in Model Year 3 and Non-participating Hospitals

Characteristic	BPCI Advanced Hospital EIs (mean)	Non-participating Hospitals (mean)	T-statistic	P-value
Bed Count	324	204	-13.8	<0.01
Resident-to-bed Ratio	0.08	0.06	-4.0	<0.01
Medicare Days Percent	40%	46%	6.2	<0.01
Disproportionate Share Percent	29%	28%	-0.4	0.72
Total Discharges for BPCI Advanced Clinical Episode MS-DRGs	2,223	1,228	-18.3	<0.01
Total Procedures for BPCI Advanced Clinical Episode HCPCS	113	59	-11.6	<0.01
Market Population	3,725,432	2,534,358	-7.0	<0.01
Per Capita Personal Income	$46,417	$44,762	-4.5	<0.01
SNF beds per 10,000	51	56	4.9	<0.01
Medicare Advantage Penetration	32%	31%	-2.5	0.01
Hospital Market Share for BPCI Advanced MS-DRGs and HCPCS	21%	27%	4.1	<0.01
Herfindahl Index	0.23	0.36	10.3	<0.01

Note: Data from 1,010 BPCI Advanced hospital EIs and 2,238 non-participating hospitals. **Appendix C** contains the BPCI Advanced hospital eligibility criteria and variable definitions. **Appendix B** contains the MS-DRGs and HCPCS that trigger each BPCI Advanced clinical episode. Unless otherwise specified, values for numeric variables were averaged for all years between 2013 and 2017 that data was available. Market characteristics were calculated for the Core-Based Statistical Area (CBSA) in which the hospital is located. EIs = episode initiators; HCPCS = Healthcare Common Procedure Coding System; MS-DRGs = Medicare Severity-Diagnosis Related Groups; SNF = skilled nursing facility.

***Source*:** The BPCI Advanced evaluation team's analysis of the Area Health Resource File (AHRF) from 2013 to 2017, CMS Provider of Service (POS) files from 2013 to 2017, CMS Inpatient Prospective Payment System (IPPS) files from 2013 to 2017, Part A Medicare claims from 2013 to 2017, and the CMS BPCI Advanced Database as of January 1, 2020.

Exhibit E.7: Characteristics of BPCI Advanced Hospital EIs, by Cohort, Model Year 3

Domain	Characteristic	First Cohort (N = 641)	First Cohort (%)	Second Cohort (N = 369)	Second Cohort (%)	Chi-Square	P-value
Census Region	Midwest	155	24%	90	24%	24.2	<0.01
	Northeast	121	19%	30	8%		
	South	235	37%	173	47%		
	West	130	20%	76	21%		
Urban/Rural	Urban	579	90%	323	88%	1.9	0.17
	Rural	62	10%	46	12%		
Ownership	For Profit	174	27%	82	22%	12.9	<0.01
	Government	27	4%	35	9%		
	Non-Profit	440	69%	252	68%		
Academic Medical Center	Yes	40	6%	14	4%	2.8	0.10
Part of Health System	Yes	616	96%	341	92%	6.4	0.01
Experience in BPCI	Yes	205	32%	64	17%	25.7	<0.01
Participation in MSSP, Next Gen, or Pioneer ACO Initiatives	Yes	67	10%	20	5%	7.5	<0.01

Note: Data from 641 BPCI Advanced hospital EIs that joined the model on October 1, 2018 (first cohort) and 369 BPCI Advanced hospital EIs that joined the model on January 1, 2020 (second cohort). **Appendix C** contains the BPCI Advanced hospital eligibility criteria and definitions of each hospital characteristic. Values for categorical variables were for the most recent year between 2013 and 2017 that data was available. Market characteristics were calculated for the Core Based Statistical Area (CBSA) in which the hospital is located. ACO = Accountable Care Organization; EIs = episode initiators; MSSP = Medicare Shared Savings Program.

***Source*:** The BPCI Advanced evaluation team's analysis of the 2016 Agency for Healthcare Research and Quality (AHRQ) Hospital Linkage File, Area Health Resource File (AHRF) from 2013 to 2017, CMS Provider of Service (POS) files from 2013 to 2017, CMS Inpatient Prospective Payment System (IPPS) files from 2013 to 2017, 2020 Master Data Management (MDM) provider file, CMS BPCI Database, and the CMS BPCI Advanced Database as of January 1, 2020.

Exhibit E.8: Characteristics of BPCI Advanced Hospital EIs, by Cohort, in Model Year 3

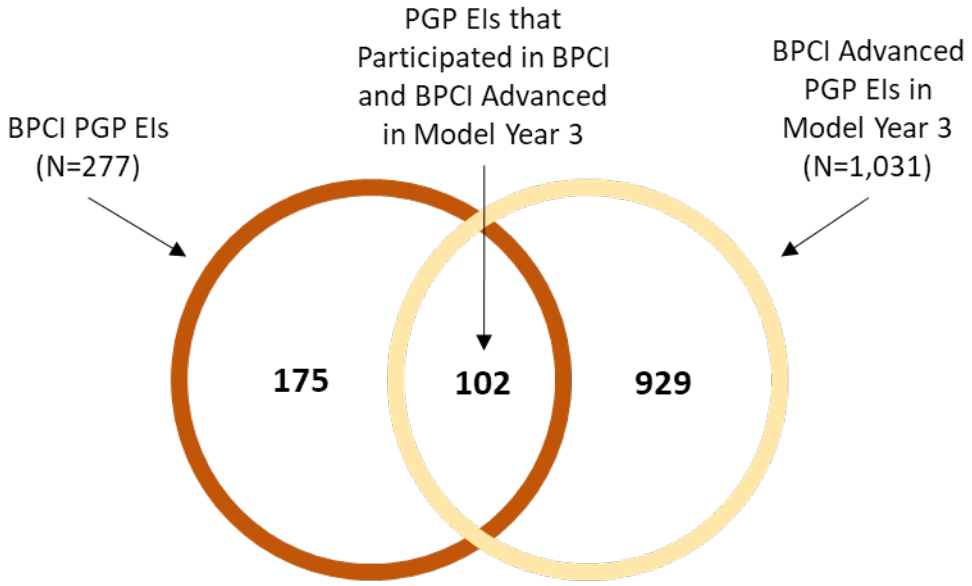
Characteristic	First Cohort (mean)	Second Cohort (mean)	T-statistic	P-value
Bed Count	324	204	-4.0	<0.01
Resident-to-bed Ratio	0.08	0.06	-3.3	<0.01
Medicare Days Percent	40%	46%	0.9	0.35
Disproportionate Share Percent	29%	28%	-2.8	<0.01
Total Discharges for BPCI Advanced Clinical Episode MS-DRGs	2,223	1,228	-4.0	<0.01
Total Procedures for BPCI Advanced Clinical Episode HCPCS	113	59	-2.5	0.01
Market Population	3,725,432	2,534,358	-3.0	<0.01
Per Capita Personal Income	$46,417	$44,762	-1.9	0.06
SNF beds per 10,000	51	56	-0.8	0.42
Medicare Advantage Penetration	32%	31%	0.2	0.85
Hospital Market Share for BPCI Advanced MS-DRGs and HCPCS	21%	27%	1.3	0.18
Herfindahl Index	0.23	0.36	2.4	0.02

Note: Data from 641 BPCI Advanced hospital EIs that joined the model on October 1, 2018 (first cohort) and 369 BPCI Advanced hospital EIs that joined the model on January 1, 2020 (second cohort). **Appendix C** contains the BPCI Advanced hospital eligibility criteria and definitions of each hospital characteristic. Values for categorical variables were for the most recent year between 2013 and 2017 that data was available. Market characteristics were calculated for the Core Based Statistical Area (CBSA) in which the hospital is located. EIs = episode initiators; HCPCS = Healthcare Common Procedure Coding System; MS-DRGs = Medicare Severity-Diagnosis Related Groups; SNF = skilled nursing facility.

***Source*:** The BPCI Advanced evaluation team's analysis of the Area Health Resource File (AHRF) from 2013 to 2017, CMS Provider of Service (POS) files from 2013 to 2017, CMS Inpatient Prospective Payment System (IPPS) files from 2013 to 2017, Part A Medicare claims from 2013 to 2017, and the CMS BPCI Advanced Database as of January 1, 2020.

C. Participating PGP Results

Exhibit E.9: BPCI and BPCI Advanced PGP EIs



Note: Each PGP is identified by a unique TIN. Therefore, we can only identify overlap between BPCI Advanced and BPCI if the PGP was participating under the same TIN. EIs = episode initiators; TIN = Taxpayer Identification Number; PGP = physician group practice.

Source: The BPCI Advanced evaluation team's analysis of the CMS BPCI Database and CMS BPCI Advanced Database as of January 1, 2020.

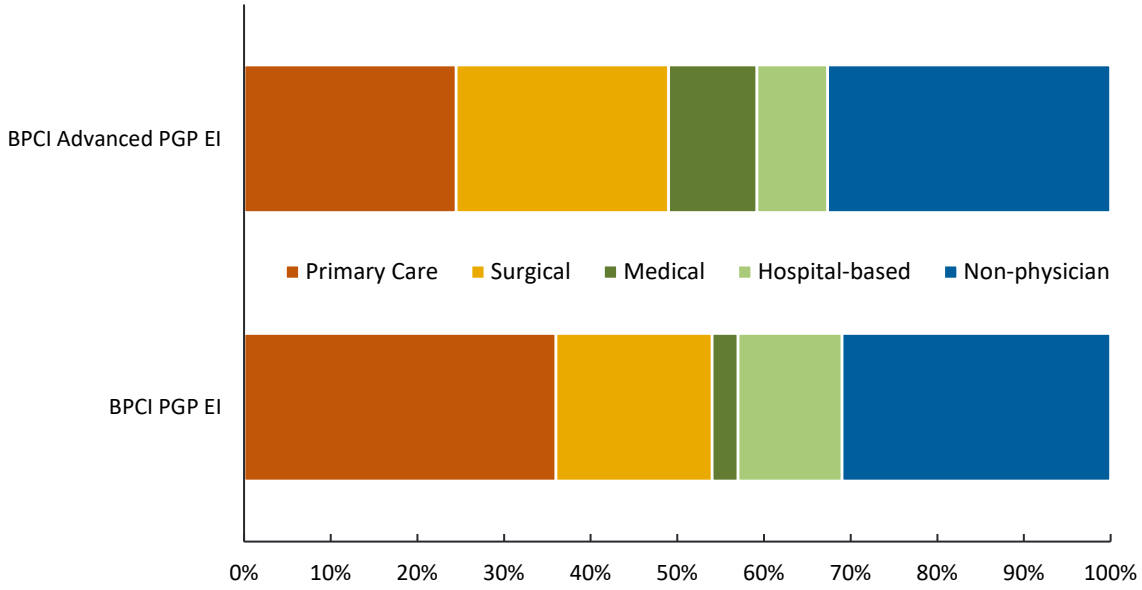
Exhibit E.10: Characteristics of BPCI Advanced and BPCI PGP EIs, Model Year 3

Characteristic	Statistic	BPCI Advanced PGP EIs (N = 545)	BPCI PGP EIs (N = 277)
Number of unique clinicians associated with the PGP EI	Mean	108	91
	25th percentile	11	9
	Median	31	38
	75th percentile	77	96
Annual discharges for BPCI Advanced MS-DRGs	Mean	1,253	1,618
	25th percentile	134	36
	Median	550	697
	75th percentile	1,236	1,821
Annual procedures for BPCI Advanced HCPCS codes	Mean	44	28
	25th percentile	0	0
	Median	5	2
	75th percentile	31	19
Number of hospitals where PGP EIs had discharges/procedures that map to one of the BPCI Advanced inpatient/ outpatient clinical episodes	Mean	4	5
	25th percentile	1	1
	Median	3	2
	75th percentile	5	5

Note: While there were 1,031 BPCI Advanced PGP EIs, only 545 PGPs existed in the baseline period. Three PGP TINs had no 2017 Medicare FFS claims; their values for all measures in this exhibit were zero. While major joint replacement of the lower extremity is both an inpatient and outpatient clinical episode as of January 1, 2020, there were no outpatient procedures during the baseline period (2013-2017). EIs = episode initiators; TIN = Taxpayer Identification Number; PGP = physician group practice; MS-DRGs = Medicare Severity-Diagnosis Related Groups; HCPCS = Healthcare Common Procedure Coding System. Annual discharges and procedures required the attending or operating National Provider Identifier (NPI) to have submitted a carrier claim under the BPCI Advanced TIN for services during the anchor stay or procedure.

Source: BPCI Advanced evaluation team's analysis of 2017 Medicare FFS Claims and the CMS BPCI and BPCI Advanced databases, as of January 1, 2020.

Exhibit E.11: Mean Distribution of Clinician Specialty among BPCI Advanced PGP EIs in Model Year 3, and BPCI PGP EIs



Note: While there were 1,031 BPCI Advanced PGP EIs, only 545 PGPs existed in the baseline period. Three PGP TINs had no 2017 Medicare FFS claims; their values for all measures in this exhibit were zero. This graph represents the distribution of clinicians for 542 BPCI Advanced PGP EIs in Model Year 3 and 237 BPCI PGP EIs identified in the 2017 Part B claims. Other physician, Ob-Gyn, and psychiatry were not included in the graph and represent 2% of the average BPCI Advanced and 1% of the average BPCI PGP EI's clinicians. For more details on the specialty categories see Appendix C. EI = episode initiator; PGP = physician group practice.

***Source*:** BPCI Advanced evaluation team's analysis 2017 Medicare Part B claims, the CMS BPCI and BPCI Advanced database as of January 1, 2020, and the Medicare Data on Provider Practice and Specialty (MD-PPAS) User Documentation version 2.3.

Appendix F: Comparison Group Standardized Difference Tables

Exhibit F.1: Standardized Differences Before and After Matching, Hospitals, Acute Myocardial Infarction

Variable	Standardized Difference Before Matching	Standardized Difference After Matching
Ownership - Non-Profit*	0.02	0.01
Ownership - For Profit*	0.24	0
Ownership - Government	-0.38	-0.02
Urban*	0.46	0.07
Rural	-0.46	-0.07
Midwest	0.17	0.25
Northeast	0.00	-0.05
South	-0.21	-0.36
West	0.06	0.22
Part of a Health System*	0.43	0.05
Bed Count – Continuous*	0.26	0.10
Bed Count - 0 to 99	-0.33	-0.15
Bed Count - 100 to 249	-0.28	-0.13
Bed Count - 250+	0.46	0.19
Occupancy Rate	0.32	0.02
Resident-Bed Ratio*	0.14	0.03
Population – Continuous*	0.28	0.07
Median Household Income*	0.21	0.13
Medicare Days Percent (%)*	-0.17	-0.01
DSH Patient Percent (%)*	0.04	0.04
Average Case Weight of Discharges*	0.27	0.03
Teaching Status	-0.03	-0.11
Medicare Advantage Penetration (%)*	0.12	0.03
Primary Care Providers per 10,000 in Market*	-0.04	0.12
SNF Beds per 10,000 in Market*	-0.13	-0.08
Specialists per 10,000 in Market	0.19	0.11
Medicare Beneficiaries Per 10,000	-0.36	-0.22
IRF in Market*	0.48	0.12
Hospital Market Share*	-0.44	-0.07
Herfindahl Index*	-0.52	-0.07
Episode Volume (ep)*	0.33	0.03
Efficiency Measure*	0.46	0.01
Standardized Part A and B Payment – Average*	0.47	-0.01
Standardized Part A and B Payment – Change*	-0.22	-0.09
Institutional PAC – Average*	0.22	0.06

Variable	Standardized Difference Before Matching	Standardized Difference After Matching
Institutional PAC – Slope*	-0.12	-0.11
First PAC Use - Average - None	-0.29	0.02
First PAC - Change - None	0.16	0.15
First PAC Use - Average - IRF	0.18	-0.04
First PAC - Change - IRF	-0.09	0.02
First PAC Use - Average - SNF	0.11	0.08
First PAC - Change - SNF	-0.07	-0.13
First PAC Use - Average - LTCH	0.21	0.00
First PAC - Change - LTCH	-0.06	0.07
First PAC Use - Average - Home Health	0.17	-0.11
First PAC - Change - Home Health	-0.07	-0.06
Institutional Days - Average	0.18	-0.01
Institutional Days - Change	-0.20	-0.20
SNF Days - Average	0.11	-0.02
SNF Days - Change	-0.18	-0.22
Home Health Days - Average	0.27	-0.03
Home Health Days - Change	-0.15	-0.12
Readmission Rate 30-Day – Average*	0.14	-0.03
Readmission Rate 30-Day – Change*	0.01	-0.06
Readmission Rate 90-Day – Average	0.26	0.04
Readmission Rate 90-Day – Change	-0.02	-0.04
Mortality Rate 30-Day – Average*	-0.07	-0.06
Mortality Rate 30-Day – Change*	-0.05	0.07
Mortality Rate 90-Day - Average	-0.05	-0.09
Mortality Rate 90-Day - Change	-0.12	0.00
Emergency Department Rate 30-Day – Average*	-0.34	-0.13
Emergency Department Rate 30-Day – Change*	-0.12	-0.01
Emergency Department Rate 90-Day - Average	-0.41	-0.24
Emergency Department Rate 90-Day - Change	-0.20	-0.03
Service Indicator - Surgical - Intensive Care Unit	0.20	0.11
Service Indicator - Intensive Care Unit	-0.03	0.03
Service Indicator - Coronary Care	0.16	0.05
Percent of Hospital Discharges in BPCI Advanced Clinical Episodes	-0.40	-0.05
Number of Total Discharges	0.33	0.08
Number of Total Discharges - 29 Inpatient Clinical Episodes	0.30	0.07
Number of Procedures - 3 Outpatient Clinical Episodes	0.14	-0.07
Clinical Episode Community Share - Surgical: Ortho Excluding Spine	-0.04	0.00
Clinical Episode Community Share - Surgical, Non-surgical: Cardiovascular	0.04	0.00
Clinical Episode Community Share - Surgical: Other	-0.01	-0.01

Variable	Standardized Difference Before Matching	Standardized Difference After Matching
Clinical Episode Community Share - Non-surgical Other	-0.04	0.04

Note: DSH = disproportionate share hospital; SNF = skilled nursing facility; IRF = inpatient rehabilitation facility; PAC = post-acute care.
* Indicates variables that were used to match on.

Exhibit F.2: Standardized Differences Before and After Matching, Hospitals, Cardiac Arrhythmia

Variable	Standardized Difference Before Matching	Standardized Difference After Matching
Ownership - Non-Profit*	-0.06	-0.03
Ownership - For Profit*	0.37	0.06
Ownership - Government	-0.39	-0.05
Urban*	0.58	-0.01
Rural	-0.58	0.01
Midwest	-0.13	0.01
Northeast	-0.11	-0.02
South	0.14	-0.04
West	0.09	0.06
Part of a Health System*	0.58	0.10
Bed Count – Continuous*	0.34	-0.06
Bed Count - 0 to 99	-0.50	-0.11
Bed Count - 100 to 249	-0.14	0.10
Bed Count - 250+	0.49	-0.03
Occupancy Rate	0.47	0.07
Resident-Bed Ratio*	-0.02	-0.04
Population – Continuous*	0.32	0.02
Median Household Income*	0.14	0.01
Medicare Days Percent (%)*	-0.20	0.00
DSH Patient Percent (%)*	0.09	0.03
Average Case Weight of Discharges*	0.37	-0.06
Teaching Status	-0.19	-0.22
Medicare Advantage Penetration (%)*	0.21	0.11
Primary Care Providers per 10,000 in Market*	-0.12	0.03
SNF Beds per 10,000 in Market*	-0.32	-0.03
Specialists per 10,000 in Market	0.20	0.03
Medicare Beneficiaries Per 10,000	-0.40	-0.05
IRF in Market*	0.57	0.04
Hospital Market Share*	-0.41	0.02
Herfindahl Index*	-0.54	0.01
Episode Volume (ep)*	0.36	-0.04

Variable	Standardized Difference Before Matching	Standardized Difference After Matching
Efficiency Measure*	0.44	0.05
Standardized Part A and B Payment – Average*	0.50	0.03
Standardized Part A and B Payment – Change*	-0.22	0.02
Institutional PAC – Average*	0.21	0.04
Institutional PAC – Slope*	-0.08	-0.06
First PAC Use - Average - None	-0.38	-0.19
First PAC - Change - None	0.11	0.03
First PAC Use - Average - IRF	0.29	-0.05
First PAC - Change - IRF	0.03	0.01
First PAC Use - Average - SNF	0.07	0.05
First PAC - Change - SNF	-0.09	-0.07
First PAC Use - Average - LTCH	0.17	0.10
First PAC - Change - LTCH	-0.03	-0.02
First PAC Use - Average - Home Health	0.31	0.22
First PAC - Change - Home Health	-0.08	0.00
Institutional Days - Average	0.13	-0.07
Institutional Days - Change	-0.20	-0.04
SNF Days - Average	0.06	-0.07
SNF Days - Change	-0.21	-0.06
Home Health Days - Average	0.40	0.24
Home Health Days - Change	-0.11	-0.12
Readmission Rate 30-Day – Average*	-0.07	0.12
Readmission Rate 30-Day – Change*	-0.10	0.01
Readmission Rate 90-Day – Average	0.03	0.07
Readmission Rate 90-Day – Change	-0.13	0.02
Mortality Rate 30-Day – Average*	-0.04	0.01
Mortality Rate 30-Day – Change*	-0.06	-0.06
Mortality Rate 90-Day - Average	-0.07	-0.06
Mortality Rate 90-Day - Change	-0.12	-0.06
Emergency Department Rate 30-Day – Average*	-0.56	-0.04
Emergency Department Rate 30-Day – Change*	-0.02	0.02
Emergency Department Rate 90-Day - Average	-0.55	-0.05
Emergency Department Rate 90-Day - Change	-0.09	-0.03
Service Indicator - Surgical - Intensive Care Unit	0.12	-0.05
Service Indicator - Intensive Care Unit	0.09	0.02
Service Indicator - Coronary Care	0.25	0.03
Percent of Hospital Discharges in BPCI Advanced Clinical Episodes	-0.45	-0.01
Number of Total Discharges	0.38	-0.07
Number of Total Discharges - 29 Inpatient Clinical Episodes	0.39	-0.07

Variable	Standardized Difference Before Matching	Standardized Difference After Matching
Number of Procedures - 3 Outpatient Clinical Episodes	0.20	-0.18
Clinical Episode Community Share - Surgical: Ortho Excluding Spine	-0.04	-0.02
Clinical Episode Community Share - Surgical, Non-surgical: Cardiovascular	0.05	0.00
Clinical Episode Community Share - Surgical: Other	0.01	-0.02
Clinical Episode Community Share - Non-surgical Other	-0.11	0.13

Note: DSH = disproportionate share hospital; SNF = skilled nursing facility; IRF = inpatient rehabilitation facility; PAC = post-acute care.
* Indicates variables that were used to match on.

Exhibit F.3: Standardized Differences Before and After Matching, Hospitals, Chronic Obstructive Pulmonary Disease, Bronchitis, Asthma

Variable	Standardized Difference Before Matching	Standardized Difference After Matching
Ownership - Non-Profit*	0.07	-0.03
Ownership - For Profit*	0.27	0.01
Ownership - Government	-0.42	0.04
Urban*	0.46	0.01
Rural	-0.46	-0.01
Midwest	-0.11	0
Northeast	0.05	0.02
South	0.05	-0.03
West	0.00	0.01
Part of a Health System*	0.62	-0.02
Bed Count – Continuous*	0.41	-0.06
Bed Count - 0 to 99	-0.64	-0.18
Bed Count - 100 to 249	0.03	0.12
Bed Count - 250+	0.48	0
Occupancy Rate	0.61	0.13
Resident-Bed Ratio*	0.09	-0.06
Population – Continuous*	0.38	0.04
Median Household Income*	0.23	0.09
Medicare Days Percent (%)*	-0.20	0.05
DSH Patient Percent (%)*	0.07	0.03
Average Case Weight of Discharges*	0.43	-0.09
Teaching Status	-0.02	-0.15
Medicare Advantage Penetration (%)*	0.19	0.13
Primary Care Providers per 10,000 in Market*	0.02	0.06
SNF Beds per 10,000 in Market*	-0.19	-0.01
Specialists per 10,000 in Market	0.32	0.12
Medicare Beneficiaries Per 10,000	-0.16	0.05

Variable	Standardized Difference Before Matching	Standardized Difference After Matching
IRF in Market*	0.53	0.02
Hospital Market Share*	-0.30	-0.06
Herfindahl Index*	-0.46	-0.04
Episode Volume (ep)*	0.55	-0.09
Efficiency Measure*	0.64	0.12
Standardized Part A and B Payment – Average*	0.76	0.13
Standardized Part A and B Payment – Change*	-0.18	0.01
Institutional PAC – Average*	0.35	0.16
Institutional PAC – Slope*	-0.02	0.01
First PAC Use - Average - None	-0.52	-0.22
First PAC - Change - None	0.15	0.07
First PAC Use - Average - IRF	0.23	0.00
First PAC - Change - IRF	-0.05	-0.07
First PAC Use - Average - SNF	0.22	0.18
First PAC - Change - SNF	0.00	0.03
First PAC Use - Average - LTCH	0.29	-0.01
First PAC - Change - LTCH	-0.03	0.00
First PAC Use - Average - Home Health	0.34	0.14
First PAC - Change - Home Health	-0.18	-0.12
Institutional Days - Average	0.33	0.08
Institutional Days - Change	-0.14	-0.16
SNF Days - Average	0.25	0.08
SNF Days - Change	-0.14	-0.17
Home Health Days - Average	0.34	0.13
Home Health Days - Change	-0.13	0.00
Readmission Rate 30-Day – Average*	0.40	-0.02
Readmission Rate 30-Day – Change*	-0.18	0.02
Readmission Rate 90-Day – Average	0.46	0.04
Readmission Rate 90-Day – Change	-0.12	0.07
Mortality Rate 30-Day – Average*	-0.02	0.00
Mortality Rate 30-Day – Change*	-0.04	0.03
Mortality Rate 90-Day - Average	0.02	-0.02
Mortality Rate 90-Day - Change	-0.04	0.12
Emergency Department Rate 30-Day – Average*	-0.44	-0.08
Emergency Department Rate 30-Day – Change*	-0.06	0.03
Emergency Department Rate 90-Day - Average	-0.47	-0.14
Emergency Department Rate 90-Day - Change	-0.03	0.02
Service Indicator - Surgical - Intensive Care Unit	0.11	-0.15
Service Indicator - Intensive Care Unit	0.34	0.19

Variable	Standardized Difference Before Matching	Standardized Difference After Matching
Service Indicator - Coronary Care	0.25	0.02
Percent of Hospital Discharges in BPCI Advanced Clinical Episodes	-0.37	0.03
Number of Total Discharges	0.46	-0.15
Number of Total Discharges - 29 Inpatient Clinical Episodes	0.45	-0.17
Number of Procedures - 3 Outpatient Clinical Episodes	0.19	-0.26
Clinical Episode Community Share - Surgical: Ortho Excluding Spine	-0.02	-0.02
Clinical Episode Community Share - Surgical, Non-surgical: Cardiovascular	0.07	0.02
Clinical Episode Community Share - Surgical: Other	0.01	-0.04
Clinical Episode Community Share - Non-surgical Other	-0.24	0.08

Note: DSH = disproportionate share hospital; SNF = skilled nursing facility; IRF = inpatient rehabilitation facility; PAC = post-acute care.
* Indicates variables that were used to match on.

Exhibit F.4: Standardized Differences Before and After Matching, Hospitals, Congestive Heart Failure

Variable	Standardized Difference Before Matching	Standardized Difference After Matching
Ownership - Non-Profit*	0.07	-0.08
Ownership - For Profit*	0.29	0.09
Ownership - Government	-0.46	-0.03
Urban*	0.60	0.05
Rural	-0.60	-0.05
Midwest	-0.03	0.10
Northeast	0.04	-0.10
South	-0.05	-0.05
West	0.07	0.06
Part of a Health System*	0.63	0.05
Bed Count – Continuous*	0.39	-0.04
Bed Count - 0 to 99	-0.55	-0.07
Bed Count - 100 to 249	-0.02	-0.04
Bed Count - 250+	0.47	0.08
Occupancy Rate	0.56	0.02
Resident-Bed Ratio*	0.13	0.04
Population – Continuous*	0.38	0.01
Median Household Income*	0.27	-0.01
Medicare Days Percent (%)*	-0.25	-0.06
DSH Patient Percent (%)*	0.02	0.07
Average Case Weight of Discharges*	0.49	0.03
Teaching Status	0.08	0.04
Medicare Advantage Penetration (%)*	0.18	0.00

Variable	Standardized Difference Before Matching	Standardized Difference After Matching
Primary Care Providers per 10,000 in Market*	0.03	0.05
SNF Beds per 10,000 in Market*	-0.25	-0.03
Specialists per 10,000 in Market	0.29	0.03
Medicare Beneficiaries Per 10,000	-0.33	0.01
IRF in Market*	0.52	-0.01
Hospital Market Share*	-0.40	-0.01
Herfindahl Index*	-0.56	0.01
Episode Volume (ep)*	0.50	-0.09
Efficiency Measure*	0.43	0.03
Standardized Part A and B Payment – Average*	0.75	0.05
Standardized Part A and B Payment – Change*	-0.19	-0.04
Institutional PAC – Average*	0.22	-0.03
Institutional PAC – Slope*	-0.10	-0.02
First PAC Use - Average - None	-0.44	-0.10
First PAC - Change - None	0.05	-0.04
First PAC Use - Average - IRF	0.28	-0.03
First PAC - Change - IRF	-0.10	-0.06
First PAC Use - Average - SNF	0.04	0.00
First PAC - Change - SNF	-0.06	0.00
First PAC Use - Average - LTCH	0.25	-0.05
First PAC - Change - LTCH	-0.04	0.01
First PAC Use - Average - Home Health	0.31	0.13
First PAC - Change - Home Health	0.03	0.08
Institutional Days - Average	0.16	-0.04
Institutional Days - Change	-0.17	-0.05
SNF Days - Average	0.05	-0.04
SNF Days - Change	-0.14	-0.05
Home Health Days - Average	0.36	0.18
Home Health Days - Change	0.00	0.05
Readmission Rate 30-Day – Average*	0.20	0.05
Readmission Rate 30-Day – Change*	-0.03	-0.03
Readmission Rate 90-Day – Average	0.29	0.06
Readmission Rate 90-Day – Change	-0.04	0.00
Mortality Rate 30-Day – Average*	0.02	-0.03
Mortality Rate 30-Day – Change*	0.02	0.01
Mortality Rate 90-Day - Average	-0.05	-0.06
Mortality Rate 90-Day - Change	-0.12	-0.06
Emergency Department Rate 30-Day – Average*	-0.64	-0.01
Emergency Department Rate 30-Day – Change*	-0.06	0.06

Variable	Standardized Difference Before Matching	Standardized Difference After Matching
Emergency Department Rate 90-Day - Average	-0.64	-0.04
Emergency Department Rate 90-Day - Change	-0.12	-0.05
Service Indicator - Surgical - Intensive Care Unit	0.16	-0.03
Service Indicator - Intensive Care Unit	0.25	0.06
Service Indicator - Coronary Care	0.28	-0.01
Percent of Hospital Discharges in BPCI Advanced Clinical Episodes	-0.44	-0.06
Number of Total Discharges	0.45	-0.09
Number of Total Discharges - 29 Inpatient Clinical Episodes	0.46	-0.09
Number of Procedures - 3 Outpatient Clinical Episodes	0.22	-0.16
Clinical Episode Community Share - Surgical: Ortho Excluding Spine	0.00	0.02
Clinical Episode Community Share - Surgical, Non-surgical: Cardiovascular	0.06	0.01
Clinical Episode Community Share - Surgical: Other	0.03	-0.01
Clinical Episode Community Share - Non-surgical Other	-0.29	-0.07

Note: DSH = disproportionate share hospital; SNF = skilled nursing facility; IRF = inpatient rehabilitation facility; PAC = post-acute care.
* Indicates variables that were used to match on.

Exhibit F.5: Standardized Differences Before and After Matching, Hospitals, Gastrointestinal Hemorrhage

Variable	Standardized Difference Before Matching	Standardized Difference After Matching
Ownership - Non-Profit*	-0.06	0.02
Ownership - For Profit*	0.36	0
Ownership - Government	-0.36	-0.03
Urban*	0.50	0
Rural	-0.50	0
Midwest	-0.10	-0.02
Northeast	-0.03	-0.08
South	0.08	0.08
West	0.04	0
Part of a Health System*	0.46	0.18
Bed Count – Continuous*	0.32	0.05
Bed Count - 0 to 99	-0.49	-0.10
Bed Count - 100 to 249	-0.13	-0.02
Bed Count - 250+	0.47	0.07
Occupancy Rate	0.48	0.14
Resident-Bed Ratio*	0.17	0.11
Population – Continuous*	0.45	-0.02
Median Household Income*	0.24	-0.07
Medicare Days Percent (%)*	-0.23	-0.09

Variable	Standardized Difference Before Matching	Standardized Difference After Matching
DSH Patient Percent (%)*	0.12	0.02
Average Case Weight of Discharges*	0.35	0.09
Teaching Status	-0.05	0.08
Medicare Advantage Penetration (%)*	0.14	0.12
Primary Care Providers per 10,000 in Market*	-0.02	-0.07
SNF Beds per 10,000 in Market*	-0.27	-0.08
Specialists per 10,000 in Market	0.30	-0.11
Medicare Beneficiaries Per 10,000	-0.33	-0.05
IRF in Market*	0.50	-0.02
Hospital Market Share*	-0.43	0.06
Herfindahl Index*	-0.55	0.03
Episode Volume (ep)*	0.39	-0.12
Efficiency Measure*	0.44	-0.05
Standardized Part A and B Payment – Average*	0.68	0.00
Standardized Part A and B Payment – Change*	0.03	0.03
Institutional PAC – Average*	0.42	-0.05
Institutional PAC – Slope*	0.08	-0.04
First PAC Use - Average - None	-0.59	-0.13
First PAC - Change - None	0.10	0.25
First PAC Use - Average - IRF	0.18	-0.10
First PAC - Change - IRF	0.04	-0.04
First PAC Use - Average - SNF	0.30	-0.01
First PAC - Change - SNF	0.09	0.01
First PAC Use - Average - LTCH	0.28	-0.06
First PAC - Change - LTCH	-0.14	-0.14
First PAC Use - Average - Home Health	0.34	0.20
First PAC - Change - Home Health	-0.24	-0.32
Institutional Days - Average	0.39	-0.09
Institutional Days - Change	0.03	-0.06
SNF Days - Average	0.34	-0.07
SNF Days - Change	0.05	-0.04
Home Health Days - Average	0.44	0.32
Home Health Days - Change	-0.28	-0.42
Readmission Rate 30-Day – Average*	0.35	0.18
Readmission Rate 30-Day – Change*	0.06	-0.10
Readmission Rate 90-Day – Average	0.48	0.15
Readmission Rate 90-Day – Change	0.03	-0.01
Mortality Rate 30-Day – Average*	0.05	0.10
Mortality Rate 30-Day – Change*	0.07	-0.02

Variable	Standardized Difference Before Matching	Standardized Difference After Matching
Mortality Rate 90-Day - Average	0.10	-0.06
Mortality Rate 90-Day - Change	0.09	0.08
Emergency Department Rate 30-Day – Average*	-0.58	0.05
Emergency Department Rate 30-Day – Change*	-0.10	0.02
Emergency Department Rate 90-Day - Average	-0.64	-0.16
Emergency Department Rate 90-Day - Change	-0.20	-0.04
Service Indicator - Surgical - Intensive Care Unit	0.16	0.16
Service Indicator - Intensive Care Unit	0.17	0.21
Service Indicator - Coronary Care	0.16	0
Percent of Hospital Discharges in BPCI Advanced Clinical Episodes	-0.51	-0.27
Number of Total Discharges	0.35	-0.07
Number of Total Discharges - 29 Inpatient Clinical Episodes	0.34	-0.12
Number of Procedures - 3 Outpatient Clinical Episodes	0.19	-0.15
Clinical Episode Community Share - Surgical: Ortho Excluding Spine	-0.07	-0.05
Clinical Episode Community Share - Surgical, Non-surgical: Cardiovascular	0.07	0.05
Clinical Episode Community Share - Surgical: Other	0.02	0.01
Clinical Episode Community Share - Non-surgical Other	-0.10	-0.05

Note: DSH = disproportionate share hospital; SNF = skilled nursing facility; IRF = inpatient rehabilitation facility; PAC = post-acute care.
* Indicates variables that were used to match on.

Exhibit F.6: Standardized Differences Before and After Matching, Hospitals, Hip & Femur Procedures Except Major Joint

Variable	Standardized Difference Before Matching	Standardized Difference After Matching
Ownership - Non-Profit*	-0.08	-0.09
Ownership - For Profit*	0.38	0.05
Ownership - Government	-0.38	0.08
Urban*	0.69	0.08
Rural	-0.69	-0.08
Midwest	-0.19	0.04
Northeast	-0.05	-0.15
South	0.03	-0.02
West	0.21	0.12
Part of a Health System*	0.55	-0.06
Bed Count – Continuous*	0.40	-0.04
Bed Count - 0 to 99	-0.52	-0.25
Bed Count - 100 to 249	-0.13	0.16
Bed Count - 250+	0.47	-0.02
Occupancy Rate	0.50	-0.01

Variable	Standardized Difference Before Matching	Standardized Difference After Matching
Resident-Bed Ratio*	0.07	-0.08
Population – Continuous*	0.43	-0.02
Median Household Income*	0.29	-0.02
Medicare Days Percent (%)*	-0.48	0.03
DSH Patient Percent (%)*	0.06	-0.06
Average Case Weight of Discharges*	0.39	-0.05
Teaching Status	-0.09	-0.13
Medicare Advantage Penetration (%)*	0.41	0.18
Primary Care Providers per 10,000 in Market*	0.03	0.07
SNF Beds per 10,000 in Market*	-0.39	-0.04
Specialists per 10,000 in Market	0.34	0.11
Medicare Beneficiaries Per 10,000	-0.49	-0.12
IRF in Market*	0.74	0.09
Hospital Market Share*	-0.60	-0.10
Herfindahl Index*	-0.71	-0.10
Episode Volume (ep)*	0.45	0.03
Efficiency Measure*	0.47	0.02
Standardized Part A and B Payment – Average*	0.52	0.02
Standardized Part A and B Payment – Change*	-0.33	0.07
Institutional PAC - Average	0.38	0.17
Institutional PAC - Slope	0.00	0.17
First PAC Use - Average – None*	-0.33	-0.02
First PAC - Change – None*	0.02	-0.08
First PAC Use - Average - IRF	0.37	-0.10
First PAC - Change - IRF	-0.05	-0.10
First PAC Use - Average - SNF	-0.26	0.15
First PAC - Change - SNF	0.07	0.21
First PAC Use - Average - LTCH	0.14	-0.10
First PAC - Change - LTCH	-0.10	0.05
First PAC Use - Average - Home Health	-0.24	-0.22
First PAC - Change - Home Health	-0.02	-0.15
Institutional Days - Average	-0.05	0.04
Institutional Days - Change	-0.23	0.08
SNF Days - Average	-0.19	0.08
SNF Days - Change	-0.19	0.09
Home Health Days - Average	0.25	-0.05
Home Health Days - Change	0.05	-0.12
Readmission Rate 30-Day – Average*	0.26	-0.03
Readmission Rate 30-Day – Change*	-0.07	-0.07

Variable	Standardized Difference Before Matching	Standardized Difference After Matching
Readmission Rate 90-Day – Average	0.34	-0.01
Readmission Rate 90-Day – Change	-0.15	-0.07
Mortality Rate 30-Day – Average*	0.18	-0.01
Mortality Rate 30-Day – Change*	-0.07	0.03
Mortality Rate 90-Day – Average	0.18	0.08
Mortality Rate 90-Day – Change	-0.06	0.05
Emergency Department Rate 30-Day – Average*	-0.46	-0.02
Emergency Department Rate 30-Day – Change*	-0.07	-0.13
Emergency Department Rate 90-Day – Average	-0.42	-0.09
Emergency Department Rate 90-Day – Change	-0.17	-0.24
Service Indicator - Surgical - Intensive Care Unit	0.17	-0.12
Service Indicator - Intensive Care Unit	0.08	0.20
Service Indicator - Coronary Care	0.42	0.19
Percent of Hospital Discharges in BPCI Advanced Clinical Episodes	-0.49	0.03
Number of Total Discharges	0.44	-0.03
Number of Total Discharges - 29 Inpatient Clinical Episodes	0.46	-0.01
Number of Procedures - 3 Outpatient Clinical Episodes	0.26	-0.11
Clinical Episode Community Share - Surgical: Ortho Excluding Spine	-0.04	0.02
Clinical Episode Community Share - Surgical, Non-surgical: Cardiovascular	0.02	-0.02
Clinical Episode Community Share - Surgical: Other	0.04	-0.02
Clinical Episode Community Share - Non-surgical Other	-0.05	0.11

Note: DSH = disproportionate share hospital; SNF = skilled nursing facility; IRF = inpatient rehabilitation facility; PAC = post-acute care.
* Indicates variables that were used to match on.

Exhibit F.7: Standardized Differences Before and After Matching, Hospitals, Major Joint Replacement of the Lower Extremity

Variable	Standardized Difference Before Matching	Standardized Difference After Matching
Ownership - Non-Profit*	-0.17	0.02
Ownership - For Profit*	0.43	0.02
Ownership - Government	-0.34	-0.06
Urban*	0.58	0.10
Rural	-0.58	-0.10
Midwest	-0.07	0.21
Northeast	0.07	0.12
South	-0.05	-0.29
West	0.07	0.02
Part of a Health System*	0.58	0
Bed Count – Continuous*	0.37	0.01

Variable	Standardized Difference Before Matching	Standardized Difference After Matching
Bed Count - 0 to 99	-0.44	-0.23
Bed Count - 100 to 249	-0.08	0.05
Bed Count - 250+	0.45	0.13
Occupancy Rate	0.50	0.16
Resident-Bed Ratio*	0.23	-0.06
Population – Continuous*	0.67	0.04
Median Household Income*	0.31	0.05
Medicare Days Percent (%)*	-0.27	-0.10
DSH Patient Percent (%)*	0.15	-0.02
Average Case Weight of Discharges*	0.41	-0.04
Teaching Status	0.12	-0.08
Medicare Advantage Penetration (%)*	0.09	0.09
Primary Care Providers per 10,000 in Market*	0.02	0.04
SNF Beds per 10,000 in Market*	-0.29	-0.05
Specialists per 10,000 in Market	0.35	0.08
Medicare Beneficiaries Per 10,000	-0.62	-0.22
IRF in Market*	0.83	0.05
Hospital Market Share*	-0.53	-0.09
Herfindahl Index*	-0.66	-0.11
Episode Volume (ep)*	0.14	-0.06
Efficiency Measure*	0.69	0.08
Standardized Part A and B Payment – Average*	0.45	0.10
Standardized Part A and B Payment – Change*	-0.40	-0.02
Institutional PAC – Average*	0.42	0.06
Institutional PAC – Slope*	-0.50	0.01
First PAC Use - Average - None	-0.48	-0.12
First PAC - Change - None	0.01	-0.07
First PAC Use - Average - IRF	0.40	0.00
First PAC - Change - IRF	-0.41	-0.13
First PAC Use - Average - SNF	0.07	0.05
First PAC - Change - SNF	-0.18	0.14
First PAC Use - Average - LTCH	0.15	0.05
First PAC - Change - LTCH	-0.21	-0.06
First PAC Use - Average - Home Health	0.08	0.05
First PAC - Change - Home Health	0.44	0.05
Institutional Days - Average	0.26	0.13
Institutional Days - Change	-0.48	-0.20
SNF Days - Average	0.13	0.12
SNF Days - Change	-0.39	-0.17

Variable	Standardized Difference Before Matching	Standardized Difference After Matching
Home Health Days - Average	0.38	0.00
Home Health Days - Change	0.12	0.24
Readmission Rate 30-Day – Average*	0.31	0.02
Readmission Rate 30-Day – Change*	-0.04	-0.08
Readmission Rate 90-Day – Average	0.35	0.03
Readmission Rate 90-Day – Change	-0.05	-0.05
Mortality Rate 30-Day – Average*	0.08	0.13
Mortality Rate 30-Day – Change*	0.02	0.03
Mortality Rate 90-Day - Average	0.13	0.09
Mortality Rate 90-Day - Change	-0.02	0.02
Emergency Department Rate 30-Day – Average*	-0.31	-0.05
Emergency Department Rate 30-Day – Change*	-0.03	-0.03
Emergency Department Rate 90-Day - Average	-0.26	-0.14
Emergency Department Rate 90-Day - Change	-0.05	0.00
Service Indicator - Surgical - Intensive Care Unit	0.11	-0.03
Service Indicator - Intensive Care Unit	0.07	0.14
Service Indicator - Coronary Care	0.24	0.05
Percent of Hospital Discharges in BPCI Advanced Clinical Episodes	-0.45	-0.11
Number of Total Discharges	0.44	0.05
Number of Total Discharges - 29 Inpatient Clinical Episodes	0.41	0.07
Number of Procedures - 3 Outpatient Clinical Episodes	0.30	0.00
Clinical Episode Community Share - Surgical: Ortho Excluding Spine	-0.05	-0.04
Clinical Episode Community Share - Surgical, Non-surgical: Cardiovascular	0.06	0.01
Clinical Episode Community Share - Surgical: Other	0.06	0.00
Clinical Episode Community Share - Non-surgical Other	-0.15	0.07

Note: DSH = disproportionate share hospital; SNF = skilled nursing facility; IRF = inpatient rehabilitation facility; PAC = post-acute care.
* Indicates variables that were used to match on.

Exhibit F.8: Standardized Differences Before and After Matching, Hospitals, Renal Failure

Variable	Standardized Difference Before Matching	Standardized Difference After Matching
Ownership - Non-Profit*	-0.13	0.10
Ownership - For Profit*	0.48	-0.06
Ownership - Government	-0.45	-0.10
Urban*	0.57	0
Rural	-0.57	0
Midwest	-0.10	0.01
Northeast	-0.11	-0.02
South	0.05	-0.01

Variable	Standardized Difference Before Matching	Standardized Difference After Matching
West	0.15	0.01
Part of a Health System*	0.57	0.16
Bed Count – Continuous*	0.27	0.08
Bed Count - 0 to 99	-0.49	-0.16
Bed Count - 100 to 249	-0.08	-0.13
Bed Count - 250+	0.43	0.21
Occupancy Rate	0.39	0.04
Resident-Bed Ratio*	0.04	-0.02
Population – Continuous*	0.39	0.00
Median Household Income*	0.27	0.08
Medicare Days Percent (%)*	-0.26	0.02
DSH Patient Percent (%)*	0.11	-0.08
Average Case Weight of Discharges*	0.34	-0.02
Teaching Status	-0.19	-0.20
Medicare Advantage Penetration (%)*	0.32	0.07
Primary Care Providers per 10,000 in Market*	0.03	0.12
SNF Beds per 10,000 in Market*	-0.36	0.05
Specialists per 10,000 in Market	0.30	0.11
Medicare Beneficiaries Per 10,000	-0.47	-0.07
IRF in Market*	0.55	0.03
Hospital Market Share*	-0.50	-0.01
Herfindahl Index*	-0.61	-0.03
Episode Volume (ep)*	0.45	0.06
Efficiency Measure*	0.47	0.08
Standardized Part A and B Payment – Average*	0.70	-0.01
Standardized Part A and B Payment – Change*	-0.13	-0.02
Institutional PAC – Average*	0.38	0.04
Institutional PAC – Slope*	0.04	-0.07
First PAC Use - Average - None	-0.50	-0.02
First PAC - Change - None	0.04	0.05
First PAC Use - Average - IRF	0.24	0.00
First PAC - Change - IRF	0.07	0.08
First PAC Use - Average - SNF	0.21	0.05
First PAC - Change - SNF	0.03	-0.09
First PAC Use - Average - LTCH	0.25	-0.03
First PAC - Change - LTCH	-0.10	-0.07
First PAC Use - Average - Home Health	0.17	-0.02
First PAC - Change - Home Health	-0.11	-0.03
Institutional Days - Average	0.33	-0.07

Variable	Standardized Difference Before Matching	Standardized Difference After Matching
Institutional Days - Change	-0.05	-0.09
SNF Days - Average	0.25	-0.08
SNF Days - Change	-0.05	-0.09
Home Health Days - Average	0.32	-0.02
Home Health Days - Change	-0.10	-0.10
Readmission Rate 30-Day – Average*	0.22	0.03
Readmission Rate 30-Day – Change*	-0.10	-0.03
Readmission Rate 90-Day – Average	0.32	0.06
Readmission Rate 90-Day – Change	-0.08	0.03
Mortality Rate 30-Day – Average*	-0.03	0.02
Mortality Rate 30-Day – Change*	0.04	0.02
Mortality Rate 90-Day - Average	-0.01	0.03
Mortality Rate 90-Day - Change	0.05	0.11
Emergency Department Rate 30-Day – Average*	-0.54	-0.10
Emergency Department Rate 30-Day – Change*	0.03	0.07
Emergency Department Rate 90-Day - Average	-0.61	-0.13
Emergency Department Rate 90-Day - Change	0.01	0.16
Service Indicator - Surgical - Intensive Care Unit	0.18	0.15
Service Indicator - Intensive Care Unit	0.04	0.06
Service Indicator - Coronary Care	0.13	0.05
Percent of Hospital Discharges in BPCI Advanced Clinical Episodes	-0.39	0.01
Number of Total Discharges	0.36	0.07
Number of Total Discharges - 29 Inpatient Clinical Episodes	0.35	0.06
Number of Procedures - 3 Outpatient Clinical Episodes	0.09	-0.12
Clinical Episode Community Share - Surgical: Ortho Excluding Spine	-0.03	-0.01
Clinical Episode Community Share - Surgical, Non-surgical: Cardiovascular	0.04	0.03
Clinical Episode Community Share - Surgical: Other	0.00	-0.05
Clinical Episode Community Share - Non-surgical Other	-0.07	0.01

Note: DSH = disproportionate share hospital; SNF = skilled nursing facility; IRF = inpatient rehabilitation facility; PAC = post-acute care.
* Indicates variables that were used to match on.

Exhibit F.9: Standardized Differences Before and After Matching, Hospitals, Sepsis

Variable	Standardized Difference Before Matching	Standardized Difference After Matching
Ownership - Non-Profit*	0.12	-0.14
Ownership - For Profit*	0.27	0.11
Ownership - Government	-0.51	0.09
Urban*	0.63	0.04
Rural	-0.63	-0.04

Variable	Standardized Difference Before Matching	Standardized Difference After Matching
Midwest	-0.02	0.11
Northeast	0.14	-0.02
South	-0.14	-0.14
West	0.05	0.07
Part of a Health System*	0.63	0
Bed Count – Continuous*	0.46	-0.03
Bed Count - 0 to 99	-0.55	-0.09
Bed Count - 100 to 249	-0.18	-0.07
Bed Count - 250+	0.61	0.12
Occupancy Rate	0.61	-0.03
Resident-Bed Ratio*	0.23	-0.02
Population – Continuous*	0.41	-0.01
Median Household Income*	0.22	-0.08
Medicare Days Percent (%)*	-0.28	-0.03
DSH Patient Percent (%)*	0.07	0.05
Average Case Weight of Discharges*	0.55	0.03
Teaching Status	0.16	-0.01
Medicare Advantage Penetration (%)*	0.23	0.02
Primary Care Providers per 10,000 in Market*	0.03	-0.08
SNF Beds per 10,000 in Market*	-0.26	-0.05
Specialists per 10,000 in Market	0.32	-0.09
Medicare Beneficiaries Per 10,000	-0.37	-0.10
IRF in Market*	0.59	0.03
Hospital Market Share*	-0.46	-0.07
Herfindahl Index*	-0.60	-0.05
Episode Volume (ep)*	0.46	-0.05
Efficiency Measure*	0.50	0.05
Standardized Part A and B Payment – Average*	0.67	0.00
Standardized Part A and B Payment – Change*	-0.22	0.01
Institutional PAC - Average	0.45	0.11
Institutional PAC - Slope	-0.03	0.06
First PAC Use - Average – None*	-0.53	-0.04
First PAC - Change – None*	0.00	-0.03
First PAC Use - Average - IRF	0.23	-0.01
First PAC - Change - IRF	-0.04	-0.07
First PAC Use - Average - SNF	0.22	0.20
First PAC - Change - SNF	0.04	0.10
First PAC Use - Average - LTCH	0.25	-0.11
First PAC - Change - LTCH	-0.12	0.00

Variable	Standardized Difference Before Matching	Standardized Difference After Matching
First PAC Use - Average - Home Health	0.06	-0.13
First PAC - Change - Home Health	0.07	0.01
Institutional Days - Average	0.34	0.02
Institutional Days - Change	-0.23	-0.11
SNF Days - Average	0.24	0.08
SNF Days - Change	-0.21	-0.12
Home Health Days - Average	0.20	-0.02
Home Health Days - Change	0.10	0.01
Readmission Rate 30-Day – Average*	0.35	0.00
Readmission Rate 30-Day – Change*	-0.09	0.02
Readmission Rate 90-Day – Average	0.40	-0.01
Readmission Rate 90-Day – Change	-0.17	-0.11
Mortality Rate 30-Day – Average*	0.48	-0.01
Mortality Rate 30-Day – Change*	-0.11	0.01
Mortality Rate 90-Day – Average	0.51	0.00
Mortality Rate 90-Day – Change	-0.15	-0.02
Emergency Department Rate 30-Day – Average*	-0.60	-0.01
Emergency Department Rate 30-Day – Change*	-0.03	0.02
Emergency Department Rate 90-Day – Average	-0.62	-0.03
Emergency Department Rate 90-Day – Change	-0.06	-0.03
Service Indicator - Surgical - Intensive Care Unit	0.23	0.15
Service Indicator - Intensive Care Unit	0.12	0.02
Service Indicator - Coronary Care	0.29	0.06
Percent of Hospital Discharges in BPCI Advanced Clinical Episodes	-0.55	-0.04
Number of Total Discharges	0.51	-0.11
Number of Total Discharges - 29 Inpatient Clinical Episodes	0.48	-0.12
Number of Procedures - 3 Outpatient Clinical Episodes	0.28	-0.14
Clinical Episode Community Share - Surgical: Ortho Excluding Spine	-0.03	-0.02
Clinical Episode Community Share - Surgical, Non-surgical: Cardiovascular	0.07	0.02
Clinical Episode Community Share - Surgical: Other	0.04	-0.01
Clinical Episode Community Share - Non-surgical Other	-0.29	0.02

Note: DSH = disproportionate share hospital; SNF = skilled nursing facility; IRF = inpatient rehabilitation facility; PAC = post-acute care.
* Indicates variables that were used to match on.

Exhibit F.10: Standardized Differences Before and After Matching, Hospitals, Simple Pneumonia and Respiratory Infections

Variable	Standardized Difference Before Matching	Standardized Difference After Matching
Ownership - Non-Profit*	0.02	-0.02
Ownership - For Profit*	0.44	0.02
Ownership - Government	-0.61	0
Urban*	0.53	-0.01
Rural	-0.53	0.01
Midwest	-0.06	0.13
Northeast	0.04	-0.01
South	0.00	-0.07
West	0.03	-0.03
Part of a Health System*	0.74	0.05
Bed Count – Continuous*	0.39	0.02
Bed Count - 0 to 99	-0.60	-0.05
Bed Count - 100 to 249	0.03	-0.11
Bed Count - 250+	0.46	0.14
Occupancy Rate	0.61	0.18
Resident-Bed Ratio*	0.08	-0.02
Population – Continuous*	0.43	0.02
Median Household Income*	0.28	0.03
Medicare Days Percent (%)*	-0.22	0.00
DSH Patient Percent (%)*	-0.04	-0.06
Average Case Weight of Discharges*	0.43	0.03
Teaching Status	-0.08	-0.10
Medicare Advantage Penetration (%)*	0.20	0.03
Primary Care Providers per 10,000 in Market*	0.06	0.11
SNF Beds per 10,000 in Market*	-0.29	-0.03
Specialists per 10,000 in Market	0.35	0.12
Medicare Beneficiaries Per 10,000	-0.27	0.03
IRF in Market*	0.57	0.04
Hospital Market Share*	-0.40	-0.01
Herfindahl Index*	-0.56	-0.02
Episode Volume (ep)*	0.44	0.06
Efficiency Measure*	0.58	0.01
Standardized Part A and B Payment – Average*	0.81	0.00
Standardized Part A and B Payment – Change*	-0.23	0.00
Institutional PAC – Average*	0.42	0.10
Institutional PAC – Slope*	-0.02	-0.04
First PAC Use - Average - None	-0.64	-0.15

Variable	Standardized Difference Before Matching	Standardized Difference After Matching
First PAC - Change - None	-0.01	-0.02
First PAC Use - Average - IRF	0.26	-0.08
First PAC - Change - IRF	0.00	0.09
First PAC Use - Average - SNF	0.26	0.18
First PAC - Change - SNF	0.02	-0.09
First PAC Use - Average - LTCH	0.25	-0.12
First PAC - Change - LTCH	-0.12	0.05
First PAC Use - Average - Home Health	0.33	0.07
First PAC - Change - Home Health	0.01	0.08
Institutional Days - Average	0.32	0.00
Institutional Days - Change	-0.17	-0.09
SNF Days - Average	0.24	0.04
SNF Days - Change	-0.15	-0.11
Home Health Days - Average	0.41	0.07
Home Health Days - Change	0.02	-0.05
Readmission Rate 30-Day – Average*	0.30	-0.09
Readmission Rate 30-Day – Change*	-0.06	0.04
Readmission Rate 90-Day – Average	0.37	-0.05
Readmission Rate 90-Day – Change	-0.15	0.03
Mortality Rate 30-Day – Average*	0.28	0.02
Mortality Rate 30-Day – Change*	-0.13	-0.02
Mortality Rate 90-Day - Average	0.30	-0.06
Mortality Rate 90-Day - Change	-0.15	-0.01
Emergency Department Rate 30-Day – Average*	-0.56	-0.03
Emergency Department Rate 30-Day – Change*	-0.08	-0.03
Emergency Department Rate 90-Day - Average	-0.51	-0.03
Emergency Department Rate 90-Day - Change	-0.06	0.07
Service Indicator - Surgical - Intensive Care Unit	0.15	0.06
Service Indicator - Intensive Care Unit	0.27	0.12
Service Indicator - Coronary Care	0.31	0.21
Percent of Hospital Discharges in BPCI Advanced Clinical Episodes	-0.42	0.02
Number of Total Discharges	0.50	0.07
Number of Total Discharges - 29 Inpatient Clinical Episodes	0.48	0.09
Number of Procedures - 3 Outpatient Clinical Episodes	0.22	-0.04
Clinical Episode Community Share - Surgical: Ortho Excluding Spine	-0.01	0.00
Clinical Episode Community Share - Surgical, Non-surgical: Cardiovascular	0.08	0.02
Clinical Episode Community Share - Surgical: Other	0.02	-0.03
Clinical Episode Community Share - Non-surgical Other	-0.29	-0.02

Note: DSH = disproportionate share hospital; SNF = skilled nursing facility; IRF = inpatient rehabilitation facility; PAC = post-acute care.
* Indicates variables that were used to match on.

Exhibit F.11: Standardized Differences Before and After Matching, Hospitals, Stroke

Variable	Standardized Difference Before Matching	Standardized Difference After Matching
Ownership - Non-Profit*	0.02	-0.09
Ownership - For Profit*	0.32	0.08
Ownership - Government	-0.45	0.02
Urban*	0.55	0.02
Rural	-0.55	-0.02
Midwest	-0.14	0.09
Northeast	0.09	0.04
South	-0.07	-0.12
West	0.15	0.01
Part of a Health System*	0.56	0.03
Bed Count – Continuous*	0.34	0.00
Bed Count - 0 to 99	-0.53	-0.16
Bed Count - 100 to 249	-0.12	-0.02
Bed Count - 250+	0.46	0.09
Occupancy Rate	0.51	0.12
Resident-Bed Ratio*	0.06	-0.07
Population – Continuous*	0.24	-0.03
Median Household Income*	0.13	-0.06
Medicare Days Percent (%)*	-0.28	0.05
DSH Patient Percent (%)*	-0.01	0.04
Average Case Weight of Discharges*	0.44	-0.02
Teaching Status	-0.11	-0.22
Medicare Advantage Penetration (%)*	0.28	0.05
Primary Care Providers per 10,000 in Market*	-0.01	-0.11
SNF Beds per 10,000 in Market*	-0.33	-0.05
Specialists per 10,000 in Market	0.25	-0.06
Medicare Beneficiaries Per 10,000	-0.26	-0.02
IRF in Market*	0.61	-0.02
Hospital Market Share*	-0.40	0.02
Herfindahl Index*	-0.49	0.03
Episode Volume (ep)*	0.44	-0.04
Efficiency Measure*	0.42	0.00
Standardized Part A and B Payment – Average*	0.57	0.02
Standardized Part A and B Payment – Change*	-0.18	0.03
Institutional PAC - Average	0.21	0.05
Institutional PAC - Slope	-0.04	0.07
First PAC Use - Average – None*	-0.26	0.01
First PAC - Change – None*	0.03	-0.01

Variable	Standardized Difference Before Matching	Standardized Difference After Matching
First PAC Use - Average - IRF	0.34	-0.08
First PAC - Change - IRF	-0.02	0.10
First PAC Use - Average - SNF	-0.25	0.12
First PAC - Change - SNF	-0.02	-0.02
First PAC Use - Average - LTCH	0.07	0.00
First PAC - Change - LTCH	-0.01	-0.01
First PAC Use - Average - Home Health	0.03	-0.09
First PAC - Change - Home Health	0.02	-0.09
Institutional Days - Average	0.03	0.06
Institutional Days - Change	-0.23	0.01
SNF Days - Average	-0.19	0.06
SNF Days - Change	-0.20	-0.01
Home Health Days - Average	0.14	-0.14
Home Health Days - Change	0.00	-0.06
Readmission Rate 30-Day – Average*	0.26	-0.05
Readmission Rate 30-Day – Change*	-0.10	-0.13
Readmission Rate 90-Day – Average	0.25	-0.02
Readmission Rate 90-Day – Change	-0.08	-0.11
Mortality Rate 30-Day – Average*	-0.01	0.02
Mortality Rate 30-Day – Change*	0.03	-0.07
Mortality Rate 90-Day – Average	-0.04	-0.03
Mortality Rate 90-Day – Change	0.06	0.01
Emergency Department Rate 30-Day – Average*	-0.37	-0.09
Emergency Department Rate 30-Day – Change*	0.04	0.04
Emergency Department Rate 90-Day – Average	-0.44	-0.20
Emergency Department Rate 90-Day – Change	0.03	0.03
Service Indicator - Surgical - Intensive Care Unit	0.15	0.06
Service Indicator - Intensive Care Unit	0.07	0.03
Service Indicator - Coronary Care	0.27	0.16
Percent of Hospital Discharges in BPCI Advanced Clinical Episodes	-0.45	-0.04
Number of Total Discharges	0.41	0.00
Number of Total Discharges - 29 Inpatient Clinical Episodes	0.42	0.02
Number of Procedures - 3 Outpatient Clinical Episodes	0.27	-0.04
Clinical Episode Community Share - Surgical: Ortho Excluding Spine	-0.02	-0.01
Clinical Episode Community Share - Surgical, Non-surgical: Cardiovascular	0.05	0.03
Clinical Episode Community Share - Surgical: Other	0.04	-0.02
Clinical Episode Community Share - Non-surgical Other	-0.27	-0.02

Note: DSH = disproportionate share hospital; SNF = skilled nursing facility; IRF = inpatient rehabilitation facility; PAC = post-acute care.
* Indicates variables that were used to match on.

Exhibit F.12: Standardized Differences Before and After Matching, Hospitals, Urinary Tract Infection

Variable	Standardized Difference Before Matching	Standardized Difference After Matching
Ownership - Non-Profit*	0.04	-0.08
Ownership - For Profit*	0.37	0.06
Ownership - Government	-0.55	0.06
Urban*	0.60	-0.04
Rural	-0.60	0.04
Midwest	0.11	0.25
Northeast	-0.05	-0.09
South	-0.21	-0.29
West	0.17	0.17
Part of a Health System*	0.68	0
Bed Count – Continuous*	0.40	0.00
Bed Count - 0 to 99	-0.54	-0.09
Bed Count - 100 to 249	-0.11	-0.08
Bed Count - 250+	0.53	0.14
Occupancy Rate	0.52	0.09
Resident-Bed Ratio*	0.07	-0.03
Population – Continuous*	0.39	0.05
Median Household Income*	0.21	-0.05
Medicare Days Percent (%)*	-0.26	0.05
DSH Patient Percent (%)*	0.02	0.13
Average Case Weight of Discharges*	0.52	-0.02
Teaching Status	-0.09	-0.15
Medicare Advantage Penetration (%)*	0.19	0.13
Primary Care Providers per 10,000 in Market*	0.02	-0.05
SNF Beds per 10,000 in Market*	-0.29	-0.05
Specialists per 10,000 in Market	0.27	-0.06
Medicare Beneficiaries Per 10,000	-0.47	-0.05
IRF in Market*	0.59	0.01
Hospital Market Share*	-0.44	0.00
Herfindahl Index*	-0.61	-0.02
Episode Volume (ep)*	0.56	-0.04
Efficiency Measure*	0.59	0.02
Standardized Part A and B Payment – Average*	0.80	0.06
Standardized Part A and B Payment – Change*	-0.11	0.04
Institutional PAC – Average*	0.40	-0.05
Institutional PAC – Slope*	0.06	0.08
First PAC Use - Average - None	-0.63	-0.13

Variable	Standardized Difference Before Matching	Standardized Difference After Matching
First PAC - Change - None	0.04	0.04
First PAC Use - Average - IRF	0.22	-0.13
First PAC - Change - IRF	0.01	0.07
First PAC Use - Average - SNF	0.27	-0.02
First PAC - Change - SNF	0.08	0.07
First PAC Use - Average - LTCH	0.15	0.11
First PAC - Change - LTCH	-0.13	-0.08
First PAC Use - Average - Home Health	0.23	0.18
First PAC - Change - Home Health	-0.14	-0.17
Institutional Days - Average	0.26	-0.11
Institutional Days - Change	-0.10	0.01
SNF Days - Average	0.21	-0.11
SNF Days - Change	-0.09	0.02
Home Health Days - Average	0.40	0.19
Home Health Days - Change	-0.02	-0.12
Readmission Rate 30-Day – Average*	0.21	-0.10
Readmission Rate 30-Day – Change*	-0.06	-0.03
Readmission Rate 90-Day – Average	0.32	-0.03
Readmission Rate 90-Day – Change	0.00	0.05
Mortality Rate 30-Day – Average*	-0.27	-0.01
Mortality Rate 30-Day – Change*	-0.10	-0.07
Mortality Rate 90-Day - Average	-0.20	0.03
Mortality Rate 90-Day - Change	-0.14	-0.12
Emergency Department Rate 30-Day – Average*	-0.52	-0.02
Emergency Department Rate 30-Day – Change*	0.00	0.01
Emergency Department Rate 90-Day - Average	-0.53	-0.11
Emergency Department Rate 90-Day - Change	0.00	0.03
Service Indicator - Surgical - Intensive Care Unit	0.17	0.11
Service Indicator - Intensive Care Unit	0.18	0.09
Service Indicator - Coronary Care	0.25	0.14
Percent of Hospital Discharges in BPCI Advanced Clinical Episodes	-0.46	-0.02
Number of Total Discharges	0.46	-0.04
Number of Total Discharges - 29 Inpatient Clinical Episodes	0.45	-0.07
Number of Procedures - 3 Outpatient Clinical Episodes	0.21	-0.18
Clinical Episode Community Share - Surgical: Ortho Excluding Spine	0.00	-0.02
Clinical Episode Community Share - Surgical, Non-surgical: Cardiovascular	0.07	0.03
Clinical Episode Community Share - Surgical: Other	0.02	-0.05
Clinical Episode Community Share - Non-surgical Other	-0.33	0.07

Note: DSH = disproportionate share hospital; SNF = skilled nursing facility; IRF = inpatient rehabilitation facility; PAC = post-acute care.
* Indicates variables that were used to match on.

Exhibit F.13: Standardized Differences Before and After Matching, Hospitals, Percutaneous Coronary Intervention (Outpatient)

Variable	Standardized Difference Before Matching	Standardized Difference After Matching
Ownership - Non-Profit*	0.23	0.05
Ownership - For Profit*	-0.32	-0.08
Ownership - Government	0.00	0
Midwest	0.01	0
Northeast	-0.15	-0.12
South	-0.01	-0.08
West	0.12	0.21
Part of a Health System*	0.15	0.09
Bed Count – Continuous*	0.36	0.12
Bed Count - 0 to 99	-0.17	0
Bed Count - 100 to 249	-0.33	-0.06
Bed Count - 250+	0.39	0.05
Occupancy Rate	0.14	0.07
Resident-Bed Ratio*	0.11	0.39
Population – Continuous*	-0.05	0.01
Median Household Income*	0.06	0.15
Medicare Days Percent (%)*	-0.20	0.02
DSH Patient Percent (%)*	-0.19	0.17
Average Case Weight of Discharges*	0.41	0.10
Teaching Status	0.12	0.06
Medicare Advantage Penetration (%)*	0.11	-0.07
Primary Care Providers per 10,000 in Market*	0.06	0.26
SNF Beds per 10,000 in Market*	-0.12	-0.13
Specialists per 10,000 in Market	0.13	0.21
Medicare Beneficiaries Per 10,000	-0.15	-0.17
IRF in Market*	0.14	-0.22
Hospital Market Share*	-0.01	0.04
Herfindahl Index*	-0.11	-0.01
Episode Volume (ep)*	0.34	0.09
Efficiency Measure*	0.12	-0.01
Standardized Part A and B Payment – Average*	0.15	0.10
Standardized Part A and B Payment – Change*	-0.06	0.19
Institutional PAC - Average	-0.05	-0.02
Institutional PAC - Slope	0.05	0.21
First PAC Use - Average - None	0.13	-0.29
First PAC - Change - None	0.17	0.15
First PAC Use - Average - IRF	0.09	-0.04

Variable	Standardized Difference Before Matching	Standardized Difference After Matching
First PAC - Change - IRF	0.19	-0.15
First PAC Use - Average - SNF	-0.08	0.00
First PAC - Change - SNF	0.03	0.29
First PAC Use - Average - LTCH	0.06	-0.01
First PAC - Change - LTCH	-0.09	-0.28
First PAC Use - Average - Home Health	-0.12	0.34
First PAC - Change - Home Health	-0.19	-0.32
Institutional Days - Average	0.06	0.10
Institutional Days - Change	-0.14	-0.07
SNF Days - Average	0.07	0.21
SNF Days - Change	-0.13	-0.10
Home Health Days - Average	-0.10	0.25
Home Health Days - Change	-0.18	-0.20
Readmission Rate 30-Day – Average*	-0.04	0.18
Readmission Rate 30-Day – Change*	-0.10	-0.08
Readmission Rate 90-Day – Average	-0.05	0.13
Readmission Rate 90-Day – Change	-0.10	0.01
Mortality Rate 30-Day – Average*	0.00	0.13
Mortality Rate 30-Day – Change*	0.04	0.05
Mortality Rate 90-Day – Average	-0.09	-0.01
Mortality Rate 90-Day – Change	0.00	-0.02
Emergency Department Rate 30-Day – Average*	0.04	-0.05
Emergency Department Rate 30-Day – Change*	-0.14	-0.10
Emergency Department Rate 90-Day – Average	0.07	0.10
Emergency Department Rate 90-Day – Change	-0.19	-0.02
Service Indicator - Surgical - Intensive Care Unit	0.05	-0.12
Service Indicator - Intensive Care Unit	0.01	0.12
Service Indicator - Coronary Care	0.36	0.23
Percent of Hospital Discharges in BPCI Advanced Clinical Episodes	-0.12	-0.08
Number of Total Discharges	0.28	0.17
Number of Total Discharges - 29 Inpatient Clinical Episodes	0.33	0.19
Number of Procedures - 3 Outpatient Clinical Episodes	0.37	0.07
Clinical Episode Community Share - Surgical: Ortho Excluding Spine	0.04	0.03
Clinical Episode Community Share - Surgical, Non-surgical: Cardiovascular	0.01	-0.02
Clinical Episode Community Share - Surgical: Other	0.01	-0.02
Clinical Episode Community Share - Non-surgical Other	-0.24	0.02

Note: All hospital EIs participating in this clinical episode were urban. DSH = disproportionate share hospital; SNF = skilled nursing facility; IRF = inpatient rehabilitation facility; PAC = post-acute care. * Indicates variables that were used to match on.

Appendix G: Impact of BPCI Advanced on Allowed Payment, Utilization, and Quality Measures by Clinical Episode, Hospitals

The following tables display risk-adjusted difference-in-differences results for all payment, utilization, and quality measures assessed in the Year 2 Annual Report. Results are presented by clinical episode. Please observe the following abbreviations, which are used throughout the appendix:

- DiD = difference-in-differences
- LCI = lower confidence interval at the 5% and 10% level
- UCI = upper confidence interval at the 5% and 10% level
- PDP = post-anchor/procedure discharge period
- PAC = post-acute care
- SNF = skilled nursing facility
- IRF = inpatient rehabilitation facility
- HH = home health
- SNF = skilled nursing facility
- Adv = Advanced
- Int = Intervention
- Comp = Comparison

Medicare payments were risk-adjusted and standardized to remove the effects of geographic differences in wages, extra amounts to account for teaching programs and other policy factors. Results reflect the BPCI Advanced evaluation team's analysis of Medicare claims and enrollment data for episodes with anchor stays/procedures that began April 1, 2013 and ended on or before December 31, 2017 (baseline period) and episodes with anchor stays/procedures that began October 1, 2018 and ended on or before August 3, 2019 (intervention period) for BPCI Advanced EIs and matched comparison providers.

‡ We rejected the null hypothesis that BPCI Advanced and matched comparison hospitals had parallel trends for this outcome (with 90% confidence). See Appendix I for parallel trends test results.

Exhibit G.1: Acute Myocardial Infarction Episodes, Hospital EIs, October 1, 2018 – August 3, 2019

Outcome	# of BPCI Adv Int Episodes	# of Comp Int Episodes	BPCI Adv Baseline	BPCI Adv Int	Comp Baseline	Comp Int	DiD	% Change	95% LCI	95% UCI	90% LCI	90% UCI
Total allowed payment amount, inpatient through 90-day PDP	9,627	10,173	$26,947	$26,755	$26,505	$26,644	-$332‡	-1.2%	-$977	$314	-$873	$209
Total paid payment amount, inpatient through 90-day PDP	9,627	10,173	$23,825	$23,645	$23,422	$23,512	-$270‡	-1.1%	-$857	$317	-$762	$222
Patients discharged to institutional PAC	9,627	10,173	24.0%	21.7%	23.4%	21.9%	-0.79 pp	-3.3%	-2.1 pp	0.6 pp	-1.9 pp	0.3 pp
Unplanned readmission rate, 90-day PDP	9,476	10,041	36.4%	35.2%	35.4%	34.0%	0.23 pp	0.6%	-1.3 pp	1.7 pp	-1.0 pp	1.5 pp
All-cause mortality rate, 90-day PDP	9,389	9,967	18.0%	16.5%	18.3%	16.5%	0.38 pp	2.1%	-0.7 pp	1.5 pp	-0.6 pp	1.3 pp
Number of days at a SNF (minimum one day), 90-day PDP	2,440	2,475	31.7	27.8	31.8	29.5	-1.5‡	-4.8%	-3.0	-0.1	-2.7	-0.3
Part A IRF allowed payment amount, 90-day PDP	9,627	10,173	$654	$725	$624	$640	$56	8.5%	-$96	$208	-$72	$183
Part A SNF allowed payment amount, 90-day PDP	9,627	10,173	$4,363	$3,788	$4,220	$4,075	-$430‡	-9.8%	-$719	-$140	-$673	-$187
Part A HH allowed payment amount, 90-day PDP	9,627	10,173	$1,143	$1,176	$1,115	$1,137	$11‡	0.9%	-$45	$67	-$36	$58

Exhibit G.2: Cardiac Arrhythmia Episodes, Hospital EIs, October 1, 2018 – August 3, 2019

Outcome	# of BPCI Adv Int Episodes	# of Comp Int Episodes	BPCI Adv Baseline	BPCI Adv Int	Comp Baseline	Comp Int	DiD	% Change	95% LCI	95% UCI	90% LCI	90% UCI
Total allowed payment amount, inpatient through 90-day PDP	16,561	18,198	$19,242	$19,646	$19,007	$19,663	-$251	-1.3%	-$629	$127	-$568	$66
Total paid payment amount, inpatient through 90-day PDP	16,561	18,198	$16,498	$16,790	$16,277	$16,757	-$188	-1.1%	-$530	$155	-$475	$99
Patients discharged to institutional PAC	16,561	18,198	15.0%	14.1%	14.8%	14.3%	-0.48 pp	-3.2%	-1.3 pp	0.3 pp	-1.1 pp	0.2 pp
Unplanned readmission rate, 90-day PDP	16,391	18,034	31.2%	29.4%	30.6%	29.7%	-0.87 pp	-2.8%	-2.0 pp	0.2 pp	-1.8 pp	0.1 pp
All-cause mortality rate, 90-day PDP	16,316	17,938	8.5%	8.2%	8.7%	8.4%	-0.12 pp	-1.4%	-0.7 pp	0.5 pp	-0.6 pp	0.4 pp
Number of days at a SNF (minimum one day), 90-day PDP	2,791	3,011	32.5	28.1	33.2	30.4	-1.6	-4.8%	-2.8	-0.3	-2.6	-0.5
Part A IRF allowed payment amount, 90-day PDP	16,561	18,198	$523	$630	$527	$563	$71	13.6%	-$21	$163	-$6	$148
Part A SNF allowed payment amount, 90-day PDP	16,561	18,198	$3,037	$2,639	$2,959	$2,832	-$271‡	-8.9%	-$448	-$94	-$419	-$122
Part A HH allowed payment amount, 90-day PDP	16,561	18,198	$1,003	$1,000	$953	$932	$18	1.8%	-$23	$58	-$16	$51

Exhibit G.3: Chronic Obstructive Pulmonary Disease, Bronchitis, Asthma Episodes, Hospital EIs, October 1, 2018 – August 3, 2019

Outcome	# of BPCI Adv Int Episodes	# of Comp Int Episodes	BPCI Adv Baseline	BPCI Adv Int	Comp Baseline	Comp Int	DiD	% Change	95% LCI	95% UCI	90% LCI	90% UCI
Total allowed payment amount, inpatient through 90-day PDP	17,468	18,035	$20,594	$20,405	$20,079	$20,385	-$495	-2.4%	-$888	-$102	-$825	-$166
Total paid payment amount, inpatient through 90-day PDP	17,468	18,035	$17,876	$17,691	$17,399	$17,630	-$417	-2.3%	-$765	-$68	-$709	-$124
Patients discharged to institutional PAC	17,468	18,035	16.1%	14.4%	14.8%	13.7%	-0.58 pp	-3.6%	-1.5 pp	0.4 pp	-1.4 pp	0.2 pp
Unplanned readmission rate, 90-day PDP	17,229	17,828	35.9%	34.3%	35.7%	34.5%	-0.39 pp	-1.1%	-1.5 pp	0.7 pp	-1.3 pp	0.5 pp
All-cause mortality rate, 90-day PDP	17,075	17,678	8.3%	7.0%	8.2%	7.2%	-0.37 pp	-4.4%	-1.0 pp	0.2 pp	-0.9 pp	0.1 pp
Number of days at a SNF (minimum one day), 90-day PDP	3,290	3,083	30.7	27.9	31.6	30.3	-1.5‡	-5.0%	-3.0	-0.1	-2.7	-0.3
Part A IRF allowed payment amount, 90-day PDP	17,468	18,035	$459	$428	$482	$568	-$118	-25.6%	-$212	-$24	-$197	-$39
Part A SNF allowed payment amount, 90-day PDP	17,468	18,035	$3,107	$2,748	$2,919	$2,782	-$222	-7.1%	-$466	$22	-$427	-$17
Part A HH allowed payment amount, 90-day PDP	17,468	18,035	$1,199	$1,214	$1,152	$1,157	$10	0.8%	-$37	$56	-$29	$49

Exhibit G.4: Congestive Heart Failure Episodes, Hospital EIs, October 1, 2018 – August 3, 2019

Outcome	# of BPCI Adv Int Episodes	# of Comp Int Episodes	BPCI Adv Baseline	BPCI Adv Int	Comp Baseline	Comp Int	DiD	% Change	95% LCI	95% UCI	90% LCI	90% UCI
Total allowed payment amount, inpatient through 90-day PDP	39,517	42,498	$26,560	$25,723	$26,282	$25,844	-$398	-1.5%	-$748	-$48	-$692	-$104
Total paid payment amount, inpatient through 90-day PDP	39,517	42,498	$23,506	$22,700	$23,240	$22,757	-$324	-1.4%	-$638	-$10	-$588	-$61
Patients discharged to institutional PAC	39,517	42,498	24.8%	21.9%	24.5%	22.0%	-0.45 pp	-1.8%	-1.2 pp	0.3 pp	-1.1 pp	0.2 pp
Unplanned readmission rate, 90-day PDP	39,167	42,158	41.2%	40.2%	40.9%	40.4%	-0.58 pp	-1.4%	-1.3 pp	0.2 pp	-1.2 pp	0.0 pp
All-cause mortality rate, 90-day PDP	38,794	41,766	18.1%	15.7%	17.9%	15.6%	-0.10 pp‡	-0.6%	-0.7 pp	0.5 pp	-0.6 pp	0.4 pp
Number of days at a SNF (minimum one day), 90-day PDP	10,989	11,582	31.1	27.6	31.5	29.8	-1.8	-5.7%	-2.6	-1.0	-2.4	-1.1
Part A IRF allowed payment amount, 90-day PDP	39,517	42,498	$666	$700	$677	$744	-$33	-4.9%	-$106	$41	-$95	$29
Part A SNF allowed payment amount, 90-day PDP	39,517	42,498	$4,523	$3,965	$4,457	$4,239	-$341	-7.5%	-$510	-$173	-$483	-$200
Part A HH allowed payment amount, 90-day PDP	39,517	42,498	$1,536	$1,615	$1,508	$1,540	$48	3.1%	$9	$86	$15	$80

Exhibit G.5: Gastrointestinal Hemorrhage Episodes, Hospital EIs, October 1, 2018 – August 3, 2019

Outcome	# of BPCI Adv Int Episodes	# of Comp Int Episodes	BPCI Adv Baseline	BPCI Adv Int	Comp Baseline	Comp Int	DiD	% Change	95% LCI	95% UCI	90% LCI	90% UCI
Total allowed payment amount, inpatient through 90-day PDP	7,407	8,414	$22,201	$22,637	$21,920	$22,391	-$34	-0.2%	-$605	$537	-$512	$444
Total paid payment amount, inpatient through 90-day PDP	7,407	8,414	$19,237	$19,713	$18,978	$19,389	$65	0.3%	-$448	$578	-$365	$495
Patients discharged to institutional PAC	7,407	8,414	19.8%	18.8%	19.8%	18.8%	-0.01 pp	-0.0%	-1.4 pp	1.4 pp	-1.2 pp	1.2 pp
Unplanned readmission rate, 90-day PDP	7,317	8,346	31.3%	31.0%	30.6%	30.2%	0.10 pp	0.3%	-1.5 pp	1.7 pp	-1.2 pp	1.4 pp
All-cause mortality rate, 90-day PDP	7,247	8,273	10.4%	9.8%	10.7%	9.8%	0.39 pp	3.8%	-0.7 pp	1.5 pp	-0.5 pp	1.3 pp
Number of days at a SNF (minimum one day), 90-day PDP	1,672	1,845	34.6	30.2	35.3	32.5	-1.6	-4.6%	-3.5	0.3	-3.1	0.0
Part A IRF allowed payment amount, 90-day PDP	7,407	8,414	$404	$493	$392	$433	$47	11.7%	-$74	$169	-$55	$150
Part A SNF allowed payment amount, 90-day PDP	7,407	8,414	$4,008	$3,525	$3,886	$3,752	-$349‡	-8.7%	-$678	-$19	-$625	-$72
Part A HH allowed payment amount, 90-day PDP	7,407	8,414	$1,007	$1,027	$992	$1,010	$2	0.2%	-$63	$67	-$53	$57

Exhibit G.6: Hip & Femur Procedures Except Major Joint Episodes, Hospital EIs, October 1, 2018 – August 3, 2019

Outcome	# of BPCI Adv Int Episodes	# of Comp Int Episodes	BPCI Adv Baseline	BPCI Adv Int	Comp Baseline	Comp Int	DiD	% Change	95% LCI	95% UCI	90% LCI	90% UCI
Total allowed payment amount, inpatient through 90-day PDP	6,297	6,154	$46,529	$45,245	$45,993	$46,681	-$1,971	-4.2%	-$2,975	-$967	-$2,813	-$1,129
Total paid payment amount, inpatient through 90-day PDP	6,297	6,154	$40,961	$40,183	$40,499	$41,319	-$1,598	-3.9%	-$2,465	-$732	-$2,325	-$872
Patients discharged to institutional PAC	6,297	6,154	88.1%	86.6%	87.6%	86.1%	-0.01 pp‡	0.0%	-1.3 pp	1.3 pp	-1.1 pp	1.1 pp
Unplanned readmission rate, 90-day PDP	6,292	6,149	21.8%	20.7%	22.3%	21.8%	-0.57 pp	-2.6%	-2.1 pp	0.9 pp	-1.8 pp	0.7 pp
All-cause mortality rate, 90-day PDP	6,133	5,979	10.5%	10.0%	10.9%	11.0%	-0.50 pp	-4.8%	-1.7 pp	0.7 pp	-1.5 pp	0.5 pp
Number of days at a SNF (minimum one day), 90-day PDP	4,706	4,347	45.2	37.7	45.0	40.9	-3.4	-7.5%	-5.1	-1.7	-4.8	-2.0
Part A IRF allowed payment amount, 90-day PDP	6,297	6,154	$4,556	$3,682	$4,432	$4,622	-$1,066	-23.4%	-$1,682	-$449	-$1,583	-$549
Part A SNF allowed payment amount, 90-day PDP	6,297	6,154	$17,686	$16,229	$17,359	$16,951	-$1,050	-5.9%	-$1,906	-$193	-$1,768	-$332
Part A HH allowed payment amount, 90-day PDP	6,297	6,154	$2,000	$2,227	$2,054	$2,096	$184	9.2%	$68	$301	$87	$282

Exhibit G.7: Major Joint Replacement of the Lower Extremity Episodes, Hospital EIs, October 1, 2018 – August 3, 2019

Outcome	# of BPCI Adv Int Episodes	# of Comp Int Episodes	BPCI Adv Baseline	BPCI Adv Int	Comp Baseline	Comp Int	DiD	% Change	95% LCI	95% UCI	90% LCI	90% UCI
Total allowed payment amount, inpatient through 90-day PDP	14,072	15,621	$28,522	$25,560	$26,948	$25,118	-$1,133	-4.0%	-$1,665	-$601	-$1,579	-$687
Total paid payment amount, inpatient through 90-day PDP	14,072	15,621	$25,634	$22,833	$24,180	$22,417	-$1,039	-4.1%	-$1,542	-$536	-$1,461	-$617
Patients discharged to institutional PAC	14,072	15,621	47.6%	30.5%	44.4%	32.1%	-4.84 pp	-10.2%	-7.7 pp	-2.0 pp	-7.2 pp	-2.5 pp
Unplanned readmission rate, 90-day PDP	14,070	15,618	12.3%	11.4%	11.8%	11.9%	-0.92 pp	-7.5%	-2.2 pp	0.4 pp	-2.0 pp	0.2 pp
All-cause mortality rate, 90-day PDP	14,006	15,552	2.2%	1.6%	1.9%	1.3%	0.03 pp	1.4%	-0.3 pp	0.3 pp	-0.2 pp	0.3 pp
Number of days at a SNF (minimum one day), 90-day PDP	4,250	4,797	25.3	20.7	23.3	20.9	-2.2‡	-8.5%	-3.3	-1.0	-3.1	-1.2
Part A IRF allowed payment amount, 90-day PDP	14,072	15,621	$1,993	$1,220	$1,370	$1,047	-$450‡	-22.6%	-$742	-$158	-$694	-$205
Part A SNF allowed payment amount, 90-day PDP	14,072	15,621	$5,281	$3,542	$4,793	$3,679	-$626	-11.9%	-$1,016	-$236	-$953	-$299
Part A HH allowed payment amount, 90-day PDP	14,072	15,621	$2,282	$2,263	$2,347	$2,373	-$44	-1.9%	-$208	$120	-$181	$93

Exhibit G.8: Renal Failure Episodes, Hospital EIs, October 1, 2018 – August 3, 2019

Outcome	# of BPCI Adv Int Episodes	# of Comp Int Episodes	BPCI Adv Baseline	BPCI Adv Int	Comp Baseline	Comp Int	DiD	% Change	95% LCI	95% UCI	90% LCI	90% UCI
Total allowed payment amount, inpatient through 90-day PDP	13,187	12,951	$26,247	$26,186	$25,840	$26,004	-$225	-0.9%	-$824	$374	-$727	$277
Total paid payment amount, inpatient through 90-day PDP	13,187	12,951	$22,933	$22,949	$22,556	$22,713	-$142	-0.6%	-$664	$381	-$580	$297
Patients discharged to institutional PAC	13,187	12,951	31.9%	30.6%	31.2%	30.6%	-0.77 pp	-2.4%	-2.1 pp	0.5 pp	-1.9 pp	0.3 pp
Unplanned readmission rate, 90-day PDP	13,062	12,857	36.0%	34.7%	35.3%	34.0%	-0.04 pp	-0.1%	-1.3 pp	1.2 pp	-1.1 pp	1.0 pp
All-cause mortality rate, 90-day PDP	12,905	12,677	17.8%	16.3%	17.6%	17.1%	-0.96 pp	-5.4%	-2.0 pp	0.1 pp	-1.8 pp	-0.1 pp
Number of days at a SNF (minimum one day), 90-day PDP	4,643	4,313	35.4	31.4	36.1	33.1	-1.0	-2.7%	-2.3	0.4	-2.1	0.2
Part A IRF allowed payment amount, 90-day PDP	13,187	12,951	$717	$775	$760	$833	-$15	-2.1%	-$163	$132	-$139	$108
Part A SNF allowed payment amount, 90-day PDP	13,187	12,951	$6,321	$5,864	$6,107	$5,970	-$319	-5.1%	-$684	$45	-$625	-$13
Part A HH allowed payment amount, 90-day PDP	13,187	12,951	$1,366	$1,409	$1,348	$1,360	$30	2.2%	-$24	$84	-$15	$76

Exhibit G.9: Sepsis Episodes, Hospital EIs, October 1, 2018 – August 3, 2019

Outcome	# of BPCI Adv Int Episodes	# of Comp Int Episodes	BPCI Adv Baseline	BPCI Adv Int	Comp Baseline	Comp Int	DiD	% Change	95% LCI	95% UCI	90% LCI	90% UCI
Total allowed payment amount, inpatient through 90-day PDP	52,396	55,709	$31,749	$31,526	$31,542	$32,203	-$883	-2.8%	-$1,285	-$482	-$1,220	-$546
Total paid payment amount, inpatient through 90-day PDP	52,396	55,709	$28,104	$28,000	$27,886	$28,489	-$706	-2.5%	-$1,067	-$346	-$1,009	-$404
Patients discharged to institutional PAC	52,396	55,709	36.3%	33.7%	34.6%	32.9%	-0.90 pp‡	-2.5%	-1.7 pp	-0.1 pp	-1.6 pp	-0.2 pp
Unplanned readmission rate, 90-day PDP	51,936	55,300	32.6%	31.5%	32.6%	32.0%	-0.43 pp‡	-1.3%	-1.1 pp	0.2 pp	-1.0 pp	0.1 pp
All-cause mortality rate, 90-day PDP	51,152	54,363	21.5%	20.5%	20.7%	19.3%	0.35 pp	1.6%	-0.3 pp	1.0 pp	-0.2 pp	0.9 pp
Number of days at a SNF (minimum one day), 90-day PDP	17,598	17,909	35.3	31.0	36.0	34.3	-2.5‡	-7.1%	-3.3	-1.7	-3.2	-1.8
Part A IRF allowed payment amount, 90-day PDP	52,396	55,709	$681	$766	$681	$759	$8	1.1%	-$81	$96	-$66	$81
Part A SNF allowed payment amount, 90-day PDP	52,396	55,709	$6,226	$5,555	$5,993	$6,060	-$738	-11.9%	-$935	-$541	-$903	-$573
Part A HH allowed payment amount, 90-day PDP	52,396	55,709	$1,170	$1,236	$1,168	$1,201	$33	2.8%	$2	$64	$7	$59

Exhibit G.10: Simple Pneumonia and Respiratory Infections Episodes, Hospital EIs, October 1, 2018 – August 3, 2019

Outcome	# of BPCI Adv Int Episodes	# of Comp Int Episodes	BPCI Adv Baseline	BPCI Adv Int	Comp Baseline	Comp Int	DiD	% Change	95% LCI	95% UCI	90% LCI	90% UCI
Total allowed payment amount, inpatient through 90-day PDP	27,596	26,016	$24,872	$23,764	$24,560	$23,574	-$122	-0.5%	-$490	$247	-$431	$187
Total paid payment amount, inpatient through 90-day PDP	27,596	26,016	$21,766	$20,777	$21,498	$20,548	-$38	-0.2%	-$367	$290	-$314	$237
Patients discharged to institutional PAC	27,596	26,016	29.0%	26.0%	28.9%	25.9%	-0.01 pp	0.0%	-0.9 pp	0.9 pp	-0.8 pp	0.8 pp
Unplanned readmission rate, 90-day PDP	27,381	25,839	31.4%	29.4%	31.1%	28.9%	0.21 pp	0.7%	-0.7 pp	1.1 pp	-0.6 pp	1.0 pp
All-cause mortality rate, 90-day PDP	27,052	25,508	17.2%	15.1%	17.3%	14.2%	1.03 pp	6.0%	0.3 pp	1.7 pp	0.4 pp	1.6 pp
Number of days at a SNF (minimum one day), 90-day PDP	7,938	7,079	33.9	29.7	34.2	31.9	-1.9‡	-5.7%	-2.9	-0.9	-2.8	-1.1
Part A IRF allowed payment amount, 90-day PDP	27,596	26,016	$572	$599	$610	$653	-$16	-2.8%	-$111	$79	-$96	$63
Part A SNF allowed payment amount, 90-day PDP	27,596	26,016	$5,245	$4,487	$5,028	$4,660	-$390	-7.4%	-$597	-$182	-$564	-$215
Part A HH allowed payment amount, 90-day PDP	27,596	26,016	$1,249	$1,325	$1,232	$1,266	$42	3.4%	-$2	$87	$5	$79

Exhibit G.11: Stroke Episodes, Hospital EIs, October 1, 2018 – August 3, 2019

Outcome	# of BPCI Adv Int Episodes	# of Comp Int Episodes	BPCI Adv Baseline	BPCI Adv Int	Comp Baseline	Comp Int	DiD	% Change	95% LCI	95% UCI	90% LCI	90% UCI
Total allowed payment amount, inpatient through 90-day PDP	18,263	19,484	$32,594	$31,693	$32,428	$32,341	-$813	-2.5%	-$1,396	-$231	-$1,302	-$325
Total paid payment amount, inpatient through 90-day PDP	18,263	19,484	$28,900	$28,172	$28,791	$28,754	-$691	-2.4%	-$1,234	-$149	-$1,146	-$237
Patients discharged to institutional PAC	18,263	19,484	50.4%	46.1%	50.7%	47.6%	-1.10 pp	-2.2%	-2.4 pp	0.2 pp	-2.2 pp	0.0 pp
Unplanned readmission rate, 90-day PDP	18,135	19,365	25.2%	24.5%	24.8%	23.8%	0.35 pp‡	1.4%	-0.6 pp	1.3 pp	-0.5 pp	1.2 pp
All-cause mortality rate, 90-day PDP	18,010	19,241	16.4%	16.1%	16.0%	15.8%	-0.02 pp	-0.1%	-0.9 pp	0.8 pp	-0.7 pp	0.7 pp
Number of days at a SNF (minimum one day), 90-day PDP	5,890	5,958	40.7	35.2	40.8	37.6	-2.3	-5.7%	-3.4	-1.2	-3.2	-1.4
Part A IRF allowed payment amount, 90-day PDP	18,263	19,484	$6,155	$5,848	$6,492	$6,433	-$247	-4.0%	-$615	$120	-$556	$61
Part A SNF allowed payment amount, 90-day PDP	18,263	19,484	$7,705	$6,399	$7,492	$6,695	-$510	-6.6%	-$823	-$197	-$772	-$248
Part A HH allowed payment amount, 90-day PDP	18,263	19,484	$1,607	$1,644	$1,624	$1,651	$10	0.6%	-$49	$69	-$39	$59

Exhibit G.12: Urinary Tract Infection Episodes, Hospital EIs, October 1, 2018 – August 3, 2019

Outcome	# of BPCI Adv Int Episodes	# of Comp Int Episodes	BPCI Adv Baseline	BPCI Adv Int	Comp Baseline	Comp Int	DiD	% Change	95% LCI	95% UCI	90% LCI	90% UCI
Total allowed payment amount, inpatient through 90-day PDP	13,631	14,601	$24,623	$24,403	$24,183	$25,018	-$1,055	-4.3%	-$1,605	-$505	-$1,517	-$594
Total paid payment amount, inpatient through 90-day PDP	13,631	14,601	$21,163	$21,101	$20,729	$21,487	-$820	-3.9%	-$1,292	-$348	-$1,216	-$424
Patients discharged to institutional PAC	13,631	14,601	36.3%	35.2%	36.6%	36.6%	-1.07 pp	-3.0%	-2.6 pp	0.4 pp	-2.3 pp	0.2 pp
Unplanned readmission rate, 90-day PDP	13,566	14,523	32.8%	32.6%	32.3%	31.8%	0.31 pp	0.9%	-0.9 pp	1.5 pp	-0.7 pp	1.3 pp
All-cause mortality rate, 90-day PDP	13,348	14,276	11.7%	10.9%	11.3%	11.3%	-0.86 pp	-7.3%	-1.7 pp	0.0 pp	-1.6 pp	-0.2 pp
Number of days at a SNF (minimum one day), 90-day PDP	5,417	5,864	37.9	32.6	38.7	36.1	-2.8	-7.3%	-4.0	-1.6	-3.8	-1.7
Part A IRF allowed payment amount, 90-day PDP	13,631	14,601	$688	$735	$720	$851	-$84	-12.2%	-$216	$48	-$195	$27
Part A SNF allowed payment amount, 90-day PDP	13,631	14,601	$7,618	$6,809	$7,639	$7,753	-$923	-12.1%	-$1,341	-$505	-$1,273	-$572
Part A HH allowed payment amount, 90-day PDP	13,631	14,601	$1,527	$1,599	$1,483	$1,517	$38	2.5%	-$16	$93	-$8	$84

Exhibit G.13: Percutaneous Coronary Intervention (Outpatient) Episodes, Hospital EIs, October 1, 2018 – August 3, 2019

Outcome	# of BPCI Adv Int Episodes	# of Comp Int Episodes	BPCI Adv Baseline	BPCI Adv Int	Comp Baseline	Comp Int	DiD	% Change	95% LCI	95% UCI	90% LCI	90% UCI
Total allowed payment amount, inpatient through 90-day PDP	5,139	5,022	$16,894	$17,775	$17,044	$18,193	-$268	-1.6%	-$803	$266	-$715	$179
Total paid payment amount, inpatient through 90-day PDP	5,139	5,022	$14,057	$14,548	$14,147	$14,919	-$280	-2.0%	-$772	$212	-$692	$132
Patients discharged to institutional PAC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Unplanned readmission rate, 90-day PDP	5,139	5,022	13.3%	14.2%	13.1%	14.3%	-0.34 pp	-2.6%	-1.9 pp	1.2 pp	-1.6 pp	1.0 pp
All-cause mortality rate, 90-day PDP	5,139	5,020	0.9%	1.1%	0.9%	0.9%	0.13 pp	13.8%	-0.3 pp	0.5 pp	-0.2 pp	0.5 pp
Number of days at a SNF (minimum one day), 90-day PDP	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Part A IRF allowed payment amount, 90-day PDP	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Part A SNF allowed payment amount, 90-day PDP	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Part A HH allowed payment amount, 90-day PDP	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Appendix H: Impact of BPCI Advanced and Sensitivity Results

The following exhibits display risk-adjusted difference-in-differences (DiD) results for the BPCI Advanced impact estimates and the sensitivity tests to understand whether the reported impact estimates were robust with respect to the episode sample used. We conducted the following four sensitivity tests:

- **Sensitivity test #1:** Excluding episodes that were treated by a BPCI participant (impacts baseline period observations only)
- **Sensitivity test #2:** Excluding episodes attributed to BPCI Advanced PGPs
- **Sensitivity test #3:** Excluding episodes aligned with Medicare Shared Savings Program (MSSP) Track 3, MSSP Enhanced, Comprehensive End Stage Renal Disease Care Model, Next Generation Accountable Care Organization (ACO) and Vermont ACO
- **Sensitivity test #4:** Including the comparison sample selected under the propensity score model with no caliper selected, and all BPCI Advanced hospital EIs

Note that BPCI Advanced impact estimates that are statistically significant at the 1%, 5% or 10% significance level are indicated by brown, medium, and light orange shaded cells, respectively. The * symbol indicates that the sensitivity test was statistically significant at the 10% level. Medicare payments were risk-adjusted and standardized to remove the effects of geographic differences in wages, extra amounts to account for teaching programs and other policy factors. Results reflect the BPCI Advanced evaluation team's analysis of Medicare claims and enrollment data for episodes with anchor stays/ procedures that began April 1, 2013 and ended on or before December 31, 2017 (baseline period) and episodes with anchor stays/procedures that began October 1, 2018 and ended on or before August 3, 2019 (intervention period) for BPCI Advanced EIs and matched comparison providers.

Exhibit H.1: BPCI Advanced Impact Estimate and Sensitivity Test Results, Total Payments by Clinical Episode, Hospital EIs, October 1, 2018 – August 3, 2019

Clinical Episode	Result	Number of BPCI Advanced Episodes	Number of Comparison Episodes	BPCI Advanced Baseline	BPCI Advanced Intervention	Comparison Baseline	Comparison Intervention	DiD
AMI	BPCI Advanced impact estimate	61,907	60,961	$26,947	$26,755	$26,505	$26,644	-$332
	Sensitivity test #1	57,325	59,099	$26,970	$26,764	$26,513	$26,668	-$361
	Sensitivity test #2	58,161	60,700	$26,956	$26,763	$26,483	$26,587	-$296
	Sensitivity test #3	59,260	58,131	$26,971	$26,760	$26,525	$26,665	-$351
	Sensitivity test #4	68,351	67,575	$27,120	$26,906	$26,621	$26,622	-$216
Cardiac Arrhythmia	BPCI Advanced impact estimate	124,561	130,037	$19,242	$19,646	$19,007	$19,663	-$251
	Sensitivity test #1	116,800	128,477	$19,209	$19,614	$18,982	$19,634	-$245
	Sensitivity test #2	114,660	129,713	$19,209	$19,691	$19,011	$19,670	-$177
	Sensitivity test #3	119,526	125,009	$19,249	$19,658	$19,014	$19,745	-$322
	Sensitivity test #4	137,529	147,369	$19,418	$19,788	$19,029	$19,689	-$290
COPD, Bronchitis, & Asthma	BPCI Advanced impact estimate	144,649	152,969	$20,594	$20,405	$20,079	$20,385	-$495
	Sensitivity test #1	128,225	149,141	$20,587	$20,401	$20,074	$20,383	-$494*
	Sensitivity test #2	134,364	152,824	$20,614	$20,384	$20,141	$20,452	-$541*
	Sensitivity test #3	139,981	146,780	$20,578	$20,337	$20,066	$20,400	-$575*
	Sensitivity test #4	165,641	171,556	$20,794	$20,554	$20,162	$20,440	-$518*
CHF	BPCI Advanced impact estimate	251,651	269,342	$26,560	$25,723	$26,282	$25,844	-$398
	Sensitivity test #1	224,743	259,737	$26,622	$25,754	$26,310	$25,882	-$441*
	Sensitivity test #2	230,692	268,999	$26,543	$25,811	$26,307	$25,873	-$298*
	Sensitivity test #3	240,881	255,627	$26,537	$25,674	$26,272	$25,822	-$413*
	Sensitivity test #4	294,357	310,576	$26,926	$25,996	$26,352	$25,903	-$481*
GI Hemorrhage	BPCI Advanced impact estimate	53,095	60,040	$22,201	$22,637	$21,920	$22,391	-$34
	Sensitivity test #1	50,712	58,879	$22,230	$22,647	$21,911	$22,413	-$84
	Sensitivity test #2	47,237	59,882	$22,258	$22,660	$22,048	$22,537	-$87
	Sensitivity test #3	51,774	58,214	$22,217	$22,665	$21,923	$22,364	$7
	Sensitivity test #4	61,856	65,798	$22,554	$22,968	$22,064	$22,507	-$29

Clinical Episode	Result	Number of BPCI Advanced Episodes	Number of Comparison Episodes	BPCI Advanced Baseline	BPCI Advanced Intervention	Comparison Baseline	Comparison Intervention	DiD
Hip & Femur	BPCI Advanced impact estimate	41,847	40,973	$46,529	$45,245	$45,993	$46,681	-$1,971
	Sensitivity test #1	38,551	40,035	$46,657	$45,341	$46,114	$46,805	-$2,006*
	Sensitivity test #2	34,567	40,861	$46,564	$45,493	$46,130	$46,846	-$1,788*
	Sensitivity test #3	40,436	39,019	$46,549	$45,209	$46,063	$46,899	-$2,176*
	Sensitivity test #4	49,233	49,077	$46,902	$45,728	$45,990	$46,663	-$1,848*
MJRLE	BPCI Advanced impact estimate	107,450	118,211	$28,522	$25,560	$26,948	$25,118	-$1,133
	Sensitivity test #1	86,405	105,893	$28,846	$25,915	$27,249	$25,400	-$1,083*
	Sensitivity test #2	86,737	117,624	$28,567	$25,627	$27,203	$25,386	-$1,124*
	Sensitivity test #3	103,125	110,593	$28,597	$25,523	$27,007	$25,051	-$1,118*
	Sensitivity test #4	132,898	133,595	$28,530	$25,669	$26,986	$25,192	-$1,067*
Renal Failure	BPCI Advanced impact estimate	94,592	89,280	$26,247	$26,186	$25,840	$26,004	-$225
	Sensitivity test #1	88,758	87,617	$26,277	$26,213	$25,878	$26,034	-$220
	Sensitivity test #2	85,166	88,967	$26,314	$26,250	$25,963	$26,136	-$237
	Sensitivity test #3	91,136	86,157	$26,233	$26,208	$25,822	$26,048	-$250
	Sensitivity test #4	106,378	106,414	$26,525	$26,435	$25,812	$26,013	-$291
Sepsis	BPCI Advanced impact estimate	306,069	320,635	$31,749	$31,526	$31,542	$32,203	-$883
	Sensitivity test #1	276,183	314,979	$31,749	$31,533	$31,590	$32,249	-$875*
	Sensitivity test #2	281,056	319,432	$31,823	$31,547	$31,690	$32,352	-$937*
	Sensitivity test #3	291,636	305,146	$31,840	$31,657	$31,623	$32,255	-$816*
	Sensitivity test #4	379,432	377,975	$32,488	$32,202	$31,649	$32,416	-$1,052*
SPRI	BPCI Advanced impact estimate	191,213	181,569	$24,872	$23,764	$24,560	$23,574	-$122
	Sensitivity test #1	170,496	177,209	$24,968	$23,840	$24,634	$23,650	-$144
	Sensitivity test #2	175,539	181,223	$24,899	$23,821	$24,680	$23,703	-$101
	Sensitivity test #3	183,169	173,721	$24,900	$23,676	$24,588	$23,607	-$242
	Sensitivity test #4	211,449	217,661	$25,209	$23,917	$24,589	$23,615	-$317*
Stroke	BPCI Advanced impact estimate	127,396	131,284	$32,594	$31,693	$32,428	$32,341	-$813
	Sensitivity test #1	119,452	128,188	$32,635	$31,695	$32,390	$32,344	-$894*
	Sensitivity test #2	118,028	130,788	$32,674	$31,680	$32,452	$32,339	-$881*
	Sensitivity test #3	122,599	125,713	$32,613	$31,641	$32,465	$32,354	-$860*
	Sensitivity test #4	128,711	134,540	$32,674	$31,729	$32,435	$32,397	-$907*

Clinical Episode	Result	Number of BPCI Advanced Episodes	Number of Comparison Episodes	BPCI Advanced Baseline	BPCI Advanced Intervention	Comparison Baseline	Comparison Intervention	DiD
UTI	BPCI Advanced impact estimate	102,315	106,488	$24,623	$24,403	$24,183	$25,018	-$1,055
	Sensitivity test #1	93,130	104,479	$24,705	$24,458	$24,217	$25,073	-$1,104*
	Sensitivity test #2	92,711	106,248	$24,630	$24,368	$24,302	$25,155	-$1,114*
	Sensitivity test #3	98,563	101,772	$24,639	$24,489	$24,189	$25,068	-$1,030*
	Sensitivity test #4	118,631	124,384	$24,929	$24,671	$24,228	$25,181	-$1,212*
PCI Outpatient	BPCI Advanced impact estimate	32,588	31,114	$16,894	$17,775	$17,044	$18,193	-$268
	Sensitivity test #1	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	Sensitivity test #2	31,102	31,110	$16,899	$17,778	$17,054	$18,211	-$278
	Sensitivity test #3	31,315	30,269	$16,897	$17,802	$17,008	$18,161	-$248
	Sensitivity test #4	33,138	31,200	$16,905	$17,791	$17,045	$18,209	-$278

Note: DiD = difference-in-differences; AMI = acute myocardial infarction; COPD = chronic obstructive pulmonary disease; CHF = congestive heart failure; GI = gastrointestinal; Hip & Femur = hip & femur procedures except major joint; MJRLE = major joint replacement of the lower extremity; SPRI = simple pneumonia and respiratory infections; UTI = urinary tract infection; PCI = percutaneous coronary intervention.

Exhibit H.2: BPCI Advanced Impact Estimate and Sensitivity Test Results, First Discharge to Institutional PAC by Clinical Episode, Hospital EIs, October 1, 2018 – August 3, 2019

Clinical Episode	Result	Number of BPCI Advanced Episodes	Number of Comparison Episodes	BPCI Advanced Baseline	BPCI Advanced Intervention	Comparison Baseline	Comparison Intervention	DiD
AMI	BPCI Advanced impact estimate	61,907	60,961	24.0%	21.7%	23.4%	21.9%	-0.79 pp
	Sensitivity test #1	57,325	59,099	23.9%	21.6%	23.4%	21.9%	-0.83 pp
	Sensitivity test #2	58,161	60,700	24.1%	21.8%	23.5%	21.9%	-0.68 pp
	Sensitivity test #3	59,260	58,131	24.0%	21.5%	23.4%	21.9%	-1.02 pp
	Sensitivity test #4	68,351	67,575	24.1%	21.7%	23.7%	21.9%	-0.53 pp
Cardiac Arrhythmia	BPCI Advanced impact estimate	124,561	130,037	15.0%	14.1%	14.8%	14.3%	-0.48 pp
	Sensitivity test #1	116,800	128,477	14.9%	14.0%	14.7%	14.3%	-0.47 pp
	Sensitivity test #2	114,660	129,713	15.0%	14.1%	14.8%	14.4%	-0.42 pp
	Sensitivity test #3	119,526	125,009	15.1%	14.1%	14.8%	14.3%	-0.40 pp
	Sensitivity test #4	137,529	147,369	15.2%	14.3%	14.9%	14.4%	-0.54 pp

Clinical Episode	Result	Number of BPCI Advanced Episodes	Number of Comparison Episodes	BPCI Advanced Baseline	BPCI Advanced Intervention	Comparison Baseline	Comparison Intervention	DiD
COPD, Bronchitis, & Asthma	BPCI Advanced impact estimate	144,649	152,969	16.1%	14.4%	14.8%	13.7%	-0.58 pp
	Sensitivity test #1	128,225	149,141	16.1%	14.5%	14.8%	13.7%	-0.57 pp
	Sensitivity test #2	134,364	152,824	16.2%	14.5%	14.9%	13.8%	-0.61 pp
	Sensitivity test #3	139,981	146,780	16.1%	14.4%	14.8%	13.6%	-0.53 pp
	Sensitivity test #4	165,641	171,556	16.0%	14.4%	14.9%	13.8%	-0.54 pp
CHF	BPCI Advanced impact estimate	251,651	269,342	24.8%	21.9%	24.5%	22.0%	-0.45 pp
	Sensitivity test #1	224,743	259,737	24.9%	21.9%	24.5%	22.1%	-0.54 pp
	Sensitivity test #2	230,692	268,999	24.8%	21.9%	24.6%	22.1%	-0.44 pp
	Sensitivity test #3	240,881	255,627	24.8%	21.8%	24.5%	21.9%	-0.40 pp
	Sensitivity test #4	294,357	310,576	24.9%	22.0%	24.3%	21.8%	-0.49 pp
GI Hemorrhage	BPCI Advanced impact estimate	53,095	60,040	19.8%	18.8%	19.8%	18.8%	-0.01 pp
	Sensitivity test #1	50,712	58,879	19.8%	18.8%	19.8%	18.8%	0.00 pp
	Sensitivity test #2	47,237	59,882	20.0%	18.8%	20.0%	18.9%	-0.20 pp
	Sensitivity test #3	51,774	58,214	19.8%	19.0%	19.8%	18.6%	0.43 pp
	Sensitivity test #4	61,856	65,798	20.4%	19.3%	20.0%	18.9%	-0.03 pp
Hip & Femur	BPCI Advanced impact estimate	41,847	40,973	88.1%	86.6%	87.6%	86.1%	-0.01 pp
	Sensitivity test #1	38,551	40,035	88.1%	86.6%	87.5%	86.1%	-0.08 pp
	Sensitivity test #2	34,567	40,861	88.2%	86.7%	87.7%	86.3%	-0.12 pp
	Sensitivity test #3	40,436	39,019	88.0%	86.4%	87.6%	86.1%	-0.02 pp
	Sensitivity test #4	49,233	49,077	88.5%	87.2%	87.9%	86.6%	0.04 pp
MJRLE	BPCI Advanced impact estimate	107,450	118,211	47.6%	30.5%	44.4%	32.1%	-4.84 pp
	Sensitivity test #1	86,405	105,893	49.2%	32.0%	46.3%	33.6%	-4.47 pp*
	Sensitivity test #2	86,737	117,624	47.8%	30.7%	45.3%	32.9%	-4.79 pp*
	Sensitivity test #3	103,125	110,593	47.9%	30.2%	44.6%	31.6%	-4.67 pp*
	Sensitivity test #4	132,898	133,595	48.5%	32.0%	45.8%	33.1%	-3.77 pp*
Renal Failure	BPCI Advanced impact estimate	94,592	89,280	31.9%	30.6%	31.2%	30.6%	-0.77 pp
	Sensitivity test #1	88,758	87,617	32.0%	30.6%	31.2%	30.7%	-0.83 pp
	Sensitivity test #2	85,166	88,967	32.1%	30.7%	31.3%	30.8%	-0.89 pp
	Sensitivity test #3	91,136	86,157	31.9%	30.6%	31.1%	30.7%	-0.86 pp
	Sensitivity test #4	106,378	106,414	32.2%	30.7%	31.3%	30.8%	-0.96 pp

Clinical Episode	Result	Number of BPCI Advanced Episodes	Number of Comparison Episodes	BPCI Advanced Baseline	BPCI Advanced Intervention	Comparison Baseline	Comparison Intervention	DiD
Sepsis	BPCI Advanced impact estimate	306,069	320,635	36.3%	33.7%	34.6%	32.9%	-0.90 pp
	Sensitivity test #1	276,183	314,979	36.3%	33.7%	34.7%	33.0%	-0.86 pp*
	Sensitivity test #2	281,056	319,432	36.4%	33.9%	34.7%	33.0%	-0.79 pp*
	Sensitivity test #3	291,636	305,146	36.4%	33.8%	34.7%	32.9%	-0.72 pp*
	Sensitivity test #4	379,432	377,975	36.5%	33.8%	34.5%	33.0%	-1.13 pp*
SPRI	BPCI Advanced impact estimate	191,213	181,569	29.0%	26.0%	28.9%	25.9%	-0.01 pp
	Sensitivity test #1	170,496	177,209	29.1%	26.0%	28.9%	25.9%	-0.09 pp
	Sensitivity test #2	175,539	181,223	29.2%	26.2%	29.0%	26.0%	0.04 pp
	Sensitivity test #3	183,169	173,721	29.1%	25.9%	28.9%	26.0%	-0.29 pp
	Sensitivity test #4	211,449	217,661	29.2%	26.0%	28.7%	25.8%	-0.18 pp
Stroke	BPCI Advanced impact estimate	127,396	131,284	50.4%	46.1%	50.7%	47.6%	-1.10 pp
	Sensitivity test #1	119,452	128,188	50.4%	46.1%	50.7%	47.6%	-1.16 pp*
	Sensitivity test #2	118,028	130,788	50.5%	46.1%	50.7%	47.6%	-1.26 pp*
	Sensitivity test #3	122,599	125,713	50.4%	45.7%	50.8%	47.6%	-1.48 pp*
	Sensitivity test #4	128,711	134,540	50.4%	46.1%	50.8%	47.7%	-1.24 pp*
UTI	BPCI Advanced impact estimate	102,315	106,488	36.3%	35.2%	36.6%	36.6%	-1.07 pp
	Sensitivity test #1	93,130	104,479	36.4%	35.3%	36.7%	36.7%	-1.08 pp
	Sensitivity test #2	92,711	106,248	36.4%	35.5%	36.7%	36.7%	-0.91 pp
	Sensitivity test #3	98,563	101,772	36.4%	35.0%	36.7%	36.6%	-1.34 pp*
	Sensitivity test #4	118,631	124,384	36.7%	35.4%	36.4%	36.5%	-1.38 pp*
PCI Outpatient	BPCI Advanced impact estimate	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	Sensitivity test #1	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	Sensitivity test #2	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	Sensitivity test #3	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	Sensitivity test #4	n/a	n/a	n/a	n/a	n/a	n/a	n/a

Note: DiD = difference-in-differences; AMI = acute myocardial infarction; COPD = chronic obstructive pulmonary disease; CHF = congestive heart failure; GI = gastrointestinal; Hip & Femur = hip & femur procedures except major joint; MJRLE = major joint replacement of the lower extremity; SPRI = simple pneumonia and respiratory infections; UTI = urinary tract infection; PCI = percutaneous coronary intervention.

Exhibit H.3: BPCI Advanced Impact Estimate and Sensitivity Test Results, Mortality Rate by Clinical Episode, Hospital EIs, October 1, 2018 – August 3, 2019

Clinical Episode	Result	Number of BPCI Advanced Episodes	Number of Comparison Episodes	BPCI Advanced Baseline	BPCI Advanced Intervention	Comparison Baseline	Comparison Intervention	DiD
AMI	BPCI Advanced impact estimate	60,619	59,824	18.0%	16.5%	18.3%	16.5%	0.38 pp
	Sensitivity test #1	56,141	57,995	17.9%	16.5%	18.3%	16.4%	0.41 pp
	Sensitivity test #2	56,962	59,570	18.0%	16.5%	18.3%	16.3%	0.40 pp
	Sensitivity test #3	58,009	57,029	18.0%	16.2%	18.4%	16.6%	0.07 pp
	Sensitivity test #4	66,876	66,259	18.0%	16.5%	18.2%	16.5%	0.21 pp
Cardiac Arrhythmia	BPCI Advanced impact estimate	122,864	128,320	8.5%	8.2%	8.7%	8.4%	-0.12 pp
	Sensitivity test #1	115,222	126,786	8.6%	8.2%	8.7%	8.4%	-0.14 pp
	Sensitivity test #2	113,087	128,000	8.5%	8.2%	8.7%	8.4%	-0.06 pp
	Sensitivity test #3	117,885	123,348	8.6%	8.1%	8.8%	8.4%	-0.15 pp
	Sensitivity test #4	135,500	145,414	8.6%	8.1%	8.7%	8.4%	-0.20 pp
COPD, Bronchitis, & Asthma	BPCI Advanced impact estimate	141,771	150,195	8.3%	7.0%	8.2%	7.2%	-0.37 pp
	Sensitivity test #1	125,691	146,447	8.4%	7.0%	8.2%	7.2%	-0.37 pp
	Sensitivity test #2	131,651	150,054	8.3%	7.0%	8.2%	7.2%	-0.37 pp
	Sensitivity test #3	137,185	144,090	8.4%	7.0%	8.3%	7.1%	-0.24 pp
	Sensitivity test #4	162,262	168,437	8.3%	7.0%	8.1%	7.2%	-0.37 pp
CHF	BPCI Advanced impact estimate	247,351	265,048	18.1%	15.7%	17.9%	15.6%	-0.10 pp
	Sensitivity test #1	220,875	255,632	18.1%	15.7%	17.9%	15.6%	-0.15 pp
	Sensitivity test #2	226,747	264,712	18.1%	15.7%	18.0%	15.7%	-0.05 pp
	Sensitivity test #3	236,744	251,530	18.2%	15.6%	18.0%	15.5%	-0.07 pp
	Sensitivity test #4	289,110	305,615	18.0%	15.5%	18.0%	15.6%	-0.08 pp
GI Hemorrhage	BPCI Advanced impact estimate	52,041	58,986	10.4%	9.8%	10.7%	9.8%	0.39 pp
	Sensitivity test #1	49,702	57,839	10.4%	9.8%	10.7%	9.8%	0.39 pp
	Sensitivity test #2	46,272	58,829	10.4%	9.9%	10.7%	9.8%	0.44 pp
	Sensitivity test #3	50,742	57,195	10.4%	9.8%	10.8%	9.8%	0.37 pp
	Sensitivity test #4	60,578	64,611	10.6%	10.0%	10.8%	9.8%	0.37 pp

Clinical Episode	Result	Number of BPCI Advanced Episodes	Number of Comparison Episodes	BPCI Advanced Baseline	BPCI Advanced Intervention	Comparison Baseline	Comparison Intervention	DiD
Hip & Femur	BPCI Advanced impact estimate	40,908	39,969	10.5%	10.0%	10.9%	11.0%	-0.50 pp
	Sensitivity test #1	37,662	39,060	10.4%	9.9%	10.9%	11.0%	-0.52 pp
	Sensitivity test #2	33,809	39,859	10.4%	10.1%	10.8%	10.9%	-0.47 pp
	Sensitivity test #3	39,534	38,054	10.5%	10.1%	10.9%	10.9%	-0.48 pp
	Sensitivity test #4	48,175	47,890	10.4%	10.0%	10.8%	10.5%	-0.10 pp
MJRLE	BPCI Advanced impact estimate	107,030	117,852	2.2%	1.6%	1.9%	1.3%	0.03 pp
	Sensitivity test #1	86,055	105,571	2.2%	1.7%	1.9%	1.4%	0.05 pp
	Sensitivity test #2	86,402	117,270	2.1%	1.7%	1.9%	1.3%	0.09 pp
	Sensitivity test #3	102,712	110,244	2.2%	1.6%	1.9%	1.4%	-0.02 pp
	Sensitivity test #4	132,434	133,177	2.1%	1.6%	1.8%	1.3%	0.01 pp
Renal Failure	BPCI Advanced impact estimate	92,782	87,524	17.8%	16.3%	17.6%	17.1%	-0.96 pp
	Sensitivity test #1	87,076	85,902	17.8%	16.4%	17.6%	17.2%	-0.97 pp*
	Sensitivity test #2	83,532	87,219	17.8%	16.5%	17.6%	17.2%	-0.81 pp
	Sensitivity test #3	89,383	84,453	17.8%	16.3%	17.7%	17.1%	-0.94 pp*
	Sensitivity test #4	104,221	104,342	17.7%	16.4%	17.8%	17.3%	-0.82 pp*
Sepsis	BPCI Advanced impact estimate	299,233	313,414	21.5%	20.5%	20.7%	19.3%	0.35 pp
	Sensitivity test #1	270,024	307,925	21.5%	20.5%	20.8%	19.4%	0.34 pp
	Sensitivity test #2	274,686	312,236	21.6%	20.6%	20.8%	19.4%	0.37 pp
	Sensitivity test #3	285,029	298,176	21.7%	20.4%	20.9%	19.5%	0.07 pp
	Sensitivity test #4	370,529	369,625	21.8%	20.6%	21.1%	19.7%	0.17 pp
SPRI	BPCI Advanced impact estimate	187,675	177,985	17.2%	15.1%	17.3%	14.2%	1.03 pp
	Sensitivity test #1	167,354	173,721	17.2%	15.1%	17.4%	14.2%	1.06 pp*
	Sensitivity test #2	172,266	177,653	17.2%	15.2%	17.4%	14.2%	1.09 pp*
	Sensitivity test #3	179,746	170,256	17.3%	15.1%	17.5%	14.2%	1.05 pp*
	Sensitivity test #4	207,362	213,433	17.1%	15.0%	17.2%	14.4%	0.77 pp*
Stroke	BPCI Advanced impact estimate	125,851	129,709	16.4%	16.1%	16.0%	15.8%	-0.02 pp
	Sensitivity test #1	117,978	126,649	16.4%	16.2%	16.1%	15.8%	0.08 pp
	Sensitivity test #2	116,605	129,218	16.4%	16.3%	16.0%	15.8%	0.14 pp
	Sensitivity test #3	121,103	124,193	16.5%	16.1%	16.1%	15.9%	-0.14 pp
	Sensitivity test #4	127,138	132,931	16.4%	16.1%	16.0%	15.8%	-0.11 pp

Clinical Episode	Result	Number of BPCI Advanced Episodes	Number of Comparison Episodes	BPCI Advanced Baseline	BPCI Advanced Intervention	Comparison Baseline	Comparison Intervention	DiD
UTI	BPCI Advanced impact estimate	100,383	104,385	11.7%	10.9%	11.3%	11.3%	-0.86 pp
	Sensitivity test #1	91,378	102,406	11.8%	10.9%	11.3%	11.3%	-0.90 pp*
	Sensitivity test #2	90,952	104,151	11.7%	11.0%	11.2%	11.1%	-0.73 pp*
	Sensitivity test #3	96,692	99,747	11.8%	10.9%	11.4%	11.3%	-0.75 pp*
	Sensitivity test #4	116,308	121,964	11.5%	10.7%	11.3%	11.4%	-0.99 pp*
PCI Outpatient	BPCI Advanced impact estimate	32,568	31,104	0.9%	1.1%	0.9%	0.9%	0.13 pp
	Sensitivity test #1	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	Sensitivity test #2	31,082	31,100	0.9%	1.1%	0.9%	0.9%	0.14 pp
	Sensitivity test #3	31,295	30,259	0.9%	1.1%	0.8%	0.9%	0.08 pp
	Sensitivity test #4	33,118	31,190	0.9%	1.1%	0.9%	0.9%	0.11 pp

Note: DiD = difference-in-differences; AMI = acute myocardial infarction; COPD = chronic obstructive pulmonary disease; CHF = congestive heart failure; GI = gastrointestinal; Hip & Femur = hip & femur procedures except major joint; MJRLE = major joint replacement of the lower extremity; SPRI = simple pneumonia and respiratory infections; UTI = urinary tract infection; PCI = percutaneous coronary intervention.

Exhibit H.4: BPCI Advanced Impact Estimate and Sensitivity Test Results, Readmission Rate by Clinical Episode, Hospital EIs, October 1, 2018 – August 3, 2019

Clinical Episode	Result	Number of BPCI Advanced Episodes	Number of Comparison Episodes	BPCI Advanced Baseline	BPCI Advanced Intervention	Comparison Baseline	Comparison Intervention	DiD
AMI	BPCI Advanced impact estimate	61,125	60,272	36.4%	35.2%	35.4%	34.0%	0.23 pp
	Sensitivity test #1	56,607	58,432	36.4%	35.2%	35.4%	34.0%	0.21 pp
	Sensitivity test #2	57,429	60,014	36.4%	35.3%	35.4%	34.1%	0.31 pp
	Sensitivity test #3	58,499	57,464	36.4%	35.1%	35.4%	33.9%	0.26 pp
	Sensitivity test #4	67,451	66,768	36.5%	35.5%	35.5%	34.1%	0.33 pp
Cardiac Arrhythmia	BPCI Advanced impact estimate	123,493	128,998	31.2%	29.4%	30.6%	29.7%	-0.87 pp
	Sensitivity test #1	115,803	127,451	31.2%	29.4%	30.6%	29.7%	-0.84 pp
	Sensitivity test #2	113,669	128,677	31.3%	29.5%	30.7%	29.7%	-0.80 pp
	Sensitivity test #3	118,492	124,006	31.2%	29.2%	30.6%	29.9%	-1.22 pp*
	Sensitivity test #4	136,242	146,201	31.2%	29.5%	30.6%	29.7%	-0.75 pp

Clinical Episode	Result	Number of BPCI Advanced Episodes	Number of Comparison Episodes	BPCI Advanced Baseline	BPCI Advanced Intervention	Comparison Baseline	Comparison Intervention	DiD
COPD, Bronchitis, & Asthma	BPCI Advanced impact estimate	142,786	151,341	35.9%	34.3%	35.7%	34.5%	-0.39 pp
	Sensitivity test #1	126,588	147,556	35.9%	34.3%	35.7%	34.5%	-0.32 pp
	Sensitivity test #2	132,615	151,199	36.0%	34.3%	35.7%	34.5%	-0.50 pp
	Sensitivity test #3	138,166	145,195	35.9%	34.1%	35.7%	34.3%	-0.45 pp
	Sensitivity test #4	163,426	169,704	36.4%	34.6%	35.7%	34.5%	-0.58 pp
CHF	BPCI Advanced impact estimate	249,658	267,464	41.2%	40.2%	40.9%	40.4%	-0.58 pp
	Sensitivity test #1	222,947	257,934	41.3%	40.2%	40.9%	40.4%	-0.56 pp
	Sensitivity test #2	228,860	267,124	41.3%	40.5%	40.9%	40.5%	-0.35 pp
	Sensitivity test #3	238,962	253,853	41.2%	40.1%	40.9%	40.4%	-0.57 pp
	Sensitivity test #4	291,885	308,418	41.7%	40.6%	41.0%	40.5%	-0.60 pp*
GI Hemorrhage	BPCI Advanced impact estimate	52,545	59,485	31.3%	31.0%	30.6%	30.2%	0.10 pp
	Sensitivity test #1	50,185	58,331	31.2%	30.9%	30.6%	30.2%	0.07 pp
	Sensitivity test #2	46,726	59,327	31.4%	30.9%	30.8%	30.4%	-0.08 pp
	Sensitivity test #3	51,240	57,678	31.3%	30.9%	30.6%	30.1%	0.04 pp
	Sensitivity test #4	61,183	65,187	31.5%	31.3%	30.7%	30.4%	0.08 pp
Hip & Femur	BPCI Advanced impact estimate	41,826	40,951	21.8%	20.7%	22.3%	21.8%	-0.57 pp
	Sensitivity test #1	38,531	40,013	21.8%	20.7%	22.2%	21.7%	-0.62 pp
	Sensitivity test #2	34,550	40,839	21.7%	21.0%	22.2%	21.8%	-0.27 pp
	Sensitivity test #3	40,415	38,999	21.8%	20.7%	22.3%	21.8%	-0.51 pp
	Sensitivity test #4	49,206	49,050	22.0%	21.1%	22.4%	21.4%	0.14 pp
MJRLE	BPCI Advanced impact estimate	107,418	118,181	12.3%	11.4%	11.8%	11.9%	-0.92 pp
	Sensitivity test #1	86,377	105,867	12.2%	11.5%	12.1%	12.1%	-0.69 pp
	Sensitivity test #2	86,711	117,594	12.3%	11.8%	11.8%	11.9%	-0.60 pp
	Sensitivity test #3	103,094	110,564	12.3%	11.3%	11.9%	12.1%	-1.21 pp*
	Sensitivity test #4	132,859	133,558	12.4%	11.8%	11.7%	11.6%	-0.50 pp
Renal Failure	BPCI Advanced impact estimate	93,770	88,615	36.0%	34.7%	35.3%	34.0%	-0.04 pp
	Sensitivity test #1	87,999	86,964	36.0%	34.7%	35.3%	34.0%	0.00 pp
	Sensitivity test #2	84,407	88,307	36.1%	34.8%	35.5%	34.3%	-0.07 pp
	Sensitivity test #3	90,336	85,519	36.0%	34.8%	35.3%	33.9%	0.23 pp
	Sensitivity test #4	105,372	105,644	36.1%	34.8%	35.1%	34.2%	-0.25 pp

Clinical Episode	Result	Number of BPCI Advanced Episodes	Number of Comparison Episodes	BPCI Advanced Baseline	BPCI Advanced Intervention	Comparison Baseline	Comparison Intervention	DiD
Sepsis	BPCI Advanced impact estimate	303,712	318,467	32.6%	31.5%	32.6%	32.0%	-0.43 pp
	Sensitivity test #1	274,055	312,861	32.6%	31.5%	32.7%	32.0%	-0.35 pp
	Sensitivity test #2	278,867	317,274	32.7%	31.5%	32.8%	32.1%	-0.52 pp
	Sensitivity test #3	289,373	303,057	32.6%	31.6%	32.6%	32.0%	-0.40 pp
	Sensitivity test #4	376,327	375,450	33.0%	32.0%	32.7%	32.0%	-0.22 pp
SPRI	BPCI Advanced impact estimate	189,958	180,359	31.4%	29.4%	31.1%	28.9%	0.21 pp
	Sensitivity test #1	169,375	176,035	31.5%	29.5%	31.2%	29.1%	0.15 pp
	Sensitivity test #2	174,374	180,019	31.4%	29.4%	31.2%	29.1%	0.05 pp
	Sensitivity test #3	181,961	172,556	31.4%	29.3%	31.1%	29.0%	0.06 pp
	Sensitivity test #4	209,997	216,250	31.5%	29.5%	31.1%	29.0%	0.03 pp
Stroke	BPCI Advanced impact estimate	126,622	130,532	25.2%	24.5%	24.8%	23.8%	0.35 pp
	Sensitivity test #1	118,712	127,447	25.2%	24.4%	24.8%	23.7%	0.35 pp
	Sensitivity test #2	117,305	130,038	25.3%	24.4%	25.0%	23.8%	0.34 pp
	Sensitivity test #3	121,852	124,989	25.2%	24.4%	24.8%	23.6%	0.43 pp
	Sensitivity test #4	127,919	133,767	25.2%	24.5%	24.9%	23.8%	0.37 pp
UTI	BPCI Advanced impact estimate	101,802	106,035	32.8%	32.6%	32.3%	31.8%	0.31 pp
	Sensitivity test #1	92,671	104,034	32.8%	32.6%	32.4%	31.9%	0.32 pp
	Sensitivity test #2	92,227	105,796	32.9%	32.4%	32.6%	32.1%	0.07 pp
	Sensitivity test #3	98,063	101,336	32.8%	32.8%	32.3%	31.7%	0.65 pp
	Sensitivity test #4	118,024	123,851	33.1%	32.8%	32.5%	32.0%	0.21 pp
PCI Outpatient	BPCI Advanced impact estimate	32,588	31,114	13.3%	14.2%	13.1%	14.3%	-0.34 pp
	Sensitivity test #1	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	Sensitivity test #2	31,102	31,110	13.4%	14.2%	13.1%	14.4%	-0.38 pp
	Sensitivity test #3	31,315	30,269	13.4%	14.3%	13.0%	14.2%	-0.30 pp
	Sensitivity test #4	33,138	31,200	13.4%	14.3%	13.1%	14.4%	-0.34 pp

Note: DiD = difference-in-differences; AMI = acute myocardial infarction; COPD = chronic obstructive pulmonary disease; CHF = congestive heart failure; GI = gastrointestinal; Hip & Femur = hip & femur procedures except major joint; MJRLE = major joint replacement of the lower extremity; SPRI = simple pneumonia and respiratory infections; UTI = urinary tract infection; PCI = percutaneous coronary intervention.

Appendix I: Parallel Trends Tests for Allowed Payment, Utilization, and Quality Measures by Clinical Episode, Hospitals

The following tables display risk-adjusted parallel trends tests results for all payment, utilization, and quality measures assessed in the Year 2 Annual Report. Results are presented by clinical episode. As noted in Appendix C, we tested the null hypothesis that BPCI Advanced participants and comparison hospitals had parallel trends during the baseline period. We rejected the null hypothesis that there were parallel trends in the baseline at the 10% level of significance. Based on this threshold, we anticipate that for one in 10 outcome measures, we would fail to reject the null hypothesis of parallel trends based on chance.

Results reflect the BPCI Advanced evaluation team's analysis of Medicare claims and enrollment data for episodes with anchor stays/procedures that began April 1, 2013 and ended on or before December 31, 2017 (baseline period for BPCI Advanced EIs and matched comparison providers).

Exhibit I.1: Acute Myocardial Infarction Episodes, Hospital EIs, October 1, 2018 – August 3, 2019

Outcome	Trend Coefficient	P-value
Total allowed payment amount, inpatient through 90-day PDP	-57.75	0.01
Patients discharged to institutional PAC	0.00	0.53
Unplanned readmission rate, 90-day PDP	0.00	0.82
All-cause mortality rate, 90-day PDP	0.00	0.39
Number of days at a SNF (minimum one day), 90-day PDP	-0.17	0.00
Part A IRF allowed payment amount, 90-day PDP	1.03	0.82
Part A SNF allowed payment amount, 90-day PDP	-22.65	0.05
Part A HH allowed payment amount, 90-day PDP	-4.17	0.07

Exhibit I.2: Cardiac Arrhythmia Episodes, Hospital Els, October 1, 2018 – August 3, 2019

Outcome	Trend Coefficient	P-value
Total allowed payment amount, inpatient through 90-day PDP	-20.42	0.11
Patients discharged to institutional PAC	0.00	0.21
Unplanned readmission rate, 90-day PDP	0.00	0.79
All-cause mortality rate, 90-day PDP	0.00	0.54
Number of days at a SNF (minimum one day), 90-day PDP	-0.06	0.18
Part A IRF allowed payment amount, 90-day PDP	1.76	0.55
Part A SNF allowed payment amount, 90-day PDP	-14.57	0.02
Part A HH allowed payment amount, 90-day PDP	-0.48	0.73

Exhibit I.3: Chronic Obstructive Pulmonary Disease, Bronchitis, Asthma Episodes, Hospital Els, October 1, 2018 – August 3, 2019

Outcome	Trend Coefficient	P-value
Total allowed payment amount, inpatient through 90-day PDP	-16.33	0.24
Patients discharged to institutional PAC	0.00	0.62
Unplanned readmission rate, 90-day PDP	0.00	0.47
All-cause mortality rate, 90-day PDP	0.00	0.25
Number of days at a SNF (minimum one day), 90-day PDP	-0.15	0.00
Part A IRF allowed payment amount, 90-day PDP	-0.82	0.79
Part A SNF allowed payment amount, 90-day PDP	-8.09	0.34
Part A HH allowed payment amount, 90-day PDP	-0.20	0.90

Exhibit I.4: Congestive Heart Failure Episodes, Hospital EIs, October 1, 2018 – August 3, 2019

Outcome	Trend Coefficient	P-value
Total allowed payment amount, inpatient through 90-day PDP	-12.52	0.27
Patients discharged to institutional PAC	0.00	0.31
Unplanned readmission rate, 90-day PDP	0.00	0.82
All-cause mortality rate, 90-day PDP	0.00	0.01
Number of days at a SNF (minimum one day), 90-day PDP	-0.05	0.11
Part A IRF allowed payment amount, 90-day PDP	-2.12	0.51
Part A SNF allowed payment amount, 90-day PDP	-9.24	0.13
Part A HH allowed payment amount, 90-day PDP	1.75	0.19

Exhibit I.5: Gastrointestinal Hemorrhage Episodes, Hospital EIs, October 1, 2018 – August 3, 2019

Outcome	Trend Coefficient	P-value
Total allowed payment amount, inpatient through 90-day PDP	-32.12	0.12
Patients discharged to institutional PAC	0.00	0.20
Unplanned readmission rate, 90-day PDP	0.00	0.18
All-cause mortality rate, 90-day PDP	0.00	0.96
Number of days at a SNF (minimum one day), 90-day PDP	-0.09	0.14
Part A IRF allowed payment amount, 90-day PDP	-0.66	0.86
Part A SNF allowed payment amount, 90-day PDP	-22.26	0.05
Part A HH allowed payment amount, 90-day PDP	-3.12	0.15

Exhibit I.6: Hip and Femur Procedures except Major Joint Episodes, Hospital EIs, October 1, 2018 – August 3, 2019

Outcome	Trend Coefficient	P-value
Total allowed payment amount, inpatient through 90-day PDP	2.55	0.94
Patients discharged to institutional PAC	0.01	0.08
Unplanned readmission rate, 90-day PDP	0.00	0.47
All-cause mortality rate, 90-day PDP	0.00	0.54
Number of days at a SNF (minimum one day), 90-day PDP	-0.05	0.41
Part A IRF allowed payment amount, 90-day PDP	-2.72	0.91
Part A SNF allowed payment amount, 90-day PDP	15.70	0.64
Part A HH allowed payment amount, 90-day PDP	0.57	0.88

Exhibit I.7: Major Joint Replacement of the Lower Extremity Episodes, Hospital EIs, October 1, 2018 – August 3, 2019

Outcome	Trend Coefficient	P-value
Total allowed payment amount, inpatient through 90-day PDP	-25.01	0.25
Patients discharged to institutional PAC	0.00	0.74
Unplanned readmission rate, 90-day PDP	0.00	0.46
All-cause mortality rate, 90-day PDP	0.00	0.56
Number of days at a SNF (minimum one day), 90-day PDP	-0.09	0.03
Part A IRF allowed payment amount, 90-day PDP	-27.45	0.06
Part A SNF allowed payment amount, 90-day PDP	-2.16	0.89
Part A HH allowed payment amount, 90-day PDP	-4.05	0.53

Exhibit I.8: Percutaneous Coronary Intervention (Outpatient) Episodes, Hospital EIs, October 1, 2018 – August 3, 2019

Outcome	Trend Coefficient	P-value
Total allowed payment amount, inpatient through 90-day PDP	-9.95	0.65
Patients discharged to institutional PAC	NA	NA
Unplanned readmission rate, 90-day PDP	0.00	0.46
All-cause mortality rate, 90-day PDP	0.00	0.97
Number of days at a SNF (minimum one day), 90-day PDP	NA	NA
Part A IRF allowed payment amount, 90-day PDP	NA	NA
Part A SNF allowed payment amount, 90-day PDP	NA	NA
Part A HH allowed payment amount, 90-day PDP	NA	NA

Exhibit I.9: Renal Failure Episodes, Hospital EIs, October 1, 2018 – August 3, 2019

Outcome	Trend Coefficient	P-value
Total allowed payment amount, inpatient through 90-day PDP	-20.48	0.31
Patients discharged to institutional PAC	0.00	0.44
Unplanned readmission rate, 90-day PDP	0.00	0.33
All-cause mortality rate, 90-day PDP	0.00	0.77
Number of days at a SNF (minimum one day), 90-day PDP	-0.01	0.80
Part A IRF allowed payment amount, 90-day PDP	1.68	0.74
Part A SNF allowed payment amount, 90-day PDP	-15.33	0.26
Part A HH allowed payment amount, 90-day PDP	-3.52	0.11

Exhibit I.10: Sepsis Episodes, Hospital EIs, October 1, 2018 – August 3, 2019

Outcome	Trend Coefficient	P-value
Total allowed payment amount, inpatient through 90-day PDP	-19.07	0.23
Patients discharged to institutional PAC	0.00	0.06
Unplanned readmission rate, 90-day PDP	0.00	0.03
All-cause mortality rate, 90-day PDP	0.00	0.88
Number of days at a SNF (minimum one day), 90-day PDP	-0.09	0.00
Part A IRF allowed payment amount, 90-day PDP	-0.67	0.83
Part A SNF allowed payment amount, 90-day PDP	-4.35	0.58
Part A HH allowed payment amount, 90-day PDP	0.03	0.98

Exhibit I.11: Simple Pneumonia and Respiratory Infections Episodes, Hospital EIs, October 1, 2018 – August 3, 2019

Outcome	Trend Coefficient	P-value
Total allowed payment amount, inpatient through 90-day PDP	-18.16	0.19
Patients discharged to institutional PAC	0.00	0.76
Unplanned readmission rate, 90-day PDP	0.00	0.48
All-cause mortality rate, 90-day PDP	0.00	0.94
Number of days at a SNF (minimum one day), 90-day PDP	-0.08	0.05
Part A IRF allowed payment amount, 90-day PDP	-0.13	0.97
Part A SNF allowed payment amount, 90-day PDP	-12.10	0.15
Part A HH allowed payment amount, 90-day PDP	-0.01	1.00

Exhibit I.12: Stroke Episodes, Hospital EIs, October 1, 2018 – August 3, 2019

Outcome	Trend Coefficient	P-value
Total allowed payment amount, inpatient through 90-day PDP	-26.10	0.22
Patients discharged to institutional PAC	0.00	0.44
Unplanned readmission rate, 90-day PDP	0.00	0.07
All-cause mortality rate, 90-day PDP	0.00	0.62
Number of days at a SNF (minimum one day), 90-day PDP	-0.03	0.45
Part A IRF allowed payment amount, 90-day PDP	8.70	0.50
Part A SNF allowed payment amount, 90-day PDP	-16.67	0.16
Part A HH allowed payment amount, 90-day PDP	2.50	0.22

Exhibit I.13: Urinary Tract Infection Episodes, Hospital EIs, October 1, 2018 – August 3, 2019

Outcome	Trend Coefficient	P-value
Total allowed payment amount, inpatient through 90-day PDP	-14.50	0.44
Patients discharged to institutional PAC	0.00	0.26
Unplanned readmission rate, 90-day PDP	0.00	0.37
All-cause mortality rate, 90-day PDP	0.00	0.32
Number of days at a SNF (minimum one day), 90-day PDP	-0.05	0.26
Part A IRF allowed payment amount, 90-day PDP	-0.49	0.91
Part A SNF allowed payment amount, 90-day PDP	0.23	0.99
Part A HH allowed payment amount, 90-day PDP	-1.83	0.36

Appendix J: Impact of BPCI Advanced on Functional Status, Care Experience, and Satisfaction

Exhibits J.1 and J.2 show estimates pooled across all clinical episodes for hospitals and physician group practices (PGPs). All remaining exhibits show results for combinations of EI type and clinical episodes. The lower confidence interval (LCI) and upper confidence interval (UCI) are also displayed for the 5% and 10% level of significance. We also report p-values to indicate joint significance for measures with multiple outcomes. * Indicates statistical significance at the 10% level. Clinical episodes for hospitals are shown in Exhibits J.3 – J.13. Clinical episodes for PGPs are shown in Exhibits J.14 – J.19.

Exhibit J.1: Beneficiary Survey Outcomes: Hospitals, Pooled Across Episodes, Wave 1 (August and September 2019)

	Outcome	Response Category	BPCI Advanced Survey Responses	Comparison Survey Responses	BPCI Advanced Rate	Comparison Rate	Difference in Rate	95% LCI	95% UCI	90% LCI	90% UCI	p-value
Change in Functional Status	Bathing, dressing, using the toilet, or eating	Improvement	3,590	3,733	54.9	57.2	-2.2	-4.8	0.3	-4.4	-0.1	0.17
		Maintained	3,590	3,733	18.4	18.3	0.0	-2.2	2.2	-1.8	1.9	
		Declined	3,590	3,733	26.7	24.5	2.2	-0.4	4.8	0.0	4.4	
	Planning regular tasks	Improvement	3,592	3,734	54.9	56.1	-1.1	-3.8	1.5	-3.3	1.1	0.21
		Maintained	3,592	3,734	13.6	14.6	-1.1	-2.9	0.8	-2.6	0.5	
		Declined	3,592	3,734	31.5	29.3	2.2	-0.4	4.7	0.1	4.3	
	Use of mobility device	Improvement	3,551	3,716	36.1	36.6	-0.4	-2.8	2.0	-2.4	1.6	0.84
		Maintained	3,551	3,716	14.8	15.2	-0.4	-2.5	1.8	-2.1	1.4	
		Declined	3,551	3,716	49.1	48.3	0.8	-1.8	3.4	-1.4	3.0	
	Walking without rest	Improvement	3,546	3,697	28.4	29.7	-1.3	-3.7	1.1	-3.3	0.7	0.35
		Maintained	3,546	3,697	27.2	25.6	1.6	-0.7	4.0	-0.4	3.6	
		Declined	3,546	3,697	44.3	44.7	-0.3	-2.8	2.1	-2.4	1.7	
	Going up or down stairs	Improvement	3,415	3,592	28.3	29.4	-1.1	-3.5	1.3	-3.1	0.9	0.10*
		Maintained	3,415	3,592	26.0	23.4	2.7	0.2	5.1	0.6	4.7	
		Declined	3,415	3,592	45.7	47.3	-1.6	-4.2	1.1	-3.8	0.6	
	Physical/emotional problems limiting social activities	Improvement	3,545	3,692	44.7	44.7	0.0	-3.1	3.1	-2.6	2.6	0.42
		Maintained	3,545	3,692	23.8	25.4	-1.6	-4.4	1.2	-3.9	0.8	
		Declined	3,545	3,692	31.5	29.9	1.6	-1.2	4.3	-0.8	3.9	
	Pain limiting regular activities	Improvement	3,555	3,729	45.4	43.7	1.7	-1.4	4.7	-0.9	4.2	0.44
		Maintained	3,555	3,729	29.6	29.5	0.0	-3.0	3.1	-2.5	2.6	
		Declined	3,555	3,729	25.0	26.8	-1.7	-4.7	1.3	-4.2	0.8	
Care Experience	Felt prepared to leave the hospital	Very or somewhat	3,590	3,747	91.3	92.4	-1.1	-3.0	0.8	-2.7	0.5	0.25
	Medical staff took your preferences into account in deciding what health care services you should have after you left the hospital	Strongly Agree or Agree	3,225	3,430	88.6	88.1	0.6	-1.8	3.0	-1.4	2.6	0.63

	Outcome	Response Category	BPCI Advanced Survey Responses	Comparison Survey Responses	BPCI Advanced Rate	Comparison Rate	Difference in Rate	95% LCI	95% UCI	90% LCI	90% UCI	p-value
Care Experience (cont'd)	Good understanding of how to take care of self before going home	Strongly Agree or Agree	3,215	3,322	91.7	91.9	-0.2	-2.0	1.6	-1.7	1.3	0.84
	Medical staff clearly explained how to take medications before going home	Strongly Agree or Agree	3,104	3,240	92.4	91.7	0.7	-1.2	2.6	-0.9	2.3	0.49
	Medical staff clearly explained what follow-up appointments or treatments would be needed before going home	Strongly Agree or Agree	3,174	3,312	93.3	92.7	0.6	-1.0	2.3	-0.7	2.0	0.44
	Able to manage your health needs since returning home	Strongly Agree or Agree	3,210	3,324	95.4	95.1	0.2	-1.0	1.5	-0.8	1.3	0.71
	Medical staff talked with you about whether you would have the help you needed when you got home	Yes	2,911	3,005	88.6	88.4	0.2	-2.2	2.5	-1.8	2.2	0.89
	If you needed help at home to manage your health, medical staff arranged services for you at home to help manage your health	Yes	2,043	2,101	73.2	72.2	1.0	-2.7	4.8	-2.1	4.2	0.59
Satisfaction with Care	Overall satisfaction with recovery	Quite a bit or Extreme	3,592	3,750	56.2	58.7	-2.5	-5.6	0.5	-5.1	0.0	0.10
	Rating of all care received after leaving the hospital	9-10	3,516	3,651	56.6	58.3	-1.7	-4.9	1.5	-4.3	1.0	0.47
		7-8	3,516	3,651	27.3	25.5	1.8	-1.2	4.8	-0.7	4.4	
		0-6	3,516	3,651	16.1	16.2	-0.1	-2.6	2.3	-2.2	1.9	

Notes: The estimates in this table are the result of a cross-sectional logistic regression risk adjustment model for binary indicators, controlling for beneficiary, hospital, and neighborhood characteristics. All responses were weighted for non-response and sampling design. The analysis was pooled across all 32 clinical episodes. Results are reported in percentage point terms. LCI = lower confidence interval; UCI = upper confidence interval. * Indicates statistical significance at the 10% level.

***Source*:** Evaluation team analysis of BPCI Advanced beneficiary survey responses for episodes that began July or August 2019.

Exhibit J.2: Beneficiary Survey Outcomes: PGPs, Pooled Across Episodes, Wave 1 (August and September 2019)

	Outcome	Response Category	BPCI Advanced Survey Responses	Comparison Survey Responses	BPCI Advanced Rate	Comparison Rate	Difference in Rate	95% LCI	95% UCI	90% LCI	90% UCI	p-value
Change in Functional Status	Bathing, dressing, using the toilet, or eating	Improvement	2,424	2,383	68.9	71.4	-2.5	-5.0	0.0	-4.6	-0.4	0.13
		Maintained	2,424	2,383	12.6	12.1	0.5	-1.4	2.5	-1.1	2.2	
		Declined	2,424	2,383	18.5	16.5	2.0	-0.4	4.3	0.0	4.0	
	Planning regular tasks	Improvement	2,413	2,383	70.9	69.9	1.0	-1.4	3.3	-1.0	3.0	0.07*
		Maintained	2,413	2,383	9.0	11.2	-2.2	-4.0	-0.3	-3.7	-0.6	
		Declined	2,413	2,383	20.1	18.9	1.2	-1.2	3.5	-0.8	3.1	
	Use of mobility device	Improvement	2,398	2,373	49.3	46.1	3.2	0.3	6.1	0.8	5.7	0.07*
		Maintained	2,398	2,373	13.5	13.9	-0.4	-2.6	1.8	-2.3	1.4	
		Declined	2,398	2,373	37.1	40.0	-2.8	-5.5	-0.1	-5.1	-0.6	
	Walking without rest	Improvement	2,384	2,356	44.6	44.8	-0.2	-3.1	2.7	-2.6	2.3	0.39
		Maintained	2,384	2,356	21.4	22.8	-1.4	-4.0	1.1	-3.6	0.7	
		Declined	2,384	2,356	34.0	32.4	1.6	-1.1	4.2	-0.6	3.8	
	Going up or down stairs	Improvement	2,322	2,297	42.5	44.8	-2.3	-5.6	0.9	-5.1	0.4	0.18
		Maintained	2,322	2,297	23.8	21.1	2.7	-0.2	5.6	0.3	5.1	
		Declined	2,322	2,297	33.7	34.0	-0.4	-2.9	2.2	-2.5	1.8	
	Physical/emotional problems limiting social activities	Improvement	2,395	2,352	55.5	57.2	-1.7	-5.0	1.7	-4.5	1.1	0.35
		Maintained	2,395	2,352	20.5	20.9	-0.4	-3.4	2.6	-2.9	2.1	
		Declined	2,395	2,352	24.0	21.9	2.1	-0.8	4.9	-0.3	4.5	
	Pain limiting regular activities	Improvement	2,400	2,387	55.8	57.1	-1.3	-4.4	1.8	-3.9	1.3	0.37
		Maintained	2,400	2,387	23.4	21.4	2.0	-0.8	4.8	-0.3	4.4	
		Declined	2,400	2,387	20.8	21.5	-0.7	-3.3	1.9	-2.9	1.4	
Care Experience	Felt prepared to leave the hospital	Very or somewhat	2,426	2,394	92.2	92.7	-0.6	-2.4	1.2	-2.1	1.0	0.54
	Medical staff took your preferences into account in deciding what health care services you should have after you left the hospital	Strongly Agree or Agree	2,223	2,195	90.3	90.8	-0.5	-2.8	1.8	-2.4	1.4	0.66

	Outcome	Response Category	BPCI Advanced Survey Responses	Comparison Survey Responses	BPCI Advanced Rate	Comparison Rate	Difference in Rate	95% LCI	95% UCI	90% LCI	90% UCI	p-value
Care Experience (cont'd)	Good understanding of how to take care of self before going home	Strongly Agree or Agree	2,188	2,145	93.2	93.5	-0.3	-2.1	1.5	-1.8	1.2	0.76
	Medical staff clearly explained how to take medications before going home	Strongly Agree or Agree	2,122	2,079	94.0	93.3	0.8	-1.0	2.5	-0.7	2.2	0.38
	Medical staff clearly explained what follow-up appointments or treatments would be needed before going home	Strongly Agree or Agree	2,179	2,148	94.6	93.9	0.7	-0.9	2.3	-0.7	2.0	0.41
	Able to manage your health needs since returning home	Strongly Agree or Agree	2,182	2,160	94.9	95.3	-0.4	-1.9	1.1	-1.7	0.9	0.60
	Medical staff talked with you about whether you would have the help you needed when you got home	Yes	1,998	1,991	90.5	90.2	0.2	-2.1	2.5	-1.7	2.2	0.84
	If you needed help at home to manage your health, medical staff arranged services for you at home to help manage your health	Yes	1,352	1,379	73.1	74.7	-1.7	-5.8	2.5	-5.1	1.8	0.43
Satisfaction with Care	Overall satisfaction with recovery	Quite a bit or Extreme	2,416	2,393	67.4	67.4	-0.1	-3.2	3.0	-2.7	2.5	0.96
	Rating of all care received after leaving the hospital	9-10	2,369	2,353	64.4	64.4	0.0	-3.4	3.3	-2.8	2.8	0.70
		7-8	2,369	2,353	22.8	22.0	0.8	-2.1	3.7	-1.6	3.3	
		0-6	2,369	2,353	12.8	13.6	-0.8	-3.1	1.4	-2.7	1.1	

Notes: The estimates in this table are the result of a cross-sectional logistic regression risk adjustment model for binary indicators, controlling for beneficiary, hospital, and neighborhood characteristics. All responses were weighted for non-response and sampling design. The analysis was pooled across all 32 clinical episodes. Results are reported in percentage point terms. LCI = lower confidence interval; UCI = upper confidence interval. * Indicates statistical significance at the 10% level.

***Source*:** Evaluation team analysis of BPCI Advanced beneficiary survey responses for episodes that began July or August 2019.

Exhibit J.3: Beneficiary Survey Outcomes: Hospitals, Major Joint Replacement of the Lower Extremity, Wave 1 (August and September 2019)

	Outcome	Response Category	BPCI Advanced Survey Responses	Comparison Survey Responses	BPCI Advanced Rate	Comparison Rate	Difference in Rate	95% LCI	95% UCI	90% LCI	90% UCI	p-value
Change in Functional Status	Bathing, dressing, using the toilet, or eating	Improvement	335	359	80.0	82.0	-2.0	-7.7	3.7	-6.8	2.8	0.60
		Maintained	335	359	6.1	6.6	-0.5	-3.9	3.0	-3.4	2.4	
		Declined	335	359	13.9	11.4	2.5	-2.4	7.4	-1.6	6.6	
	Planning regular tasks	Improvement	334	355	82.7	84.3	-1.6	-6.6	3.4	-5.8	2.6	0.81
		Maintained	334	355	6.8	6.4	0.5	-2.9	3.9	-2.4	3.3	
		Declined	334	355	10.5	9.3	1.2	-2.9	5.2	-2.3	4.6	
	Use of mobility device	Improvement	332	359	51.3	54.9	-3.6	-10.4	3.1	-9.3	2.0	0.45
		Maintained	332	359	11.4	12.1	-0.6	-4.8	3.5	-4.1	2.8	
		Declined	332	359	37.3	33.0	4.3	-2.4	10.9	-1.3	9.8	
	Walking without rest	Improvement	333	354	55.8	55.4	0.4	-6.5	7.2	-5.4	6.1	0.29
		Maintained	333	354	15.2	18.8	-3.6	-8.6	1.5	-7.8	0.6	
		Declined	333	354	29.0	25.8	3.2	-2.8	9.2	-1.8	8.2	
	Going up or down stairs	Improvement	324	340	56.9	58.5	-1.6	-9.2	6.0	-8.0	4.8	0.41
		Maintained	324	340	21.8	18.1	3.7	-2.3	9.7	-1.3	8.7	
		Declined	324	340	21.4	23.4	-2.1	-7.7	3.5	-6.8	2.6	
	Physical/emotional problems limiting social activities	Improvement	333	354	70.0	71.9	-1.8	-8.9	5.3	-7.7	4.1	0.87
		Maintained	333	354	12.4	11.2	1.2	-4.2	6.6	-3.3	5.8	
		Declined	333	354	17.5	17.0	0.6	-4.6	5.7	-3.7	4.9	
	Pain limiting regular activities	Improvement	335	359	73.0	72.5	0.5	-5.7	6.7	-4.7	5.7	0.78
		Maintained	335	359	14.0	12.9	1.2	-3.9	6.2	-3.0	5.4	
		Declined	335	359	13.0	14.6	-1.7	-6.9	3.5	-6.0	2.7	
Care Experience	Felt prepared to leave the hospital	Very or somewhat	336	354	94.3	95.2	-0.9	-3.9	2.1	-3.4	1.6	0.56
	Medical staff took your preferences into account in deciding what health care services you should have after you left the hospital	Strongly Agree or Agree	314	338	95.2	94.8	0.4	-3.1	4.0	-2.5	3.4	0.81

	Outcome	Response Category	BPCI Advanced Survey Responses	Comparison Survey Responses	BPCI Advanced Rate	Comparison Rate	Difference in Rate	95% LCI	95% UCI	90% LCI	90% UCI	p-value
Care Experience (cont'd)	Good understanding of how to take care of self before going home	Strongly Agree or Agree	325	341	95.7	95.1	0.6	-2.9	4.1	-2.3	3.6	0.72
	Medical staff clearly explained how to take medications before going home	Strongly Agree or Agree	309	324	94.2	94.8	-0.6	-3.6	2.5	-3.1	2.0	0.72
	Medical staff clearly explained what follow-up appointments or treatments would be needed before going home	Strongly Agree or Agree	320	337	96.1	95.9	0.2	-2.5	2.9	-2.0	2.4	0.88
	Able to manage your health needs since returning home	Strongly Agree or Agree	322	340	96.0	96.7	-0.6	-3.5	2.2	-3.0	1.7	0.65
	Medical staff talked with you about whether you would have the help you needed when you got home	Yes	309	328	96.4	95.1	1.2	-2.7	5.2	-2.0	4.5	0.53
	If you needed help at home to manage your health, medical staff arranged services for you at home to help manage your health	Yes	224	222	87.3	82.1	5.2	-2.2	12.7	-1.0	11.5	0.17
Satisfaction with Care	Overall satisfaction with recovery	Quite a bit or Extreme	337	361	73.7	72.7	1.0	-5.8	7.9	-4.7	6.8	0.77
	Rating of all care received after leaving the hospital	9-10	336	357	69.5	70.8	-1.3	-9.0	6.4	-7.7	5.1	0.09*
		7-8	336	357	23.1	16.9	6.3	-0.9	13.5	0.2	12.3	
		0-6	336	357	7.3	12.3	-5.0	-10.3	0.4	-9.4	-0.5	

Notes: The estimates in this table are the result of a cross-sectional logistic regression risk adjustment model for binary indicators, controlling for beneficiary, hospital, and neighborhood characteristics. All responses were weighted for non-response and sampling design. Results are reported in percentage point terms. LCI = lower confidence interval; UCI = upper confidence interval. * Indicates statistical significance at the 10% level.

***Source*:** Evaluation team analysis of BPCI Advanced beneficiary survey responses for episodes that began July or August 2019.

Exhibit J.4: Beneficiary Survey Outcomes: Hospitals, Spine, Bone, and Joint Episodes, Excluding MJRLE, Wave 1 (August and September 2019)

	Outcome	Response Category	BPCI Advanced Survey Responses	Comparison Survey Responses	BPCI Advanced Rate	Comparison Rate	Difference in Rate	95% LCI	95% UCI	90% LCI	90% UCI	p-value
Change in Functional Status	Bathing, dressing, using the toilet, or eating	Improvement	408	390	58.5	54.4	4.2	-1.9	10.2	-0.9	9.2	0.25
		Maintained	408	390	11.1	14.1	-3.0	-7.3	1.4	-6.6	0.7	
		Declined	408	390	30.4	31.6	-1.2	-7.3	5.0	-6.3	4.0	
	Planning regular tasks	Improvement	406	394	67.3	65.3	2.0	-3.2	7.2	-2.4	6.3	0.31
		Maintained	406	394	10.6	8.5	2.1	-1.8	5.9	-1.1	5.3	
		Declined	406	394	22.1	26.2	-4.0	-9.5	1.5	-8.6	0.6	
	Use of mobility device	Improvement	402	388	32.4	26.1	6.3	1.3	11.2	2.1	10.4	0.01*
		Maintained	402	388	7.8	13.0	-5.3	-9.2	-1.4	-8.5	-2.0	
		Declined	402	388	59.9	60.9	-1.0	-6.4	4.4	-5.5	3.5	
	Walking without rest	Improvement	398	387	31.3	24.4	6.9	1.9	11.8	2.7	11.0	0.01*
		Maintained	398	387	14.3	13.4	0.9	-3.3	5.2	-2.6	4.5	
		Declined	398	387	54.4	62.2	-7.8	-12.9	-2.7	-12.0	-3.5	
	Going up or down stairs	Improvement	390	379	32.2	28.0	4.1	-1.2	9.4	-0.3	8.5	0.28
		Maintained	390	379	16.7	17.0	-0.3	-5.1	4.6	-4.3	3.8	
		Declined	390	379	51.1	55.0	-3.9	-9.5	1.8	-8.6	0.9	
	Physical/emotional problems limiting social activities	Improvement	404	384	47.5	44.8	2.7	-4.2	9.7	-3.1	8.6	0.71
		Maintained	404	384	17.0	17.1	-0.1	-5.4	5.1	-4.5	4.3	
		Declined	404	384	35.5	38.1	-2.6	-9.3	4.1	-8.2	3.0	
	Pain limiting regular activities	Improvement	403	390	43.4	40.3	3.1	-3.2	9.4	-2.2	8.3	0.06*
		Maintained	403	390	24.0	19.4	4.5	-1.2	10.3	-0.2	9.3	
		Declined	403	390	32.6	40.2	-7.6	-14.1	-1.1	-13.0	-2.2	
Care Experience	Felt prepared to leave the hospital	Very or somewhat	404	386	91.8	88.4	3.4	-0.8	7.6	-0.1	6.9	0.11
	Medical staff took your preferences into account in deciding what health care services you should have after you left the hospital	Strongly Agree or Agree	385	370	89.1	89.5	-0.4	-5.2	4.5	-4.5	3.7	0.88

	Outcome	Response Category	BPCI Advanced Survey Responses	Comparison Survey Responses	BPCI Advanced Rate	Comparison Rate	Difference in Rate	95% LCI	95% UCI	90% LCI	90% UCI	p-value
Care Experience (cont'd)	Good understanding of how to take care of self before going home	Strongly Agree or Agree	372	352	92.7	90.7	2.0	-2.5	6.4	-1.8	5.7	0.38
	Medical staff clearly explained how to take medications before going home	Strongly Agree or Agree	346	331	93.1	89.3	3.8	-1.0	8.7	-0.2	7.9	0.12
	Medical staff clearly explained what follow-up appointments or treatments would be needed before going home	Strongly Agree or Agree	367	339	93.5	91.1	2.4	-1.9	6.7	-1.2	6.0	0.27
	Able to manage your health needs since returning home	Strongly Agree or Agree	376	353	98.0	95.6	2.4	0.0	4.8	0.4	4.4	0.05*
	Medical staff talked with you about whether you would have the help you needed when you got home	Yes	350	335	92.7	89.6	3.0	-1.3	7.3	-0.6	6.6	0.17
	If you needed help at home to manage your health, medical staff arranged services for you at home to help manage your health	Yes	268	245	79.9	79.7	0.3	-6.5	7.1	-5.4	6.0	0.94
Satisfaction with Care	Overall satisfaction with recovery	Quite a bit or Extreme	408	392	60.4	55.6	4.8	-2.1	11.6	-1.0	10.5	0.17
	Rating of all care received after leaving the hospital	9-10	398	385	65.0	56.9	8.1	0.9	15.3	2.1	14.1	0.07*
		7-8	398	385	22.6	25.3	-2.7	-9.1	3.6	-8.0	2.6	
		0-6	398	385	12.4	17.8	-5.4	-11.2	0.5	-10.3	-0.5	

Notes: The estimates in this table are the result of a cross-sectional logistic regression risk adjustment model for binary indicators, controlling for beneficiary, hospital, and neighborhood characteristics. All responses were weighted for non-response and sampling design. Stratum includes the following clinical episodes: back and neck except spinal fusion (inpatient); back and neck except spinal fusion (outpatient); spinal fusion (non-cervical); cervical spinal fusion; combined anterior poster spinal fusion; fractures of the femur and hip or pelvis; hip and femur procedures except major joint; lower extremity and humerus procedure; major joint replacement of the upper extremity; and double joint replacement of the lower extremity. Results are reported in percentage point terms. MJRLE = major joint replacement of the lower extremity; LCI = lower confidence interval; UCI = upper confidence interval. * Indicates statistical significance at the 10% level.

***Source*:** Evaluation team analysis of BPCI Advanced beneficiary survey responses for episodes that began July or August 2019.

Exhibit J.5: Beneficiary Survey Outcomes: Hospitals, Congestive Heart Failure, Wave 1 (August and September 2019)

	Outcome	Response Category	BPCI Advanced Survey Responses	Comparison Survey Responses	BPCI Advanced Rate	Comparison Rate	Difference in Rate	95% LCI	95% UCI	90% LCI	90% UCI	p-value
Change in Functional Status	Bathing, dressing, using the toilet, or eating	Improvement	288	292	48.7	54.2	-5.4	-12.6	1.7	-11.4	0.6	0.15
		Maintained	288	292	23.7	24.9	-1.2	-7.4	5.1	-6.4	4.1	
		Declined	288	292	27.6	21.0	6.6	-0.2	13.4	0.9	12.3	
	Planning regular tasks	Improvement	291	293	49.2	51.2	-2.0	-9.6	5.7	-8.4	4.4	0.01*
		Maintained	291	293	12.9	20.9	-8.0	-14.0	-2.0	-13.0	-3.0	
		Declined	291	293	37.9	27.9	10.0	2.7	17.2	3.9	16.1	
	Use of mobility device	Improvement	287	288	24.9	28.7	-3.7	-10.1	2.6	-9.1	1.6	0.46
		Maintained	287	288	21.2	18.5	2.7	-3.3	8.8	-2.3	7.8	
		Declined	287	288	53.9	52.9	1.0	-6.0	8.0	-4.8	6.8	
	Walking without rest	Improvement	286	288	16.7	19.6	-2.9	-8.3	2.5	-7.4	1.7	0.30
		Maintained	286	288	34.1	29.6	4.5	-1.6	10.6	-0.6	9.6	
		Declined	286	288	49.2	50.8	-1.6	-8.3	5.0	-7.2	3.9	
	Going up or down stairs	Improvement	272	273	16.9	16.7	0.2	-5.6	6.0	-4.6	5.1	0.92
		Maintained	272	273	27.7	26.4	1.2	-5.4	7.8	-4.3	6.7	
		Declined	272	273	55.4	56.9	-1.5	-8.8	5.8	-7.6	4.6	
	Physical/emotional problems limiting social activities	Improvement	289	290	40.3	34.6	5.8	-2.5	14.1	-1.2	12.7	0.07*
		Maintained	289	290	28.2	37.9	-9.7	-17.9	-1.5	-16.5	-2.8	
		Declined	289	290	31.4	27.5	3.9	-3.3	11.1	-2.1	9.9	
	Pain limiting regular activities	Improvement	286	293	43.9	41.3	2.6	-5.6	10.8	-4.3	9.5	0.52
		Maintained	286	293	30.6	35.3	-4.7	-12.8	3.4	-11.5	2.1	
		Declined	286	293	25.5	23.4	2.1	-5.5	9.7	-4.2	8.5	
Care Experience	Felt prepared to leave the hospital	Very or somewhat	292	293	93.8	90.9	3.0	-1.6	7.5	-0.9	6.8	0.20
	Medical staff took your preferences into account in deciding what health care services you should have after you left the hospital	Strongly Agree or Agree	261	273	90.7	86.1	4.6	-1.2	10.4	-0.2	9.5	0.12

	Outcome	Response Category	BPCI Advanced Survey Responses	Comparison Survey Responses	BPCI Advanced Rate	Comparison Rate	Difference in Rate	95% LCI	95% UCI	90% LCI	90% UCI	p-value
Care Experience (cont'd)	Good understanding of how to take care of self before going home	Strongly Agree or Agree	259	259	91.6	91.4	0.2	-5.0	5.4	-4.1	4.5	0.94
	Medical staff clearly explained how to take medications before going home	Strongly Agree or Agree	253	250	92.9	89.6	3.3	-1.8	8.4	-1.0	7.6	0.21
	Medical staff clearly explained what follow-up appointments or treatments would be needed before going home	Strongly Agree or Agree	249	257	92.7	93.4	-0.6	-5.1	3.8	-4.4	3.1	0.77
	Able to manage your health needs since returning home	Strongly Agree or Agree	263	253	94.7	93.1	1.6	-2.2	5.3	-1.6	4.7	0.41
	Medical staff talked with you about whether you would have the help you needed when you got home	Yes	257	231	84.5	87.1	-2.6	-8.8	3.6	-7.8	2.6	0.42
	If you needed help at home to manage your health, medical staff arranged services for you at home to help manage your health	Yes	205	191	76.2	73.5	2.7	-5.8	11.3	-4.4	9.9	0.53
Satisfaction with Care	Overall satisfaction with recovery	Quite a bit or Extreme	290	294	51.0	51.6	-0.6	-9.2	7.9	-7.8	6.5	0.89
	Rating of all care received after leaving the hospital	9-10	294	285	54.9	52.2	2.7	-6.7	12.1	-5.1	10.5	0.73
		7-8	294	285	28.0	27.9	0.1	-8.0	8.2	-6.7	6.9	
		0-6	294	285	17.0	19.9	-2.8	-10.0	4.4	-8.8	3.2	

Notes: The estimates in this table are the result of a cross-sectional logistic regression risk adjustment model for binary indicators, controlling for beneficiary, hospital, and neighborhood characteristics. All responses were weighted for non-response and sampling design. Results are reported in percentage point terms. LCI = lower confidence interval; UCI = upper confidence interval. * Indicates statistical significance at the 10% level.

***Source*:** Evaluation team analysis of BPCI Advanced beneficiary survey responses for episodes that began July or August 2019.

Exhibit J.6: Beneficiary Survey Outcomes: Hospitals, Percutaneous Coronary Intervention, Wave 1 (August and September 2019)

	Outcome	Response Category	BPCI Advanced Survey Responses	Comparison Survey Responses	BPCI Advanced Rate	Comparison Rate	Difference in Rate	95% LCI	95% UCI	90% LCI	90% UCI	p-value
Change in Functional Status	Bathing, dressing, using the toilet, or eating	Improvement	399	457	85.8	84.9	1.0	-3.5	5.5	-2.8	4.7	0.91
		Maintained	399	457	6.4	6.6	-0.2	-2.9	2.6	-2.5	2.1	
		Declined	399	457	7.7	8.5	-0.8	-4.5	2.9	-3.9	2.3	
	Planning regular tasks	Improvement	401	458	79.7	79.5	0.3	-4.0	4.5	-3.3	3.8	0.47
		Maintained	401	458	10.7	9.2	1.5	-1.7	4.7	-1.2	4.1	
		Declined	401	458	9.6	11.3	-1.8	-5.3	1.8	-4.7	1.2	
	Use of mobility device	Improvement	400	457	70.5	66.7	3.8	-1.3	8.9	-0.4	8.0	0.22
		Maintained	400	457	9.2	12.0	-2.8	-6.3	0.8	-5.7	0.2	
		Declined	400	457	20.2	21.3	-1.0	-5.5	3.5	-4.8	2.8	
	Walking without rest	Improvement	394	454	58.2	54.2	4.0	-1.3	9.3	-0.5	8.4	0.33
		Maintained	394	454	28.3	31.5	-3.2	-8.6	2.2	-7.7	1.3	
		Declined	394	454	13.5	14.3	-0.8	-5.2	3.7	-4.5	3.0	
	Going up or down stairs	Improvement	378	448	53.1	51.7	1.4	-4.8	7.5	-3.8	6.5	0.91
		Maintained	378	448	30.5	31.6	-1.1	-6.7	4.6	-5.8	3.7	
		Declined	378	448	16.4	16.6	-0.3	-4.6	4.0	-3.9	3.3	
	Physical/emotional problems limiting social activities	Improvement	396	457	65.6	59.4	6.2	0.3	12.2	1.3	11.2	0.07*
		Maintained	396	457	20.6	22.2	-1.6	-7.4	4.2	-6.4	3.3	
		Declined	396	457	13.8	18.5	-4.7	-9.6	0.3	-8.8	-0.5	
	Pain limiting regular activities	Improvement	391	460	57.6	53.6	3.9	-3.2	11.1	-2.1	9.9	0.53
		Maintained	391	460	25.0	26.4	-1.5	-7.4	4.5	-6.4	3.5	
		Declined	391	460	17.5	19.9	-2.5	-7.8	2.9	-6.9	2.0	
Care Experience	Felt prepared to leave the hospital	Very or somewhat	400	461	97.6	96.7	0.8	-1.7	3.3	-1.2	2.9	0.51
	Medical staff took your preferences into account in deciding what health care services you should have after you left the hospital	Strongly Agree or Agree	342	396	93.2	91.6	1.6	-2.2	5.5	-1.6	4.8	0.41

	Outcome	Response Category	BPCI Advanced Survey Responses	Comparison Survey Responses	BPCI Advanced Rate	Comparison Rate	Difference in Rate	95% LCI	95% UCI	90% LCI	90% UCI	p-value
Care Experience (cont'd)	Good understanding of how to take care of self before going home	Strongly Agree or Agree	373	417	97.7	92.1	5.6	2.5	8.7	3.0	8.2	0.00*
	Medical staff clearly explained how to take medications before going home	Strongly Agree or Agree	375	421	98.3	94.2	4.1	1.5	6.7	1.9	6.3	0.00*
	Medical staff clearly explained what follow-up appointments or treatments would be needed before going home	Strongly Agree or Agree	379	427	97.5	95.1	2.4	-0.2	5.1	0.2	4.6	0.08*
	Able to manage your health needs since returning home	Strongly Agree or Agree	366	412	98.9	96.2	2.7	0.3	5.0	0.7	4.7	0.03*
	Medical staff talked with you about whether you would have the help you needed when you got home	Yes	296	353	90.6	87.7	2.9	-1.6	7.5	-0.9	6.8	0.21
	If you needed help at home to manage your health, medical staff arranged services for you at home to help manage your health	Yes	122	151	56.6	45.9	10.7	0.6	20.8	2.3	19.1	0.04*
Satisfaction with Care	Overall satisfaction with recovery	Quite a bit or Extreme	401	463	78.3	70.8	7.5	1.2	13.8	2.2	12.8	0.02*
	Rating of all care received after leaving the hospital	9-10	366	441	66.8	69.1	-2.3	-10.1	5.6	-8.8	4.3	0.49
		7-8	366	441	23.3	19.8	3.5	-2.9	9.9	-1.9	8.9	
		0-6	366	441	9.9	11.2	-1.2	-5.7	3.2	-5.0	2.5	

Notes: The estimates in this table are the result of a cross-sectional logistic regression risk adjustment model for binary indicators, controlling for beneficiary, hospital, and neighborhood characteristics. All responses were weighted for non-response and sampling design. Stratum includes inpatient and outpatient percutaneous coronary intervention episodes. Results are reported in percentage point terms. LCI = lower confidence interval; UCI = upper confidence interval. * Indicates statistical significance at the 10% level.

***Source*:** Evaluation team analysis of BPCI Advanced beneficiary survey responses for episodes that began July or August 2019.

Exhibit J.7: Beneficiary Survey Outcomes: Hospitals, Cardiac Episodes, Excluding CHF and PCI, Wave 1 (August and September 2019)

	Outcome	Response Category	BPCI Advanced Survey Responses	Comparison Survey Responses	BPCI Advanced Rate	Comparison Rate	Difference in Rate	95% LCI	95% UCI	90% LCI	90% UCI	p-value
Change in Functional Status	Bathing, dressing, using the toilet, or eating	Improvement	316	350	72.3	73.2	-1.0	-6.5	4.6	-5.6	3.7	0.89
		Maintained	316	350	12.9	11.9	1.0	-3.2	5.2	-2.5	4.5	
		Declined	316	350	14.8	14.8	0.0	-5.4	5.3	-4.5	4.4	
	Planning regular tasks	Improvement	316	353	67.1	68.7	-1.6	-7.5	4.4	-6.5	3.4	0.85
		Maintained	316	353	12.0	11.7	0.3	-4.6	5.2	-3.8	4.4	
		Declined	316	353	20.9	19.6	1.3	-4.0	6.5	-3.1	5.7	
	Use of mobility device	Improvement	313	349	52.4	53.3	-1.0	-6.7	4.8	-5.8	3.9	0.60
		Maintained	313	349	14.1	15.8	-1.7	-6.7	3.2	-5.9	2.4	
		Declined	313	349	33.5	30.8	2.7	-2.8	8.2	-1.9	7.3	
	Walking without rest	Improvement	306	352	41.4	43.7	-2.2	-8.9	4.5	-7.8	3.4	0.21
		Maintained	306	352	32.0	26.4	5.6	-0.8	11.9	0.2	10.9	
		Declined	306	352	26.6	29.9	-3.3	-9.2	2.5	-8.2	1.6	
	Going up or down stairs	Improvement	297	339	37.8	43.7	-5.8	-12.0	0.3	-11.0	-0.7	0.18
		Maintained	297	339	29.8	26.5	3.2	-2.9	9.4	-1.9	8.4	
		Declined	297	339	32.4	29.8	2.6	-3.2	8.3	-2.2	7.4	
	Physical/emotional problems limiting social activities	Improvement	309	347	53.2	57.9	-4.7	-11.9	2.5	-10.8	1.4	0.41
		Maintained	309	347	23.6	20.1	3.6	-3.0	10.1	-1.9	9.1	
		Declined	309	347	23.2	22.0	1.1	-5.3	7.6	-4.3	6.5	
	Pain limiting regular activities	Improvement	312	353	46.5	53.8	-7.3	-14.8	0.1	-13.6	-1.1	0.16
		Maintained	312	353	30.8	26.3	4.5	-2.6	11.6	-1.4	10.4	
		Declined	312	353	22.7	19.9	2.8	-3.8	9.4	-2.7	8.3	
Care Experience	Felt prepared to leave the hospital	Very or somewhat	315	353	91.9	97.5	-5.6	-8.8	-2.4	-8.3	-2.9	0.00*
	Medical staff took your preferences into account in deciding what health care services you should have after you left the hospital	Strongly Agree or Agree	273	313	86.4	90.7	-4.3	-9.6	1.0	-8.8	0.2	0.11

	Outcome	Response Category	BPCI Advanced Survey Responses	Comparison Survey Responses	BPCI Advanced Rate	Comparison Rate	Difference in Rate	95% LCI	95% UCI	90% LCI	90% UCI	p-value
Care Experience (cont'd)	Good understanding of how to take care of self before going home	Strongly Agree or Agree	282	329	92.1	93.2	-1.0	-4.9	2.8	-4.3	2.2	0.59
	Medical staff clearly explained how to take medications before going home	Strongly Agree or Agree	280	329	92.7	94.0	-1.4	-5.3	2.6	-4.6	1.9	0.50
	Medical staff clearly explained what follow-up appointments or treatments would be needed before going home	Strongly Agree or Agree	276	330	93.8	93.9	-0.1	-3.8	3.6	-3.2	3.0	0.97
	Able to manage your health needs since returning home	Strongly Agree or Agree	277	329	95.7	96.4	-0.7	-4.2	2.8	-3.6	2.3	0.71
	Medical staff talked with you about whether you would have the help you needed when you got home	Yes	244	283	89.9	84.9	4.9	-1.0	10.9	0.0	9.9	0.10
	If you needed help at home to manage your health, medical staff arranged services for you at home to help manage your health	Yes	163	184	64.6	63.0	1.7	-8.6	11.9	-6.9	10.2	0.75
Satisfaction with Care	Overall satisfaction with recovery	Quite a bit or Extreme	312	352	57.8	63.6	-5.8	-12.8	1.2	-11.6	0.1	0.11
	Rating of all care received after leaving the hospital	9-10	308	341	59.2	69.2	-10.0	-18.4	-1.7	-17.0	-3.1	0.05*
		7-8	308	341	24.5	20.1	4.4	-2.6	11.3	-1.5	10.2	
		0-6	308	341	16.3	10.7	5.7	0.0	11.3	0.9	10.4	

Notes: The estimates in this table are the result of a cross-sectional logistic regression risk adjustment model for binary indicators, controlling for beneficiary, hospital, and neighborhood characteristics. All responses were weighted for non-response and sampling design. Stratum includes the following clinical episodes: acute myocardial infarction; cardiac arrhythmia; cardiac defibrillator (outpatient); cardiac defibrillator (inpatient); cardiac valve; pacemaker; and coronary artery bypass graft. Results are reported in percentage point terms.
CHF = congestive heart failure; PCI = percutaneous coronary intervention; LCI = lower confidence interval; UCI = upper confidence interval. * Indicates statistical significance at the 10% level.

***Source*:** Evaluation team analysis of BPCI Advanced beneficiary survey responses for episodes that began July or August 2019.

Exhibit J.8: Beneficiary Survey Outcomes: Hospitals, Stroke, Wave 1 (August and September 2019)

	Outcome	Response Category	BPCI Advanced Survey Responses	Comparison Survey Responses	BPCI Advanced Rate	Comparison Rate	Difference in Rate	95% LCI	95% UCI	90% LCI	90% UCI	p-value
Change in Functional Status	Bathing, dressing, using the toilet, or eating	Improvement	325	324	50.5	54.9	-4.4	-11.2	2.4	-10.0	1.3	0.38
		Maintained	325	324	12.6	10.4	2.2	-2.4	6.8	-1.7	6.1	
		Declined	325	324	36.9	34.7	2.2	-4.8	9.1	-3.6	8.0	
	Planning regular tasks	Improvement	321	326	45.8	49.7	-3.9	-11.6	3.9	-10.3	2.6	0.40
		Maintained	321	326	11.6	9.2	2.4	-1.8	6.6	-1.1	5.9	
		Declined	321	326	42.6	41.1	1.5	-6.4	9.3	-5.1	8.1	
	Use of mobility device	Improvement	319	325	40.6	37.5	3.1	-3.1	9.3	-2.1	8.3	0.43
		Maintained	319	325	5.9	7.9	-2.0	-5.8	1.8	-5.2	1.2	
		Declined	319	325	53.5	54.6	-1.1	-7.6	5.5	-6.6	4.4	
	Walking without rest	Improvement	320	321	27.3	30.3	-3.1	-8.9	2.8	-8.0	1.8	0.48
		Maintained	320	321	20.3	17.5	2.8	-3.3	8.9	-2.3	7.9	
		Declined	320	321	52.4	52.2	0.3	-6.7	7.2	-5.6	6.1	
	Going up or down stairs	Improvement	309	311	30.5	34.7	-4.2	-11.0	2.6	-9.8	1.5	0.43
		Maintained	309	311	17.1	17.4	-0.3	-5.8	5.2	-4.9	4.3	
		Declined	309	311	52.4	47.9	4.4	-2.9	11.7	-1.7	10.5	
	Physical/emotional problems limiting social activities	Improvement	320	322	36.0	38.8	-2.9	-10.5	4.8	-9.3	3.6	0.76
		Maintained	320	322	16.5	15.8	0.7	-5.1	6.5	-4.1	5.5	
		Declined	320	322	47.6	45.4	2.2	-6.1	10.5	-4.8	9.1	
	Pain limiting regular activities	Improvement	317	329	41.3	44.1	-2.7	-10.5	5.1	-9.3	3.8	0.76
		Maintained	317	329	28.5	26.5	2.0	-4.6	8.6	-3.6	7.5	
		Declined	317	329	30.2	29.4	0.7	-6.4	7.9	-5.3	6.7	
Care Experience	Felt prepared to leave the hospital	Very or somewhat	316	325	87.7	92.9	-5.2	-10.4	0.1	-9.6	-0.8	0.05*
	Medical staff took your preferences into account in deciding what health care services you should have after you left the hospital	Strongly Agree or Agree	304	308	88.7	89.2	-0.5	-6.3	5.3	-5.4	4.3	0.86

	Outcome	Response Category	BPCI Advanced Survey Responses	Comparison Survey Responses	BPCI Advanced Rate	Comparison Rate	Difference in Rate	95% LCI	95% UCI	90% LCI	90% UCI	p-value
Care Experience (cont'd)	Good understanding of how to take care of self before going home	Strongly Agree or Agree	283	292	91.8	90.3	1.6	-3.4	6.6	-2.6	5.7	0.54
	Medical staff clearly explained how to take medications before going home	Strongly Agree or Agree	278	286	92.7	89.1	3.6	-1.3	8.4	-0.5	7.6	0.15
	Medical staff clearly explained what follow-up appointments or treatments would be needed before going home	Strongly Agree or Agree	284	289	92.2	89.6	2.5	-2.8	7.9	-1.9	7.0	0.35
	Able to manage your health needs since returning home	Strongly Agree or Agree	279	295	95.4	95.0	0.4	-2.9	3.7	-2.4	3.2	0.81
	Medical staff talked with you about whether you would have the help you needed when you got home	Yes	257	264	90.7	88.0	2.8	-3.4	8.9	-2.4	7.9	0.38
	If you needed help at home to manage your health, medical staff arranged services for you at home to help manage your health	Yes	194	202	73.2	77.2	-4.1	-13.2	5.1	-11.7	3.6	0.38
Satisfaction with Care	Overall satisfaction with recovery	Quite a bit or Extreme	322	327	52.0	56.0	-4.0	-11.2	3.2	-10.1	2.1	0.28
	Rating of all care received after leaving the hospital	9-10	321	326	56.7	59.5	-2.8	-11.7	6.1	-10.2	4.6	0.76
		7-8	321	326	25.6	23.0	2.6	-4.7	9.9	-3.5	8.7	
		0-6	321	326	17.7	17.6	0.1	-7.0	7.3	-5.8	6.1	

Notes: The estimates in this table are the result of a cross-sectional logistic regression risk adjustment model for binary indicators, controlling for beneficiary, hospital, and neighborhood characteristics. All responses were weighted for non-response and sampling design. Results are reported in percentage point terms. LCI = lower confidence interval; UCI = upper confidence interval. * Indicates statistical significance at the 10% level.

***Source*:** Evaluation team analysis of BPCI Advanced beneficiary survey responses for episodes that began July or August 2019.

Exhibit J.9: Beneficiary Survey Outcomes: Hospitals, Simple Pneumonia and Respiratory Infections, Wave 1 (August and September 2019)

	Outcome	Response Category	BPCI Advanced Survey Responses	Comparison Survey Responses	BPCI Advanced Rate	Comparison Rate	Difference in Rate	95% LCI	95% UCI	90% LCI	90% UCI	p-value
Change in Functional Status	Bathing, dressing, using the toilet, or eating	Improvement	278	322	50.6	50.7	-0.1	-6.5	6.3	-5.4	5.2	0.98
		Maintained	278	322	19.8	20.3	-0.5	-7.0	5.9	-5.9	4.8	
		Declined	278	322	29.6	29.0	0.6	-6.1	7.4	-5.0	6.3	
	Planning regular tasks	Improvement	280	319	46.4	53.6	-7.2	-14.4	0.0	-13.3	-1.2	0.03*
		Maintained	280	319	18.8	11.7	7.2	1.7	12.7	2.6	11.8	
		Declined	280	319	34.8	34.7	0.1	-6.7	6.9	-5.6	5.8	
	Use of mobility device	Improvement	271	322	29.7	36.8	-7.1	-13.7	-0.5	-12.6	-1.6	0.11
		Maintained	271	322	18.1	15.5	2.6	-3.3	8.5	-2.3	7.6	
		Declined	271	322	52.2	47.7	4.5	-1.9	10.9	-0.9	9.9	
	Walking without rest	Improvement	277	315	19.4	28.3	-8.9	-15.0	-2.8	-14.0	-3.8	0.02*
		Maintained	277	315	31.6	25.9	5.7	-0.8	12.3	0.2	11.2	
		Declined	277	315	49.0	45.8	3.2	-3.0	9.4	-2.0	8.4	
	Going up or down stairs	Improvement	260	309	24.3	30.0	-5.7	-12.4	1.0	-11.3	-0.1	0.05*
		Maintained	260	309	30.0	22.4	7.6	1.2	14.0	2.3	13.0	
		Declined	260	309	45.7	47.6	-2.0	-8.8	4.9	-7.7	3.8	
	Physical/emotional problems limiting social activities	Improvement	270	318	42.9	42.7	0.2	-7.9	8.2	-6.6	6.9	0.99
		Maintained	270	318	27.8	27.5	0.3	-7.3	7.9	-6.1	6.7	
		Declined	270	318	29.3	29.8	-0.5	-8.6	7.6	-7.3	6.3	
	Pain limiting regular activities	Improvement	280	318	43.0	42.6	0.4	-8.4	9.2	-7.0	7.8	0.94
		Maintained	280	318	32.0	31.1	0.9	-7.5	9.3	-6.2	7.9	
		Declined	280	318	25.0	26.3	-1.3	-8.9	6.3	-7.6	5.1	
Care Experience	Felt prepared to leave the hospital	Very or somewhat	284	327	94.4	87.5	6.9	2.3	11.5	3.1	10.8	0.00*
	Medical staff took your preferences into account in deciding what health care services you should have after you left the hospital	Strongly Agree or Agree	243	299	89.3	85.1	4.2	-1.8	10.2	-0.9	9.2	0.17

	Outcome	Response Category	BPCI Advanced Survey Responses	Comparison Survey Responses	BPCI Advanced Rate	Comparison Rate	Difference in Rate	95% LCI	95% UCI	90% LCI	90% UCI	p-value
Care Experience (cont'd)	Good understanding of how to take care of self before going home	Strongly Agree or Agree	252	276	93.0	90.3	2.8	-2.0	7.5	-1.2	6.7	0.26
	Medical staff clearly explained how to take medications before going home	Strongly Agree or Agree	237	272	93.7	91.0	2.7	-2.8	8.2	-1.9	7.3	0.34
	Medical staff clearly explained what follow-up appointments or treatments would be needed before going home	Strongly Agree or Agree	242	275	94.9	90.9	3.9	-1.9	9.8	-1.0	8.9	0.19
	Able to manage your health needs since returning home	Strongly Agree or Agree	248	275	93.9	92.9	1.0	-3.3	5.2	-2.6	4.5	0.66
	Medical staff talked with you about whether you would have the help you needed when you got home	Yes	217	255	90.8	89.3	1.5	-4.3	7.3	-3.4	6.4	0.61
	If you needed help at home to manage your health, medical staff arranged services for you at home to help manage your health	Yes	172	183	71.5	68.0	3.4	-7.5	14.3	-5.7	12.5	0.54
Satisfaction with Care	Overall satisfaction with recovery	Quite a bit or Extreme	280	321	53.3	56.7	-3.4	-12.1	5.2	-10.6	3.8	0.44
	Rating of all care received after leaving the hospital	9-10	275	317	57.5	55.5	2.0	-8.1	12.1	-6.4	10.4	0.51
		7-8	275	317	27.0	24.4	2.5	-6.2	11.3	-4.8	9.8	
		0-6	275	317	15.5	20.1	-4.5	-12.5	3.4	-11.2	2.1	

Notes: The estimates in this table are the result of a cross-sectional logistic regression risk adjustment model for binary indicators, controlling for beneficiary, hospital, and neighborhood characteristics. All responses were weighted for non-response and sampling design. Results are reported in percentage point terms. LCI = lower confidence interval; UCI = upper confidence interval. * Indicates statistical significance at the 10% level.

***Source*:** Evaluation team analysis of BPCI Advanced beneficiary survey responses for episodes that began July or August 2019.

Exhibit J.10: Beneficiary Survey Outcomes: Hospitals, Chronic Obstructive Pulmonary Disease, Bronchitis, Asthma, Wave 1 (August and September 2019)

	Outcome	Response Category	BPCI Advanced Survey Responses	Comparison Survey Responses	BPCI Advanced Rate	Comparison Rate	Difference in Rate	95% LCI	95% UCI	90% LCI	90% UCI	p-value
Change in Functional Status	Bathing, dressing, using the toilet, or eating	Improvement	307	301	58.1	52.5	5.7	-0.9	12.2	0.2	11.2	0.14
		Maintained	307	301	23.2	23.6	-0.4	-6.8	5.9	-5.8	4.9	
		Declined	307	301	18.7	23.9	-5.2	-11.2	0.7	-10.3	-0.2	
	Planning regular tasks	Improvement	308	303	50.6	53.8	-3.2	-9.5	3.1	-8.4	2.1	0.57
		Maintained	308	303	21.9	19.8	2.1	-3.5	7.8	-2.6	6.8	
		Declined	308	303	27.4	26.4	1.0	-5.6	7.6	-4.5	6.6	
	Use of mobility device	Improvement	301	301	33.2	34.4	-1.2	-6.8	4.4	-5.9	3.5	0.80
		Maintained	301	301	17.0	15.5	1.5	-3.4	6.4	-2.6	5.6	
		Declined	301	301	49.8	50.1	-0.3	-6.6	6.0	-5.6	5.0	
	Walking without rest	Improvement	307	301	26.8	21.3	5.6	-0.5	11.6	0.5	10.6	0.15
		Maintained	307	301	33.9	34.6	-0.7	-7.2	5.8	-6.1	4.7	
		Declined	307	301	39.3	44.1	-4.9	-11.3	1.6	-10.3	0.6	
	Going up or down stairs	Improvement	295	290	24.2	21.1	3.1	-3.2	9.3	-2.1	8.3	0.02*
		Maintained	295	290	33.3	27.3	6.0	-0.1	12.2	0.9	11.2	
		Declined	295	290	42.5	51.6	-9.1	-15.6	-2.7	-14.5	-3.7	
	Physical/emotional problems limiting social activities	Improvement	302	301	41.8	33.8	8.0	0.6	15.4	1.8	14.2	0.04*
		Maintained	302	301	31.2	30.7	0.5	-6.9	8.0	-5.7	6.8	
		Declined	302	301	27.0	35.5	-8.5	-16.0	-1.0	-14.8	-2.3	
	Pain limiting regular activities	Improvement	306	303	39.6	39.0	0.7	-7.3	8.6	-6.0	7.3	0.69
		Maintained	306	303	33.5	31.3	2.3	-5.6	10.2	-4.3	8.9	
		Declined	306	303	26.8	29.8	-3.0	-9.9	4.0	-8.8	2.9	
Care Experience	Felt prepared to leave the hospital	Very or somewhat	311	302	87.2	90.2	-3.0	-8.0	2.1	-7.2	1.3	0.25
	Medical staff took your preferences into account in deciding what health care services you should have after you left the hospital	Strongly Agree or Agree	276	267	83.6	87.5	-3.9	-10.1	2.4	-9.1	1.3	0.22

	Outcome	Response Category	BPCI Advanced Survey Responses	Comparison Survey Responses	BPCI Advanced Rate	Comparison Rate	Difference in Rate	95% LCI	95% UCI	90% LCI	90% UCI	p-value
Care Experience (cont'd)	Good understanding of how to take care of self before going home	Strongly Agree or Agree	276	265	88.6	88.9	-0.3	-5.7	5.1	-4.8	4.2	0.92
	Medical staff clearly explained how to take medications before going home	Strongly Agree or Agree	275	263	87.6	93.2	-5.6	-10.4	-0.8	-9.6	-1.6	0.02*
	Medical staff clearly explained what follow-up appointments or treatments would be needed before going home	Strongly Agree or Agree	276	264	87.9	95.0	-7.2	-11.9	-2.4	-11.1	-3.2	0.00*
	Able to manage your health needs since returning home	Strongly Agree or Agree	282	268	92.1	91.7	0.4	-4.5	5.3	-3.7	4.5	0.87
	Medical staff talked with you about whether you would have the help you needed when you got home	Yes	260	250	88.3	87.8	0.5	-4.8	5.7	-3.9	4.9	0.86
	If you needed help at home to manage your health, medical staff arranged services for you at home to help manage your health	Yes	197	192	71.0	68.8	2.2	-6.9	11.2	-5.4	9.7	0.64
Satisfaction with Care	Overall satisfaction with recovery	Quite a bit or Extreme	307	305	50.5	56.6	-6.1	-14.0	1.7	-12.7	0.4	0.13
	Rating of all care received after leaving the hospital	9-10	305	292	55.0	52.9	2.0	-6.7	10.8	-5.3	9.4	0.81
		7-8	305	292	24.6	27.1	-2.5	-10.3	5.2	-9.0	4.0	
		0-6	305	292	20.4	20.0	0.5	-6.7	7.7	-5.5	6.5	

Notes: The estimates in this table are the result of a cross-sectional logistic regression risk adjustment model for binary indicators, controlling for beneficiary, hospital, and neighborhood characteristics. All responses were weighted for non-response and sampling design. Results are reported in percentage point terms. LCI = lower confidence interval; UCI = upper confidence interval. * Indicates statistical significance at the 10% level.

***Source*:** Evaluation team analysis of BPCI Advanced beneficiary survey responses for episodes that began July or August 2019.

Exhibit J.11: Beneficiary Survey Outcomes: Hospitals, Sepsis, Wave 1 (August and September 2019)

	Outcome	Response Category	BPCI Advanced Survey Responses	Comparison Survey Responses	BPCI Advanced Rate	Comparison Rate	Difference in Rate	95% LCI	95% UCI	90% LCI	90% UCI	p-value
Change in Functional Status	Bathing, dressing, using the toilet, or eating	Improvement	296	312	42.1	48.4	-6.3	-12.7	0.2	-11.6	-0.9	0.13
		Maintained	296	312	22.3	21.6	0.7	-6.0	7.4	-4.9	6.3	
		Declined	296	312	35.5	30.0	5.6	-1.6	12.7	-0.4	11.6	
	Planning regular tasks	Improvement	296	310	46.4	47.4	-1.0	-7.6	5.5	-6.5	4.4	0.84
		Maintained	296	310	14.2	15.2	-0.9	-5.8	3.9	-5.0	3.1	
		Declined	296	310	39.4	37.4	2.0	-4.8	8.7	-3.7	7.6	
	Use of mobility device	Improvement	291	308	32.3	28.8	3.5	-3.2	10.3	-2.1	9.2	0.41
		Maintained	291	308	15.2	18.4	-3.1	-8.9	2.7	-8.0	1.7	
		Declined	291	308	52.5	52.8	-0.4	-8.2	7.5	-7.0	6.2	
	Walking without rest	Improvement	291	309	25.0	25.6	-0.6	-7.0	5.8	-5.9	4.7	0.66
		Maintained	291	309	23.2	25.5	-2.3	-8.8	4.1	-7.8	3.1	
		Declined	291	309	51.9	48.9	3.0	-3.8	9.7	-2.7	8.6	
	Going up or down stairs	Improvement	283	300	23.9	23.3	0.6	-5.3	6.6	-4.3	5.6	0.91
		Maintained	283	300	23.1	24.5	-1.4	-7.8	5.0	-6.7	4.0	
		Declined	283	300	53.0	52.2	0.7	-6.0	7.5	-4.9	6.4	
	Physical/emotional problems limiting social activities	Improvement	291	304	41.5	41.0	0.5	-7.9	9.0	-6.5	7.6	0.22
		Maintained	291	304	22.2	28.4	-6.3	-14.0	1.4	-12.7	0.2	
		Declined	291	304	36.3	30.6	5.7	-2.6	14.1	-1.2	12.7	
	Pain limiting regular activities	Improvement	290	307	43.4	35.4	8.0	-0.7	16.7	0.7	15.3	0.17
		Maintained	290	307	31.4	34.1	-2.7	-11.9	6.6	-10.4	5.1	
		Declined	290	307	25.2	30.6	-5.4	-14.0	3.3	-12.6	1.9	
Care Experience	Felt prepared to leave the hospital	Very or somewhat	294	320	90.4	93.1	-2.7	-8.0	2.6	-7.2	1.7	0.31
	Medical staff took your preferences into account in deciding what health care services you should have after you left the hospital	Strongly Agree or Agree	263	296	88.1	88.0	0.2	-6.1	6.5	-5.1	5.5	0.95

	Outcome	Response Category	BPCI Advanced Survey Responses	Comparison Survey Responses	BPCI Advanced Rate	Comparison Rate	Difference in Rate	95% LCI	95% UCI	90% LCI	90% UCI	p-value
Care Experience (cont'd)	Good understanding of how to take care of self before going home	Strongly Agree or Agree	246	265	93.0	93.7	-0.7	-5.1	3.8	-4.4	3.1	0.77
	Medical staff clearly explained how to take medications before going home	Strongly Agree or Agree	237	263	92.2	91.6	0.6	-4.6	5.7	-3.8	4.9	0.83
	Medical staff clearly explained what follow-up appointments or treatments would be needed before going home	Strongly Agree or Agree	245	269	94.9	91.9	3.0	-1.8	7.7	-1.0	7.0	0.22
	Able to manage your health needs since returning home	Strongly Agree or Agree	252	269	97.4	96.7	0.8	-1.9	3.4	-1.4	3.0	0.57
	Medical staff talked with you about whether you would have the help you needed when you got home	Yes	223	236	88.7	89.5	-0.8	-7.6	6.0	-6.5	4.9	0.81
	If you needed help at home to manage your health, medical staff arranged services for you at home to help manage your health	Yes	158	180	75.8	76.6	-0.8	-11.2	9.7	-9.5	8.0	0.88
Satisfaction with Care	Overall satisfaction with recovery	Quite a bit or Extreme	292	311	56.7	61.4	-4.7	-12.7	3.3	-11.4	2.0	0.25
	Rating of all care received after leaving the hospital	9-10	288	305	53.7	57.8	-4.2	-14.2	5.8	-12.5	4.2	0.51
		7-8	288	305	30.4	29.9	0.5	-9.5	10.4	-7.9	8.8	
		0-6	288	305	15.9	12.2	3.7	-3.1	10.5	-2.0	9.4	

Notes: The estimates in this table are the result of a cross-sectional logistic regression risk adjustment model for binary indicators, controlling for beneficiary, hospital, and neighborhood characteristics. All responses were weighted for non-response and sampling design. Results are reported in percentage point terms. LCI = lower confidence interval; UCI = upper confidence interval. * Indicates statistical significance at the 10% level.

***Source*:** Evaluation team analysis of BPCI Advanced beneficiary survey responses for episodes that began July or August 2019.

Exhibit J.12: Beneficiary Survey Outcomes: Hospitals, Kidney and Infectious Diseases Excluding Sepsis, Wave 1 (August and September 2019)

	Outcome	Response Category	BPCI Advanced Survey Responses	Comparison Survey Responses	BPCI Advanced Rate	Comparison Rate	Difference in Rate	95% LCI	95% UCI	90% LCI	90% UCI	p-value
Change in Functional Status	Bathing, dressing, using the toilet, or eating	Improvement	301	310	49.5	49.6	-0.2	-6.2	5.8	-5.2	4.8	0.99
		Maintained	301	310	21.2	20.9	0.3	-5.1	5.7	-4.2	4.8	
		Declined	301	310	29.4	29.5	-0.1	-6.5	6.2	-5.5	5.2	
	Planning regular tasks	Improvement	300	306	50.1	49.1	1.0	-5.0	6.9	-4.0	5.9	0.38
		Maintained	300	306	13.6	17.1	-3.4	-8.3	1.5	-7.5	0.7	
		Declined	300	306	36.3	33.8	2.5	-3.6	8.5	-2.6	7.5	
	Use of mobility device	Improvement	298	307	29.8	31.9	-2.2	-7.7	3.4	-6.8	2.5	0.25
		Maintained	298	307	13.5	10.1	3.4	-0.6	7.3	0.0	6.7	
		Declined	298	307	56.7	57.9	-1.2	-6.8	4.4	-5.9	3.5	
	Walking without rest	Improvement	296	306	22.9	25.2	-2.3	-8.1	3.5	-7.2	2.6	0.53
		Maintained	296	306	28.2	24.8	3.4	-2.6	9.5	-1.6	8.5	
		Declined	296	306	48.9	50.0	-1.1	-6.5	4.2	-5.6	3.3	
	Going up or down stairs	Improvement	284	298	21.2	26.0	-4.8	-11.0	1.3	-10.0	0.3	0.01*
		Maintained	284	298	27.6	18.5	9.1	3.1	15.0	4.1	14.1	
		Declined	284	298	51.3	55.5	-4.2	-11.0	2.5	-9.9	1.4	
	Physical/emotional problems limiting social activities	Improvement	297	304	35.7	44.6	-9.0	-16.4	-1.5	-15.2	-2.7	0.04*
		Maintained	297	304	24.6	18.6	6.0	-0.7	12.8	0.4	11.7	
		Declined	297	304	39.7	36.8	2.9	-5.0	10.8	-3.7	9.5	
	Pain limiting regular activities	Improvement	300	306	40.6	40.1	0.5	-7.5	8.6	-6.2	7.3	0.93
		Maintained	300	306	29.8	28.9	0.9	-6.0	7.8	-4.9	6.7	
		Declined	300	306	29.6	31.0	-1.4	-9.1	6.2	-7.9	5.0	
Care Experience	Felt prepared to leave the hospital	Very or somewhat	304	307	86.1	91.0	-5.0	-10.2	0.2	-9.3	-0.6	0.06*
	Medical staff took your preferences into account in deciding what health care services you should have after you left the hospital	Strongly Agree or Agree	278	286	87.0	87.8	-0.8	-6.6	5.0	-5.6	4.1	0.79

	Outcome	Response Category	BPCI Advanced Survey Responses	Comparison Survey Responses	BPCI Advanced Rate	Comparison Rate	Difference in Rate	95% LCI	95% UCI	90% LCI	90% UCI	p-value
Care Experience (cont'd)	Good understanding of how to take care of self before going home	Strongly Agree or Agree	249	256	85.3	90.8	-5.5	-11.4	0.3	-10.4	-0.7	0.06*
	Medical staff clearly explained how to take medications before going home	Strongly Agree or Agree	236	239	90.0	90.5	-0.6	-5.8	4.7	-4.9	3.8	0.83
	Medical staff clearly explained what follow-up appointments or treatments would be needed before going home	Strongly Agree or Agree	245	253	91.1	91.2	0.0	-5.2	5.2	-4.3	4.3	0.99
	Able to manage your health needs since returning home	Strongly Agree or Agree	245	263	93.9	94.2	-0.2	-4.5	4.1	-3.8	3.4	0.92
	Medical staff talked with you about whether you would have the help you needed when you got home	Yes	234	227	88.5	88.6	-0.2	-6.2	5.9	-5.2	4.9	0.96
	If you needed help at home to manage your health, medical staff arranged services for you at home to help manage your health	Yes	171	186	68.7	70.4	-1.7	-12.1	8.7	-10.4	7.0	0.75
Satisfaction with Care	Overall satisfaction with recovery	Quite a bit or Extreme	305	310	50.2	55.2	-5.0	-13.2	3.1	-11.8	1.8	0.22
	Rating of all care received after leaving the hospital	9-10	305	301	51.4	53.6	-2.2	-10.9	6.5	-9.5	5.1	0.83
		7-8	305	301	29.3	27.0	2.3	-5.6	10.3	-4.3	9.0	
		0-6	305	301	19.3	19.4	-0.1	-7.8	7.5	-6.6	6.3	

Notes: The estimates in this table are the result of a cross-sectional logistic regression risk adjustment model for binary indicators, controlling for beneficiary, hospital, and neighborhood characteristics. All responses were weighted for non-response and sampling design. Stratum includes the following clinical episodes: renal failure; cellulitis; and urinary tract infection. Results are reported in percentage point terms. LCI = lower confidence interval; UCI = upper confidence interval. * Indicates statistical significance at the 10% level.

***Source*:** Evaluation team analysis of BPCI Advanced beneficiary survey responses for episodes that began July or August 2019.

Exhibit J.13: Beneficiary Survey Outcomes: Hospitals, Gastrointestinal, Wave 1 (August and September 2019)

	Outcome	Response Category	BPCI Advanced Survey Responses	Comparison Survey Responses	BPCI Advanced Rate	Comparison Rate	Difference in Rate	95% LCI	95% UCI	90% LCI	90% UCI	p-value
Change in Functional Status	Bathing, dressing, using the toilet, or eating	Improvement	337	316	63.0	63.0	0.0	-5.9	6.0	-5.0	5.0	0.51
		Maintained	337	316	16.2	13.7	2.5	-2.2	7.2	-1.4	6.4	
		Declined	337	316	20.8	23.3	-2.5	-8.3	3.3	-7.4	2.4	
	Planning regular tasks	Improvement	339	317	65.0	62.2	2.8	-2.5	8.1	-1.7	7.3	0.54
		Maintained	339	317	13.2	15.0	-1.8	-6.0	2.3	-5.3	1.7	
		Declined	339	317	21.8	22.8	-1.0	-5.8	3.9	-5.0	3.1	
	Use of mobility device	Improvement	337	312	38.8	41.8	-3.0	-8.4	2.4	-7.5	1.5	0.55
		Maintained	337	312	15.1	13.8	1.4	-3.7	6.4	-2.8	5.6	
		Declined	337	312	46.1	44.4	1.6	-3.7	7.0	-2.8	6.1	
	Walking without rest	Improvement	338	310	32.4	34.8	-2.4	-9.2	4.4	-8.1	3.3	0.78
		Maintained	338	310	26.3	25.6	0.7	-5.3	6.8	-4.4	5.8	
		Declined	338	310	41.3	39.6	1.7	-5.2	8.6	-4.1	7.5	
	Going up or down stairs	Improvement	323	305	36.3	35.4	0.9	-5.5	7.2	-4.4	6.2	0.89
		Maintained	323	305	24.3	25.8	-1.5	-7.8	4.8	-6.7	3.8	
		Declined	323	305	39.4	38.8	0.6	-6.2	7.5	-5.1	6.3	
	Physical/emotional problems limiting social activities	Improvement	334	311	50.0	47.7	2.4	-5.6	10.3	-4.3	9.0	0.72
		Maintained	334	311	28.0	27.5	0.5	-7.1	8.1	-5.8	6.9	
		Declined	334	311	21.9	24.8	-2.9	-10.2	4.4	-9.0	3.2	
	Pain limiting regular activities	Improvement	334	315	49.5	47.5	2.0	-5.6	9.5	-4.3	8.3	0.33
		Maintained	334	315	30.4	27.5	2.9	-4.4	10.3	-3.2	9.1	
		Declined	334	315	20.1	25.0	-4.9	-11.4	1.6	-10.4	0.5	
Care Experience	Felt prepared to leave the hospital	Very or somewhat	334	319	93.2	94.5	-1.2	-4.7	2.2	-4.1	1.6	0.48
	Medical staff took your preferences into account in deciding what health care services you should have after you left the hospital	Strongly Agree or Agree	286	284	85.6	84.4	1.3	-5.4	7.9	-4.3	6.8	0.71

	Outcome	Response Category	BPCI Advanced Survey Responses	Comparison Survey Responses	BPCI Advanced Rate	Comparison Rate	Difference in Rate	95% LCI	95% UCI	90% LCI	90% UCI	p-value
Care Experience (cont'd)	Good understanding of how to take care of self before going home	Strongly Agree or Agree	298	270	89.5	90.6	-1.2	-6.1	3.8	-5.3	3.0	0.64
	Medical staff clearly explained how to take medications before going home	Strongly Agree or Agree	278	262	92.9	93.2	-0.4	-4.3	3.6	-3.7	2.9	0.85
	Medical staff clearly explained what follow-up appointments or treatments would be needed before going home	Strongly Agree or Agree	291	272	92.4	92.7	-0.3	-4.6	4.0	-3.9	3.3	0.89
	Able to manage your health needs since returning home	Strongly Agree or Agree	300	267	94.2	95.1	-0.9	-4.6	2.8	-4.0	2.2	0.63
	Medical staff talked with you about whether you would have the help you needed when you got home	Yes	264	243	82.8	84.7	-1.9	-8.6	4.9	-7.5	3.8	0.59
	If you needed help at home to manage your health, medical staff arranged services for you at home to help manage your health	Yes	169	165	66.3	68.7	-2.3	-12.2	7.5	-10.6	5.9	0.64
Satisfaction with Care	Overall satisfaction with recovery	Quite a bit or Extreme	338	314	58.6	56.6	1.9	-5.3	9.2	-4.2	8.0	0.60
	Rating of all care received after leaving the hospital	9-10	320	301	55.2	57.5	-2.3	-12.0	7.5	-10.4	5.9	0.14
		7-8	320	301	29.0	21.8	7.2	-0.9	15.3	0.4	14.0	
		0-6	320	301	15.8	20.7	-5.0	-12.5	2.6	-11.3	1.4	

Notes: The estimates in this table are the result of a cross-sectional logistic regression risk adjustment model for binary indicators, controlling for beneficiary, hospital, and neighborhood characteristics. All responses were weighted for non-response and sampling design. Stratum includes the following clinical episodes: major bowel procedure; gastrointestinal hemorrhage; gastrointestinal obstruction; and disorders of the liver. Results are reported in percentage point terms. LCI = lower confidence interval; UCI = upper confidence interval.
* Indicates statistical significance at the 10% level.

***Source*:** Evaluation team analysis of BPCI Advanced beneficiary survey responses for episodes that began July or August 2019.

Exhibit J.14: Beneficiary Survey Outcomes: PGPs, Major Joint Replacement of the Lower Extremity, Wave 1 (August and September 2019)

	Outcome	Response Category	BPCI Advanced Survey Responses	Comparison Survey Responses	BPCI Advanced Rate	Comparison Rate	Difference in Rate	95% LCI	95% UCI	90% LCI	90% UCI	p-value
Change in Functional Status	Bathing, dressing, using the toilet, or eating	Improvement	384	379	84.8	86.4	-1.7	-6.0	2.7	-5.3	1.9	0.75
		Maintained	384	379	5.4	5.0	0.4	-2.8	3.7	-2.3	3.1	
		Declined	384	379	9.8	8.5	1.3	-2.8	5.3	-2.2	4.7	
	Planning regular tasks	Improvement	385	378	88.8	88.1	0.8	-3.8	5.3	-3.0	4.6	0.51
		Maintained	385	378	3.1	4.7	-1.6	-4.2	1.1	-3.8	0.7	
		Declined	385	378	8.0	7.3	0.8	-3.5	5.0	-2.8	4.3	
	Use of mobility device	Improvement	381	379	64.9	59.1	5.9	-0.3	12.0	0.7	11.0	0.08*
		Maintained	381	379	13.4	13.1	0.2	-3.9	4.4	-3.2	3.7	
		Declined	381	379	21.7	27.8	-6.1	-11.5	-0.7	-10.6	-1.6	
	Walking without rest	Improvement	377	379	68.7	63.3	5.4	-0.4	11.3	0.5	10.3	0.19
		Maintained	377	379	15.4	18.2	-2.9	-7.7	2.0	-6.9	1.2	
		Declined	377	379	15.9	18.5	-2.6	-7.2	2.0	-6.4	1.3	
	Going up or down stairs	Improvement	371	369	62.4	64.1	-1.7	-8.5	5.0	-7.4	3.9	0.58
		Maintained	371	369	22.5	19.5	2.9	-3.0	8.9	-2.0	7.9	
		Declined	371	369	15.2	16.3	-1.2	-5.5	3.2	-4.8	2.4	
	Physical/emotional problems limiting social activities	Improvement	384	374	71.5	73.4	-1.9	-8.6	4.8	-7.5	3.7	0.86
		Maintained	384	374	16.5	15.2	1.3	-4.6	7.2	-3.7	6.2	
		Declined	384	374	12.0	11.4	0.6	-4.0	5.3	-3.3	4.5	
	Pain limiting regular activities	Improvement	387	382	76.9	76.7	0.2	-5.3	5.8	-4.4	4.9	0.89
		Maintained	387	382	13.0	12.4	0.6	-4.2	5.4	-3.4	4.6	
		Declined	387	382	10.1	11.0	-0.8	-4.4	2.8	-3.8	2.2	
Care Experience	Felt prepared to leave the hospital	Very or somewhat	389	379	95.3	94.5	0.8	-2.3	4.0	-1.8	3.5	0.59
	Medical staff took your preferences into account in deciding what health care services you should have after you left the hospital	Strongly Agree or Agree	369	361	91.6	92.4	-0.7	-4.9	3.4	-4.2	2.7	0.73

	Outcome	Response Category	BPCI Advanced Survey Responses	Comparison Survey Responses	BPCI Advanced Rate	Comparison Rate	Difference in Rate	95% LCI	95% UCI	90% LCI	90% UCI	p-value
Care Experience (cont'd)	Good understanding of how to take care of self before going home	Strongly Agree or Agree	375	360	95.6	93.6	1.9	-1.4	5.3	-0.9	4.7	0.26
	Medical staff clearly explained how to take medications before going home	Strongly Agree or Agree	363	353	95.5	94.4	1.1	-1.8	4.0	-1.3	3.5	0.46
	Medical staff clearly explained what follow-up appointments or treatments would be needed before going home	Strongly Agree or Agree	375	355	95.5	95.9	-0.4	-3.2	2.4	-2.7	1.9	0.78
	Able to manage your health needs since returning home	Strongly Agree or Agree	373	360	96.0	96.2	-0.1	-2.6	2.4	-2.2	2.0	0.93
	Medical staff talked with you about whether you would have the help you needed when you got home	Yes	366	350	93.8	93.5	0.3	-4.0	4.5	-3.3	3.8	0.89
	If you needed help at home to manage your health, medical staff arranged services for you at home to help manage your health	Yes	229	241	79.2	82.0	-2.8	-10.8	5.3	-9.5	4.0	0.50
Satisfaction with Care	Overall satisfaction with recovery	Quite a bit or Extreme	390	381	80.8	79.2	1.6	-4.1	7.4	-3.2	6.5	0.58
	Rating of all care received after leaving the hospital	9-10	381	376	74.3	74.0	0.3	-6.8	7.4	-5.6	6.3	0.62
		7-8	381	376	19.1	17.6	1.5	-4.8	7.8	-3.7	6.8	
		0-6	381	376	6.6	8.5	-1.8	-5.8	2.2	-5.2	1.5	

Notes: The estimates in this table are the result of a cross-sectional logistic regression risk adjustment model for binary indicators, controlling for beneficiary, hospital, and neighborhood characteristics. All responses were weighted for non-response and sampling design. Results are reported in percentage point terms. PGP = physician group practice; LCI = lower confidence interval; UCI = upper confidence interval. * Indicates statistical significance at the 10% level.

Source: Evaluation team analysis of BPCI Advanced beneficiary survey responses for episodes that began July or August 2019.

Exhibit J.15: Beneficiary Survey Outcomes: PGPs, Spine, Bone, and Joint Episodes, Excluding MJRLE, Wave 1 (August and September 2019)

	Outcome	Response Category	BPCI Advanced Survey Responses	Comparison Survey Responses	BPCI Advanced Rate	Comparison Rate	Difference in Rate	95% LCI	95% UCI	90% LCI	90% UCI	p-value
Change in Functional Status	Bathing, dressing, using the toilet, or eating	Improvement	406	402	66.2	67.9	-1.6	-6.9	3.6	-6.0	2.8	0.82
		Maintained	406	402	10.8	10.5	0.3	-3.5	4.2	-2.9	3.6	
		Declined	406	402	23.0	21.7	1.3	-3.5	6.1	-2.7	5.3	
	Planning regular tasks	Improvement	409	402	72.3	72.2	0.1	-4.7	4.9	-3.9	4.1	0.37
		Maintained	409	402	6.6	9.0	-2.3	-5.8	1.1	-5.3	0.6	
		Declined	409	402	21.1	18.8	2.2	-2.5	7.0	-1.7	6.2	
	Use of mobility device	Improvement	400	396	45.2	37.8	7.4	2.4	12.4	3.2	11.6	0.01*
		Maintained	400	396	9.5	13.4	-3.8	-7.9	0.2	-7.2	-0.4	
		Declined	400	396	45.3	48.8	-3.5	-8.8	1.7	-8.0	0.9	
	Walking without rest	Improvement	400	396	40.7	40.0	0.7	-4.4	5.8	-3.6	5.0	0.95
		Maintained	400	396	17.5	17.4	0.1	-4.6	4.8	-3.8	4.1	
		Declined	400	396	41.7	42.6	-0.8	-6.2	4.5	-5.3	3.7	
	Going up or down stairs	Improvement	393	383	38.4	38.2	0.2	-5.6	6.0	-4.7	5.0	0.28
		Maintained	393	383	20.4	17.2	3.2	-1.5	7.9	-0.7	7.1	
		Declined	393	383	41.2	44.6	-3.4	-8.7	1.9	-7.8	1.0	
	Physical/emotional problems limiting social activities	Improvement	402	395	50.7	52.9	-2.2	-8.6	4.2	-7.6	3.2	0.70
		Maintained	402	395	19.3	19.7	-0.4	-5.8	5.1	-4.9	4.2	
		Declined	402	395	30.0	27.4	2.5	-3.5	8.6	-2.5	7.6	
	Pain limiting regular activities	Improvement	410	400	53.0	54.9	-1.9	-8.0	4.1	-7.0	3.2	0.32
		Maintained	410	400	22.1	18.2	3.9	-1.2	9.1	-0.4	8.2	
		Declined	410	400	24.9	26.9	-2.0	-7.4	3.4	-6.5	2.5	
Care Experience	Felt prepared to leave the hospital	Very or somewhat	407	399	89.9	90.3	-0.4	-4.4	3.7	-3.7	3.0	0.86
	Medical staff took your preferences into account in deciding what health care services you should have after you left the hospital	Strongly Agree or Agree	381	374	93.5	91.4	2.1	-1.9	6.1	-1.2	5.4	0.30

	Outcome	Response Category	BPCI Advanced Survey Responses	Comparison Survey Responses	BPCI Advanced Rate	Comparison Rate	Difference in Rate	95% LCI	95% UCI	90% LCI	90% UCI	p-value
Care Experience (cont'd)	Good understanding of how to take care of self before going home	Strongly Agree or Agree	367	361	91.9	95.2	-3.2	-6.7	0.2	-6.1	-0.3	0.07*
	Medical staff clearly explained how to take medications before going home	Strongly Agree or Agree	344	337	93.0	95.1	-2.1	-5.7	1.4	-5.1	0.9	0.24
	Medical staff clearly explained what follow-up appointments or treatments would be needed before going home	Strongly Agree or Agree	363	365	93.6	95.2	-1.7	-5.0	1.6	-4.4	1.1	0.32
	Able to manage your health needs since returning home	Strongly Agree or Agree	360	365	92.9	97.3	-4.4	-7.7	-1.1	-7.2	-1.6	0.01*
	Medical staff talked with you about whether you would have the help you needed when you got home	Yes	336	346	92.3	90.9	1.4	-3.3	6.1	-2.5	5.3	0.55
	If you needed help at home to manage your health, medical staff arranged services for you at home to help manage your health	Yes	219	240	69.0	71.5	-2.5	-11.1	6.1	-9.6	4.7	0.57
Satisfaction with Care	Overall satisfaction with recovery	Quite a bit or Extreme	407	405	64.7	66.2	-1.5	-8.0	4.9	-6.9	3.9	0.64
	Rating of all care received after leaving the hospital	9-10	401	396	66.9	68.0	-1.1	-8.2	6.0	-7.0	4.9	0.63
		7-8	401	396	17.4	18.9	-1.5	-7.2	4.3	-6.3	3.4	
		0-6	401	396	15.6	13.1	2.6	-3.0	8.1	-2.1	7.2	

Notes: The estimates in this table are the result of a cross-sectional logistic regression risk adjustment model for binary indicators, controlling for beneficiary, hospital, and neighborhood characteristics. All responses were weighted for non-response and sampling design. Stratum includes the following clinical episodes: Back and neck except spinal fusion (inpatient); back and neck except spinal fusion (outpatient); spinal fusion (non-cervical); cervical spinal fusion; combined anterior poster spinal fusion; fractures of the femur and hip or pelvis; hip and femur procedures except major joint; lower extremity and humerus procedure; major joint replacement of the upper extremity; double joint replacement of the lower extremity. Results are reported in percentage point terms. MJRLE = major joint replacement of the lower extremity; PGP = physician group practice; LCI = lower confidence interval; UCI = upper confidence interval. * Indicates statistical significance at the 10% level.

***Source*:** Evaluation team analysis of BPCI Advanced beneficiary survey responses for episodes that began July or August 2019.

Exhibit J.16: Beneficiary Survey Outcomes: PGPs, Congestive Heart Failure, Wave 1 (August and September 2019)

	Outcome	Response Category	BPCI Advanced Survey Responses	Comparison Survey Responses	BPCI Advanced Rate	Comparison Rate	Difference in Rate	95% LCI	95% UCI	90% LCI	90% UCI	p-value
Change in Functional Status	Bathing, dressing, using the toilet, or eating	Improvement	315	294	54.7	55.2	-0.5	-7.7	6.7	-6.5	5.5	0.99
		Maintained	315	294	21.7	21.6	0.1	-5.9	6.1	-4.9	5.1	
		Declined	315	294	23.5	23.2	0.4	-6.7	7.4	-5.5	6.3	
	Planning regular tasks	Improvement	316	298	48.9	55.5	-6.6	-13.6	0.4	-12.4	-0.8	0.06*
		Maintained	316	298	23.0	17.0	6.0	0.3	11.7	1.2	10.8	
		Declined	316	298	28.1	27.5	0.6	-6.5	7.8	-5.4	6.6	
	Use of mobility device	Improvement	312	295	26.3	24.6	1.7	-3.9	7.3	-3.0	6.4	0.61
		Maintained	312	295	15.5	18.0	-2.5	-7.5	2.6	-6.7	1.7	
		Declined	312	295	58.2	57.4	0.8	-5.3	6.8	-4.3	5.8	
	Walking without rest	Improvement	311	290	19.7	19.7	0.0	-5.9	6.0	-5.0	5.0	0.96
		Maintained	311	290	27.8	26.9	0.9	-5.4	7.1	-4.4	6.1	
		Declined	311	290	52.5	53.4	-0.9	-7.9	6.1	-6.7	4.9	
	Going up or down stairs	Improvement	303	284	22.3	25.0	-2.7	-9.5	4.0	-8.4	2.9	0.21
		Maintained	303	284	27.4	22.0	5.4	-0.6	11.4	0.4	10.4	
		Declined	303	284	50.3	53.0	-2.7	-9.6	4.3	-8.5	3.2	
	Physical/emotional problems limiting social activities	Improvement	315	292	41.1	39.3	1.8	-5.8	9.4	-4.5	8.1	0.88
		Maintained	315	292	26.7	26.8	-0.1	-7.2	7.0	-6.1	5.8	
		Declined	315	292	32.2	33.9	-1.7	-9.5	6.2	-8.2	4.9	
	Pain limiting regular activities	Improvement	319	303	43.1	40.6	2.5	-5.6	10.7	-4.3	9.3	0.82
		Maintained	319	303	30.2	31.3	-1.1	-9.3	7.1	-8.0	5.7	
		Declined	319	303	26.7	28.1	-1.4	-8.8	6.0	-7.6	4.8	
Care Experience	Felt prepared to leave the hospital	Very or somewhat	324	303	89.5	92.0	-2.5	-7.3	2.2	-6.5	1.4	0.30
	Medical staff took your preferences into account in deciding what health care services you should have after you left the hospital	Strongly Agree or Agree	297	274	89.4	89.2	0.1	-4.7	5.0	-3.9	4.2	0.96

	Outcome	Response Category	BPCI Advanced Survey Responses	Comparison Survey Responses	BPCI Advanced Rate	Comparison Rate	Difference in Rate	95% LCI	95% UCI	90% LCI	90% UCI	p-value
Care Experience (cont'd)	Good understanding of how to take care of self before going home	Strongly Agree or Agree	290	259	88.6	93.2	-4.6	-9.0	-0.1	-8.3	-0.9	0.04*
	Medical staff clearly explained how to take medications before going home	Strongly Agree or Agree	282	265	92.2	90.3	2.0	-2.8	6.8	-2.0	6.0	0.42
	Medical staff clearly explained what follow-up appointments or treatments would be needed before going home	Strongly Agree or Agree	289	263	93.9	93.8	0.2	-4.0	4.4	-3.4	3.7	0.94
	Able to manage your health needs since returning home	Strongly Agree or Agree	291	265	92.6	93.3	-0.6	-4.9	3.7	-4.2	3.0	0.78
	Medical staff talked with you about whether you would have the help you needed when you got home	Yes	270	247	88.4	91.6	-3.2	-8.3	1.9	-7.4	1.0	0.21
	If you needed help at home to manage your health, medical staff arranged services for you at home to help manage your health	Yes	222	198	77.8	79.7	-1.9	-10.0	6.3	-8.7	4.9	0.65
Satisfaction with Care	Overall satisfaction with recovery	Quite a bit or Extreme	322	301	50.1	55.8	-5.7	-13.6	2.1	-12.3	0.8	0.15
	Rating of all care received after leaving the hospital	9-10	309	295	55.7	50.7	5.0	-4.0	14.1	-2.5	12.6	0.49
		7-8	309	295	31.8	33.9	-2.1	-10.7	6.6	-9.3	5.1	
		0-6	309	295	12.5	15.4	-3.0	-9.5	3.6	-8.4	2.5	

Notes: The estimates in this table are the result of a cross-sectional logistic regression risk adjustment model for binary indicators, controlling for beneficiary, hospital, and neighborhood characteristics. All responses were weighted for non-response and sampling design. Results are reported in percentage point terms. PGP = physician group practice; LCI = lower confidence interval; UCI = upper confidence interval. * Indicates statistical significance at the 10% level.

***Source*:** Evaluation team analysis of BPCI Advanced beneficiary survey responses for episodes that began July or August 2019.

Exhibit J.17: Beneficiary Survey Outcomes: PGPs, Cardiovascular Episodes, Excluding CHF, Wave 1 (August and September 2019)

	Outcome	Response Category	BPCI Advanced Survey Responses	Comparison Survey Responses	BPCI Advanced Rate	Comparison Rate	Difference in Rate	95% LCI	95% UCI	90% LCI	90% UCI	p-value
Change in Functional Status	Bathing, dressing, using the toilet, or eating	Improvement	358	358	70.7	72.1	-1.4	-7.4	4.6	-6.4	3.7	0.87
		Maintained	358	358	10.4	9.5	0.9	-3.0	4.7	-2.3	4.1	
		Declined	358	358	18.9	18.4	0.5	-4.8	5.8	-4.0	5.0	
	Planning regular tasks	Improvement	358	359	67.5	63.3	4.2	-1.5	9.9	-0.5	9.0	0.33
		Maintained	358	359	9.8	11.0	-1.2	-4.9	2.5	-4.3	1.9	
		Declined	358	359	22.7	25.7	-3.0	-8.9	2.8	-7.9	1.9	
	Use of mobility device	Improvement	356	359	53.1	52.7	0.4	-5.3	6.0	-4.3	5.1	0.53
		Maintained	356	359	13.9	11.8	2.1	-1.9	6.0	-1.2	5.3	
		Declined	356	359	33.0	35.5	-2.4	-8.3	3.4	-7.3	2.5	
	Walking without rest	Improvement	351	347	36.1	43.3	-7.1	-13.1	-1.2	-12.1	-2.2	0.06*
		Maintained	351	347	27.7	25.4	2.3	-3.0	7.6	-2.1	6.7	
		Declined	351	347	36.2	31.4	4.8	-1.1	10.8	-0.1	9.8	
	Going up or down stairs	Improvement	338	341	36.8	37.4	-0.6	-6.4	5.3	-5.5	4.3	0.97
		Maintained	338	341	28.5	27.9	0.5	-4.8	5.9	-3.9	5.0	
		Declined	338	341	34.7	34.7	0.0	-5.9	5.9	-4.9	5.0	
	Physical/emotional problems limiting social activities	Improvement	354	351	48.3	53.1	-4.9	-11.3	1.6	-10.3	0.5	0.31
		Maintained	354	351	23.7	20.7	3.0	-2.8	8.8	-1.8	7.8	
		Declined	354	351	28.0	26.1	1.9	-4.5	8.3	-3.4	7.2	
	Pain limiting regular activities	Improvement	351	358	47.0	45.5	1.4	-5.6	8.4	-4.4	7.3	0.39
		Maintained	351	358	30.5	27.7	2.8	-3.4	9.0	-2.4	8.0	
		Declined	351	358	22.5	26.7	-4.2	-10.6	2.1	-9.6	1.1	
Care Experience	Felt prepared to leave the hospital	Very or somewhat	355	365	94.8	94.1	0.8	-3.0	4.5	-2.4	3.9	0.69
	Medical staff took your preferences into account in deciding what health care services you should have after you left the hospital	Strongly Agree or Agree	327	333	90.9	90.2	0.6	-4.4	5.6	-3.5	4.8	0.81

	Outcome	Response Category	BPCI Advanced Survey Responses	Comparison Survey Responses	BPCI Advanced Rate	Comparison Rate	Difference in Rate	95% LCI	95% UCI	90% LCI	90% UCI	p-value
Care Experience (cont'd)	Good understanding of how to take care of self before going home	Strongly Agree or Agree	321	327	94.3	94.3	0.0	-3.7	3.6	-3.1	3.0	0.98
	Medical staff clearly explained how to take medications before going home	Strongly Agree or Agree	323	320	94.6	93.3	1.3	-2.6	5.2	-2.0	4.6	0.52
	Medical staff clearly explained what follow-up appointments or treatments would be needed before going home	Strongly Agree or Agree	325	335	94.5	93.0	1.6	-2.8	6.0	-2.1	5.3	0.49
	Able to manage your health needs since returning home	Strongly Agree or Agree	322	337	95.9	95.4	0.5	-3.1	4.0	-2.5	3.4	0.79
	Medical staff talked with you about whether you would have the help you needed when you got home	Yes	292	296	88.9	83.3	5.6	-0.2	11.4	0.8	10.4	0.06*
	If you needed help at home to manage your health, medical staff arranged services for you at home to help manage your health	Yes	181	180	75.3	66.5	8.8	-1.5	19.0	0.2	17.3	0.09*
Satisfaction with Care	Overall satisfaction with recovery	Quite a bit or Extreme	351	359	63.0	60.2	2.8	-4.4	10.0	-3.2	8.8	0.44
	Rating of all care received after leaving the hospital	9-10	352	355	61.5	61.5	0.0	-8.4	8.4	-7.0	7.0	0.96
		7-8	352	355	22.1	21.3	0.8	-5.9	7.5	-4.8	6.4	
		0-6	352	355	16.4	17.2	-0.8	-7.5	5.9	-6.4	4.9	

Notes: The estimates in this table are the result of a cross-sectional logistic regression risk adjustment model for binary indicators, controlling for beneficiary, hospital, and neighborhood characteristics. All responses were weighted for non-response and sampling design. Stratum includes the following clinical episodes: acute myocardial infarction; cardiac arrhythmia; cardiac defibrillator (outpatient); cardiac defibrillator (inpatient); cardiac valve; pacemaker; percutaneous coronary intervention (inpatient); percutaneous coronary intervention (outpatient); and coronary artery bypass graft. Results are reported in percentage point terms. CHF = congestive heart failure; PGP = physician group practice; LCI = lower confidence interval; UCI = upper confidence interval. * Indicates statistical significance at the 10% level.

***Source*:** Evaluation team analysis of BPCI Advanced beneficiary survey responses for episodes that began July or August 2019.

Exhibit J.18: Beneficiary Survey Outcomes: PGPs, Pulmonary Episodes, Wave 1 (August and September 2019)

	Outcome	Response Category	BPCI Advanced Survey Responses	Comparison Survey Responses	BPCI Advanced Rate	Comparison Rate	Difference in Rate	95% LCI	95% UCI	90% LCI	90% UCI	p-value
Change in Functional Status	Bathing, dressing, using the toilet, or eating	Improvement	329	321	57.3	60.0	-2.8	-9.2	3.7	-8.2	2.6	0.58
		Maintained	329	321	18.5	19.0	-0.4	-5.9	5.0	-5.0	4.1	
		Declined	329	321	24.2	21.0	3.2	-3.0	9.4	-2.0	8.4	
	Planning regular tasks	Improvement	323	317	56.8	57.5	-0.7	-6.9	5.5	-5.9	4.5	0.47
		Maintained	323	317	13.3	15.7	-2.4	-7.1	2.3	-6.4	1.5	
		Declined	323	317	29.8	26.8	3.1	-2.8	9.0	-1.9	8.0	
	Use of mobility device	Improvement	315	321	39.2	39.5	-0.2	-6.1	5.6	-5.2	4.7	0.78
		Maintained	315	321	14.2	15.6	-1.4	-5.8	3.0	-5.1	2.3	
		Declined	315	321	46.6	44.9	1.7	-4.4	7.8	-3.4	6.8	
	Walking without rest	Improvement	319	320	28.8	30.3	-1.5	-8.0	5.0	-7.0	4.0	0.82
		Maintained	319	320	32.0	29.9	2.1	-4.6	8.7	-3.5	7.6	
		Declined	319	320	39.2	39.8	-0.6	-6.8	5.7	-5.8	4.6	
	Going up or down stairs	Improvement	308	314	28.1	28.3	-0.3	-6.9	6.4	-5.8	5.3	0.67
		Maintained	308	314	26.3	23.9	2.4	-3.5	8.3	-2.5	7.4	
		Declined	308	314	45.6	47.8	-2.2	-8.5	4.1	-7.5	3.1	
	Physical/emotional problems limiting social activities	Improvement	320	315	45.0	47.1	-2.1	-10.6	6.4	-9.2	5.0	0.85
		Maintained	320	315	26.1	25.9	0.2	-7.3	7.6	-6.1	6.4	
		Declined	320	315	29.0	27.0	2.0	-5.7	9.6	-4.4	8.4	
	Pain limiting regular activities	Improvement	318	316	40.2	45.0	-4.8	-12.8	3.1	-11.5	1.8	0.02*
		Maintained	318	316	29.5	35.3	-5.8	-13.7	2.2	-12.4	0.9	
		Declined	318	316	30.3	19.7	10.6	3.4	17.8	4.6	16.6	
Care Experience	Felt prepared to leave the hospital	Very or somewhat	328	314	89.1	89.6	-0.5	-5.7	4.7	-4.8	3.9	0.86
	Medical staff took your preferences into account in deciding what health care services you should have after you left the hospital	Strongly Agree or Agree	291	297	88.9	86.1	2.8	-2.6	8.2	-1.7	7.3	0.31

	Outcome	Response Category	BPCI Advanced Survey Responses	Comparison Survey Responses	BPCI Advanced Rate	Comparison Rate	Difference in Rate	95% LCI	95% UCI	90% LCI	90% UCI	p-value
Care Experience (cont'd)	Good understanding of how to take care of self before going home	Strongly Agree or Agree	288	289	92.7	91.0	1.7	-2.9	6.2	-2.1	5.4	0.47
	Medical staff clearly explained how to take medications before going home	Strongly Agree or Agree	285	281	94.9	92.5	2.4	-1.4	6.2	-0.8	5.6	0.22
	Medical staff clearly explained what follow-up appointments or treatments would be needed before going home	Strongly Agree or Agree	284	283	94.2	92.5	1.8	-2.3	5.9	-1.7	5.2	0.40
	Able to manage your health needs since returning home	Strongly Agree or Agree	290	283	96.2	93.9	2.3	-1.2	5.8	-0.6	5.3	0.20
	Medical staff talked with you about whether you would have the help you needed when you got home	Yes	256	263	87.0	88.5	-1.6	-7.8	4.6	-6.8	3.6	0.62
	If you needed help at home to manage your health, medical staff arranged services for you at home to help manage your health	Yes	176	183	65.7	69.7	-4.0	-14.1	6.1	-12.4	4.4	0.43
Satisfaction with Care	Overall satisfaction with recovery	Quite a bit or Extreme	327	318	55.7	58.7	-3.0	-10.8	4.8	-9.5	3.5	0.45
	Rating of all care received after leaving the hospital	9-10	317	308	56.6	52.7	4.0	-4.9	12.8	-3.4	11.4	0.64
		7-8	317	308	27.3	28.6	-1.3	-9.5	6.9	-8.2	5.5	
		0-6	317	308	16.1	18.8	-2.7	-9.7	4.4	-8.5	3.2	

Notes: The estimates in this table are the result of a cross-sectional logistic regression risk adjustment model for binary indicators, controlling for beneficiary, hospital, and neighborhood characteristics. All responses were weighted for non-response and sampling design. Stratum contains the following clinical episodes: simple pneumonia and respiratory infections, and chronic obstructive pulmonary disease, bronchitis, and asthma. Results are reported in percentage point terms. PGP = physician group practice; LCI = lower confidence interval; UCI = upper confidence interval. * Indicates statistical significance at the 10% level.

***Source*:** Evaluation team analysis of BPCI Advanced beneficiary survey responses for episodes that began July or August 2019.

Exhibit J.19: Beneficiary Survey Outcomes: Hospitals, Kidney and Infectious Diseases, Wave 1 (August and September 2019)

	Outcome	Response Category	BPCI Advanced Survey Responses	Comparison Survey Responses	BPCI Advanced Rate	Comparison Rate	Difference in Rate	95% LCI	95% UCI	90% LCI	90% UCI	p-value
Change in Functional Status	Bathing, dressing, using the toilet, or eating	Improvement	363	364	51.2	57.8	-6.7	-12.3	-1.0	-11.4	-1.9	0.05*
		Maintained	363	364	23.5	19.0	4.5	-1.0	10.0	-0.1	9.1	
		Declined	363	364	25.4	23.2	2.2	-4.1	8.5	-3.1	7.4	
	Planning regular tasks	Improvement	360	366	53.3	51.3	1.9	-4.3	8.1	-3.3	7.1	0.13
		Maintained	360	366	13.6	18.8	-5.2	-10.3	-0.1	-9.5	-0.9	
		Declined	360	366	33.2	29.9	3.3	-3.1	9.7	-2.1	8.6	
	Use of mobility device	Improvement	365	357	34.3	34.9	-0.6	-6.2	5.1	-5.3	4.1	0.96
		Maintained	365	357	13.9	14.3	-0.4	-5.4	4.6	-4.6	3.8	
		Declined	365	357	51.8	50.8	1.0	-5.4	7.4	-4.4	6.3	
	Walking without rest	Improvement	360	361	23.7	32.2	-8.5	-14.4	-2.5	-13.5	-3.5	0.00*
		Maintained	360	361	24.5	28.3	-3.8	-9.5	1.9	-8.6	1.0	
		Declined	360	361	51.8	39.6	12.3	5.7	18.9	6.8	17.8	
	Going up or down stairs	Improvement	354	351	26.6	32.7	-6.1	-12.6	0.3	-11.5	-0.7	0.16
		Maintained	354	351	22.5	20.9	1.6	-4.3	7.6	-3.4	6.6	
		Declined	354	351	50.9	46.4	4.5	-1.9	10.9	-0.9	9.9	
	Physical/emotional problems limiting social activities	Improvement	356	359	42.7	45.2	-2.5	-9.8	4.9	-8.6	3.7	0.15
		Maintained	356	359	22.7	27.0	-4.3	-10.5	2.0	-9.5	1.0	
		Declined	356	359	34.6	27.8	6.7	-0.4	13.9	0.7	12.7	
	Pain limiting regular activities	Improvement	353	360	36.7	41.2	-4.4	-11.9	3.1	-10.7	1.9	0.12
		Maintained	353	360	33.6	26.8	6.8	0.3	13.4	1.3	12.3	
		Declined	353	360	29.7	32.1	-2.4	-9.3	4.5	-8.2	3.4	
Care Experience	Felt prepared to leave the hospital	Very or somewhat	356	368	88.9	90.9	-2.0	-6.5	2.5	-5.7	1.7	0.38
	Medical staff took your preferences into account in deciding what health care services you should have after you left the hospital	Strongly Agree or Agree	333	329	86.6	89.5	-2.9	-8.6	2.8	-7.7	1.9	0.32

	Outcome	Response Category	BPCI Advanced Survey Responses	Comparison Survey Responses	BPCI Advanced Rate	Comparison Rate	Difference in Rate	95% LCI	95% UCI	90% LCI	90% UCI	p-value
Care Experience (cont'd)	Good understanding of how to take care of self before going home	Strongly Agree or Agree	314	311	91.5	92.4	-0.9	-5.3	3.6	-4.6	2.9	0.71
	Medical staff clearly explained how to take medications before going home	Strongly Agree or Agree	307	295	91.0	91.6	-0.6	-5.2	4.0	-4.5	3.3	0.80
	Medical staff clearly explained what follow-up appointments or treatments would be needed before going home	Strongly Agree or Agree	311	309	92.4	91.4	1.0	-3.3	5.2	-2.6	4.5	0.66
	Able to manage your health needs since returning home	Strongly Agree or Agree	318	310	93.9	93.6	0.3	-4.0	4.6	-3.3	3.9	0.89
	Medical staff talked with you about whether you would have the help you needed when you got home	Yes	280	283	86.5	86.6	-0.1	-6.3	6.1	-5.3	5.1	0.98
	If you needed help at home to manage your health, medical staff arranged services for you at home to help manage your health	Yes	199	203	64.9	69.3	-4.4	-13.7	4.8	-12.2	3.3	0.35
Satisfaction with Care	Overall satisfaction with recovery	Quite a bit or Extreme	352	362	58.9	59.5	-0.7	-8.0	6.7	-6.8	5.5	0.85
	Rating of all care received after leaving the hospital	9-10	353	364	53.9	56.7	-2.9	-11.7	6.0	-10.3	4.6	0.82
		7-8	353	364	27.2	25.7	1.4	-6.0	8.9	-4.8	7.7	
		0-6	353	364	19.0	17.6	1.4	-5.0	7.8	-4.0	6.8	

Notes: The estimates in this table are the result of a cross-sectional logistic regression risk adjustment model for binary indicators, controlling for beneficiary, hospital, and neighborhood characteristics. All responses were weighted for non-response and sampling design. Stratum includes the following clinical episodes: renal failure; cellulitis; and urinary tract infection; and sepsis. Results are reported in percentage point terms. PGP = physician group practice; LCI = lower confidence interval; UCI = upper confidence interval. * Indicates statistical significance at the 10% level.

***Source*:** Evaluation team analysis of BPCI Advanced beneficiary survey responses for episodes that began July or August 2019.

Appendix K: Supplemental Medicare Program Savings Results

Exhibit K.1: Net Medicare Savings by Clinical Episode, October 1, 2018 – August 3, 2019

Clinical Episode	Change in Non-standardized Payments	Reconciliation Payments	Net Savings to Medicare	Percent Change
AMI	$3,042,421	$7,449,651	-$4,407,230	-1.7%
Cardiac Arrhythmia	$3,423,815	$11,897,536	-$8,473,721	-2.9%
COPD, Bronchitis, Asthma	$8,608,719	$18,390,596	-$9,781,877	-2.6%
CHF	$14,971,891	$80,043,888	-$65,071,997	-6.1%
GI Hemorrhage	-$545,092	$2,141,134	-$2,686,226	-1.7%
Hip & Femur Procedures	$10,364,908	$4,429,872	$5,935,036	2.2%
MJRLE	$15,933,866	-$6,215,108	$22,148,974	6.2%
PCI (Outpatient)	$1,531,004	$677,957	$853,047	1.2%
Renal failure	$2,108,594	$12,074,252	-$9,965,658	-3.0%
Sepsis	$48,524,675	$105,962,104	-$57,437,429	-2.8%
SPRI	$1,153,440	$28,984,998	-$27,831,558	-4.4%
Stroke	$12,730,868	$24,434,484	-$11,703,616	-2.2%
UTI	$12,796,218	$2,988,315	$9,807,903	2.9%

Note: The estimate of the change in non-standardized payments is based on difference-in-differences (DiD) models of standardized Medicare paid amounts during the episode. Net savings to Medicare is the estimated change in non-standardized payments plus reconciliation payments. Net savings, change in non-standardized payments, and reconciliation payments are reported such that a positive value indicates savings to Medicare and a negative value indicates losses to Medicare. Percent change is the estimated net savings (losses) to Medicare as a percent of the baseline spending. AMI = acute myocardial infarction; COPD = chronic obstructive pulmonary disease; CHF = congestive heart failure; GI = gastrointestinal; Hip & Femur Procedures = hip and femur procedures except major joint; MJRLE = major joint replacement of the lower extremity; PCI = percutaneous coronary intervention; SPRI = simple pneumonia and respiratory infections; UTI = urinary tract infection.

Source: The BPCI Advanced evaluation team's analysis of Medicare claims and enrollment data for episodes with anchor stays/ procedures that began April 1, 2013 and ended on or before December 31, 2017 (baseline period) and episodes with anchor stays/ procedures that began October 1, 2018 and ended on or before August 3, 2019 (intervention period) for BPCI Advanced EIs and matched comparison providers and CMS reconciliation data from the same period.

Appendix L: Beneficiary Survey Instrument

Health Care Experience Survey

We are interested in the quality of care you received at the hospital listed in the cover letter, and how your recovery has been going. We understand that this was probably a difficult time for you and your family. We appreciate you taking the time to tell us about your health care experiences. Please be assured that all responses are confidential.

There are four sections of this survey. The first section asks about how you were feeling *just before* you went to the hospital listed in the cover letter. The second section asks about how you are *currently* feeling. The third section asks about your experience and satisfaction with the hospital and any other places where you received care after you left the hospital. The last questions in the survey are about you.

Instructions:

- Please read each question carefully and respond by marking the box next to the response that most closely represents your opinion.
- Please mark only one box for each question, unless it tells you to "Choose all that apply."
- Many people use a PENCIL in case they want to change their answers. Please erase cleanly or white out any marks you wish to change. Please do NOT use a felt tip pen.
- Please do not make any stray marks on the form.

1. **First, please indicate who is completing this survey.**

☒ Person named in the cover letter

☒ Person named in the cover letter, with help from a family member, friend or caregiver

☒ A family member, friend, or caregiver of the person named in the cover letter

☒ Someone else who is not a family member, friend, or caregiver of the person named in the cover letter

☒ **If the person to whom this was mailed cannot complete the survey, and there is no one else who can do it for him or her**, please mark this response and return the blank survey to Abt Associates, P.O. Box 5720, Hopkins, MN 55343 using the postage-paid envelope provided.

Section 1. Before the Hospital

We would like to know how you were doing before you went to the hospital listed in the cover letter. Please think about your overall health and all of your medical needs at that time, and not just the reason you went to the hospital listed in your cover letter.

2. Thinking about the week before you went to the hospital, how much help did you need from another person with bathing, dressing, using the toilet, or eating?

   ☒ No help needed from another person
   ☒ Some help needed from another person
   ☒ Complete help needed from another person
   ☒ Don't know/Don't remember

3. Thinking about the week before you went to the hospital, how much help did you need from another person with planning regular tasks, such as making a grocery list or remembering to take medication?

   ☒ No help needed from another person
   ☒ Some help needed from another person
   ☒ Complete help needed from another person
   ☒ Don't know/Don't remember

4. Thinking about the week before you went to the hospital, what best describes your use of a mobility device such as a wheelchair, scooter, walker, or cane?

   ☒ I never used a mobility device
   ☒ I sometimes used a mobility device
   ☒ I always used a mobility device
   ☒ Don't know/Don't remember

5. Thinking about the week before you went to the hospital, what best describes your ability to walk by yourself without resting? That is, without the help of another person or the help of a mobility device.

   ☒ I could walk several blocks by myself without resting or using a mobility device
   ☒ I could walk one block by myself without resting or using a mobility device
   ☒ I could walk from one room to another by myself without resting or using a mobility device
   ☒ I was not able to walk by myself without resting or using a mobility device
   ☒ Don't know/Don't remember

6. Thinking about the week before you went to the hospital, how much difficulty did you have walking up or down 12 stairs?

   ☒ I had no difficulty walking up or down 12 stairs
   ☒ I had some difficulty walking up or down 12 stairs
   ☒ I had a lot of difficulty walking up or down 12 stairs
   ☒ I was not able to walk up or down 12 stairs
   ☒ Don't know/Don't remember

7. Thinking about the week before you went to the hospital, how often did your physical health or emotional problems interfere with your social activities (like visiting friends, relatives, etc.)?

   ☒ All of the time
   ☒ Most of the time
   ☒ Some of the time
   ☒ A little of the time
   ☒ None of the time
   ☒ Don't know/Don't remember

8. Thinking about the week before you went to the hospital, how much did pain interfere with your normal activities?

   ☒ All of the time
   ☒ Most of the time
   ☒ Some of the time
   ☒ A little of the time
   ☒ None of the time
   ☒ Don't know/Don't remember

Section 2. After the Hospital

It has been a few months since your hospital care and we would like to know how you are doing today. Please think about your overall health and all of your medical needs, and not just the reason you went to the hospital listed in your cover letter.

9. How much help do you currently need from another person with bathing, dressing, using the toilet, or eating?

   ☒ No help needed from another person
   ☒ Some help needed from another person
   ☒ Complete help needed from another person
   ☒ Don't know/Don't remember

10. How much help do you currently need from another person with planning regular tasks, such as making a grocery list or remembering to take medication?

- ☒ No help needed from another person
- ☒ Some help needed from another person
- ☒ Complete help needed from another person
- ☒ Don't know/Don't remember

11. What currently best describes your use of a mobility device such as a wheelchair, scooter, walker, or cane?

- ☒ I never use a mobility device
- ☒ I sometimes use a mobility device
- ☒ I always use a mobility device
- ☒ Don't know/Don't remember

12. What best describes your current ability to walk by yourself without resting? That is, without the help of another person or the help of a mobility device.

- ☒ I can walk several blocks by myself without resting or using a mobility device
- ☒ I can walk one block by myself without resting or using a mobility device
- ☒ I can walk from one room to another by myself without resting or using a mobility device
- ☒ I am not able to walk by myself without resting or using a mobility device
- ☒ Don't know/Don't remember

13. Do you currently have difficulty walking up or down 12 stairs?

- ☒ I have no difficulty walking up or down 12 stairs
- ☒ I have some difficulty walking up or down 12 stairs
- ☒ I have a lot of difficulty walking up or down 12 stairs
- ☒ I am not able to walk up or down 12 stairs
- ☒ Don't know/Don't remember

14. How often does your physical health or emotional problems currently interfere with your social activities (like visiting friends, relatives, etc.)?

- ☒ All of the time
- ☒ Most of the time
- ☒ Some of the time
- ☒ A little of the time
- ☒ None of the time
- ☒ Don't know/Don't remember

15. How much does pain currently interfere with your normal activities?

- ☒ All of the time
- ☒ Most of the time
- ☒ Some of the time
- ☒ A little of the time
- ☒ None of the time
- ☒ Don't know/Don't remember

16. Overall, since you left the hospital, how satisfied are you with your recovery?

- ☒ Not at all satisfied
- ☒ Slightly satisfied
- ☒ Moderately satisfied
- ☒ Quite a bit satisfied
- ☒ Extremely satisfied
- ☒ Don't know/Don't remember

Section 3. Health Care Experiences

Now, we would like to hear about your experiences while you were at the hospital listed in the cover letter and any other place where you received care after the hospital.

In the following questions, the term "medical staff" means doctors, nurses, physical or occupational therapists and any other medical professionals who helped take care of you at the hospital and afterwards, in other facilities or at home. For example, after leaving the hospital you may have received care from medical staff in a nursing home, rehabilitation facility, assisted living facility, a doctor's office, or at home.

We'd like to learn about your experience as you were leaving the hospital in the cover letter.

17. Looking back to the time you left the hospital, overall, how prepared did you feel to leave?

- ☒ Unprepared
- ☒ Moderately prepared
- ☒ Very prepared
- ☒ Don't know/Don't remember

Thinking about when you left the hospital listed in the cover letter, how much do you agree or disagree with the following statement?

18. The medical staff took your preferences and those of your family or your caregiver into account in deciding what health care services you should have after you left the hospital.

- ☒ Strongly Disagree
- ☒ Disagree
- ☒ Agree
- ☒ Strongly Agree
- ☒ Don't Know/Don't Remember
- ☒ Not Applicable

19. Where do you reside now?

- ☒ At my own home, in someone else's home, or in an assisted living facility **(Continue with the next section by following the arrow)**
- ☒ In a rehabilitation center, nursing home, or other health care facility **(Skip to Question 26 located on Page L-8)**

Thinking about when you left the hospital listed in the cover letter, how much do you agree or disagree with the following statements?

20. Before you prepared to go home (or to someone else's home, or to an assisted living facility), you and your family or caregiver had a good understanding of how to take care of yourself.

- ☒ Strongly Disagree
- ☒ Disagree
- ☒ Agree
- ☒ Strongly Agree
- ☒ Don't Know/Don't Remember
- ☒ Not Applicable

21. Before you prepared to go home (or to someone else's home, or to an assisted living facility), medical staff clearly explained how to take your medications.

- ☒ Strongly Disagree
- ☒ Disagree
- ☒ Agree
- ☒ Strongly Agree
- ☒ Don't Know/Don't Remember
- ☒ Not Applicable, did not receive new medications

22. Before you prepared to go home (or to someone else's home, or to an assisted living facility), medical staff clearly explained what follow-up appointments or treatments would be needed.

- ☒ Strongly Disagree
- ☒ Disagree
- ☒ Agree
- ☒ Strongly Agree
- ☒ Don't Know/Don't Remember
- ☒ Not Applicable

23. Overall, since you returned home (or to someone else's home, or to an assisted living facility), you and your caregivers have been able to manage your health needs.

- ☒ Strongly Disagree
- ☒ Disagree
- ☒ Agree
- ☒ Strongly Agree
- ☒ Don't Know/Don't Remember
- ☒ Not applicable

24. Before you prepared to go home (or to someone else's home, or to an assisted living facility), did doctors, nurses, or other staff talk with you about whether you would have the help you needed when you got home?

- ☒ Yes
- ☒ No
- ☒ Don't Know/Don't Remember
- ☒ Not applicable

25. Since leaving the hospital, if you needed help at home to manage your health, did medical staff arrange services for you at home to help manage your health?

- ☒ Yes
- ☒ No
- ☒ Don't Know/Don't Remember
- ☒ Not Applicable, did not require help at home

26. Now we would like you to think about all of the healthcare you received after leaving the hospital. Using any number from 0 to 10, where 0 is the worst health care possible and 10 is the best health care possible, what number would you use to rate all of your health care after leaving the hospital?

☒ 0 (Worst possible)	☒ 4	☒ 8
☒ 1	☒ 5	☒ 9
☒ 2	☒ 6	☒ 10 (Best possible)
☒ 3	☒ 7	

Section 4. Personal Characteristics

27. What is the highest grade or level of school that you completed?

- ☒ 8th grade or less
- ☒ Some high school, but did not graduate
- ☒ High school graduate or GED
- ☒ Some college or 2-year (associate's) degree
- ☒ 4-year (bachelor's) college degree or equivalent
- ☒ More than 4-year college degree (such as a master's or doctoral degree)

28. We may like to call you in the future for a 5 to 10 minute follow-up regarding your care experience. Participation is completely voluntary. May we have your permission to call you for a brief survey in the future?

- ☒ Yes, you may contact me for another brief survey in the future
- ☒ No, you may not contact me for another brief survey in the future

IF YOU'D LIKE TO BE CONTACTED IN THE FUTURE

29. So that we have the most up to date contact information for you in the future, please provide the best telephone number to reach you:

Telephone number with area code:

_____-_____-_____

Thank you for completing the survey!

Please mail it back in the enclosed postage-paid envelope

Abt Associates, P.O. Box 5720, Hopkins, MN 55343

Appendix M: Clinical Expert Network Panel Summaries and Panelists

I. Clinical Expert Network (CEN) Kick-off: An Introduction to the BPCI Advanced Model

- Event date: May 16, 2019
- Event facilitator: Christine LaRocca, MD, Telligen Medical Director
- Event participants: Areas of expertise
  - Geriatric Medicine and Gerontology
  - Orthopedic Surgery
  - Neurosurgery
  - Interventional Cardiology
  - Pulmonary Sciences and Critical Care Medicine
  - Cardiovascular and Thoracic Surgery

A. Kick-off call topics

1. Model Background & Overview
   a. Goals, Characteristics, & Participants
   b. Clinical Episodes
   c. Advanced Alternative Payment Models
   d. Target Price & Reconciliation
2. Model Evaluation & Data Sources
3. Clinical Expert Network
   a. Goals & Expectations
   b. Member Responsibilities
   c. Meet the Members
   d. Meet the Facilitator
4. Model Resources

II. Second CEN Meeting: Overview of First Annual Report and Model Year 3 Updates

- Event date: February 7, 2020
- Event facilitator: Christine LaRocca, MD, Telligen Medical Director
- Event participants: Areas of expertise (see above)

A. Second CEN meeting call topics:

1. Overview of the First Annual Report
    a. Research Questions
    b. Summary of Key Findings
    c. Selected Results
        i. As of March 1, 2019, 334 unique convener and non-convener model participants represented 715 hospital Episode Initiators (EIs) and 580 Physician Group Practice (PGP) EIs.
            1) Over 44% of EIs were participating under one of the five largest conveners.
        ii. Approximately 22% of eligible hospitals participated in BPCI Advanced.
            1) Participating hospitals were larger and more likely to be located in urban and more competitive markets than hospitals that did not participate.
        iii. Approximately 28% of the 580 PGP EIs were operating under a unique Taxpayer Identification Number (TIN) that did not exist in the baseline period.
        iv. Financial opportunity was a common reason cited for joining the model and selecting a particular clinical episode.
            1) Participants noted they evaluated historical payments and preliminary target prices, as supplied by CMS, when choosing among the clinical episodes.
        v. Hospital EIs were more likely to participate in medical clinical episodes and PGP EIs were more likely to participate in surgical clinical episodes.
        vi. During the first six months of the model, BPCI Advanced hospitals and PGPs accounted for 9% and 7%, respectively, of eligible BPCI Advanced hospitals' discharges and outpatient procedures in the 32 clinical episodes.

2. Model Year 3 Updates
    a. Review Model Year 3 Fact Sheet
    b. Model Participation
    c. Policy/Methodology Updates
    d. Changes to Clinical Episodes
    e. Clinical Episode Selection

B. Second CEN meeting discussion takeaways:

- **Approximately 28% of the 580 PGP EIs were operating under a unique TIN that did not exist in the baseline period. How difficult is it for physicians to bill different TINs?**
    - CEN members believed it would be difficult to determine if a patient would be in the model and then identify the appropriate TIN to bill. Several experts noted that their practice only has one TIN and they were not aware of how one could bill to other TINs.
- **Hospital EIs were more likely to participate in medical clinical episodes and PGP EIs were more likely to participate in surgical clinical episodes; over half of the hospital EIs participated in the congestive heart failure clinical episode and a third participated in the chronic obstructive pulmonary disease, bronchitis, and asthma clinical episode. Why do hospitals and PGPs select different clinical episodes (e.g., hospitals selecting medical episodes; PGPs selecting surgical episodes)?**
    - Regarding hospital clinical episode selections, CEN members discussed that these are very common episodes and may be representative of what hospitals typically see for medical care. Hospitals may be choosing based on volume. Hospitals may have chosen these episodes because they are higher needs patients with higher cost conditions and there are opportunities for their hospitalists to improve care.
    - Regarding PGP clinical episode selections, CEN members discussed that proceduralists and specialists are choosing the episodes in which they can be successful; these are surgical specialists and so they may select very specific procedures that they can control.
- **The CEN was asked to comment on these findings: To understand the breadth of BPCI Advanced participation, the evaluation team calculated the proportion of eligible hospitals, clinicians, and hospital discharges and outpatient procedures attributed to BPCI Advanced during the first six months of the model (October 2018 through March 2019), finding that the reach of BPCI Advanced being 23% of clinicians and 16% of eligible discharges.**
    - One orthopedic surgeon interpreted these findings as indicating that there may not be a great deal of interest in the BPCI Advanced model for orthopedic practices due to the design of the model. For example, episode length is too long and may include costs not related to the triggering procedure. Additionally, he

commented that the model's risk stratification may not fully account for the complexity of patients.

- **The CEN discussed the BPCI Advanced Model changes from Model Years 1 and 2 to Model Year 3, and what unintended consequences might occur due to these changes.**
  - Regarding spinal fusion episodes being combined into a single spinal fusion episode, the CEN was asked if this change could lead to any unintended consequences whereby a less expensive procedure is conducted in the place of a more expensive one. The CEN noted that it is conceivable that this change could result in a lower cost fusion being performed instead of a higher cost fusion. The neurosurgeon expert stated that, in combining these episodes into one, the accuracy of the episode may decrease due to the variation in the case types. For example, cervical cases will have a different patient population than noncervical fusions; these cases will, in turn, be different than anterior and posterior fusions. Fusion types will encompass different procedures, patients, and post-acute care needs, as well as different rates of complications.
  - The CEN participants were asked to comment on the precedence rule changes for percutaneous coronary intervention (PCI) followed by transcatheter aortic valve replacement (TAVR). The cardiovascular surgeon indicated it is common for patients to undergo TAVR first, followed by PCI; due to complications from the TAVR procedure, patients may require PCI. A gaming opportunity may be to do a (potentially unnecessary) PCI first, in order to not be "on the hook" for the PCI in the TAVR episode.
  - Regarding how this precedence rule change might encourage model participants to delay the TAVR beyond 90 days of the PCI so that a hospital or PGP could be involved in both clinical episodes, the cardiac surgeon noted that the performance of TAVR after PCI can usually, but not always, wait a few months. If it is financially more advantageous to wait, this may occur.
  - Conversely, the CEN discussed if there are any expensive PCIs that a model participant would want "canceled," such that the rule change would encourage model participants to perform the TAVR in the 90-day window post-PCI. The interventional cardiologist noted that there are some PCIs that are very expensive, such as when left ventricular support is necessary for high-risk PCI in patients with left ventricular dysfunction, when atherectomy (drilling or sanding) is performed to debulk calcified plaque, and if multiple stents are required. As to whether TAVRs can be safely performed within the 90-day window after high-risk PCIs, this CEN member stated that when there is left ventricular dysfunction and a complex PCI is performed, his practice prefers to wait four to six weeks before performing TAVR or other complex procedures, assuming the patient can wait that long. If both the coronaries and the valves require attention urgently then the surgeon would have to push ahead in close sequence.

- **CEN members were asked to review and comment on the Model Year 3 list of 31 inpatient clinical episodes and four outpatient clinical episodes.**
  - The geriatrician noted that her organization does not see much bariatric surgery in the Medicare population. She was not able to comment on other centers.
  - One panelist was surprised to see urinary tract infections (UTI) and cellulitis as inpatient episodes; this panelist noted that, if a patient is admitted for these conditions, the hospital tends to code as sepsis.
  - One panelist noted that there is a global push to detect sepsis early. This can result in the over-diagnosis of sepsis. This may be related to an overall attention to the disease.

III. CEN Ad-hoc Request: Healthcare Common Procedure Coding System (HCPCS) Code Aggregation for the Outpatient PCI Episode Analysis

- Date: April 19, 2020
- Discussion facilitator: Christine LaRocca, MD, Telligen Medical Director
- CEN ad hoc request participants: Areas of expertise
  - Interventional Cardiology
  - Cardiovascular and Thoracic Surgery

A. CEN ad hoc request topic:

For the multivariate regression used to analyze BPCI Advanced outcomes, the evaluation team identified the need to control for the HCPCS codes associated with an outpatient PCI episode, as there are a large number of associated codes and, in some cases, these codes reflect a small sample size with limited statistical power. Due to this, the evaluation team considered aggregating similar procedure codes (i.e., similar beneficiaries in terms of severity, post-acute discharge needs, and other metrics) for this analysis. Telligen consulted CEN members for their recommendation on how to aggregate the codes listed in Exhibit M.1.

Exhibit M.1: HCPCS Codes for the Outpatient PCI Episode Analysis

Code	Description
92920	Percutaneous transluminal coronary angioplasty; single major coronary artery or branch
92924	Percutaneous transluminal coronary atherectomy, with coronary angioplasty when performed; single major coronary artery or branch
92928	Percutaneous transcatheter placement of intracoronary stent(s), with coronary angioplasty when performed; single major coronary artery or branch
92933	Percutaneous transluminal coronary atherectomy, with intracoronary stent, with coronary angioplasty when performed; single major coronary artery or branch
92937	Percutaneous transluminal revascularization of or through coronary artery bypass graft (CABG) (internal mammary, free arterial, venous), any combination of intracoronary stent, atherectomy and angioplasty, including distal protection when performed; single vessel
92943	Percutaneous transluminal revascularization of chronic total occlusion (CTO), coronary artery, coronary artery branch, or CABG, any combination of intracoronary stent, atherectomy and angioplasty; single vessel
C9600	Percutaneous transcatheter placement of drug eluting intracoronary stent(s), with coronary angioplasty when performed; single major coronary artery or branch
C9602	Percutaneous transluminal coronary atherectomy, with drug eluting intracoronary stent, with coronary angioplasty when performed; single major coronary artery or branch
C9604	Percutaneous transluminal revascularization of or through CABG (internal mammary, free arterial, venous), any combination of drug-eluting intracoronary stent, atherectomy and angioplasty, including distal protection when performed; single vessel
C9606	Percutaneous transluminal revascularization of acute total/subtotal occlusion during acute myocardial infarction (AMI), coronary artery or CABG, any combination of drug-eluting intracoronary stent, atherectomy and angioplasty, including aspiration thrombectomy when performed, single vessel
C9607	Percutaneous transluminal revascularization of CTO, coronary artery, coronary artery branch, or CABG, any combination of drug-eluting intracoronary stent, atherectomy and angioplasty; single vessel

B. CEN ad hoc request takeaways

- Exhibit M.2 contains recommendations for groupings.
- The following comments were provided to support these recommendations:
  - The AMI code (Group 3 in Exhibit M.2) would not be legitimately included as an outpatient PCI.
  - Group 4 includes a heterogenous mix of post-**CABG** patients, "who are surely going to have different outcomes." This grouping also includes a range of methods (atherectomy versus not) and types of stents (bare metal or drug eluting), which also contributes to variability in outcomes.
  - Some elements, such as CTO and atherectomy, are mostly created to include more physician work in the professional payment and may have some, but not a significant, impact on outcome.

Exhibit M.2: CEN Recommendations for Aggregating HCPCS Codes for the Outpatient PCI Episode Analysis

Grouping	Code	Description	PCI Type	Special Aspects	Patient Type
Group 1	92920	Percutaneous transluminal coronary angioplasty; single major coronary artery or branch	No Stent	None noted	Either care/ treatment plan not followed or staging for surgery
	92924	Percutaneous transluminal coronary atherectomy, with coronary angioplasty when performed; single major coronary artery or branch	No Stent		Either care/ treatment plan not followed or staging for surgery
Group 2	92928	Percutaneous transcatheter placement of intracoronary stent(s), with coronary angioplasty when performed; single major coronary artery or branch	Bare metal or Drug Eluting Stent	None noted	
	92933	Percutaneous transluminal coronary atherectomy, with intracoronary stent, with coronary angioplasty when performed; single major coronary artery or branch	Bare metal or Drug Eluting Stent	Atherectomy may presage early bad outcome; CEN member deferred to Cardiology as to the value of separation	
	C9600	Percutaneous transcatheter placement of drug eluting intracoronary stent(s), with coronary angioplasty when performed; single major coronary artery or branch	Drug Eluting Stent	None noted	
	C9602	Percutaneous transluminal coronary atherectomy, with drug eluting intracoronary stent, with coronary angioplasty when performed; single major coronary artery or branch	Drug Eluting Stent	Atherectomy may presage early bad outcome; CEN member deferred to Cardiology as to the value of separation	

Grouping	Code	Description	PCI Type	Special Aspects	Patient Type
Group 3	C9606	Percutaneous transluminal revascularization of acute total/subtotal occlusion during AMI, coronary artery or CABG, any combination of drug-eluting intracoronary stent, atherectomy and angioplasty, including aspiration thrombectomy when performed, single vessel	Any type of PCI	None noted	CEN member would not include AMI as an outpatient procedure
Group 4	C9604	Percutaneous transluminal revascularization of or through CABG (internal mammary, free arterial, venous), any combination of drug-eluting intracoronary stent, atherectomy and angioplasty, including distal protection when performed; single vessel	Drug Eluting Stent	None noted	Includes post-CABG patients; these patients will have a different outcome profile
	92937	Percutaneous transluminal revascularization of or through CABG (internal mammary, free arterial, venous), any combination of intracoronary stent, atherectomy and angioplasty, including distal protection when performed; single vessel	Any Stent	None noted	Includes post-CABG patients; these patients will have a different outcome profile
	C9607	Percutaneous transluminal revascularization of CTO, coronary artery, coronary artery branch, or CABG, any combination of drug-eluting intracoronary stent, atherectomy and angioplasty; single vessel	Drug Eluting Stent	CTO	Includes post-CABG patients; these patients will have a different outcome profile
	92943	Percutaneous transluminal revascularization of CTO, coronary artery, coronary artery branch, or CABG, any combination of intracoronary stent, atherectomy and angioplasty; single vessel	Any Stent	CTO	Includes post-CABG patients; these patients will have a different outcome profile