CMS Bundled Payments for Care Improvement Initiative Models 2-4: Year 7 Evaluation & Monitoring Annual Report – Appendices

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The Lewin Group, Inc.

With our partners:

Abt Associates, GDIT, and Telligen

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List of Appendices

Appendix A: Glossary of Terms & Acronym List

Exhibit A.1: Glossary

Name	Definition
30- and 90-day Post-Discharge Period (PDP)	The 30 or 90 days following discharge from the anchor hospital stay (Models 2 and 4) or the qualifying hospital stay (Model 3)
Acute care hospital (ACH)	A health care facility that provides inpatient medical care and other related services for acute medical conditions or injuries.
Anchor hospital stay	The hospitalization that triggers the start of the episode of care for Models 2 and 4.
Awardee	A risk-bearing, financially responsible organization in the BPCI initiative. This entity may or may not be an episode initiator (EI).
Awardee Convener (AC)	Parent companies, health systems, or other organizations that assume financial risk under the Model for Medicare beneficiaries that initiate episodes at their respective Episode Initiating Bundled Payment Provider Organization (EI-BPPO). An AC may or may not be a Medicare provider or initiate episodes.
Baseline time period	The period of time that precedes the intervention period as a basis for comparison in difference-in-difference modeling. The baseline period spans from Q4 2011 through Q3 2012.
Benchmark	The model estimate of what payments would have been absent the initiative. CMS calculated a payment for each participant from historical allowed amounts and then used a national trend to update it to the intervention period for each MS-DRG/provider combination. Not applicable for Model 4.
Beneficiary Incentive	This is one of the waivers of fraud and abuse law an Awardee may utilize. This allows Awardees to offer patients certain incentives not tied to standard provision of health care, if it supports a clinical goal.
Bundle	The services provided during the episodes that are linked for payment purposes. The bundle varies based on the model and chosen episode length.
Bundle length	A pre-specified duration of time: 30, 60, or 90 days.
Clinical episode	One of the 48 episodes of the BPCI initiative related to a specific set of MS-DRGs.
Designated Awardee Convener (DAC)	Parent companies, health systems, or other organizations that assume financial risk under the Model for Medicare beneficiaries that initiate episodes at their respective Episode Initiating Bundled Payment Provider Organization (EI-BPPO). These Awardees may or may not be Medicare providers or initiate episodes themselves. Unlike an Awardee Convener, this Awardee joined the initiative under a Facilitator Convener.
Designated Awardee (DA)	An entity that initiates episodes but, unlike a Single Awardee, joins the initiative under a Facilitator Convener (FC). The DA would have an agreement with CMS and assume financial risk for episodes initiated at its institution.
Episode Initiator (EI)	Under Model 2, an EI is the participating hospital where the BPCI episode begins or a participating PGP if one of its physicians is the patient's admitting physician or surgeon for the anchor hospitalization. Under Model 3, an EI may be a participating PGP or a participating SNF, HHA, IRF, or LTCH that admits the patient within 30 days following a hospital discharge for an MS-DRG for the relevant clinical episodes (anchor hospitalization). Under Model 4, an EI is the participating hospital where the BPCI episode begins. SAs and DAs are EIs. ACs and DACs may or may not be EIs themselves and also have one or more EIs under their Awardee structure.

Name	Definition
Episode of Care	For all three models, an episode of care is triggered by an inpatient hospitalization for one of 48 clinical groupings of MS-DRGs. For Model 2, the episode is defined as an anchor hospitalization plus post discharge services provided within 30, 60, or 90 days of discharge from the anchor stay, including all readmissions that are not explicitly excluded (certain services unrelated to the triggering hospitalization are excluded from the episode). For Model 3, the episode begins upon admission to a post-acute care setting (including home health) within 30 days of discharge from the qualifying hospitalization and includes all services provided within the 30, 60, or 90 days of this admission (again, certain services unrelated to the triggering hospitalization are excluded from the episode). For Model 4, the episode is defined as an anchor hospitalization plus post discharge services provided within 30 days of discharge from the anchor stay, including all readmissions that are not explicitly excluded (certain services unrelated to the triggering hospitalization are excluded from the episode).
Episode-specific	Specific to one of the 48 clinical episodes.
Episode start	The beginning of the episode of care. For Models 2 and 4, the episode begins with admission to the anchor hospital. For Model 3, the episode begins when the beneficiary is admitted to the participating (or comparison group) PAC provider within 30 days of discharge from the qualifying hospitalization.
Facilitator Convener (FC)	An entity that submits a BPCI application and serves an administrative and technical assistance function on behalf of one or more Designated Awardees or Designated Awardee Conveners. A Facilitator Convener does not have an agreement with CMS, nor do they bear financial risk under the Model.
Gainsharing	This is one of the waivers of fraud and abuse law an Awardee may utilize. This allows participants to develop a methodology and share any Internal Cost Savings (ICS) and/or Net Payment Reconciliation Amounts (NPRA) as applicable.
Implementation Protocol	Awardee-submitted document that contains general Awardee information, care redesign interventions, gainsharing plan/methodology if applicable, and other details regarding waiver use.
Internal Cost Savings (ICS)	For each EIP, the measurable, actual, and verifiable cost savings realized by the EIP resulting from Care Redesign undertaken by the EIP in connection with providing items and services to Model 2, 3, or 4 beneficiaries within specific episodes of care. Internal Cost Savings does not include savings realized by any individual or entity that is not an EIP.
Model 2	Retrospective acute and post-acute care episode. The episode of care includes inpatient stay in the acute care hospital and all related services during the episode. The episode ends 30, 60, or 90 days after hospital discharge.
Model 3	Retrospective post-acute care only. The episode of care is triggered by an acute care hospital stay and begins at initiation of post-acute care services. The post-acute care services must begin within 30 days of discharge from the inpatient stay and end 30, 60, or 90 days after the initiation of the episode.
Model 4	Prospective acute care hospital stay only. CMS makes a single, prospectively determined bundled payment to the hospital that encompasses all services furnished during the inpatient stay by the hospital, physicians, and other practitioners. Related readmissions for 30 days after hospital discharge are included in the bundled payment amount.
Net Payment Reconciliation Amount (NPRA)	The target price minus the total dollar amount of Medicare fee-for-service expenditures for items and services (collectively referred to as "Aggregate FFS Payment" or "AFP") furnished by the Awardee, the episode initiator, EIPs, gainsharers, or third party providers during an episode of care. Not applicable for Model 4.

Name	Definition
Reconciliation Payment	The target price minus the total dollar amount of Medicare fee-for-service expenditures for items and services (collectively referred to as "Aggregate FFS Payment" or "AFP") furnished by the Awardee, the episode initiator, EIPs, gainsharers, or third party providers during an episode of care. Not applicable for Model 4.
Participant	An ACH, PGP, SNF, LTCH, HHA, or IRF that is actually initiating episodes under the BPCI initiative *or* an Awardee that is not an episode initiator.
Phase 1	An initial period before a participant is "at financial risk". During this time period," CMS and the potential participant prepare for implementation of the BPCI initiative and assumption of financial risk.
Phase 2	The phase of the initiative when a participant is considered "at risk" and is allowed to begin initiating some or all of its clinical episodes and bearing financial risk, as applicable.
Post-acute care (PAC)	All care services received by the beneficiary after discharge from the qualifying hospital stay. Includes care from the PAC provider (SNF, IRF, LTCH, HHA) as well as any potential inpatient hospitalizations (readmissions), professional services, and/or outpatient care.
Post-acute care qualifying admission	An admission to a participating (or comparison group) PAC provider within 30 days of discharge from the qualifying hospitalization upon which a Model 3 episode begins.
Post-discharge period (PDP)	Period of time starting on the day of the anchor hospitalization (Model 2 and 4), qualifying hospitalization (Model 3), or transfer hospital discharge.
Qualifying hospital stay	The acute-care hospitalization that preceded the start of a Model 3 episode of care. All Model 3 episodes of care started within 30 days of discharge from this acute-care qualifying hospitalization.
Risk adjustment	When sufficient sample size was available, we risk adjusted our outcomes. Without adequate risk adjustment, providers with a sicker or more service intensive patient mix would have worse outcomes and providers with healthier patients would 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.
Single Awardee (SA)	An individual Medicare provider that assumes financial risk for episodes initiated at their institution. SAs are also episode initiators.
Target price	The target price is equal to the benchmark minus 2-3% of the benchmark. Participants with intervention episode payments below their target price received the difference as reconciliation payments. Participants with intervention episode payments above their target price repaid the difference to CMS. Thus, it was intended that CMS achieved savings equal to 2-3% of the benchmark.
Three-day SNF Waiver	This is one of the Medicare payment policy waivers an Awardee may utilize. This allows Model 2 participants to waive the three-day hospital stay requirement for Part A skilled nursing facility coverage.

Exhibit A.2: Acronyms

Acronym	Definition
AC	Awardee Convener
ACH	Acute Care Hospital
ACO	Accountable Care Organization
AHRF	Area Health Resource File
BPCI	Bundled Payments for Care Improvement
CCN	CMS Certification Number
CHF	Congestive Heart Failure
CMS	Centers for Medicare & Medicaid Services
COPD	Chronic Obstructive Pulmonary Disease
DAC	Designated Awardee Convener
DiD	Difference in Difference
ED	Emergency Department
EI	Episode Initiator
FC	Facilitator Convener
FFS	Fee-for-service
HCC	Hierarchical Condition Category
HH	Home Health
HHA	Home Health Agency
ICS	Internal Cost Saving
IP	Implementation Protocol
IRF	Inpatient Rehabilitation Facility
LOS	Length of stay
LTCH	Long Term Care Hospital
MJRLE	Major Joint Replacement of the Lower Extremity
MS-DRG	Medicare Severity-adjusted Diagnosis Related Group
NPRA	Net Payment Reconciliation Amount
PAC	Post-acute Care
PBP	Post-Bundle Period
PCP	Primary Care Physician
PDP	Post-Discharge Period
PGP	Physician Group Practice
POS	Provider of Service
SA	Single Awardee
SNF	Skilled Nursing Facility
SPRI	Simple Pneumonia and Respiratory Infection
UTI	Urinary Tract Infection

Appendix B: BPCI Clinical Episodes and Medicare Severity Diagnosis Related Groups (MS-DRGs)

Clinical Episode	MS-DRGs that trigger the clinical episode														
Acute myocardial infarction	280	281	282												
AICD generator or lead	245	265													
Amputation	239	240	241	255	256	257	474	475	476	616	617	618			
Atherosclerosis	302	303													
Back & neck except spinal fusion	490	491	518	519	520										
Cardiac arrhythmia	308	309	310												
Cardiac defibrillator	222	223	224	225	226	227									
Cardiac valve	216	217	218	219	220	221	266	267							
Cellulitis	602	603													
Cervical spinal fusion	471	472	473												
Chest pain	313														
Chronic obstructive pulmonary disease, bronchitis, asthma	190	191	192	202	203										
Combined anterior posterior spinal fusion	453	454	455												
Complex non-cervical spinal fusion	456	457	458												
Congestive heart failure	291	292	293												
Coronary artery bypass graft	231	232	233	234	235	236									
Diabetes	637	638	639												
Double joint replacement of the lower extremity	461	462													
Esophagitis, gastroenteritis and other digestive disorders	391	392													
Fractures of the femur and hip or pelvis	533	534	535	536											
Gastrointestinal hemorrhage	377	378	379												
Gastrointestinal obstruction	388	389	390												
Hip & femur procedures except major joint	480	481	482												

Clinical Episode	MS-DRGs that trigger the clinical episode														
Lower extremity & humerus procedure except hip, foot, femur	492	493	494												
Major bowel procedure	329	330	331												
Major cardiovascular procedure	237	238	268	269	270	271	272								
Major joint replacement of the lower extremity	469	470													
Major joint replacement of the upper extremity	483	484													
Medical non-infectious orthopedic	537	538	551	552	553	554	555	556	557	558	559	560	561	562	563
Medical peripheral vascular disorders	299	300	301												
Nutritional and metabolic disorders	640	641													
Other knee procedures	485	486	487	488	489										
Other respiratory	186	187	188	189	204	205	206	207	208						
Other vascular surgery	252	253	254												
Pacemaker	242	243	244												
Pacemaker device replacement or revision	258	259	260	261	262										
Percutaneous coronary intervention	246	247	248	249	250	251	273	274							
Red blood cell disorders	811	812													
Removal of orthopedic devices	495	496	497	498	499										
Renal failure	682	683	684												
Revision of the hip or knee	466	467	468												
Sepsis	870	871	872												
Simple pneumonia and respiratory infections	177	178	179	193	194	195									
Spinal fusion (non-cervical)	459	460													
Stroke	61	62	63	64	65	66									
Syncope & collapse	312														
Transient ischemia	69														
Urinary tract infection	689	690													

Appendix C: Methods

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

A. Data Sources

Exhibit C.1 lists the data sources and their uses for this study. Overall, we used provider-level data sources to identify and describe Bundled Payments for Care Improvement (BPCI) participants and select comparison providers. Medicare claims and enrollment data were used to construct episodes of care for patients at BPCI-participating sites (BPCI population) and at matched comparison providers. We also used claims data to create outcome measures and beneficiary risk factors associated with the outcomes.

Exhibit C.1: Data Sources used in the BPCI Evaluation

	Dataset Name	Date Range	Dataset Contents	Use
Provider-level secondary data sources	CMS BPCI database	2013-2018	Information compiled by CMS on BPCI participants and their clinical episodes, including participant name, CMS Certification Number, location, type (hospital, skilled nursing facility (SNF), etc.), BPCI "role", Model, clinical episode(s) and length(s), BPCI participation start and end dates, and contact information.	Used to identify Quarter 4 2013 through Quarter 3 2018 BPCI participating providers and clinical episodes. Identified participants in Model 1 of BPCI to exclude from comparison group.
	Medicare Provider Enrollment, Chain, and Ownership System (PECOS)	2011-2014	Information on Medicare providers, including ownership and chain relationships among providers.	Used to identify ownership of BPCI providers and potential comparison providers and to create an indicator of whether the provider was part of a chain. Both of these characteristics were used in the creation of the comparison groups.
	Provider of Services (POS) file	2011-2015	Information on Medicare-approved institutional providers, including provider number, size, and staffing.	Used within descriptive analysis of BPCI and non-BPCI participants. Used as predictors in provider propensity model on participation in BPCI.
	Area Health Resource File (AHRF)	2011	County-level data on population, environment, geography, health care facilities, and health care professionals.	Descriptive analysis of BPCI and non-BPCI market characteristics. Used as predictors in provider propensity model on participation in BPCI.
	Master Data Management (MDM)	2013-2018	Provider- and beneficiary-level information on participation in CMMI payment demonstration programs.	Used to identify providers who are involved in an Accountable Care Organization (ACO) or other Medicare Shared Savings programs.
	Inpatient Prospective Payment System (IPPS) annual files	2011	Hospital-level file containing provider characteristics such as bed count, resident-bed ratio, and discharge counts.	Used as predictors in provider propensity model on participation in BPCI.

	Dataset Name	Date Range	Dataset Contents	Use
Transaction-level secondary data sources	Medicare fee-for-service (FFS) claims	Jan 2010- Sep 2018	Medicare Part A and B claims.	Used to create episodes of care and outcome measures such as readmissions, emergency department (ED) visits, number of days in SNF. Also used to create risk factors including hierarchical condition categories and health care utilization prior to anchor/qualifying hospitalization.
	Medicare standardized payments	Jan 2011- Sep 2018	Medicare standardized payments for 100% of Part A and B claims received via the Integrated Data Repository (IDR) from another CMS contractor.	Used to create Medicare standardized payment amounts (Part A and B) and allowed standardized payment outcomes (including beneficiary out-of-pocket amounts).
	The Master Beneficiary Summary File (MBSF)	Jan 2010- Sep 2018	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.
	Minimum Data Set (MDS)	2011-2018	Comprehensive post-acute patient assessments completed by clinicians. Required for residents of Medicare-certified SNF facilities. Administered at entry to the facility, at discharge, days 14, 30, 60, 90, and quarterly thereafter.	Used to identify whether beneficiary had a stay at a facility prior to IP admission.
	Healthcare Integrated General Ledger Accounting System (HIGLAS)	2013-2018	Transaction-level Medicare outlays for net payment reconciliation amounts (NPRA), ACO overlap adjustments, post episode spending amount and other ad hoc payments.	Used to calculate total net outlays by model for Medicare Programs Savings calculations

B. Characteristics of the Initiative and Participants

We relied on both secondary quantitative and primary qualitative data to describe the BPCI-participating providers and their implementation of the initiative. To summarize characteristics of the initiative and participants at the baseline and during the course of the initiative, Lewin ran a series of descriptive analyses on the measures included in Exhibits C.2 through C.4

Exhibit C.2: Provider Characteristics Variable Definitions, Models 2 - 4

Variable Name	Definition	Model(s)	Source
Ownership	The ownership type of a provider (e.g. for-profit, non-profit, government)	2, 3, 4	2013 POS file
Urban/Rural	CBSA urban/rural indicator	2, 3, 4	2013 POS file
Part of Chain	Indicator of whether the provider is part of a chain, based on if they share a TIN with another hospital	2, 3, 4	October 2012 PECOS
Bed Count	Number of beds	2, 3 (SNF), 4	2011 CMS IPPS annual files
BPCI Discharges	Number of hospital discharges for any of the 48 BPCI clinical episode groups in 2011	2, 3, 4	2011 Medicare claims
Medicare Days	Medicare days as a percent of total inpatient days according to CMS IPPS data	2, 4	2011 CMS IPPS annual files
Resident-Bed Ratio	Average number of residents assigned per bed according to CMS IPPS data	2, 4	2011 CMS IPPS annual files
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	2, 4	2011 CMS IPPS annual files
Hospital Market Share	Proportion of the hospital discharges to all discharges for the 48 BPCI clinical episodes in the market	2, 4	2013 Medicare claims
SNF Market Share	CBSA-level market share of provider (number of provider MS-DRGs divided by all MS-DRGS in the CBSA), for the 48 BPCI clinical episodes	3	2013 Medicare claims
Nursing Home Overall Score	Number of points out of 5 in overall rating and in three areas: Quality, Survey/Health Inspections, and Staffing	3	2011 Nursing Home Compare
IRF in CBSA	Indicator of whether or not there is an IRF in the CBSA	3	2011 AHRF
SNF in Hospital	Indicator of whether or not a SNF is part of a hospital	3	2011 Nursing Home Compare
Number of Employed Nurses in HHA	Number of nurses employed by a home health agency	3 (HHA)	2013 POS file

Exhibit C.3: BPCI-participating Physician Group Practice Characteristics Variable Definitions, Model 2[1]

Variable Name	Description	Technical Definition	Eligible Sample	Source
Physician Specialty Distribution	Percentage of physicians by broad specialty categories (see Exhibit C.4)	Each clinician was assigned the specialty associated with their NPI in Part B claims data from 2012 to 2016. When a physician was matched to more than one specialty, which occurred in approximately 8% of cases, we assigned a single specialty and category.[2] Hospitalists identified using the methodology for the 'hospitalist physician group practice (PGP),' as described in third row of this exhibit, were placed in the hospital-based category.	All physician NPIs associated with BPCI PGP TINs. Approximately 3.9% of clinicians were dropped from the analysis due to lack of a specialty in the data.	TIN/NPI Crosswalk as of Q4 2016 from reconciliation contractor; 2012–2016 Part B Claims
Single-specialty PGP	Number of PGPs identified as single-specialty PGPs	Using the specialty categories assigned to each physician when calculating the physician specialty distribution, we calculated the percentage of physicians in each of the specialty categories at each PGP. Based on the methodology of Welch et. al. (2013), a PGP was then defined as single-specialty if at least 90% of physicians at the practice were in the same specialty category. A PGP identified as a single-specialty practice in any year from 2012–2016 is counted as a single-specialty practice.	All BPCI Model 2 PGPs with at least one NPI during the baseline period and at least one NPI during the intervention period.	TIN/NPI Crosswalk as of Q4 2016 from reconciliation contractor; 2012–2016 Medicare Part B Claims
Hospitalist PGP	Number of PGPs identified as hospitalist PGPs	We identified BPCI PGP hospitalist practices using a two-step process based on the methodology described in Welch et. al. (2014). To lessen the impact of fluctuation in the claims data, PGPs were counted as hospitalist practices if they met the criteria of the methodology in any year from 2012–2016. **Step 1:** Each physician is flagged as a hospitalist if the physician's specialty fell into the primary care category and at least 90% of their total Part B allowed charges billed under the PGP TIN occurred in a hospital setting. **Step 2:** PGPs were considered a hospitalist practice if at least 70% of the physicians at the practice during the year were flagged as a hospitalist.	All BPCI Model 2 PGPs with at least one NPI during the baseline period and at least one NPI during the intervention period.	TIN/NPI Crosswalk as of Q4 2016 from reconciliation contractor; 2012–2016 Medicare Part B Claims

[1] To count clinicians at a PGP, each clinician was weighted by the proportion of the year that they were employed at the PGP, as reported on the TIN/NPI crosswalk. For example, if a PGP had a clinician with a listed start date of February 1, 2012 and an end date of August 1, 2012, the clinician was employed for 183 days (inclusive of the end date) out of 366, for a count of 0.5.

[2] CMS. (February 2017). Medicare Data on Provider Practice and Specialty (MD-PPAS): User Documentation Version 2.2.

Variable Name	Description	Technical Definition	Eligible Sample	Source
Non-physicians as a Proportion of PGP Clinicians	Proportion of clinicians that are non-physicians within BPCI PGPs	Clinicians were identified as non-physicians according to the Medicare provider specialty associated with their NPI in Part B claims from 2012–2016. We then calculated the percentage of non-physicians out of total clinical staff for each PGP and each year included in the analysis.	All BPCI Model 2 PGPs with at least one NPI during the baseline period and at least one NPI during the intervention period.	TIN/NPI Crosswalk as of Q4 2016 from reconciliation contractor; 2012–2016 Medicare Part B Claims
Average Quarterly Discharges per BPCI PGP	Average number of Part A hospital discharges for BPCI clinical episodes at BPCI PGPs	To obtain these averages, both the operating and attending physician NPIs on the 2012–Q32016 Part A claims dataset were mapped to the NPIs on the TIN/NPI crosswalk. If a discharge fell within a physician's dates of employment at a PGP, the discharge was counted for that PGP. The total discharges for each PGP for each year were counted and divided by 4 to obtain a quarterly figure (they were divided by three for 2016, as the data included only three quarters of claims). Discharges related to any MS-DRG, including those that do not trigger a BPCI clinical episode, were counted in order to give an estimate of total practice size. Assigning discharges by both attending and operating physician occasionally allowed a single discharge to be counted at two different PGPs; however, this had a negligible effect on the results.	All BPCI Model 2 PGPs with at least one NPI during the baseline period and at least one NPI during the intervention period.	TIN/NPI Crosswalk as of Q4 2016, 2010-2016 Medicare Part A Claims
Average Quarterly Discharges per BPCI Physician	Average number of Part A hospital discharges per physician for BPCI clinical episodes at BPCI PGPs	For this outcome, total annual discharges for each PGP were divided by the count of physicians at the PGP for the year. The figure was then divided by four to obtain a quarterly average for each PGP. To obtain physician-level averages, we calculated each physician's total annual discharges within their employment dates at BPCI-participating PGPs on the TIN/NPI Crosswalk. These were divided by the fraction of the year that each physician was employed to obtain an annualized figure, which was then divided by 4 to obtain a quarterly average. This method was also applied to obtain the figures for MJRLE only, restricted to physicians identified as orthopedic surgeons in the Part B claims data.	All BPCI Model 2 PGPs with at least one NPI during the baseline period and at least one NPI during the intervention period.	TIN/NPI Crosswalk as of Q4 2016, 2010- 2016 Medicare Part A Claims

Exhibit C.4: Definition of Physician Specialty Categories Used to Define Physician Group Practice Characteristics

Broad Specialty Category	Included Physician Specialties
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
Surgical specialty	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 specialty	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

Note: The specialty categories in this exhibit were used to create the physician specialty distribution, single specialty PGP, and hospitalist PGP variables defined in Exhibit C.3 above. In the case that a physician had more than one listed specialty, 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: CMS. (February 2017). Medicare Data on Provider Practice and Specialty (MD-PPAS): User Documentation Version 2.2.

C. Impact of BPCI on Claims-based Outcomes

In this section, we define the outcomes and the methodology used to estimate the impact of BPCI on payments, utilization, and quality. We also describe the BPCI population and the methodology for creating comparison groups for each combination of provider type and clinical episode for Models 2, 3, and 4 analyzed in this report.

1. Outcomes

We used data from claims to create outcomes on payments, utilization of health care services, and quality. The following exhibits define these outcomes and characteristics. Exhibit C.5 displays the BPCI bundle period and the measurement period for the outcomes analyzed for Models 2, 3, and 4. Exhibit C.6 provides detailed information about each outcome, including the name, description, technical definition, and eligible sample, organized by outcome domain.

Exhibit C.5: Bundle and Measurement Periods for BPCI Models 2, 3, and 4

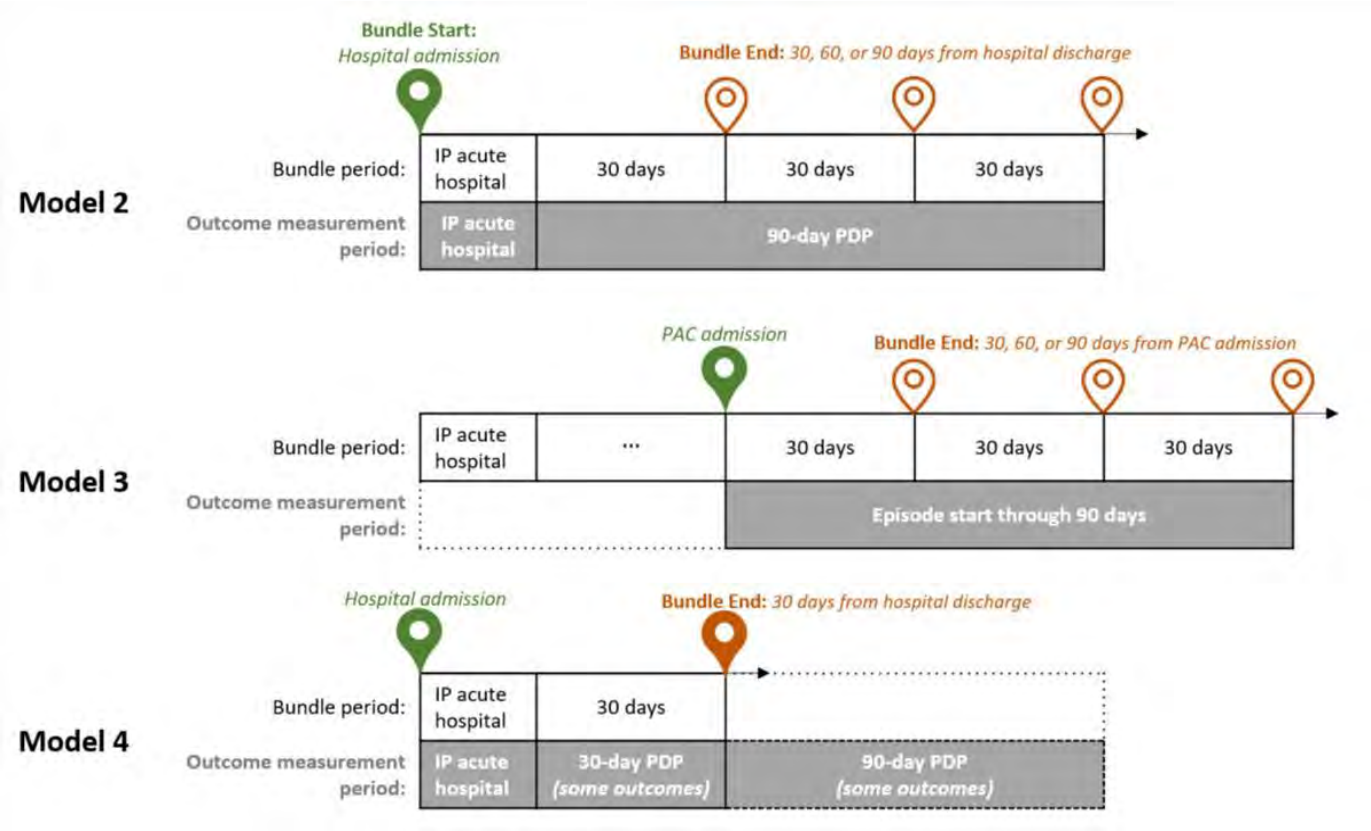


Exhibit C.6: Claim- and Assessment-based Outcomes Definitions

Domain	Outcome Name	Description	Technical Definition	Eligible Sample[a]	Model(s)
Payment	Standardized Total Allowed Payment Amount, IP through 90-day PDP	Total Medicare Part A & B standardized allowed amount, during the anchor hospital stay + 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 A&B enrollment throughout the measurement period or until death; 2) had a measurement period that ended on or before December 31, 2018; 3) had non-missing Part A and B payments during the bundle period and anchor hospital stay; 4) were alive at the beginning of the measurement period for post-bundle payment outcomes.	2, 4
Payment	Standardized Total Amount Paid by Medicare, IP through 90-day PDP	Total Medicare Part A & B standardized paid amount, during the anchor hospital stay + 90-day PDP	The sum of Medicare payment excluding beneficiary out-of-pocket amounts for all health care services. Payments in the lower/upper ends are winsorized.[b]	Beneficiaries who: 1) maintained FFS A&B enrollment throughout the measurement period or until death; 2) had a measurement period that ended on or before December 31, 2018; 3) had non-missing Part A and B payments during the bundle period and anchor hospital stay; 4) were alive at the beginning of the measurement period for post-bundle payment outcomes.	2, 4
Payment	Medicare Part A Standardized Allowed Amount, 90-day PDP (various settings)	Average Medicare Part A standardized allowed amount, for various settings, 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 inpatient readmissions, SNF, HHA, and IRF during the 90-day PDP. Payments in the lower/upper ends are winsorized. [b]	Beneficiaries who: 1) maintained FFS A&B enrollment throughout the measurement period or until death; 2) had a measurement period that ended on or before December 31, 2018; 3) had non-missing Part A payments during the bundle period and anchor/qualifying hospital stay.	2, 4
Payment	Standardized Total Allowed Payment Amount, From Episode Start Through 90 days	Total Medicare Part A & B standardized allowed amount, from the start of the episode + 90 days	The sum of Medicare payment and beneficiary out-of-pocket amounts for all health care services from episode start (i.e., PAC admission) through 90 days. Payments in the lower/upper ends are winsorized.[b]	Beneficiaries who: 1) maintained FFS A&B enrollment throughout the measurement period or until death; 2) had a measurement period that ended on or before December 31, 2018; 3) had non-missing Part A and B payments during the measurement period.	3
Payment	Standardized Total Amount Paid by Medicare, From Episode Start Through 90 days	Total Medicare Part A & B standardized paid amount, from the start of the episode + 90-days	The sum of Medicare payment excluding beneficiary out-of-pocket amounts for all health care services from episode start through 90 days. Payments in the lower/upper ends are winsorized.[b]	Beneficiaries who: 1) maintained FFS A&B enrollment throughout the measurement period or until death; 2) had a measurement period that ended on or before December 31, 2018; 3) had non-missing Part A and B payments during the measurement period.	3

Domain	Outcome Name	Description	Technical Definition	Eligible Sample[a]	Model(s)
Payment	Medicare Part A Standardized Allowed Amount, From Episode Start Through 90 days (various settings)	Average Medicare Part A standardized allowed amount, for various settings, from the start of the episode + 90-days	The sum of Medicare payment and beneficiary out-of-pocket amounts for Part A health care services provided for inpatient readmissions, SNF, HHA, and IRF from episode start through 90 days. Payments in the lower/upper ends are winsorized.[c]	Beneficiaries who: 1) maintained FFS A&B enrollment throughout the measurement period or until death; 2) had a measurement period that ended on or before December 31, 2018; 3) had non-missing Part A payments during the measurement period.	3
Payment	Total Medicare Part B Standardized Allowed Amount, From Episode Start Through 90 days	Total Medicare Part B standardized allowed amount, from the start of the episode + 90-days	The sum of Medicare payment and beneficiary out-of-pocket amounts for all Part B health care services from episode start through 90 days. Payments in the lower/upper ends are winsorized.[b]	Beneficiaries who: 1) maintained FFS A&B enrollment throughout the measurement period or until death; 2) had a measurement period that ended on or before December 31, 2018; 3) had non-missing Part B payments during the measurement period.	3
Payment	Standardized Total Allowed Payment Amount, IP through 30-day PDP	Total Medicare Part A & B standardized allowed amount, during the anchor hospital stay + 30-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.[c]	Beneficiaries who: 1) maintained FFS A&B enrollment throughout the measurement period or until death; 2) had a measurement period that ended on or before December 31, 2018; 3) had non-missing Part A and B payments during the bundle period and anchor hospital stay; 4) were alive at the beginning of the measurement period for post-bundle payment outcomes.	4
Payment	Medicare Part A Standardized Allowed Amount, 30-day PDP (various settings)	Average Medicare Part A standardized allowed amount, for various settings, totaled within the 30-day PDP	The sum of Medicare payment and beneficiary out-of-pocket amounts for Part A health care services provided for inpatient readmissions, SNF, HHA, and IRF during the 30-day PDP. Payments in the lower/upper ends are winsorized.[c]	Beneficiaries who: 1) maintained FFS A&B enrollment throughout the measurement period or until death; 2) had a measurement period that ended on or before December 31, 2018; 3) had non-missing Part A payments during the bundle period and anchor/qualifying hospital stay.	4
Utilization	Discharged to Post-acute Care (PAC) Settings	The proportion of episodes that were discharged from the inpatient hospital stay to any PAC setting, including HHA	The proportion of episodes where the first PAC setting was SNF, LTCH, IRF, or HHA.	Beneficiaries who: 1) maintained FFS A&B enrollment throughout the measurement period or until death; 2) had a measurement period that ended on or before December 31, 2018; 3) were admitted to SNF, LTCH, or IRF within 5 days of discharge from the hospital or were admitted to home health within 14 days of anchor discharge.	2, 4

Domain	Outcome Name	Description	Technical Definition	Eligible Sample[a]	Model(s)
Utilization	Discharged to Institutional Post-acute Care (PAC) Settings among Those Discharged to any PAC Setting	The proportion of episodes discharged from the hospital to an institutional PAC setting among episodes that were discharged to any PAC setting (including HHA)	The proportion of episodes where the first PAC setting was SNF, LTCH, or IRF among episodes that were discharged to any PAC setting.	Beneficiaries who: 1) maintained FFS A&B enrollment throughout the measurement period or until death; 2) had a measurement period that ended on or before December 31, 2018; 3) had a first PAC setting of SNF, LTCH, IRF or HHA; 4) were admitted to SNF, LTCH, or IRF within 5 days of discharge from the hospital or were admitted to home health within 14 days of discharge from the hospital.	2, 4
Utilization	Number of SNF Days	Average number of SNF days of care during the 90-day PDP among episodes with at least one SNF day of care	The number of days of skilled nursing facility (SNF) care (not necessarily consecutive) during the 90-day PDP.	Beneficiaries who: 1) maintained FFS A&B enrollment throughout the measurement period or until death; 2) had a measurement period that ended on or before December 31, 2018; 3) were alive at the time of anchor/qualifying discharge; 4) had at least one SNF day during the 90-day PDP.	2, 3 (SNF), 4
Utilization	Number of Home Health Visits	Average number of home health visits during the 90-day PDP	The number of home health visits on home health claims during the 90-day PDP.	Beneficiaries who: 1) maintained FFS A&B enrollment throughout the measurement period or until death; 2) had a measurement period that ended on or before March 31, 2017; 3) were alive at the time of anchor/qualifying discharge; 4) had at least one home health visit during the 90-day PDP.	3 (HHA)
Quality	Emergency Department (ED) Use without Hospitalization, 90-day PDP	Episodes with one or more ED visits for which the beneficiary requires medical treatment but is not admitted to the hospital 90 days after discharge from an anchor hospital stay	Binary outcome (1= at least one ED visit without readmission during measurement period; 0= no eligible ED visits without readmission during measurement period). Eligible ED visits are outpatient claims with a code indicating the beneficiary used the emergency room but was not admitted.	Beneficiaries who: 1) maintained FFS A&B enrollment throughout the measurement period or until death; 2) had a measurement period that ended on or before December 31, 2018; 3) were discharged from the anchor hospital in accordance with medical advice; 4) were alive at the time of anchor discharge.	2, 3, 4

Domain	Outcome Name	Description	Technical Definition	Eligible Sample[a]	Model(s)
Quality	Unplanned Readmission Rate, 90-day PDP	Episodes with one or more unplanned, all-cause readmissions for any condition, 90 days after anchor discharge	Binary outcome (1= at least one readmission during measurement period; 0= no eligible readmissions during measurement period). Eligible readmissions are inpatient prospective payment system (IPPS) claims with an MS-DRG not on the list of excluded MS-DRGs for the given clinical episode.[d]	Beneficiaries who: 1) maintained FFS A&B enrollment throughout the measurement period or until death; 2) had a measurement period that ended on or before December 31, 2018; 3) were discharged from the anchor hospital stay in accordance with medical advice; 4) were alive at the time of anchor discharge.	2, 3, 4
Quality	All-cause Mortality, 90-day PDP	Death from any cause during 90 days after discharge from the anchor hospital stay	If date of death occurred during the measurement period, then mortality outcome =1.	Beneficiaries who: 1) maintained FFS A&B enrollment throughout the measurement period or until death; 2) have a measurement period that ends on or before December 31, 2018; 3) were not enrolled in the Medicare Hospice program in the six months prior to the anchor/qualifying admission; 4) had reliable mortality status in the data; 5) were discharged from the anchor hospital in accordance with medical advice; 6) were alive at the time of anchor hospital discharge. *For beneficiaries with multiple anchor hospitalizations, one hospitalization per quarter was randomly selected for inclusion in this measure.*	2, 3, 4

Note: Payments 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). All measures are created using claims data. 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 anchor hospital admission; and 2) had non-missing age and gender data.

[b] The outcome total Medicare Part A & B standardized allowed and paid payment amounts are calculated as the sum of acute payments during the inpatient stay and services during the 90-day post-discharge period after winsorizing. Acute payments are winsorized by quarter, MS-DRG, and episode initiator (EI) type at the 2nd and 98th percentile for Part A and at the 1st and 99th percentile for B. All other payments are winsorized by quarter, clinical episode, episode length, and EI type at the 1st and 99th percentiles.

[c] These Medicare Part A payment outcomes are winsorized by quarter, clinical episode and EI type at the 1st and 99th percentiles.

[d] This 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.

2. Study Populations

The quantitative analysis used a difference-in-differences (DiD) design to estimate the differential change in payments, utilization, and quality outcomes between the baseline and intervention period for beneficiaries who received services from BPCI episode initiators (EIs) relative to beneficiaries who received services from a comparison group of non-BPCI providers. This comparison group is designed to be similar to BPCI EIs with respect to baseline characteristics that could affect their decision to participate and could be related to their performance under BPCI. Such characteristics include market-level and provider-specific attributes. Because providers voluntarily enrolled in BPCI, they were likely to be different than non-participants in ways that may bias our results. For example, BPCI EIs may have had less efficient care in the pre-intervention period and consequently had more room for improvement relative to non-participants.

We constructed comparison groups for 32 Model 2 hospital clinical episodes, 21 Model 2 physician group practice (PGP) clinical episodes, 11 Model 3 skilled nursing facility (SNF) clinical episodes, three Model 3 home health agency (HHA) clinical episodes, and two Model 4 hospital clinical episodes that were considered to have a sufficient sample size for meaningful analysis (Exhibit C.7a-C.7d below). A combination was deemed to have sufficient sample if there were at least 20 EIs with at least 1,000 clinically relevant episodes.[3] However, several groups with somewhat lower sample sizes were included for unique policy importance. Comparison groups were selected from the universe of Medicare hospitals that had not entered Phase 2 of BPCI. The methods for matching treatment and comparison providers varied by BPCI provider type, and are described below.

We constructed overall Model 2 hospital, Model 2 PGP, Model 3 SNF, Model 3 HHA, and Model 4 ACH level estimates by pooling episodes for the provider type and clinical episode combinations using all clinical episodes with sufficient sample size to analyze. Finally, we created a pooled estimate for Model 2 hospital and Model 2 PGP episodes broken out by whether or not the clinical episode was a medical or surgical episode. To do this, we stratified the clinical episodes by whether or not the MS-DRGs in each clinical episode were more surgical or medical in nature. A list of these can be found in Exhibits C.7a through C.7e.

[3] Groups were considered meaningful for the analysis if there was enough participation in BPCI, but no formal power calculation was conducted to assess minimum sample size.

Exhibit C.7a: Distribution of Episodes Across Clinical Episodes for Model 2 Hospitals, Q4 2013 through Q3 2018

	Clinical Episode	Intervention Episodes (N)	Share of All Clinical Episodes	Share of All Surgical or Medical Clinical Episodes
Surgical Clinical Episodes	Major joint replacement of the lower extremity	187,304	32.5%	72.1%
	Hip & femur procedures except major joint	14,276	2.5%	5.5%
	Medical non-infectious orthopedic	13,091	2.3%	5.0%
	Percutaneous coronary intervention	9,454	1.6%	3.6%
	Cardiac valve	7,052	1.2%	2.7%
	Spinal fusion (non-cervical)	6,053	1.1%	2.3%
	Coronary artery bypass graft	5,898	1.0%	2.3%
	Major bowel procedure	5,360	0.9%	2.1%
	Major joint replacement of the upper extremity	2,879	0.5%	1.1%
	Other vascular surgery	2,464	0.4%	0.9%
	Cervical spinal fusion	2,089	0.4%	0.8%
	Revision of the hip or knee	2,056	0.4%	0.8%
	Lower extremity and humerus procedure except hip, foot, femur	1,843	0.3%	0.7%
Medical Clinical Episodes	Congestive heart failure	63,131	11.0%	20.0%
	Sepsis	52,346	9.1%	16.5%
	Simple pneumonia and respiratory infections	41,778	7.3%	13.2%
	Chronic obstructive pulmonary disease, bronchitis, asthma	35,798	6.2%	11.3%
	Stroke	23,384	4.1%	7.4%
	Urinary tract infection	16,268	2.8%	5.1%
	Renal failure	13,537	2.3%	4.3%
	Acute myocardial infarction	10,249	1.8%	3.2%
	Cardiac arrhythmia	10,020	1.7%	3.2%
	Cellulitis	9,230	1.6%	2.9%
	Other respiratory	9,102	1.6%	2.9%
	Esophagitis, gastroenteritis and other digestive disorders	7,232	1.3%	2.3%
	Gastrointestinal hemorrhage	6,915	1.2%	2.2%
	Nutritional and metabolic disorders	5,035	0.9%	1.6%
	Gastrointestinal obstruction	2,959	0.5%	0.9%
	Diabetes	2,901	0.5%	0.9%
	Syncope & collapse	2,499	0.4%	0.8%
	Fractures of the femur and hip or pelvis	2,064	0.4%	0.7%
	Transient ischemia	1,857	0.3%	0.6%

Note: Clinical episodes are ordered by the number of intervention episodes.

Source: Lewin analysis of Medicare claims and enrollment data for episodes that began Q4 2013 through Q3 2018 for BPCI providers.

Exhibit C.7b: Distribution of Episodes Across Clinical Episodes for Model 2 PGPs, Q4 2013 through Q3 2018

	Clinical Episode	Intervention Episodes (N)	Share of All Clinical Episodes	Share of All Surgical or Medical Clinical Episodes
Surgical Clinical Episodes	Major joint replacement of the lower extremity	104,779	39.3%	80.6%
	Hip & femur procedures except major joint	8,883	3.3%	6.8%
	Major joint replacement of the upper extremity	4,838	1.8%	3.7%
	Medical non-infectious orthopedic	4,593	1.7%	3.5%
	Spinal fusion (non-cervical)	3,512	1.3%	2.7%
	Percutaneous coronary intervention	3,335	1.3%	2.6%
Medical Clinical Episodes	Sepsis	34,108	12.8%	25.0%
	Congestive heart failure	16,682	6.3%	12.2%
	Simple pneumonia and respiratory infections	16,091	6.0%	11.8%
	Chronic obstructive pulmonary disease, bronchitis, asthma	13,441	5.0%	9.8%
	Urinary tract infection	7,920	3.0%	5.8%
	Renal failure	7,791	2.9%	5.7%
	Other respiratory	6,268	2.4%	4.6%
	Acute myocardial infarction	5,919	2.2%	4.3%
	Esophagitis, gastroenteritis and other digestive disorders	5,053	1.9%	3.7%
	Stroke	4,928	1.8%	3.6%
	Cardiac arrhythmia	4,777	1.8%	3.5%
	Cellulitis	4,262	1.6%	3.1%
	Gastrointestinal hemorrhage	3,577	1.3%	2.6%
	Nutritional and metabolic disorders	3,435	1.3%	2.5%
	Gastrointestinal obstruction	2,397	0.9%	1.8%

Note: Clinical episodes are ordered by the number of intervention episodes.

Source: Lewin analysis of Medicare claims and enrollment data for episodes that began Q4 2013 through Q3 2018 for BPCI providers.

Exhibit C.7c: Distribution of Episodes Across Clinical Episodes for Model 3 SNF, Q4 2013 through Q3 2018

Clinical Episode	Intervention Episodes (N)	Share of All Clinical Episodes
Major joint replacement of the lower extremity	11,031	24.1%
Sepsis	7,508	16.4%
Simple pneumonia and respiratory infections	4,892	10.7%
Congestive heart failure	4,805	10.5%
Hip & femur procedures except major joint	4,772	10.4%
Medical non-infectious orthopedic	3,443	7.5%
Urinary tract infection	2,958	6.5%
Stroke	2,022	4.4%
Renal failure	1,937	4.2%
Chronic obstructive pulmonary disease, bronchitis, asthma	1,287	2.8%
Other respiratory	1,039	2.3%

Note: Clinical episodes are ordered by the number of intervention episodes.

Source: Lewin analysis of Medicare claims and enrollment data for episodes that began Q4 2013 through Q3 2018 for BPCI providers.

C.7d: Distribution of Episodes Across Clinical Episodes for Model 3 HHA, Q4 2013 through Q3 2018

Clinical Episode	Intervention Episodes (N)	Share of All Clinical Episodes
Major joint replacement of the lower extremity	6,803	45.2%
Congestive heart failure	6,609	43.9%
Simple pneumonia and respiratory infections	1,638	10.9%

Note: Clinical episodes are ordered by the number of intervention episodes.

Source: Lewin analysis of Medicare claims and enrollment data for episodes that began Q4 2013 through Q3 2018 for BPCI providers.

C.7e: Distribution of Episodes Across Clinical Episodes for Model 4 ACH, Q4 2013 through Q3 2018

Clinical Episode	Intervention Episodes (N)	Share of All Clinical Episodes
Major joint replacement of the lower extremity	7,122	86.4%
Coronary artery bypass graft	1,124	13.6%

Note: Clinical episodes are ordered by the number of intervention episodes.

Source: Lewin analysis of Medicare claims and enrollment data for episodes that began Q4 2013 through Q3 2018 for BPCI providers.

a. BPCI Study Population

For hospitals, SNFs, and HHAs, the BPCI treatment group was defined as participants that had at least five discharges in both 2011 and 2012 and participated in the clinical episode for more than one quarter. We required a minimum of five discharges in order to calculate baseline payments, utilization, and quality outcomes to include in the matching algorithm.

The BPCI PGP treatment group was defined using a slightly different approach to accommodate the comparison group approach for the analysis of PGP episodes (see section b. Comparison Group below), because we did not have reliable data on physician affiliation for non-BPCI PGPs. First, we identified BPCI-participating PGPs that participated in the clinical episode for more than one quarter. Then, we defined the BPCI PGP treatment group as *hospitals* where BPCI-participating PGPs initiated episodes. The treatment group was limited to hospitals where BPCI-participating PGPs initiated at least one BPCI PGP episode in both the baseline (Q4 2011 through Q3 2012) and intervention (Q4 2013 through Q3 2018) periods to have a consistent group of hospitals in both time periods. We also limited the PGP treatment group to hospitals that had at least five discharges in both 2011 and 2012 in order to calculate baseline outcomes for matching.[4] (See **Appendix L** for information on the episodes excluded during the comparison group selection process).

The share of BPCI participants included in the analysis varied by participant type because of the inclusion criteria above. Exhibit C.8 below displays the share of BPCI providers in the analytical sample out of all BPCI providers in the clinical episodes with sufficient sample to analyze.[5] It also displays the share of episodes initiated by the participants in the analytical sample among all BPCI episodes initiated in the clinical episodes with sufficient sample to analyze.

Exhibit C.8: Percentage of BPCI Providers and Percentage of Episodes in the Analytical Sample among Clinical Episodes Analyzed, by Model and Participant Type

Model and Participant Type	Percentage of BPCI providers in the analytical sample	Percentage of episodes in the analytical sample
Model 2 Hospitals	96.9%	88.5%
Model 2 PGPs	76.2%	54.3%
Model 3 SNFs	65.3%	65.7%
Model 3 HHAs	82.6%	89.3%
Model 4 Hospitals	89.5%	92.8%

Note: The percentage of BPCI providers in the analytical sample is calculated among providers participating in the clinical episodes with sufficient sample size to analyze. The percentage of episodes in the analytical sample is calculated among episodes initiated by participants in the clinical episodes with sufficient sample size to analyze. PGP=physician group practice. SNF=skilled nursing facility. HHA=home health agency.

The BPCI study population includes Phase 2 episodes initiated by BPCI EIs who were included in the treatment group of hospitals, SNFs, HHAs, and PGPs. For PGPs, we included the episodes at the treatment group of hospitals that were admitted by BPCI-participating PGPs. If an EI participant stopped participating in the clinical episode during this period, we included the episodes that it initiated up until its withdrawal date.

[4] When describing the creation of Model 2 PGP treatment and comparison groups, we will use the terms 'Model 2 BPCI PGP hospitals' and 'Model 2 PGP comparison hospitals'. There are portions in this section when we use the term 'BPCI participants' to define the treatment group across all EI types; for Model 2 PGPs, the 'BPCI participants' refers to the hospitals where the BPCI PGPs initiated episodes, because our unit of matching for BPCI-participating PGPs was the hospital.

[5] For example, for Model 2 hospitals, we analyzed 32 out of the 48 clinical episodes. Our sample included 96.9% of the BPCI Model 2 hospitals that participated in the 32 clinical episodes.

b. Comparison Group

Except for PGPs, we created matched comparison providers of the same type. BPCI hospitals were matched to non-BPCI hospitals, BPCI SNFs were matched to non-BPCI SNFs, and BPCI HHAs were matched to non-BPCI HHAs. For PGPs, we did not have reliable data on physician affiliation to create non-BPCI PGPs, so we instead matched hospitals where BPCI-participating PGP episodes were initiated to hospitals that had little to no admissions from BPCI-participating PGPs.

Comparison providers and episodes for both participant types were selected in four steps. First, providers were selected for the comparison pool (i.e., identified as potential comparison providers) if they: (i) shared key characteristics with BPCI EIs, (ii) were eligible to participate in the BPCI initiative, (iii) were not located in markets where BPCI EIs of the same provider type accounted for over half of the discharges associated with any of the 48 BPCI clinical episodes, (iv) were not participating in BPCI, and (v) were not affiliated with BPCI participants. Second, each BPCI treatment group provider was matched with up to 15 comparison providers using statistical matching techniques to minimize the differences in the distributions of characteristics between BPCI and comparison providers. Third, episodes were constructed for beneficiaries treated by matched comparison providers based on the BPCI program rules. Finally, a sample of episodes was drawn from among those identified in the previous step to match the distribution of BPCI episodes by MS-DRG and quarter in which the episode was initiated. A detailed description of these steps is below.

Step 1: Exclude ineligible non-participating providers

Exclusions were applied for each Model, EI type, and clinical episode separately. Providers were excluded from the comparison pool if they met any of the following criteria:

- Were ineligible to participate in BPCI (e.g., in Model 2, hospitals that were not paid under Medicare's inpatient prospective payment system).
- Were owned by a BPCI-participating organization.
- Participated in any of the BPCI Models (Model 1 through Model 4).
- Were missing key matching characteristics, such as ownership status (government, non-profit, for-profit) or location (rural/urban).
- Were located in a market where BPCI participants of the same provider type accounted for over half of the discharges associated with any of the 48 BPCI clinical episodes. This exclusion avoided including providers that may be exposed to "spillover effects" of BPCI in those locations, which could cause changes in utilization for other local providers that may confound the results. Potential spillover effects include non-BPCI beneficiaries receiving care from BPCI participants, comparison providers adopting practices similar to BPCI participants, or BPCI affecting referral patterns in the market.
- Had fewer than five clinically relevant discharges during either calendar year 2011 or 2012. These providers were excluded in order to remove providers that did not have meaningful episode volume in the baseline.

A complicating factor of the hospital-level matching for PGPs was that treatment occurs at the PGP level, not the hospital level. Thus, a Model 2 BPCI PGP hospital can have both BPCI PGP

and non-BPCI PGP episodes during the intervention period. In order to provide a large pool of eligible comparison hospitals for the PGPs, while also limiting the comparison pool's exposure to BPCI, hospitals were considered eligible for the PGP comparison pool as long as they had less than one percent of their patient discharges in the same clinical community treated by physicians in BPCI PGPs. Clinical communities are a broad classification of clinical episodes defined in Exhibit C.9. They represent the clinical episodes that are most likely to experience exposure to one another in the hospital setting.

Exhibit C.9: Clinical Episode and Clinical Community Relationship

Clinical Community	Clinical Episode
Surgical: Ortho Excluding Spine	• Amputation • 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 • Other knee procedures • Removal of orthopedic devices • Revision of the hip or knee
Surgical, Non-surgical: Cardiovascular	• Acute myocardial infarction • AICD generator or lead • Atherosclerosis • Cardiac arrhythmia • Cardiac defibrillator • Cardiac valve • Chest pain • Congestive heart failure • Coronary artery bypass graft • Major cardiovascular procedure • Medical peripheral vascular disorders • Other vascular surgery • Pacemaker • Pacemaker device replacement or revision • Percutaneous coronary intervention • Syncope & collapse
Surgical: Other	• Back and neck except spinal fusion • Cervical spinal fusion • Combined anterior posterior spinal fusion • Complex non-cervical spinal fusion • Major bowel procedure • Spinal fusion (non-cervical)

Clinical Community	Clinical Episode
Non-surgical Other	• Cellulitis • Chronic obstructive pulmonary disease, bronchitis, asthma • Diabetes • Esophagitis, gastroenteritis and other digestive disorders • Fractures of the femur and hip or pelvis • Gastrointestinal hemorrhage • Gastrointestinal obstruction • Medical non-infectious orthopedic • Nutritional and metabolic disorders • Other respiratory • Red blood cell disorders • Renal failure • Sepsis • Simple pneumonia and respiratory infections • Stroke • Transient ischemia • Urinary tract infection

Step 2: Use matching algorithms to select close matches

For each strata, we assessed the performance of a Propensity Score Matching (PSM) model using key variables, and we altered the covariates in the model if the balance was undesirable (see below for more details). For one HHA strata, we used a Mahalanobis Distance Matching (MDM) model, which allowed us to better match an outlier provider (more detail on this instance is provided below). In general, PSM performed well, especially for strata with larger sample sizes.

A *propensity score* is defined as the predictive probability of receiving the "treatment" (BPCI participation), conditional on a set of characteristics. This probability was estimated using a logistic regression model that included key factors thought to influence both the participation decision and performance in BPCI. These factors included market characteristics (e.g., population size, primary care physician to population ratios), provider characteristics (e.g., ownership status, number of beds), and performance- and practice pattern-related factors (e.g., historical Part A Medicare payments, use of PAC services). The variables considered for matching Models 2, 3 and 4 by provider type are displayed in Exhibit C.10.

Exhibit C.10: Key Variables used for Matching by Provider Type, Models 2-4

Variable	Model 2 ACH	Model 2 PGP	Model 3 HHA	Model 3 SNF	Model 4 ACH
Ownership - Non-Profit, Government, For-Profit	X	X	X	X	X
Urban/Rural Location	X	X	X	X	X
Bed Count	X	X		X	X
Number of Nurses Employed by an HHA			X		
Chain Indicator	X	X		X	X
SNF in Hospital				X	
Medicare Days as a Percent of Total Inpatient Days	X	X			X
Resident-Bed Ratio	X	X			X

Variable	Model 2 ACH	Model 2 PGP	Model 3 HHA	Model 3 SNF	Model 4 ACH
Number of points out of 5 in overall rating and in three areas: Quality, Survey/Health Inspections, and Staffing (from Nursing Home Compare)				X	
Disproportionate Share Percent	X	X			X
Teaching Status	X	X			X
Population Size of Market Area	X	X	X	X	X
Median Household Income	X	X		X	X
Medicare Advantage Penetration	X	X		X	X
Primary Care Providers per 10,000 in Market	X	X			X
SNF Beds per 10,000 in Market	X	X		X	X
Inpatient Rehabilitation Facility in Market	X	X		X	X
Provider Market Share of the 48 potential BPCI clinical episodes	X	X		X	X
Herfindahl Index of Hospital Market Shares	X	X		X	X
Herfindahl Index of SNF Market Shares				X	
Percentage of total discharges in the 48 BPCI clinical episodes in 2011	X	X	X	X	X
Number of discharges for clinical episode in 2011	X	X	X	X	X
Number of SNF days per patient within 90 days after an ACH by clinical episode in 2011				X	
Number of HHA days per patient within 90 days after an ACH discharge by clinical episode in 2011			X	X	
Percent of patients in 2011 that went home with no post-acute care by clinical episode	X	X			X
Percent of patients in 2011 that used an inpatient rehabilitation facility as first post-acute care setting by clinical episode	X	X			X
Percent of patients in 2011 that used a SNF as first post-acute care setting by clinical episode	X	X			X
Percent of patients in 2011 that used a long-term care hospital as first post-acute care setting by clinical episode	X	X			X
Percent of patients in 2011 that went home with HHA services as first post-acute care setting by clinical episode	X	X			X
Emergency department use by clinical episode in 2011	X	X	X	X	X
Change in emergency department use by clinical episode from 2011 to 2012	X	X	X	X	X
Unplanned readmission rate by clinical episode in 2011	X	X	X	X	X
Change in unplanned readmission rate by clinical episode from 2011 to 2012	X	X	X	X	X
All-cause mortality rate in 2011 by clinical episode	X	X	X	X	X
Change in all-cause mortality rate by clinical episode from 2011 to 2012	X	X	X	X	X
Average 90-day standardized Medicare Part A payment amount by clinical episode in 2011	X	X	X	X	X

Variable	Model 2 ACH	Model 2 PGP	Model 3 HHA	Model 3 SNF	Model 4 ACH
Change in average 90-day standardized Medicare Part A payment amount by clinical episode from 2011 to 2012	X	X	X	X	X

Note: PGP=physician group practice. SNF=skilled nursing facility. HHA=home health agency

Using the coefficients from the logistic regression model, we constructed a propensity score as the predicted probability of participating in BPCI. Each BPCI participant was matched with up to 15 comparison providers with a propensity score absolute difference below a defined caliper. In cases where more than 15 providers fell within the caliper, the 15 closest providers were matched to the BPCI participant. Comparison providers were allowed to be used as matches for more than one participant. A caliper acts as a constraint on the "distance" between BPCI and potential comparison providers based on the difference in absolute value in their estimated propensity scores. Any comparison providers outside of the caliper of a BPCI provider would not be matched to that BPCI provider. BPCI providers with no potential matches inside the caliper were excluded from the analysis. These BPCI providers typically had outliers measured in several of the key factors used for matching, such as the number of discharges for the episode or the share of BPCI episodes in the market. Calipers were chosen based on the standard deviation of the estimated log-odds propensity score. Multiple calipers were tested for each strata to identify the specification that generated the most similar comparison group across all of the attributes considered important for matching.

The key diagnostic used to determine similarity between BPCI and comparison providers was the standardized difference in the mean of each of the matching variables between participants and non-participants. The standardized difference compares the differences in means in relation to the standard deviation pooled across BPCI and comparison providers. We typically preferred the method that yielded the lowest standardized difference of means across the largest number of covariates and that resulted in the fewest number of standardized differences greater than 0.20 for any particular variable.[6] We prioritized minimizing the standardized differences of performance-related variables (90-day standardized Medicare Part A payment, unplanned readmission rates, mortality rates, and emergency department use rates). Standardized differences below 0.10 were targeted for these variables. In a few cases where the standardized differences were larger, we used alternative model specifications to improve matching.

In the case of Model 3 HHA congestive heart failure, it was difficult to match one participant which was much larger than the others using PSM. Due to the participant's outlier characteristics, no comparison providers fell within its calipers, and it was important not to remove it from the analysis because the participant contributed to a large share of the BPCI episodes. Using MDM, we coarsened the two outlier characteristics to yield better matches for the other characteristics. We were able to match 15 comparison providers with small mean differences in the key matching diagnostics.

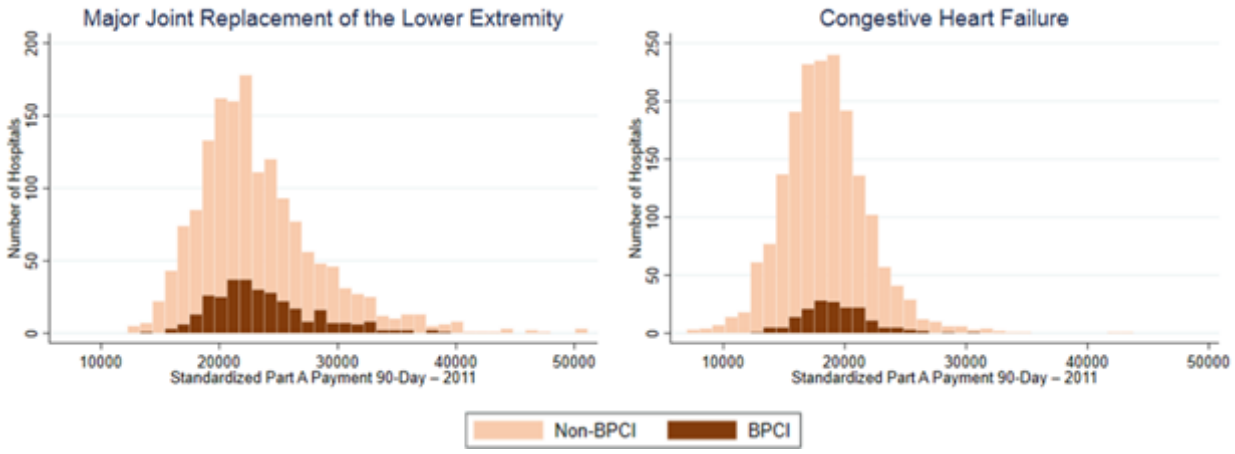
Additionally, some clinical episodes under Model 3 SNF suffer from small sample sizes, both overall and per SNF, making it difficult to identify strong matches for potential comparison providers.

[6] Stuart, E.A. (2010). Matching methods for causal inference: A review and a look forward. S*tatistical science: a review journal of the Institute of Mathematical Statistics*, *25*(1), 1.

Appendix L shows the calipers chosen for each PSM model as well as the standardized differences of each covariate included in the matching models between BPCI providers and matched comparison providers for each clinical episode for Model 2 PGPs. **Appendix S** of the Year 5 Evaluation & Monitoring Annual Report shows this information for each clinical episode for Model 2 hospitals, Model 3 SNFs, and Model 3 HHAs. [7] **Appendix J** of the Year 3 Evaluation & Monitoring Annual Report shows this information for each clinical episode for Model 4 hospitals.[8] Our ability to construct comparison groups (and the share of BPCI providers included in the analysis) varied across clinical episodes. The standardized differences were less than 0.10 for each of the eight key performance measures for 16 of the 69 Model, EI type and clinical episode groups. However, the average of the standardized differences for the key performance measures was less than 0.10 for all clinical episodes.

Exhibit C.11 visually depicts the rationale for selecting a subset of providers from non-participants to serve as the counterfactual for BPCI participants. It displays the frequency histograms of BPCI Model 2 hospitals and non-participants for an average payment outcome in the baseline (average Part A standardized allowed amounts in 2011) for the two clinical episodes with the highest participation, major joint replacement of the lower extremity and congestive heart failure. For both clinical episodes, the distribution of BPCI participant hospitals is contained within the distribution of non-participant hospitals. However, since BPCI is a voluntary model, the BPCI participants are not randomly sampled from the larger non-participant distribution, but are instead more heavily weighted toward higher payments. (Participants with higher average payments in the baseline will have higher target prices, making it easier to earn reconciliation payments.)

Exhibit C.11: Frequency histograms of Hospitals by Average Part A Standardized Allowed Amounts, BPCI-participating Hospitals and Non-participating Hospitals, 2011



Note: The Part A standardized allowed amounts are for the inpatient stay and 90 days post discharge. Average payments were calculated for 2011 using the sample of beneficiaries eligible to be a BPCI episode. The BPCI-participating and non-participating hospitals include those that were considered eligible after exclusions were applied, as described in section C.2.a., BPCI Study Population, and in Step 1 of section C.2.b., Comparison Group.

Source: Lewin analysis of Medicare claims and enrollment data for hospitals that participated in Model 2 of BPCI and non-participating hospitals, 2011.

[7] The report is available for download from: https://innovation.cms.gov/initiatives/Bundled-Payments/index.html.
[8] The report is available for download from: https://innovation.cms.gov/initiatives/Bundled-Payments/index.html.

By matching on key market and provider characteristics in the baseline, including outcome levels and outcome trends, we select a subset of the non-participant population that is more similar to this non-random sample of BPCI participants, namely a sample of comparison hospitals 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 "regression to the mean" bias depending on whether treatment and comparison providers are drawn from the same distribution or different distributions.[9,10,11] If treatment and comparison providers are drawn from the same distribution and differences in outcome levels (e.g., payment levels) in the pre-intervention period are due to the treatment assignment mechanism (i.e., higher-payment hospitals are more likely to participate as it may be easier to generate financial gains), then matching on outcome levels in the pre-intervention period would mitigate this particular bias.[12,13] On the other hand, if treatment and comparison providers are drawn from different distributions—for example, a situation in which the treatment distribution has a higher mean than the comparison distribution—then the matching process would limit the analysis sample mostly to the left tail (lower payments) of the treatment distribution and to the right tail (higher payments) of the comparison distribution. Both groups would then likely revert to their means in the intervention period, creating a biased DiD estimate. However, this second scenario is not the case for the BPCI initiative, since the treatment group is not matched to the left tail of a distribution of the universe of BPCI-eligible hospitals. Note that BPCI was a nation-wide initiative with a large number of participants that spanned a wide range of geographies and provider types.[14] Matches were found for nearly all BPCI participants within the specified calipers (see Exhibit C.12 below). Through matching, the BPCI 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 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]

[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.

[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.

[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.

[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.

[14] For the surgical and medical clinical episodes with the highest participation, major joint replacement of the lower extremity and congestive heart failure, respectively, the distribution of BPCI-participant hospitals is contained within the distribution of non-participant hospitals.

[15] Bilinski, A., & Hatfield, L. A. (2020). Nothing to see here? Non-inferiority approaches to parallel trends and other model assumptions. *arXiv:1805.03273v5 [stat.ME]*. Available for download from: https://arxiv.org/abs/1805.03273.

Exhibit C.12: Share of BPCI Participants that Matched to the Comparison Group within the Selected Calipers, across Clinical Episodes Analyzed, by Model and Participant Type

Model and Participant Type	Share of Participants that Matched within the Selected Caliper
Model 2 Hospital	98.5%
Model 2 PGP	94.5%
Model 3 SNF	99.8%
Model 3 HHA	100.0%
Model 4 Hospital	100.0%

Note: The figures in this table are expressed as a share of the number of BPCI participants that remained after applying exclusions and before matching to the comparison group. Because Model 2 PGPs were matched at the hospital level, the figure in this table is the share of Model 2 BPCI PGP treatment *hospitals* (those associated with BPCI PGPs) that were matched to comparison hospitals. PGP = physician group practice; SNF = skilled nursing facility; HHA = home health agency.

Step 3: Construct episodes for matched comparison providers

The BPCI episode algorithm rules were applied to construct simulated episodes that would have been assigned to comparison facilities if they had participated in BPCI. We constructed simulated episodes from October 2010 through September 2018. For the Model 2 PGP hospital comparison group, we excluded episodes at the comparison hospitals that were initiated by a BPCI-participating PGPs in the same clinical community.

Step 4: Select random sample of comparison group episodes

We drew a random sample of comparison episodes from the episodes identified in the previous step. Each BPCI episode was randomly matched to one episode from the pool of comparison episodes in the same quarter with the same MS-DRG originating from the comparison providers that were matched to the BPCI participant. In the case of major joint replacement of the lower extremity, episodes were also randomly matched by whether the patient had a fracture or not. The matched comparison episode was then excluded from the pool of episodes eligible for future matching. In some cases, the comparison pool did not contain enough episodes resulting in unmatched participant episodes.

3. Analytical Methods

The DiD approach quantifies the impact of BPCI by comparing changes in outcomes for BPCI episodes with changes in outcomes for comparison episodes, between the baseline and intervention periods. This approach eliminates biases from time invariant differences between the BPCI and comparison episodes and controls for trends that are common between the BPCI and comparison populations.[16] The risk-adjustment regression model incorporates data from two periods prior to BPCI implementation (baseline and Phase 1) as well as the intervention period. Phase 1 started when participants could begin signing up for BPCI but no participants had entered Phase 2, 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 participation and outcomes, which could bias the results.

risk-bearing or intervention phase. It encompasses the one year period prior to the BPCI intervention period. Because some BPCI participants may have started to implement changes during Phase 1 in preparation for Phase 2, the Phase 1 period was excluded from the DiD baseline. Including Phase 1 in the DiD baseline would likely underestimate the BPCI effect given that participants started to prepare for the intervention during that period. Thus, the DiD compares changes in outcomes from the baseline period to the intervention period.

- The DiD baseline period was from October 2011 through September 2012.
- Phase 1 was from October 2012 through September 2013.
- The BPCI intervention period was from October 2013 through September 2018.

Consider the following linear model to illustrate the DiD calculation in a regression framework:

$$Y_{i,k,t} = \alpha + \beta_1 BPCI_{i,k} + \beta_2 T_t + \delta BPCI_{i,k} \cdot T_t + \boldsymbol{X}_{i,k,t}'\beta + u_{i,k,t}$$

Where $Y_{i,k,t}$ is the outcome of interest for individual i with provider k in quarter t, $BPCI_{i,k}$ is an indicator variable taking the value of 1 if individual i was treated by a BPCI provider, T_t indicates the period (i.e., baseline, Phase I, or intervention), and $X_{i,k,t}$ are beneficiary demographics, clinical characteristics observed before hospitalization, and provider characteristics. The vector β is a vector of regression coefficients that captures the impact of risk factors $\boldsymbol{X_{i,k,t}}$ on the outcome of interest. The regression coefficient β_1 captures any inherent, time invariant differences between the control and the treatment groups, β_2 provides an estimate of the potential time trends in the outcome of interest over the period before and after the intervention that is common to both the control and treatment groups, while $u_{i,k,t}$ represents a random error term. In this linear example, the DiD estimate is the coefficient δ, which determines the differential in outcome Y experienced by beneficiaries receiving services from BPCI providers during the intervention period relative to beneficiaries receiving services from providers in the comparison group.

We used multivariate regression models to control for differences in beneficiary demographics, clinical characteristics, and prior care use before the hospitalization, along with provider characteristics that might be correlated with the outcome (see Exhibit C.13). We used a variety of empirical specifications including ordinary least squares (OLS), logistic regressions, and two-part models. Regression models were selected depending on the type and characteristics of the outcome measure. For example, logistic models were estimated for the binary quality outcomes (e.g., mortality rate). OLS was estimated for the total number of days measures (e.g., number of SNF days) as well as the payment measures where all individuals by default had positive expenditures, such as total payments during the inpatient stay and 90-day PDP. Two part models were favored for payment outcomes where more than 5% of individuals had zero payments for the particular outcome. These payment outcomes included the individual Part A payments that were affected by zero-mass and skewedness.

The overall Model 2 hospital, Model 2 PGP, Model 3 SNF, Model 3 HHA, and Model 4 hospital estimates were calculated by pooling episodes from all of the clinical episodes that had sufficient sample size to create analytical samples as described above. The inclusion criteria resulted in 32 clinical episodes for Model 2 hospitals, 21 clinical episodes for Model 2 PGPs, 11 clinical episodes for Model 3 SNFs, three clinical episodes for Model 3 HHAs, and two clinical episodes for Model 4 hospitals. We pooled the episodes for these clinical episodes for each model and participant type

and estimated the DiD separately for each model and participant type. We also stratified clinical episodes as medical or surgical clinical episodes and created pooled medical or surgical estimates separately for hospitals and PGPs. To do this, we stratified the clinical episodes by whether or not the MS-DRGs in each clinical episode were more surgical or medical in nature. A list of these can be found in Exhibits C.7a through C.7e above. We used the same risk-adjustment model that was used for the individual clinical episodes for the overall and the medical and surgical level estimates, but also added in clinical episode dummies to control for each clinical episode. Clinical episodes without sufficient sample size were not included in these estimates.

Exhibit C.13: Predictive Risk Factors Used to Risk Adjust Claims Outcomes

Domain	Variables
Service Mix	• Alternative specifications ▪ Anchor MS-DRG ▪ MS-DRG group: anchor MS-DRG with and without complications grouped together ▪ Clinical episode (used for the all-Model and participant type estimates)
Patient Demographics & Enrollment	• Age (under 65, 65-79, 80+) • Gender • Medicaid status • Disability status • Alignment to Medicare Shared Savings Program or Pioneer ACO during BPCI episode
Prior health conditions	• Alternative specifications ▪ HCC indicators from qualifying services and diagnoses from claims and data for six months preceding the anchor admission or qualifying stay ▪ HCC indicators aggregated to risk variable groups (RV-HCC) according to NQF measure 1789 (Exhibit C.14 shows a crosswalk from 2013 HCC indicators to RV-HCC) ▪ HCC index, HCC indicators weighted by their relative weight in the 2013 CMS-HCC model
Utilization measures preceding the start of the anchor stay/ qualifying inpatient stay	• Alternative specifications ▪ Binary indicators for utilization of ED, inpatient, SNF, nursing facility, IRF, HHA services in the **six months** preceding the start of the episode ▪ Number of days of ED, inpatient, SNF, IRF, HHA service use in the **one month** preceding the start of the episode, and ever in a NF/SNF in the six months preceding the start of the episode ▪ Number of days of ED, inpatient, SNF, IRF, HHA service use in the **six months** preceding the start of the episode, and ever in a NF/SNF in the six months preceding the start of the episode
Geography	• Alternative specifications ▪ State indicators ▪ Census region indicators
Provider Characteristics	• Size • Ownership status • Whether the hospital was in a Comprehensive Care for Joint Replacement Model market for Model 2 episodes

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.14: Crosswalk HCC Indicators to Risk Variable Group HCC

Risk Variable Group Label	CMS-HCCs	Description
rv1	**1, 5**	**Severe infection**
	1	HIV/AIDS
	5	Opportunistic infections
rv2	**111, 112**	**Other infectious disease & pneumonias**
	111	Aspiration and specified bacterial pneumonias
	112	Pneumococcal pneumonia, emphysema, lung abscess
rv3	**7**	**Metastatic cancer and acute leukemia**
rv4	**8, 9**	**Severe cancer**
	8	Lung, upper digestive tract, and other severe cancers
	9	Lymphatic, head and neck, brain, and other major cancers
rv6	**10**	**Breast, prostate, colorectal and other cancers and tumors**
rv9	**15-19, 119**	**Diabetes mellitus**
	15	Diabetes with renal or peripheral circulatory manifestation
	16	Diabetes with neurologic or other specified manifestation
	17	Diabetes with acute complications
	18	Diabetes with ophthalmologic or unspecified manifestation
	19	Diabetes without complication
	119	Proliferative diabetic retinopathy and vitreous hemorrhage
rv10	**21**	**Protein-calorie malnutrition**
rv11	**25, 26**	**End-Stage liver disease**
	25	End-Stage liver disease
	26	Cirrhosis of liver
rv12	**44**	**Severe hematological disorders**
rv14	**51, 52**	**Drug and alcohol disorders**
	51	Drug/alcohol psychosis
	52	Drug/alcohol dependence
rv15	**54, 55**	**Psychiatric comorbidity**
	54	Schizophrenia
	55	Major depressive, bipolar, and paranoid disorders
rv18	**67-69, 100, 101, 177**	**Hemiplegia, paraplegia, paralysis, functional disability**
	67	Quadriplegia, other extensive paralysis
	68	Paraplegia
	69	Spinal cord disorders/injuries
	100	Hemiplegia/hemiparesis
	101	Cerebral Palsy and other paralytic syndromes
	177	Amputation status, lower limb/amputation complications
rv19	**74**	**Seizure disorders and convulsions**
rv20	**80**	**Congestive Heart Failure**

Risk Variable Group Label	CMS-HCCs	Description
rv21	**81-83, 104, 105**	**Coronary atherosclerosis or angina, cerebrovascular disease**
	81	Acute myocardial infarction
	82	Unstable angina and other acute ischemic heart disease
	83	Angina pectoris/old myocardial infarction
	104	Vascular disease with complications
	105	Vascular disease
rv24	**92**	**Specified heart arrhythmias**
rv26	**108**	**Chronic obstructive pulmonary disease**
rv29	**130**	**Dialysis status**
rv30	**148, 149**	**Ulcers**
	148	Decubitus skin ulcer
	149	Chronic skin ulcer, except decubitus
rv31	**2**	**Septicemia/shock**
rv34	**79**	**Cardio-respiratory failure and shock**
rv39	**131**	**Renal failure**
rv40	**32**	**Pancreatic disease**
rv41	**38**	**Rheumatoid arthritis and inflammatory connective tissue disease**
rv42	**77**	**Respirator dependence/tracheostomy status**
rv43	**174**	**Major organ transplant status**
rv45	**158**	**Hip fracture/dislocation**

Note: CMS-HCC = Centers for Medicare & Medicaid Services hierarchical condition category.

Source: RV to HCC mapping based on the Hospital-wide Readmission Measure, HWR Tech Report, July 2012; modified to reflect the 2013 CMS HCC Factors that were applied to our sample.

Estimates from the multivariate regression models were used to construct model-predicted outcomes during the baseline and intervention periods for both BPCI-participating and comparison providers. To control for changes in service and case-mix over time, as well as differences between BPCI and comparison beneficiaries, we used the same reference population of beneficiaries to calculate predicted outcomes for BPCI and comparison group providers: all beneficiaries during the baseline and intervention period.

The DiD estimate was calculated by first taking the difference in the predicted outcomes between the baseline and intervention for both BPCI and comparison providers, and then taking the difference between the changes for BPCI and comparison providers. Taking the difference in such differentials across all BPCI beneficiaries yields the Effect of the Treatment on the Treated (ETT) analog of the DiD estimate. The ETT is the average gain from treatment for those who were actually treated. Standard errors of ETT estimation were computed using the Delta method.[17]

[17] The delta method expands a function of a random variable about its mean, usually with a Taylor approximation, and then takes the variance. Specifically, if Y= f(x) is any function of a random variable X, we need only calculate the variance of X and the first derivative of the function to approximate the variance of Y. Let μ_x be the mean of X and $f'(x)$ be the first derivative, a Taylor expansion of Y = f(x) about μ_x gives the approximation:

We attempted to construct a comparison group of providers that closely matched BPCI providers in key characteristics, but we could not guarantee that BPCI and comparison providers would have parallel trends during the baseline period for every outcome. We tested the null hypothesis that BPCI participants and comparison providers had parallel trends during the baseline for the key claim-based outcomes for all Model and participant types and clinical episodes in this evaluation: unplanned readmissions, emergency department use, all-cause mortality, and the key total standardized allowed payments. In this report, we report all DiD estimates, but we note when we rejected the null hypothesis that there were parallel trends in baseline.

There are some outcomes for which we do not report the DiD estimate because of small sample sizes. We report DiD estimates for each outcome if the sample exceeds 30 BPCI episodes during the intervention period for outcomes evaluated using duration, logistic, and OLS models. We use a minimum of 100 BPCI episodes with a positive value of the outcome during the intervention period to report DiD estimates for outcomes using two-part models. In addition, we require each outcome to have data from at least three BPCI providers. Some outcomes, including IRF payments and mortality, suffer from small sample sizes, and consequently, DiD estimates for these outcomes typically were not reported.

D. Estimate of Savings to Medicare Due to BPCI

Net Medicare savings were calculated by subtracting reconciliation payments from the change in aggregate non-standardized Medicare paid amounts due to BPCI. We calculated net Medicare savings for Models 2 and 3 of the BPCI initiative. For Model 2 only, we also estimated net Medicare savings for surgical and medical episodes initiated by hospitals and PGPs. Because payments to providers through the CMS HIGLAS system were not available at the clinical episode level, we used the reconciliation payments that CMS would have expected, had downside risk not been eliminated, from the EI-level reconciliation reports provided by the reconciliation contractor when calculating these estimates. Additionally, we calculated net Medicare savings by clinical episode for Model 2 hospitals, Model 2 PGPs, Model 3 SNFs, and Model 3 HHAs. Again, since payments to the providers through the CMS HIGLAS system were not available at the clinical episode level, we used the reconciliation payments that CMS would have expected, had downside risk not been eliminated when calculating clinical episode level estimates. Exhibit C.15 defines the measures used in these analyses.

$Y = f(x) \approx f(\mu_x) + f'(\mu_x)(x - \mu x)$. Taking the variance of both sides yields: $Var(Y) = Var(f(X)) \approx [f'(\mu_x)]^2 Var(X)$. For example, suppose $Y = X^2$. Then $f(x) = X^2$ and $f'(x) = 2x$, so that $Var(Y) \approx (2\mu_x)^2 Var(X)$.

Exhibit C.15: Definition of Measures Used in the Analyses of Net Savings to Medicare

Measure	Definition
Change in total standardized paid amounts per episode	A per-episode estimate of the change in Medicare paid payment amounts, excluding beneficiary copays and deductibles, attributable to BPCI using a DiD regression model for clinical episodes evaluated within the given Model. For Model 2 episodes, the payment outcome was the standardized Medicare paid amounts for services during the inpatient stay and 90 day PDP. For Model 3 episodes, the payment outcome was the standardized allowed Medicare paid amounts from episode start through 90 days. The DiD estimate was multiplied by (-1) so that a positive estimate indicates a decline in payments.
Total number of BPCI episodes	The number of intervention episodes initiated by the BPCI participants across all 48 clinical episodes according to EI-level reconciliation reports provided by CMS. This dataset includes clinical episodes and EI types for which we did not find matched comparison groups.
Change in aggregate standardized paid amounts	The DiD estimate of per-episode change in standardized paid amounts multiplied by the total number of BPCI episodes.
Standardized to non-standardized conversion factor	A ratio of non-standardized to standardized Medicare paid amounts based on BPCI intervention episodes. For Model 2, the ratio included payments for services during the 90 day PDP; for Model 3, the ratio included payments for services during the 90 days following the start of the episode.
Change in aggregate non-standardized paid amounts	The total change in standardized Medicare paid amounts multiplied by the conversion factor. Non-standardized Medicare paid amounts reflect actual Medicare payments made to providers because they include adjustments for wages, practice expenses, and other initiatives (e.g., medical education).
Reconciliation payments	Includes performance payments to providers as well as any amounts owed to CMS (Net Payment Reconciliation Amounts) and other components. A positive value indicates that more funds have been paid than recovered. These data were extracted from CMS's HIGLAS system, Q4 2013 through Q3 2018.
Net savings to Medicare	The total change in non-standardized Medicare paid amounts less reconciliation payments. A positive value indicates savings.
Reconciliation payments (downside risk not eliminated)	The performance payouts expected if CMS had not eliminated downside risk for some episodes and had required participants to return funds when payments were above the target. These data were extracted from EI-level reconciliation reports provided by the reconciliation contractor, Q4 2013 through Q3 2018.
Net savings to Medicare (downside risk not eliminated)	The change in aggregate non-standardized Medicare paid amounts less reconciliation payments (downside risk not eliminated).

E. Comparison of Medicare FFS Spending Reductions that are Calculated with the use of Model Benchmarks and that are Estimated by the Evaluation

For Models 2 and 3 of the BPCI initiative, we calculated the Medicare FFS spending reductions that are calculated with the use of model benchmarks and that are estimated by the evaluation under BPCI from the baseline to the performance period overall for each model and for each clinical episode with sufficient sample size for analysis. The reductions in spending that are calculated with the use of model benchmarks is the difference between the benchmark price and average FFS episode payments in the intervention period. It assumes that episode payments would have followed national trends, absent BPCI, and any difference is due to the initiative. We computed the evaluation estimate of Medicare FFS spending reductions using a DiD regression

framework similar to what used in the impact estimates. The evaluation estimate assumes that episode payments would have followed the trend of the matched comparison group, and any difference, after accounting for case-mix changes, is due to the initiative. In order to compare the two estimates, the payment outcome for the evaluation estimate is the standardized allowed payment covered within the bundle. This most closely matches the spending reductions that are calculated with the use of model benchmarks. The risk adjustment model used for the DiD includes the same risk-adjustment covariates as the impact estimates. We also control for the length of episode due to the fact the payments vary significantly for 30, 60 and 90-day bundles. We used a pooled model for the overall Model 2 and 3 estimates using the same covariates, but also included a dummy for each clinical episode to control for differential levels of payments for each clinical episode. Exhibit C.16 defines the measures used in this analysis.

Exhibit C.16: Definition of Measures Used in the Comparison of Medicare FFS Spending Reductions that are Calculated with the use of Model Benchmarks and that are Estimated by the Evaluation

Measure	Definition
Model benchmark	The CMS-calculated historical payment for each participant, updated to the performance period based on national trends and accounting for MS-DRG and provider characteristics. Also referred to as the benchmark price. These data were extracted from EI-level reconciliation reports provided by the reconciliation contractor, Q4 2013 through Q3 2018.
Medicare FFS spending reductions calculated with the use of model benchmarks	The difference between the model benchmark and average FFS episode payments in the intervention period. The data are based on the reconciliation contractor EI-level reconciliation reports, Q4 2013 through Q3 2018.
Evaluation estimate of payments absent BPCI	Baseline BPCI payments plus the change in comparison-group payments, accounting for MS-DRG and provider and patient characteristics. The BPCI baseline payments and the comparison-group payments were estimated based on a DiD model using the standardized allowed payments for services covered within the bundle.
Average FFS episode payments in the intervention period	The standardized allowed payments for services covered within the bundle for BPCI providers during the performance period, accounting for MS-DRG and provider and patient characteristics.
Medicare FFS spending reductions that are estimated by the evaluation	The difference between the average FFS episode payments in the intervention period and the evaluation estimate of payments absent BPCI.

Appendix D: Supplemental Sample Characteristics

This appendix presents additional information about the BPCI providers included in the BPCI impact estimates. See **Appendix D** of the Year 6 Evaluation & Monitoring Annual Report[1] for the number of Model 2 Hospital and Model 2 physician group practice (PGP) BPCI discharges and share of these BPCI discharges as a share of all eligible hospitals.

Note, in the tables below, "All Clinical Episodes" refers to the sample characteristics across all clinical episodes in the analytical sample, i.e., those with sufficient volume for risk adjustment. "Surgical clinical episodes" and "medical clinical episodes" refer to sample characteristics across the clinical episodes included in each category as described in **Appendix C**. There are 32 clinical episodes in the analytical sample for Model 2 hospital-initiated episodes, 21 for Model 2 PGP episodes, 11 for Model 3 skilled nursing facility (SNF), three for Model 3 home health agency (HHA), and two for Model 4 hospital episodes.

The number of BPCI providers in the first column and the number that stopped participating in the clinical episode represent unique providers in the analytical sample across the clinical episodes. The number of BPCI episodes and the proportion of episodes from BPCI providers that stopped participating in the clinical episode are calculated by summing episodes across the clinical episodes. Average length of participation is calculated as an average of all provider/clinical episode combinations in the analytical sample across the clinical episodes. The average length of participation varies because providers and other organizations that volunteered to participate in BPCI could enter into the risk-bearing phase of the initiative during a two-year period through September 2015, and they could enter additional clinical episodes through December 2015. Providers could stop participating in a given clinical episode or terminate their participation in the initiative completely at any time.

Results reflect Lewin analysis of Medicare claims and enrollment data for the intervention period (Q4 2013 through Q3 2018) for BPCI providers.

[1] The report is available for download at https://innovation.cms.gov/initiatives/Bundled-Payments/index.html.

Exhibit D1: Characteristics of the Matched BPCI Providers Included in the BPCI Impact Estimates, by Clinical Episode, Model 2 Hospitals, Q4 2013 – Q3 2018

Clinical Episode	BPCI Hospitals (N)	BPCI Episodes (N)	Average Length of Participation (Quarters)	Hospitals that Stopped Participating in the Clinical Episode (N)	Proportion of Episodes from Hospitals that Stopped Participating in the Clinical Episode (%)
Acute myocardial infarction	93	10,249	9	52	40.1%
Cardiac arrhythmia	70	10,020	8	44	35.8%
Cardiac valve	31	7,052	10	18	38.0%
Cellulitis	79	9,230	9	42	34.3%
Cervical spinal fusion	34	2,089	9	20	31.4%
Chronic obstructive pulmonary disease, bronchitis, asthma	133	35,798	11	58	25.8%
Congestive heart failure	173	63,131	10	96	34.4%
Coronary artery bypass graft	43	5,898	12	17	30.1%
Diabetes	45	2,901	9	26	33.4%
Esophagitis, gastroenteritis, and other digestive disorders	58	7,232	8	37	38.6%
Fractures of the femur and hip or pelvis	47	2,064	10	25	30.4%
Gastrointestinal hemorrhage	58	6,915	6	45	48.7%
Gastrointestinal obstruction	51	2,959	7	35	46.0%
Hip & femur procedures except major joint	101	14,276	10	47	23.9%
Lower extremity and humerus procedures except hip, foot, femur	37	1,843	10	20	35.4%
Major bowel procedure	46	5,360	9	29	41.6%
Major joint replacement of the lower extremity	303	187,304	12	132	26.1%
Major joint replacement of the upper extremity	26	2,879	10	11	29.9%
Medical non-infectious orthopedic	94	13,091	9	48	24.7%

Clinical Episode	BPCI Hospitals (N)	BPCI Episodes (N)	Average Length of Participation (Quarters)	Hospitals that Stopped Participating in the Clinical Episode (N)	Proportion of Episodes from Hospitals that Stopped Participating in the Clinical Episode (%)
Nutritional and metabolic disorders	57	5,035	8	35	34.4%
Other respiratory	62	9,102	9	30	23.9%
Other vascular surgery	36	2,464	9	25	42.6%
Percutaneous coronary intervention	45	9,454	10	24	40.2%
Renal failure	75	13,537	9	44	36.6%
Revision of the hip or knee	32	2,056	9	18	24.5%
Sepsis	119	52,346	9	64	31.5%
Simple pneumonia and respiratory infections	132	41,778	10	68	31.5%
Spinal fusion (non-cervical)	46	6,053	9	25	29.2%
Stroke	77	23,384	10	39	30.0%
Syncope & collapse	37	2,499	9	20	36.3%
Transient ischemia	30	1,857	10	16	29.2%
Urinary tract infection	83	16,268	10	38	22.0%
Medical Clinical Episodes	**284**	**316,305**	**9**	**239**	**32.1%**
Surgical Clinical Episodes	**344**	**259,819**	**10**	**233**	**27.5%**
All Clinical Episodes	**406**	**576,124**	**10**	**317**	**30.0%**

Exhibit D2: Characteristics of the Matched BPCI Providers Included in the BPCI Impact Estimates, by Clinical Episode, Model 2 PGPs, Q4 2013 – Q3 2018

Clinical Episodes	BPCI PGPs (N)	BPCI Episodes (N)	Average Length of Participation (Quarters)	PGPs that Stopped Participating in the Clinical Episode (N)	Proportion of Episodes from PGPs that Stopped Participating in the Clinical Episode (%)
Acute myocardial infarction	50	5,919	10	21	31.6%
Cardiac arrhythmia	34	4,777	10	20	56.6%
Cellulitis	52	4,262	9	27	44.7%
Chronic obstructive pulmonary disease, bronchitis, asthma	57	13,441	9	35	52.8%
Congestive heart failure	47	16,682	9	27	37.3%
Esophagitis, gastroenteritis, and other digestive disorders	44	5,053	9	22	40.0%
Gastrointestinal hemorrhage	35	3,577	9	19	57.4%
Gastrointestinal obstruction	37	2,397	9	22	43.1%
Hip & femur procedures except major joint	63	8,883	9	32	45.2%
Major joint replacement of the lower extremity	109	104,779	11	39	18.4%
Major joint replacement of the upper extremity	32	4,838	9	15	23.5%
Medical non-infectious orthopedic	42	4,593	9	24	57.7%
Nutritional and metabolic disorders	41	3,435	10	23	69.4%
Other respiratory	46	6,268	9	25	20.9%
Percutaneous coronary intervention	27	3,335	10	14	64.4%
Renal failure	42	7,791	9	24	52.8%
Sepsis	61	34,108	9	35	32.9%
Simple pneumonia and respiratory infections	62	16,091	9	30	29.4%
Spinal fusion (non-cervical)	18	3,512	10	8	29.5%
Stroke	36	4,928	10	16	38.0%
Urinary tract infection	51	7,920	10	25	62.4%

Clinical Episodes	BPCI PGPs (N)	BPCI Episodes (N)	Average Length of Participation (Quarters)	PGPs that Stopped Participating in the Clinical Episode (N)	Proportion of Episodes from PGPs that Stopped Participating in the Clinical Episode (%)
Medical Clinical Episodes	**102**	**136,649**	**9**	**95**	**40.6%**
Surgical Clinical Episodes	**156**	**129,940**	**10**	**93**	**23.3%**
All Clinical Episodes	**189**	**266,589**	**9**	**140**	**32.2%**

Exhibit D3: Characteristics of the Matched BPCI Providers Included in the BPCI Impact Estimates, by Clinical Episode, Model 3 SNF, Q4 2013 – Q3 2018

Clinical Episodes	BPCI SNFs (N)	BPCI Episodes (N)	Average Length of Participation (Quarters)	SNFs that Stopped Participating in the Clinical Episode (N)	Proportion of Episodes from SNFs that Stopped Participating in the Clinical Episode (%)
Chronic obstructive pulmonary disease, bronchitis, asthma	98	1,287	10	55	46.9%
Congestive heart failure	182	4,805	10	90	31.1%
Hip & femur procedures except major joint	119	4,772	11	40	8.5%
Major joint replacement of the lower extremity	220	11,031	11	94	15.1%
Medical non-infectious orthopedic	125	3,443	10	64	33.9%
Other respiratory	78	1,039	10	45	46.9%
Renal failure	97	1,937	10	55	52.0%
Sepsis	194	7,508	10	98	32.9%
Simple pneumonia and respiratory infections	237	4,892	10	114	30.0%
Stroke	98	2,022	10	50	35.5%
Urinary tract infection	153	2,958	10	88	42.4%
All Clinical Episodes	**493**	**45,694**	**10**	**335**	**27.9%**

Exhibit D4: Characteristics of the Matched BPCI Providers Included in the BPCI Impact Estimates, by Clinical Episode, Model 3 HHA, Q4 2013 – Q3 2018

Clinical Episodes	BPCI HHAs (N)	BPCI Episodes (N)	Average Length of Participation (Quarters)	HHAs that Stopped Participating in the Clinical Episode (N)	Proportion of Episodes from HHAs that Stopped Participating in the Clinical Episode (%)
Congestive heart failure	46	6,609	7	37	15.9%
Major joint replacement of the lower extremity	37	6,803	9	22	11.9%
Simple pneumonia and respiratory infections	37	1,638	8	31	48.2%
All Clinical Episodes	**71**	**15,050**	**8**	**57**	**17.6%**

Exhibit D5: Characteristics of the Matched BPCI Providers included in the BPCI Impact Estimates, by Clinical Episode, Model 4 Hospitals, Q4 2013 – Q3 2018

Clinical Episodes	BPCI Hospitals (N)	BPCI Episodes (N)	Average Length of Participation (Quarters)	Hospitals that Stopped Participating in the Clinical Episode (N)	Proportion of Episodes from Hospitals that Stopped Participating in the Clinical Episode (%)
Coronary artery bypass graft	7	1,124	8	7	100.0%
Major joint replacement of lower extremity	14	7,122	7	12	51.7%
All Clinical Episodes	**17**	**8,246**	**7**	**16**	**58.3%**

Appendix E: Impact of BPCI on Payment, Utilization, and Quality Measures, Baseline to Intervention, Model 2 Hospital-initiated Episodes

The following tables display risk-adjusted difference-in-differences results for the payment, utilization, and quality measures assessed in the report. Results are presented by clinical episode. The DiD estimates are also presented as a percentage of what episode payments would have been absent BPCI, which is calculated as the average BPCI baseline payment amount plus the average change in the episode payment amount for the comparison group from baseline to intervention. 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-discharge period
- IP = inpatient hospitalizations
- PAC = post-acute care
- SNF = skilled nursing facility
- IRF = inpatient rehabilitation facility

An asterisk (*) indicates the estimate may be biased because we reject the null hypothesis that BPCI and comparison episodes were on parallel trends for this outcome during the baseline period (with 90% confidence), which is required for an unbiased estimate. Equal trends test was conducted for the total allowed payment amount, mortality, readmission rate, and emergency department visits.

Note that sample sizes reflect the number of episodes initiated during the intervention period that met inclusion criteria for the given outcome. Medicare payments are risk-adjusted and standardized to remove the effect of geographic differences in wages, extra amounts to account for teaching programs and other policy factors. Results reflect Lewin analysis of Medicare claims, assessment, and enrollment data for episodes that began Q4 2011 through Q3 2012 (baseline) and Q4 2013 through Q3 2018 (intervention period) for BPCI episode initiators and the matched comparison providers.

Exhibit E.1: Acute Myocardial Infarction Episodes, Model 2 Hospitals, Q4 2011 – Q3 2018

Outcome	BPCI Episodes (N)	Comparison Episodes (N)	BPCI Baseline	BPCI Intervention	Comparison Baseline	Comparison Intervention	DiD	95% LCI	95% UCI	90% LCI	90% UCI	DiD (%)
Standardized total allowed payment amount, IP through 90-day PDP	10,189	10,187	$26,298	$26,287	$26,143	$26,749	-$617	-$1,704	$470	-$1,530	$295	-2.3%
Standardized total amount paid by Medicare, IP through 90-day PDP	10,184	10,185	$23,551	$23,440	$23,310	$23,763	-$564	-$1,568	$440	-$1,407	$279	-2.3%
Readmissions standardized allowed amount, 90-day PDP	10,237	10,245	$4,877	$5,129	$4,968	$5,408	-$188	-$715	$340	-$630	$255	-3.5%
SNF standardized allowed amount, 90-day PDP	10,237	10,245	$3,716	$3,550	$3,981	$3,837	-$23	-$488	$441	-$413	$367	-0.6%
HHA standardized allowed amount, 90-day PDP	10,237	10,245	$1,100	$1,181	$1,082	$1,128	$34	-$59	$127	-$44	$112	3.0%
IRF standardized allowed amount, 90-day PDP	10,237	10,245	$492	$578	$530	$601	$15	-$166	$197	-$137	$167	2.7%
Patients discharged to a PAC facility	10,188	10,204	45.3%	43.6%	45.4%	42.7%	1.0	-1.4	3.4	-1.1	3.0	2.3%
Patients discharged to institutional PAC of those who were discharged to any PAC setting	4,507	4,282	53.7%	50.4%	53.3%	50.4%	-0.5	-4.4	3.5	-3.8	2.9	-0.9%
Number of SNF days, 90-day PDP	2,613	2,428	30.3	26.5	31.3	29.4	-1.8	-4.3	0.7	-3.9	0.3	-6.4%
Emergency department use, 90-day PDP	10,031	10,082	21.6%	24.0%	23.3%	25.8%	-0.1	-2.2	2.0	-1.9	1.7	-0.4%
Unplanned readmission rate, 90-day PDP	10,031	10,082	29.9%	28.1%	30.6%	29.3%	-0.6	-2.9	1.7	-2.5	1.4	-2.0%
All-cause mortality rate, 90-day PDP	9,954	10,015	18.3%	16.0%	17.5%	15.5%	-0.2	-2.0	1.6	-1.7	1.3	-1.3%

Exhibit E.2: Cardiac Arrhythmia Episodes, Model 2 Hospitals, Q4 2011 – Q3 2018

Outcome	BPCI Episodes (N)	Comparison Episodes (N)	BPCI Baseline	BPCI Intervention	Comparison Baseline	Comparison Intervention	DiD	95% LCI	95% UCI	90% LCI	90% UCI	DiD (%)
Standardized total allowed payment amount, IP through 90-day PDP	9,954	9,912	$17,122	$17,663	$16,808	$18,091	-$742	-$1,417	-$67	-$1,309	-$176	-4.0%
Standardized total amount paid by Medicare, IP through 90-day PDP	9,949	9,905	$14,698	$15,073	$14,453	$15,399	-$570	-$1,192	$51	-$1,092	-$49	-3.6%
Readmissions standardized allowed amount, 90-day PDP	10,019	10,017	$3,331	$3,539	$3,373	$3,632	-$52	-$421	$317	-$361	$258	-1.4%
SNF standardized allowed amount, 90-day PDP	10,019	10,017	$2,755	$2,504	$2,405	$2,540	-$386	-$723	-$48	-$669	-$102	-13.3%
HHA standardized allowed amount, 90-day PDP	10,019	10,017	$844	$937	$831	$844	$81	$2	$160	$15	$147	9.5%
IRF standardized allowed amount, 90-day PDP	10,019	10,017	$352	$369	$386	$458	-$55	-$197	$87	-$174	$64	-13.0%
Patients discharged to a PAC facility	10,013	10,005	32.6%	31.9%	30.4%	30.3%	-0.6	-2.6	1.4	-2.3	1.1	-1.9%
Patients discharged to institutional PAC of those who were discharged to any PAC setting	3,375	2,956	43.0%	42.2%	40.4%	41.8%	-2.2	-6.5	2.1	-5.8	1.4	-5.0%
Number of SNF days, 90-day PDP	1,833	1,488	32.8	27.5	33.1	31.3	-3.5	-6.2	-0.7	-5.7	-1.2	-11.2%
Emergency department use, 90-day PDP	9,918	9,927	21.5%	24.4%	22.1%	23.4%	1.7	-0.2	3.6	0.1	3.3	7.5%
Unplanned readmission rate, 90-day PDP	9,918	9,927	22.3%	21.7%	23.6%	22.8%	0.4	-1.5	2.2	-1.2	1.9	1.7%
All-cause mortality rate, 90-day PDP	9,862	9,897	7.2%	6.9%	7.5%	7.0%	0.3	-1.0	1.5	-0.8	1.3	3.9%

Exhibit E.3: Cardiac Valve Episodes, Model 2 Hospitals, Q4 2011 – Q3 2018

Outcome	BPCI Episodes (N)	Comparison Episodes (N)	BPCI Baseline	BPCI Intervention	Comparison Baseline	Comparison Intervention	DiD	95% LCI	95% UCI	90% LCI	90% UCI	DiD (%)
Standardized total allowed payment amount, IP through 90-day PDP	7,036	7,040	$61,657	$60,226	$63,061	$61,304	$326	-$1,399	$2,051	-$1,121	$1,774	0.5%
Standardized total amount paid by Medicare, IP through 90-day PDP	7,036	7,040	$58,115	$56,917	$59,390	$57,874	$318	-$1,285	$1,921	-$1,027	$1,663	0.6%
Readmissions standardized allowed amount, 90-day PDP	7,043	7,052	$3,931	$3,334	$4,017	$3,492	-$72	-$620	$475	-$532	$387	-2.1%
SNF standardized allowed amount, 90-day PDP	7,043	7,052	$3,898	$2,724	$4,076	$3,315	-$413	-$1,205	$378	-$1,078	$251	-13.2%
HHA standardized allowed amount, 90-day PDP	7,043	7,052	$1,821	$1,788	$1,828	$1,678	$116	-$85	$317	-$53	$285	6.9%
IRF standardized allowed amount, 90-day PDP	7,043	7,052	$2,176	$1,678	$2,046	$1,570	-$22	-$894	$851	-$754	$710	-1.3%
Patients discharged to a PAC facility	7,048	7,048	75.5%	67.7%	77.4%	66.4%	3.2	-4.8	11.2	-3.6	9.9	4.9%
Patients discharged to institutional PAC of those who were discharged to any PAC setting	4,852	4,584	54.2%	35.5%	52.8%	45.9%	-11.8	-19.1	-4.5	-18.0	-5.6	-25.0%
Number of SNF days, 90-day PDP	1,421	1,798	24.9	24.1	25.7	23.8	1.0	-1.5	3.6	-1.1	3.2	4.5%
Emergency department use, 90-day PDP	7,033	7,045	20.5%	22.1%	20.8%	22.8%	-0.4	-3.2	2.4	-2.7	1.9	-1.8%
Unplanned readmission rate, 90-day PDP	7,033	7,045	26.9%	21.1%	28.1%	23.1%	-0.8*	-3.6	1.9	-3.1	1.5	-3.8%
All-cause mortality rate, 90-day PDP	7,017	7,040	4.8%	3.3%	4.6%	3.2%	0.0	-1.8	1.7	-1.5	1.4	-0.9%

Exhibit E.4: Cellulitis Episodes, Model 2 Hospitals, Q4 2011 – Q3 2018

Outcome	BPCI Episodes (N)	Comparison Episodes (N)	BPCI Baseline	BPCI Intervention	Comparison Baseline	Comparison Intervention	DiD	95% LCI	95% UCI	90% LCI	90% UCI	DiD (%)
Standardized total allowed payment amount, IP through 90-day PDP	9,116	9,117	$19,598	$19,755	$19,627	$20,630	-$847	-$1,672	-$21	-$1,539	-$154	-4.1%
Standardized total amount paid by Medicare, IP through 90-day PDP	9,109	9,112	$16,958	$17,040	$16,921	$17,687	-$684	-$1,421	$53	-$1,302	-$65	-3.9%
Readmissions standardized allowed amount, 90-day PDP	9,228	9,229	$3,158	$3,420	$2,994	$3,377	-$120	-$482	$241	-$424	$183	-3.4%
SNF standardized allowed amount, 90-day PDP	9,228	9,229	$4,209	$3,784	$4,254	$4,497	-$668	-$1,173	-$163	-$1,092	-$244	-15.0%
HHA standardized allowed amount, 90-day PDP	9,228	9,229	$1,339	$1,553	$1,321	$1,466	$68	-$26	$163	-$11	$148	4.6%
IRF standardized allowed amount, 90-day PDP	9,228	9,229	$500	$453	$427	$448	-$68	-$247	$111	-$218	$82	-13.0%
Patients discharged to a PAC facility	9,229	9,230	50.9%	50.3%	49.6%	48.9%	0.1	-2.2	2.4	-1.8	2.0	0.3%
Patients discharged to institutional PAC of those who were discharged to any PAC setting	4,717	4,468	46.8%	43.9%	44.0%	43.4%	-2.4	-6.4	1.5	-5.7	0.9	-5.2%
Number of SNF days, 90-day PDP	2,439	2,285	33.9	28.6	35.2	32.5	-2.6	-5.3	0.1	-4.8	-0.3	-8.2%
Emergency department use, 90-day PDP	9,063	9,095	23.4%	25.0%	21.6%	22.9%	0.3	-1.6	2.1	-1.3	1.8	1.2%
Unplanned readmission rate, 90-day PDP	9,063	9,095	24.2%	24.1%	24.8%	24.5%	0.1	-2.0	2.3	-1.7	2.0	0.6%
All-cause mortality rate, 90-day PDP	9,012	9,040	6.2%	5.8%	6.3%	5.8%	0.1	-1.0	1.3	-0.9	1.1	2.2%

Exhibit E.5: Cervical Spinal Fusion Episodes, Model 2 Hospitals, Q4 2011 – Q3 2018

Outcome	BPCI Episodes (N)	Comparison Episodes (N)	BPCI Baseline	BPCI Intervention	Comparison Baseline	Comparison Intervention	DiD	95% LCI	95% UCI	90% LCI	90% UCI	DiD (%)
Standardized total allowed payment amount, IP through 90-day PDP	2,040	2,065	$29,819	$31,746	$29,845	$31,544	$229	-$1,783	$2,241	-$1,460	$1,918	0.7%
Standardized total amount paid by Medicare, IP through 90-day PDP	2,040	2,064	$26,820	$28,681	$26,862	$28,378	$346	-$1,514	$2,206	-$1,215	$1,907	1.2%
Readmissions standardized allowed amount, 90-day PDP	2,088	2,088	$1,756	$1,839	$1,754	$1,630	$206	-$461	$874	-$354	$767	12.6%
SNF standardized allowed amount, 90-day PDP	2,088	2,088	$2,598	$2,203	$2,726	$2,649	-$318	-$1,169	$532	-$1,032	$395	-12.6%
HHA standardized allowed amount, 90-day PDP	2,088	2,088	$999	$1,136	$982	$1,069	$50	-$207	$307	-$166	$266	4.6%
IRF standardized allowed amount, 90-day PDP	2,088	2,088	$2,366	$2,684	$2,200	$2,327	$191	-$762	$1,144	-$609	$991	7.7%
Patients discharged to a PAC facility	2,089	2,089	37.9%	40.0%	36.9%	38.0%	1.0	-5.9	7.9	-4.8	6.8	2.5%
Patients discharged to institutional PAC of those who were discharged to any PAC setting	907	814	62.7%	55.1%	64.6%	57.9%	-0.9	-10.7	8.8	-9.1	7.3	-1.7%
Number of SNF days, 90-day PDP	345	349	31.0	27.9	30.2	29.8	-2.6	-9.3	4.0	-8.2	3.0	-8.6%
Emergency department use, 90-day PDP	2,087	2,085	20.7%	21.4%	20.5%	20.7%	0.5	-4.0	5.0	-3.2	4.3	2.5%
Unplanned readmission rate, 90-day PDP	2,087	2,085	11.4%	9.5%	11.5%	10.7%	-1.1	-5.0	2.8	-4.3	2.2	-10.3%
All-cause mortality rate, 90-day PDP	2,086	2,083	1.4%	1.2%	1.9%	1.5%	0.2	-1.0	1.5	-0.8	1.3	23.3%

Exhibit E.6: Chronic Obstructive Pulmonary Disease Bronchitis Asthma Episodes, Model 2 Hospitals, Q4 2011 – Q3 2018

Outcome	BPCI Episodes (N)	Comparison Episodes (N)	BPCI Baseline	BPCI Intervention	Comparison Baseline	Comparison Intervention	DiD	95% LCI	95% UCI	90% LCI	90% UCI	DiD (%)
Standardized total allowed payment amount, IP through 90-day PDP	35,333	35,297	$18,963	$19,072	$18,734	$19,418	-$575	-$1,046	-$103	-$971	-$179	-2.9%
Standardized total amount paid by Medicare, IP through 90-day PDP	35,302	35,267	$16,568	$16,570	$16,317	$16,801	-$481	-$917	-$45	-$847	-$115	-2.8%
Readmissions standardized allowed amount, 90-day PDP	35,774	35,792	$4,100	$4,222	$4,075	$4,189	$8	-$212	$227	-$177	$192	0.2%
SNF standardized allowed amount, 90-day PDP	35,774	35,792	$2,648	$2,458	$2,672	$2,814	-$332	-$541	-$123	-$507	-$157	-11.9%
HHA standardized allowed amount, 90-day PDP	35,774	35,792	$1,127	$1,239	$1,113	$1,144	$81	$22	$139	$32	$130	7.0%
IRF standardized allowed amount, 90-day PDP	35,774	35,792	$458	$462	$415	$447	-$29	-$130	$72	-$114	$56	-5.9%
Patients discharged to a PAC facility	35,791	35,790	39.9%	40.7%	39.7%	39.2%	1.2	-0.3	2.8	-0.1	2.5	3.1%
Patients discharged to institutional PAC of those who were discharged to any PAC setting	15,378	13,587	37.8%	34.9%	37.6%	37.5%	-2.8	-5.2	-0.4	-4.9	-0.8	-7.5%
Number of SNF days, 90-day PDP	7,130	6,414	30.4	25.5	30.9	28.4	-2.4	-4.0	-0.8	-3.7	-1.1	-8.6%
Emergency department use, 90-day PDP	35,276	35,357	23.9%	26.1%	24.1%	26.5%	-0.2	-1.4	1.0	-1.2	0.8	-0.8%
Unplanned readmission rate, 90-day PDP	35,276	35,357	32.2%	31.1%	32.5%	31.4%	0.0	-1.3	1.2	-1.1	1.0	-0.1%
All-cause mortality rate, 90-day PDP	34,982	35,141	8.6%	7.0%	8.7%	6.9%	0.2	-0.6	0.9	-0.5	0.8	2.3%

Exhibit E.7: Congestive Heart Failure Episodes, Model 2 Hospitals, Q4 2011 – Q3 2018

Outcome	BPCI Episodes (N)	Comparison Episodes (N)	BPCI Baseline	BPCI Intervention	Comparison Baseline	Comparison Intervention	DiD	95% LCI	95% UCI	90% LCI	90% UCI	DiD (%)
Standardized total allowed payment amount, IP through 90-day PDP	62,793	62,773	$24,749	$25,127	$24,430	$25,219	-$411	-$890	$69	-$813	-$8	-1.6%
Standardized total amount paid by Medicare, IP through 90-day PDP	62,764	62,742	$22,014	$22,282	$21,672	$22,243	-$303	-$737	$132	-$667	$62	-1.3%
Readmissions standardized allowed amount, 90-day PDP	63,076	63,120	$5,569	$5,804	$5,459	$5,747	-$53	-$284	$178	-$246	$140	-0.9%
SNF standardized allowed amount, 90-day PDP	63,076	63,120	$4,155	$3,894	$3,951	$4,100	-$409	-$645	-$174	-$607	-$212	-9.5%
HHA standardized allowed amount, 90-day PDP	63,076	63,120	$1,430	$1,582	$1,408	$1,488	$72	$4	$140	$15	$129	4.8%
IRF standardized allowed amount, 90-day PDP	63,076	63,120	$521	$540	$519	$623	-$85	-$182	$13	-$166	-$3	-13.6%
Patients discharged to a PAC facility	63,052	63,057	54.4%	54.4%	54.3%	52.6%	1.6	-0.1	3.3	0.2	3.1	3.1%
Patients discharged to institutional PAC of those who were discharged to any PAC setting	35,360	32,579	43.8%	40.8%	43.6%	41.5%	-0.8	-2.6	1.0	-2.4	0.7	-1.9%
Number of SNF days, 90-day PDP	17,849	16,333	30.7	27.0	30.8	29.3	-2.3	-3.3	-1.2	-3.2	-1.4	-7.8%
Emergency department use, 90-day PDP	62,486	62,588	22.2%	24.3%	21.7%	24.4%	-0.6	-1.5	0.3	-1.3	0.2	-2.3%
Unplanned readmission rate, 90-day PDP	62,486	62,588	37.6%	36.2%	38.0%	36.7%	0.0	-1.2	1.1	-1.0	0.9	-0.1%
All-cause mortality rate, 90-day PDP	61,627	62,025	19.0%	17.0%	19.1%	16.5%	0.6	-0.3	1.5	-0.2	1.4	3.7%

Exhibit E.8: Coronary Artery Bypass Graft Episodes, Model 2 Hospitals, Q4 2011 – Q3 2018

Outcome	BPCI Episodes (N)	Comparison Episodes (N)	BPCI Baseline	BPCI Intervention	Comparison Baseline	Comparison Intervention	DiD	95% LCI	95% UCI	90% LCI	90% UCI	DiD (%)
Standardized total allowed payment amount, IP through 90-day PDP	5,876	5,882	$47,162	$48,678	$47,816	$50,104	-$773	-$2,757	$1,211	-$2,438	$893	-1.6%
Standardized total amount paid by Medicare, IP through 90-day PDP	5,875	5,882	$44,038	$45,371	$44,601	$46,713	-$780	-$2,656	$1,097	-$2,355	$796	-1.7%
Readmissions standardized allowed amount, 90-day PDP	5,887	5,893	$2,714	$2,725	$2,452	$2,547	-$84	-$653	$485	-$562	$394	-3.0%
SNF standardized allowed amount, 90-day PDP	5,887	5,893	$3,025	$2,714	$2,796	$3,072	-$586	-$1,190	$18	-$1,093	-$79	-17.8%
HHA standardized allowed amount, 90-day PDP	5,887	5,893	$1,754	$1,883	$1,846	$1,973	$3	-$180	$186	-$151	$156	0.1%
IRF standardized allowed amount, 90-day PDP	5,887	5,893	$1,358	$1,243	$1,739	$2,138	-$514	-$1,072	$45	-$982	-$45	-29.2%
Patients discharged to a PAC facility	5,898	5,893	79.0%	76.9%	79.2%	81.0%	-3.8	-9.8	2.2	-8.8	1.3	-4.7%
Patients discharged to institutional PAC of those who were discharged to any PAC setting	4,729	4,607	39.8%	35.2%	42.9%	44.4%	-6.2	-11.4	-1.0	-10.6	-1.9	-15.0%
Number of SNF days, 90-day PDP	1,445	1,455	23.5	21.4	22.2	21.3	-1.1	-4.0	1.7	-3.5	1.3	-5.0%
Emergency department use, 90-day PDP	5,885	5,885	19.8%	22.5%	22.3%	22.2%	2.8	-0.5	6.1	0.0	5.6	14.1%
Unplanned readmission rate, 90-day PDP	5,885	5,885	19.8%	17.2%	19.9%	17.5%	-0.3	-3.3	2.7	-2.8	2.2	-1.7%
All-cause mortality rate, 90-day PDP	5,877	5,885	1.9%	1.9%	1.6%	1.3%	0.3	-0.6	1.2	-0.5	1.1	19.0%

Exhibit E.9: Diabetes Episodes, Model 2 Hospitals, Q4 2011 – Q3 2018

Outcome	BPCI Episodes (N)	Comparison Episodes (N)	BPCI Baseline	BPCI Intervention	Comparison Baseline	Comparison Intervention	DiD	95% LCI	95% UCI	90% LCI	90% UCI	DiD (%)
Standardized total allowed payment amount, IP through 90-day PDP	2,846	2,849	$22,048	$21,895	$21,594	$21,451	-$10	-$1,766	$1,745	-$1,484	$1,463	0.0%
Standardized total amount paid by Medicare, IP through 90-day PDP	2,844	2,843	$18,983	$18,995	$18,682	$18,315	$380	-$1,196	$1,955	-$943	$1,702	2.0%
Readmissions standardized allowed amount, 90-day PDP	2,901	2,900	$4,448	$4,533	$4,095	$4,206	-$27	-$784	$731	-$662	$609	-0.6%
SNF standardized allowed amount, 90-day PDP	2,901	2,900	$4,367	$3,779	$4,161	$4,396	-$823	-$1,660	$15	-$1,526	-$119	-17.9%
HHA standardized allowed amount, 90-day PDP	2,901	2,900	$1,181	$1,307	$1,266	$1,199	$192	$8	$377	$37	$348	17.3%
IRF standardized allowed amount, 90-day PDP												
Patients discharged to a PAC facility	2,901	2,900	46.6%	46.2%	48.1%	45.0%	2.6	-1.5	6.8	-0.8	6.1	6.1%
Patients discharged to institutional PAC of those who were discharged to any PAC setting	1,355	1,305	42.8%	44.1%	43.3%	44.6%	0.0	-6.3	6.3	-5.3	5.3	0.0%
Number of SNF days, 90-day PDP	729	723	37.6	29.3	35.9	34.0	-6.4	-11.0	-1.9	-10.3	-2.6	-18.0%
Emergency department use, 90-day PDP	2,810	2,844	26.4%	27.6%	25.6%	28.2%	-1.4	-5.5	2.7	-4.8	2.0	-4.9%
Unplanned readmission rate, 90-day PDP	2,810	2,844	31.1%	28.3%	28.7%	28.6%	-2.6	-7.0	1.7	-6.3	1.0	-8.5%
All-cause mortality rate, 90-day PDP	2,793	2,829	8.9%	6.8%	7.3%	6.8%	-1.7	-4.4	1.0	-3.9	0.6	-19.7%

Exhibit E.10: Esophagitis Gastroenteritis and Other Digestive Disorders Episodes, Model 2 Hospitals, Q4 2011 – Q3 2018

Outcome	BPCI Episodes (N)	Comparison Episodes (N)	BPCI Baseline	BPCI Intervention	Comparison Baseline	Comparison Intervention	DiD	95% LCI	95% UCI	90% LCI	90% UCI	DiD (%)
Standardized total allowed payment amount, IP through 90-day PDP	7,086	7,112	$16,738	$17,001	$16,115	$17,281	-$903	-$1,753	-$53	-$1,617	-$190	-5.0%
Standardized total amount paid by Medicare, IP through 90-day PDP	7,080	7,108	$14,350	$14,536	$13,707	$14,672	-$779	-$1,552	-$5	-$1,428	-$129	-5.1%
Readmissions standardized allowed amount, 90-day PDP	7,232	7,229	$3,523	$3,677	$3,280	$3,569	-$135	-$536	$267	-$472	$202	-3.5%
SNF standardized allowed amount, 90-day PDP	7,232	7,229	$2,461	$2,169	$2,269	$2,346	-$370	-$724	-$15	-$667	-$72	-14.6%
HHA standardized allowed amount, 90-day PDP	7,232	7,229	$848	$960	$840	$905	$46	-$42	$135	-$28	$121	5.1%
IRF standardized allowed amount, 90-day PDP	7,232	7,229	$411	$390	$247	$338	-$112	-$249	$25	-$227	$3	-22.3%
Patients discharged to a PAC facility	7,231	7,229	31.4%	31.2%	27.8%	28.2%	-0.6	-2.7	1.5	-2.3	1.1	-1.9%
Patients discharged to institutional PAC of those who were discharged to any PAC setting	2,320	1,999	43.1%	38.9%	36.6%	38.8%	-6.4	-10.8	-1.9	-10.1	-2.6	-14.1%
Number of SNF days, 90-day PDP	1,181	1,022	31.5	27.0	32.4	29.0	-1.0	-4.1	2.1	-3.6	1.6	-3.7%
Emergency department use, 90-day PDP	7,120	7,134	24.3%	26.6%	24.0%	25.1%	1.3	-0.8	3.3	-0.5	3.0	5.0%
Unplanned readmission rate, 90-day PDP	7,120	7,134	24.6%	24.3%	23.6%	24.7%	-1.4*	-3.6	0.8	-3.2	0.5	-5.4%
All-cause mortality rate, 90-day PDP	7,087	7,107	6.4%	6.1%	5.2%	5.4%	-0.5	-1.9	0.9	-1.7	0.6	-7.6%

Exhibit E.11: Fractures of the Femur, and Hip or Pelvis Episodes, Model 2 Hospitals, Q4 2011 – Q3 2018

Outcome	BPCI Episodes (N)	Comparison Episodes (N)	BPCI Baseline	BPCI Intervention	Comparison Baseline	Comparison Intervention	DiD	95% LCI	95% UCI	90% LCI	90% UCI	DiD (%)
Standardized total allowed payment amount, IP through 90-day PDP	2,052	2,044	$30,007	$30,219	$30,501	$30,396	$316	-$1,912	$2,545	-$1,554	$2,187	1.1%
Standardized total amount paid by Medicare, IP through 90-day PDP	2,051	2,042	$25,789	$26,270	$26,191	$26,289	$384	-$1,557	$2,325	-$1,245	$2,013	1.5%
Readmissions standardized allowed amount, 90-day PDP	2,064	2,064	$2,112	$2,663	$2,471	$2,525	$497	-$173	$1,166	-$65	$1,059	22.9%
SNF standardized allowed amount, 90-day PDP	2,064	2,064	$14,563	$13,386	$14,881	$13,553	$150	-$1,661	$1,962	-$1,370	$1,670	1.1%
HHA standardized allowed amount, 90-day PDP	2,064	2,064	$1,969	$2,193	$2,018	$2,127	$115	-$127	$357	-$88	$318	5.5%
IRF standardized allowed amount, 90-day PDP	2,064	2,064	$1,947	$1,869	$1,471	$2,177	-$784	-$1,768	$200	-$1,610	$42	-29.5%
Patients discharged to a PAC facility	2,063	2,062	87.9%	86.6%	88.9%	84.2%	3.4	-0.6	7.4	0.0	6.8	4.1%
Patients discharged to institutional PAC of those who were discharged to any PAC setting	1,797	1,725	89.9%	89.1%	87.9%	88.4%	-1.3	-4.8	2.1	-4.2	1.5	-1.5%
Number of SNF days, 90-day PDP	1,497	1,422	39.9	33.7	39.7	35.6	-2.1	-5.6	1.4	-5.0	0.8	-5.9%
Emergency department use, 90-day PDP	2,061	2,058	18.1%	18.4%	17.0%	18.5%	-1.3	-5.7	3.2	-5.0	2.5	-6.4%
Unplanned readmission rate, 90-day PDP	2,061	2,058	16.9%	18.9%	19.4%	18.7%	2.8	-1.8	7.3	-1.1	6.6	17.1%
All-cause mortality rate, 90-day PDP	2,008	2,015	10.5%	13.7%	12.1%	14.1%	1.2	-2.8	5.1	-2.2	4.5	9.2%

Exhibit E.12: Gastrointestinal Hemorrhage Episodes, Model 2 Hospitals, Q4 2011 – Q3 2018

Outcome	BPCI Episodes (N)	Comparison Episodes (N)	BPCI Baseline	BPCI Intervention	Comparison Baseline	Comparison Intervention	DiD	95% LCI	95% UCI	90% LCI	90% UCI	DiD (%)
Standardized total allowed payment amount, IP through 90-day PDP	6,878	6,873	$19,931	$19,858	$19,880	$20,684	-$876	-$1,776	$25	-$1,631	-$120	-4.2%
Standardized total amount paid by Medicare, IP through 90-day PDP	6,877	6,869	$17,342	$17,243	$17,292	$17,883	-$690	-$1,490	$110	-$1,362	-$19	-3.8%
Readmissions standardized allowed amount, 90-day PDP	6,914	6,912	$3,664	$3,860	$3,428	$3,692	-$68	-$490	$354	-$422	$286	-1.7%
SNF standardized allowed amount, 90-day PDP	6,914	6,912	$3,235	$2,775	$3,213	$3,292	-$539	-$1,026	-$52	-$948	-$130	-16.3%
HHA standardized allowed amount, 90-day PDP	6,914	6,912	$859	$962	$854	$899	$58	-$47	$164	-$31	$147	6.4%
IRF standardized allowed amount, 90-day PDP	6,914	6,912	$336	$319	$415	$467	-$69	-$248	$110	-$219	$81	-17.7%
Patients discharged to a PAC facility	6,909	6,911	36.7%	34.8%	34.6%	34.1%	-1.4	-4.3	1.4	-3.8	1.0	-3.9%
Patients discharged to institutional PAC of those who were discharged to any PAC setting	2,435	2,399	51.8%	47.1%	51.7%	48.7%	-1.7	-6.6	3.2	-5.8	2.4	-3.5%
Number of SNF days, 90-day PDP	1,386	1,358	32.5	28.4	32.3	30.9	-2.7	-6.0	0.6	-5.5	0.1	-8.7%
Emergency department use, 90-day PDP	6,834	6,837	18.1%	19.6%	18.0%	20.9%	-1.4	-3.5	0.6	-3.2	0.3	-6.8%
Unplanned readmission rate, 90-day PDP	6,834	6,837	25.7%	24.4%	24.4%	24.8%	-1.7*	-4.3	0.9	-3.9	0.5	-6.5%
All-cause mortality rate, 90-day PDP	6,793	6,784	10.5%	8.9%	9.7%	8.5%	-0.4*	-2.0	1.1	-1.7	0.9	-4.5%

Exhibit E.13: Gastrointestinal Obstruction Episodes, Model 2 Hospitals, Q4 2011 – Q3 2018

Outcome	BPCI Episodes (N)	Comparison Episodes (N)	BPCI Baseline	BPCI Intervention	Comparison Baseline	Comparison Intervention	DiD	95% LCI	95% UCI	90% LCI	90% UCI	DiD (%)
Standardized total allowed payment amount, IP through 90-day PDP	2,934	2,918	$16,990	$16,764	$17,361	$16,419	$715	-$506	$1,937	-$310	$1,740	4.5%
Standardized total amount paid by Medicare, IP through 90-day PDP	2,932	2,914	$14,676	$14,317	$15,061	$14,002	$700	-$428	$1,827	-$247	$1,646	5.1%
Readmissions standardized allowed amount, 90-day PDP	2,957	2,959	$3,521	$3,608	$4,026	$3,407	$706	$7	$1,405	$120	$1,292	24.3%
SNF standardized allowed amount, 90-day PDP	2,957	2,959	$2,317	$1,973	$2,159	$1,972	-$158	-$690	$374	-$605	$289	-7.4%
HHA standardized allowed amount, 90-day PDP	2,957	2,959	$680	$792	$731	$728	$115	-$5	$235	$14	$215	16.9%
IRF standardized allowed amount, 90-day PDP												
Patients discharged to a PAC facility	2,957	2,958	27.1%	26.4%	27.2%	24.9%	1.5	-1.8	4.7	-1.2	4.2	5.9%
Patients discharged to institutional PAC of those who were discharged to any PAC setting	801	726	50.7%	38.4%	43.9%	42.5%	-10.8	-18.8	-2.7	-17.6	-4.0	-21.9%
Number of SNF days, 90-day PDP	408	379	29.9	29.3	30.1	28.4	1.1	-3.5	5.7	-2.8	4.9	3.9%
Emergency department use, 90-day PDP	2,927	2,926	19.4%	21.8%	20.2%	21.0%	1.5	-2.0	5.1	-1.5	4.5	7.5%
Unplanned readmission rate, 90-day PDP	2,927	2,926	21.4%	22.3%	25.9%	23.1%	3.7	0.3	7.1	0.8	6.6	20.0%
All-cause mortality rate, 90-day PDP	2,908	2,900	9.6%	7.0%	8.4%	7.1%	-1.3	-3.3	0.7	-3.0	0.3	-15.7%

Exhibit E.14: Hip & Femur Procedures Except Major Joint Episodes, Model 2 Hospitals, Q4 2011 – Q3 2018

Outcome	BPCI Episodes (N)	Comparison Episodes (N)	BPCI Baseline	BPCI Intervention	Comparison Baseline	Comparison Intervention	DiD	95% LCI	95% UCI	90% LCI	90% UCI	DiD (%)
Standardized total allowed payment amount, IP through 90-day PDP	14,252	14,237	$44,097	$43,340	$43,274	$45,003	-$2,486	-$3,467	-$1,505	-$3,310	-$1,663	-5.4%
Standardized total amount paid by Medicare, IP through 90-day PDP	14,251	14,234	$38,712	$38,409	$38,019	$39,573	-$1,857	-$2,672	-$1,042	-$2,541	-$1,173	-4.6%
Readmissions standardized allowed amount, 90-day PDP	14,272	14,275	$2,839	$2,798	$2,756	$2,609	$105	-$180	$391	-$134	$345	3.9%
SNF standardized allowed amount, 90-day PDP	14,272	14,275	$17,784	$16,051	$16,819	$17,810	-$2,724	-$3,676	-$1,771	-$3,523	-$1,924	-14.5%
HHA standardized allowed amount, 90-day PDP	14,272	14,275	$1,968	$2,377	$1,949	$2,156	$202	$99	$305	$115	$288	9.3%
IRF standardized allowed amount, 90-day PDP	14,272	14,275	$3,367	$3,228	$3,675	$3,654	-$119	-$735	$498	-$636	$399	-3.5%
Patients discharged to a PAC facility	14,273	14,272	93.6%	94.2%	92.7%	94.0%	-0.8	-2.0	0.3	-1.8	0.1	-0.9%
Patients discharged to institutional PAC of those who were discharged to any PAC setting	13,516	13,355	93.4%	92.6%	92.9%	92.9%	-0.8	-2.1	0.6	-1.9	0.4	-0.8%
Number of SNF days, 90-day PDP	11,183	10,784	45.6	37.1	44.9	41.7	-5.3	-6.9	-3.6	-6.7	-3.8	-12.4%
Emergency department use, 90-day PDP	14,262	14,266	16.6%	18.7%	17.8%	18.2%	1.6	0.0	3.3	0.2	3.1	9.6%
Unplanned readmission rate, 90-day PDP	14,262	14,266	21.9%	20.2%	21.4%	19.8%	-0.2	-2.0	1.6	-1.7	1.4	-0.8%
All-cause mortality rate, 90-day PDP	14,030	13,986	10.4%	9.9%	9.7%	9.7%	-0.5	-1.8	0.9	-1.6	0.7	-4.4%

Exhibit E.15: Lower Extremity and Humerus Procedure Except Hip Foot Femur Episodes, Model 2 Hospitals, Q4 2011 – Q3 2018

Outcome	BPCI Episodes (N)	Comparison Episodes (N)	BPCI Baseline	BPCI Intervention	Comparison Baseline	Comparison Intervention	DiD	95% LCI	95% UCI	90% LCI	90% UCI	DiD (%)
Standardized total allowed payment amount, IP through 90-day PDP	1,813	1,807	$35,024	$37,420	$35,053	$38,699	-$1,250	-$3,662	$1,162	-$3,274	$774	-3.2%
Standardized total amount paid by Medicare, IP through 90-day PDP	1,812	1,806	$30,449	$32,814	$30,648	$33,730	-$718	-$2,818	$1,382	-$2,480	$1,045	-2.1%
Readmissions standardized allowed amount, 90-day PDP	1,843	1,842	$2,233	$2,675	$2,438	$2,552	$327	-$439	$1,094	-$316	$971	14.0%
SNF standardized allowed amount, 90-day PDP	1,843	1,842	$13,281	$13,337	$13,117	$13,963	-$790	-$2,699	$1,120	-$2,392	$813	-5.6%
HHA standardized allowed amount, 90-day PDP	1,843	1,842	$1,822	$1,962	$1,793	$2,056	-$124	-$396	$149	-$352	$105	-5.9%
IRF standardized allowed amount, 90-day PDP	1,843	1,842	$1,297	$1,401	$1,562	$2,016	-$349	-$1,147	$450	-$1,019	$322	-19.9%
Patients discharged to a PAC facility	1,843	1,842	79.8%	79.4%	82.4%	82.4%	-0.4	-5.4	4.6	-4.6	3.8	-0.4%
Patients discharged to institutional PAC of those who were discharged to any PAC setting	1,505	1,505	77.0%	81.0%	81.9%	77.9%	8.1	2.7	13.5	3.6	12.6	11.1%
Number of SNF days, 90-day PDP	1,149	1,081	44.8	40.0	42.0	44.1	-6.9	-11.4	-2.4	-10.7	-3.1	-14.8%
Emergency department use, 90-day PDP	1,842	1,841	16.6%	17.1%	16.3%	18.5%	-1.7	-6.5	3.1	-5.7	2.3	-9.2%
Unplanned readmission rate, 90-day PDP	1,842	1,841	16.3%	18.5%	18.5%	18.0%	2.7*	-1.9	7.3	-1.1	6.6	17.2%
All-cause mortality rate, 90-day PDP	1,838	1,837	4.9%	3.4%	3.4%	2.9%	-1.0*	-3.3	1.4	-2.9	1.0	-21.9%

Exhibit E.16: Major Bowel Procedure Episodes, Model 2 Hospitals, Q4 2011 – Q3 2018

Outcome	BPCI Episodes (N)	Comparison Episodes (N)	BPCI Baseline	BPCI Intervention	Comparison Baseline	Comparison Intervention	DiD	95% LCI	95% UCI	90% LCI	90% UCI	DiD (%)
Standardized total allowed payment amount, IP through 90-day PDP	5,323	5,330	$37,889	$36,372	$37,180	$35,796	-$133	-$1,740	$1,474	-$1,482	$1,216	-0.4%
Standardized total amount paid by Medicare, IP through 90-day PDP	5,322	5,328	$34,376	$33,016	$33,763	$32,437	-$34	-$1,503	$1,436	-$1,267	$1,200	-0.1%
Readmissions standardized allowed amount, 90-day PDP	5,352	5,359	$3,230	$3,709	$3,492	$3,433	$539	-$44	$1,122	$50	$1,028	17.0%
SNF standardized allowed amount, 90-day PDP	5,352	5,359	$3,968	$3,403	$3,736	$3,674	-$503	-$1,121	$115	-$1,021	$16	-12.9%
HHA standardized allowed amount, 90-day PDP	5,352	5,359	$1,348	$1,585	$1,377	$1,412	$201	$63	$340	$85	$318	14.6%
IRF standardized allowed amount, 90-day PDP	5,352	5,359	$857	$942	$819	$779	$124	-$166	$414	-$119	$367	15.2%
Patients discharged to a PAC facility	5,355	5,359	55.8%	57.6%	55.2%	53.0%	4.0	0.2	7.8	0.8	7.2	7.4%
Patients discharged to institutional PAC of those who were discharged to any PAC setting	3,090	2,779	52.4%	48.2%	50.3%	48.7%	-2.6	-7.3	2.1	-6.6	1.3	-5.2%
Number of SNF days, 90-day PDP	1,359	1,221	31.7	25.7	30.1	28.4	-4.3	-8.0	-0.6	-7.4	-1.2	-14.3%
Emergency department use, 90-day PDP	5,339	5,355	18.4%	21.3%	18.8%	19.9%	1.7	-1.3	4.7	-0.8	4.2	8.8%
Unplanned readmission rate, 90-day PDP	5,339	5,355	23.3%	24.3%	23.1%	23.1%	0.9	-2.5	4.3	-2.0	3.8	3.8%
All-cause mortality rate, 90-day PDP	5,322	5,343	6.9%	6.0%	6.7%	5.6%	0.2	-1.5	1.9	-1.2	1.7	3.8%

Exhibit E.17: Major Joint Replacement of the Lower Extremity Episodes, Model 2 Hospitals, Q4 2011 – Q3 2018

Outcome	BPCI Episodes (N)	Comparison Episodes (N)	BPCI Baseline	BPCI Intervention	Comparison Baseline	Comparison Intervention	DiD	95% LCI	95% UCI	90% LCI	90% UCI	DiD (%)
Standardized total allowed payment amount, IP through 90-day PDP	186,342	186,447	$27,476	$25,523	$27,012	$26,271	-$1,212	-$1,536	-$889	-$1,484	-$941	-4.5%
Standardized total amount paid by Medicare, IP through 90-day PDP	186,336	186,442	$24,803	$22,844	$24,356	$23,530	-$1,132	-$1,437	-$828	-$1,388	-$877	-4.7%
Readmissions standardized allowed amount, 90-day PDP	187,075	187,276	$1,232	$1,245	$1,140	$1,178	-$25	-$92	$42	-$81	$32	-2.0%
SNF standardized allowed amount, 90-day PDP	187,075	187,276	$5,407	$3,923	$5,291	$4,498	-$691	-$966	-$416	-$922	-$460	-15.0%
HHA standardized allowed amount, 90-day PDP	187,075	187,276	$2,184	$2,242	$2,277	$2,278	$58	-$50	$165	-$32	$147	2.6%
IRF standardized allowed amount, 90-day PDP	187,075	187,276	$1,598	$888	$1,428	$1,125	-$406	-$600	-$213	-$569	-$244	-31.4%
Patients discharged to a PAC facility	187,294	187,294	86.9%	78.5%	89.4%	83.9%	-3.0	-5.8	-0.3	-5.3	-0.7	-3.7%
Patients discharged to institutional PAC of those who were discharged to any PAC setting	151,207	153,524	61.5%	44.5%	59.3%	48.1%	-6.0	-8.4	-3.5	-8.0	-3.9	-11.8%
Number of SNF days, 90-day PDP	60,670	65,869	24.6	21.2	24.2	22.9	-2.1	-2.7	-1.5	-2.6	-1.6	-9.0%
Emergency department use, 90-day PDP	187,014	187,225	13.5%	14.5%	13.8%	14.6%	0.3	-0.2	0.8	-0.2	0.7	1.9%
Unplanned readmission rate, 90-day PDP	187,014	187,225	10.0%	8.8%	9.5%	8.7%	-0.3	-0.8	0.1	-0.7	0.0	-3.7%
All-cause mortality rate, 90-day PDP	186,455	186,717	1.9%	1.8%	1.9%	1.8%	0.1	-0.1	0.2	-0.1	0.2	2.9%

Exhibit E.18: Major Joint Replacement of the Upper Extremity Episodes, Model 2 Hospitals, Q4 2011 – Q3 2018

Outcome	BPCI Episodes (N)	Comparison Episodes (N)	BPCI Baseline	BPCI Intervention	Comparison Baseline	Comparison Intervention	DiD	95% LCI	95% UCI	90% LCI	90% UCI	DiD (%)
Standardized total allowed payment amount, IP through 90-day PDP	2,859	2,845	$23,021	$24,613	$23,477	$24,573	$496	-$1,078	$2,070	-$825	$1,817	2.1%
Standardized total amount paid by Medicare, IP through 90-day PDP	2,859	2,844	$20,392	$21,950	$20,912	$21,890	$579*	-$831	$1,990	-$605	$1,763	2.7%
Readmissions standardized allowed amount, 90-day PDP	2,879	2,878	$610	$1,031	$897	$1,080	$239	-$135	$612	-$75	$552	30.1%
SNF standardized allowed amount, 90-day PDP	2,879	2,878	$3,288	$2,302	$3,606	$2,792	-$172	-$1,167	$822	-$1,007	$663	-7.0%
HHA standardized allowed amount, 90-day PDP	2,879	2,878	$1,387	$1,506	$1,462	$1,338	$243	-$91	$577	-$37	$523	19.2%
IRF standardized allowed amount, 90-day PDP												
Patients discharged to a PAC facility	2,879	2,879	48.7%	49.6%	50.0%	42.9%	8.0	0.1	15.8	1.4	14.5	19.1%
Patients discharged to institutional PAC of those who were discharged to any PAC setting	1,483	1,172	48.0%	36.3%	56.2%	36.9%	7.5	-4.9	20.0	-2.9	18.0	26.3%
Number of SNF days, 90-day PDP	492	464	29.5	25.2	28.0	29.1	-5.5	-10.4	-0.5	-9.6	-1.3	-17.8%
Emergency department use, 90-day PDP	2,879	2,876	14.4%	13.6%	14.6%	15.1%	-1.3	-5.1	2.4	-4.5	1.8	-9.0%
Unplanned readmission rate, 90-day PDP	2,879	2,876	6.5%	7.0%	8.5%	7.3%	1.7	-1.0	4.4	-0.5	3.9	32.0%
All-cause mortality rate, 90-day PDP												

Exhibit E.19: Medical Non-Infectious Orthopedic Episodes, Model 2 Hospitals, Q4 2011 – Q3 2018

Outcome	BPCI Episodes (N)	Comparison Episodes (N)	BPCI Baseline	BPCI Intervention	Comparison Baseline	Comparison Intervention	DiD	95% LCI	95% UCI	90% LCI	90% UCI	DiD (%)
Standardized total allowed payment amount, IP through 90-day PDP	12,904	12,814	$27,782	$27,557	$26,182	$28,085	-$2,128	-$3,162	-$1,095	-$2,996	-$1,261	-7.2%
Standardized total amount paid by Medicare, IP through 90-day PDP	12,890	12,807	$24,015	$24,011	$22,581	$24,250	-$1,674	-$2,581	-$766	-$2,435	-$912	-6.5%
Readmissions standardized allowed amount, 90-day PDP	13,090	13,089	$3,460	$3,446	$3,315	$3,396	-$95	-$431	$242	-$377	$188	-2.7%
SNF standardized allowed amount, 90-day PDP	13,090	13,089	$10,188	$9,116	$9,539	$10,242	-$1,774	-$2,585	-$964	-$2,455	-$1,094	-16.3%
HHA standardized allowed amount, 90-day PDP	13,090	13,089	$1,664	$2,005	$1,702	$1,904	$138	$30	$245	$47	$228	7.4%
IRF standardized allowed amount, 90-day PDP	13,090	13,089	$1,843	$1,968	$1,163	$1,587	-$299	-$645	$46	-$589	-$10	-13.2%
Patients discharged to a PAC facility	13,085	13,089	70.5%	71.9%	68.6%	71.5%	-1.5	-3.8	0.7	-3.4	0.3	-2.1%
Patients discharged to institutional PAC of those who were discharged to any PAC setting	9,520	9,273	75.3%	75.8%	71.9%	74.8%	-2.4	-5.2	0.5	-4.8	0.0	-3.0%
Number of SNF days, 90-day PDP	7,003	6,805	39.2	31.4	38.8	35.5	-4.5	-6.6	-2.4	-6.3	-2.8	-12.6%
Emergency department use, 90-day PDP	12,969	12,995	20.7%	23.6%	21.2%	22.6%	1.5	-0.4	3.4	-0.1	3.1	6.7%
Unplanned readmission rate, 90-day PDP	12,969	12,995	23.6%	22.2%	23.6%	22.4%	-0.2	-2.0	1.7	-1.7	1.4	-0.7%
All-cause mortality rate, 90-day PDP	12,865	12,926	7.3%	6.9%	6.5%	6.9%	-0.9	-2.1	0.3	-1.9	0.1	-11.3%

Exhibit E.20: Nutritional and Metabolic Disorders Episodes, Model 2 Hospitals, Q4 2011 – Q3 2018

Outcome	BPCI Episodes (N)	Comparison Episodes (N)	BPCI Baseline	BPCI Intervention	Comparison Baseline	Comparison Intervention	DiD	95% LCI	95% UCI	90% LCI	90% UCI	DiD (%)
Standardized total allowed payment amount, IP through 90-day PDP	4,947	4,934	$20,194	$21,309	$21,261	$21,580	$797*	-$460	$2,053	-$258	$1,851	3.9%
Standardized total amount paid by Medicare, IP through 90-day PDP	4,941	4,931	$17,385	$18,390	$18,346	$18,488	$862*	-$246	$1,971	-$68	$1,793	4.9%
Readmissions standardized allowed amount, 90-day PDP	5,034	5,035	$3,460	$4,097	$4,004	$3,803	$837	$309	$1,365	$394	$1,280	25.7%
SNF standardized allowed amount, 90-day PDP	5,034	5,035	$5,379	$5,039	$5,119	$5,507	-$727	-$1,452	-$2	-$1,336	-$118	-12.6%
HHA standardized allowed amount, 90-day PDP	5,034	5,035	$1,072	$1,296	$1,077	$1,194	$108	-$17	$232	$3	$212	9.0%
IRF standardized allowed amount, 90-day PDP	5,034	5,035	$491	$464	$507	$569	-$88	-$325	$149	-$287	$111	-16.0%
Patients discharged to a PAC facility	5,034	5,029	47.9%	50.5%	48.4%	48.6%	2.4	-1.0	5.8	-0.4	5.3	5.1%
Patients discharged to institutional PAC of those who were discharged to any PAC setting	2,658	2,366	59.1%	52.1%	55.0%	55.0%	-6.9	-11.7	-2.2	-11.0	-2.9	-11.8%
Number of SNF days, 90-day PDP	1,625	1,499	35.4	30.8	36.0	34.0	-2.6	-6.1	0.8	-5.5	0.3	-7.8%
Emergency department use, 90-day PDP	4,970	4,972	23.3%	24.4%	22.6%	23.8%	-0.1	-2.9	2.7	-2.4	2.2	-0.4%
Unplanned readmission rate, 90-day PDP	4,970	4,972	24.9%	25.7%	26.2%	25.7%	1.3	-1.5	4.1	-1.0	3.6	5.3%
All-cause mortality rate, 90-day PDP	4,910	4,925	15.9%	14.0%	14.0%	14.0%	-1.9	-4.1	0.4	-3.8	0.0	-11.8%

Exhibit E.21: Other Respiratory Episodes, Model 2 Hospitals, Q4 2011 – Q3 2018

Outcome	BPCI Episodes (N)	Comparison Episodes (N)	BPCI Baseline	BPCI Intervention	Comparison Baseline	Comparison Intervention	DiD	95% LCI	95% UCI	90% LCI	90% UCI	DiD (%)
Standardized total allowed payment amount, IP through 90-day PDP	9,038	9,025	$29,434	$29,691	$29,196	$30,092	-$640	-$1,910	$630	-$1,706	$426	-2.1%
Standardized total amount paid by Medicare, IP through 90-day PDP	9,035	9,024	$26,406	$26,537	$26,212	$26,798	-$455	-$1,623	$712	-$1,435	$524	-1.7%
Readmissions standardized allowed amount, 90-day PDP	9,100	9,101	$5,324	$5,472	$5,308	$5,456	$1	-$591	$593	-$496	$498	0.0%
SNF standardized allowed amount, 90-day PDP	9,100	9,101	$4,039	$4,117	$3,970	$4,477	-$429	-$907	$49	-$830	-$27	-9.4%
HHA standardized allowed amount, 90-day PDP	9,100	9,101	$1,200	$1,308	$1,207	$1,255	$60	-$44	$164	-$27	$148	4.8%
IRF standardized allowed amount, 90-day PDP	9,100	9,101	$811	$619	$620	$720	-$292	-$512	-$72	-$476	-$107	-32.0%
Patients discharged to a PAC facility	9,051	9,061	51.8%	51.9%	50.6%	51.1%	-0.3	-3.4	2.8	-2.9	2.3	-0.6%
Patients discharged to institutional PAC of those who were discharged to any PAC setting	4,789	4,489	55.6%	51.1%	54.8%	53.2%	-2.9	-6.7	0.8	-6.1	0.2	-5.4%
Number of SNF days, 90-day PDP	2,595	2,381	30.7	27.5	30.1	30.4	-3.5	-6.0	-1.0	-5.6	-1.4	-11.2%
Emergency department use, 90-day PDP	8,947	8,981	21.9%	23.2%	22.0%	24.0%	-0.7	-3.0	1.5	-2.6	1.2	-3.0%
Unplanned readmission rate, 90-day PDP	8,947	8,981	33.1%	32.9%	34.0%	33.7%	0.1	-2.6	2.9	-2.2	2.5	0.4%
All-cause mortality rate, 90-day PDP	8,853	8,891	19.6%	17.6%	20.5%	18.3%	0.1*	-2.2	2.4	-1.8	2.0	0.7%

Exhibit E.22: Other Vascular Surgery Episodes, Model 2 Hospitals, Q4 2011 – Q3 2018

Outcome	BPCI Episodes (N)	Comparison Episodes (N)	BPCI Baseline	BPCI Intervention	Comparison Baseline	Comparison Intervention	DiD	95% LCI	95% UCI	90% LCI	90% UCI	DiD (%)
Standardized total allowed payment amount, IP through 90-day PDP	2,435	2,431	$36,673	$38,397	$36,136	$38,474	-$614	-$2,928	$1,700	-$2,556	$1,328	-1.6%
Standardized total amount paid by Medicare, IP through 90-day PDP	2,435	2,431	$33,078	$34,793	$32,670	$34,856	-$471	-$2,596	$1,655	-$2,255	$1,313	-1.3%
Readmissions standardized allowed amount, 90-day PDP	2,460	2,462	$5,513	$5,757	$5,867	$5,833	$279	-$772	$1,329	-$603	$1,160	5.1%
SNF standardized allowed amount, 90-day PDP	2,460	2,462	$5,002	$5,045	$4,134	$4,806	-$629	-$1,549	$291	-$1,401	$143	-11.1%
HHA standardized allowed amount, 90-day PDP	2,460	2,462	$1,467	$1,603	$1,401	$1,599	-$61	-$258	$135	-$226	$103	-3.7%
IRF standardized allowed amount, 90-day PDP	2,460	2,462	$1,131	$1,551	$1,081	$1,264	$237	-$311	$786	-$223	$698	18.1%
Patients discharged to a PAC facility	2,464	2,461	57.7%	56.7%	52.2%	56.4%	-5.2	-10.6	0.2	-9.7	-0.6	-8.4%
Patients discharged to institutional PAC of those who were discharged to any PAC setting	1,439	1,386	55.2%	53.3%	48.6%	48.2%	-1.6	-9.1	6.0	-7.9	4.8	-2.8%
Number of SNF days, 90-day PDP	759	705	35.4	31.3	34.3	32.6	-2.4	-6.8	2.0	-6.1	1.3	-7.0%
Emergency department use, 90-day PDP	2,447	2,454	21.3%	23.2%	21.1%	24.8%	-1.8*	-5.9	2.4	-5.3	1.7	-7.1%
Unplanned readmission rate, 90-day PDP	2,447	2,454	27.6%	27.9%	29.9%	28.9%	1.3	-3.3	6.0	-2.6	5.3	5.1%
All-cause mortality rate, 90-day PDP	2,434	2,438	10.0%	8.0%	9.7%	6.6%	1.1	-1.7	3.9	-1.3	3.5	15.9%

Exhibit E.23: Percutaneous Coronary Intervention Episodes, Model 2 Hospitals, Q4 2011 – Q3 2018

Outcome	BPCI Episodes (N)	Comparison Episodes (N)	BPCI Baseline	BPCI Intervention	Comparison Baseline	Comparison Intervention	DiD	95% LCI	95% UCI	90% LCI	90% UCI	DiD (%)
Standardized total allowed payment amount, IP through 90-day PDP	9,314	9,345	$24,309	$27,449	$24,471	$27,350	$260*	-$581	$1,102	-$445	$966	1.0%
Standardized total amount paid by Medicare, IP through 90-day PDP	9,309	9,341	$21,962	$24,776	$22,133	$24,662	$284*	-$502	$1,070	-$376	$944	1.2%
Readmissions standardized allowed amount, 90-day PDP	9,453	9,451	$3,105	$3,719	$3,575	$3,605	$584	$120	$1,047	$195	$973	18.6%
SNF standardized allowed amount, 90-day PDP	9,453	9,451	$1,300	$1,479	$1,074	$1,423	-$170	-$436	$96	-$393	$53	-10.3%
HHA standardized allowed amount, 90-day PDP	9,453	9,451	$652	$723	$594	$640	$25	-$76	$127	-$60	$111	3.7%
IRF standardized allowed amount, 90-day PDP	9,453	9,451	$415	$361	$397	$413	-$70	-$221	$81	-$197	$56	-16.3%
Patients discharged to a PAC facility	9,451	9,449	22.4%	22.8%	20.0%	20.9%	-0.5	-3.5	2.6	-3.0	2.1	-2.0%
Patients discharged to institutional PAC of those who were discharged to any PAC setting	2,243	1,975	40.0%	37.6%	34.7%	36.4%	-4.2	-11.1	2.6	-10.0	1.5	-10.1%
Number of SNF days, 90-day PDP	995	853	29.2	27.1	28.5	27.9	-1.5	-5.5	2.4	-4.8	1.8	-5.4%
Emergency department use, 90-day PDP	9,412	9,412	20.0%	23.9%	21.0%	25.9%	-1.1	-3.3	1.1	-2.9	0.8	-4.3%
Unplanned readmission rate, 90-day PDP	9,412	9,412	19.0%	21.1%	21.0%	20.0%	3.2*	0.9	5.4	1.3	5.0	17.5%
All-cause mortality rate, 90-day PDP	9,397	9,406	3.5%	3.8%	3.8%	3.7%	0.4	-0.7	1.5	-0.6	1.3	10.9%

Exhibit E.24: Renal Failure Episodes, Model 2 Hospitals, Q4 2011 – Q3 2018

Outcome	BPCI Episodes (N)	Comparison Episodes (N)	BPCI Baseline	BPCI Intervention	Comparison Baseline	Comparison Intervention	DiD	95% LCI	95% UCI	90% LCI	90% UCI	DiD (%)
Standardized total allowed payment amount, IP through 90-day PDP	13,407	13,376	$24,870	$24,085	$25,038	$25,810	-$1,557	-$2,411	-$704	-$2,274	-$841	-6.1%
Standardized total amount paid by Medicare, IP through 90-day PDP	13,395	13,364	$21,789	$21,060	$21,966	$22,445	-$1,208	-$1,961	-$456	-$1,840	-$577	-5.4%
Readmissions standardized allowed amount, 90-day PDP	13,530	13,531	$4,246	$4,311	$4,374	$4,520	-$80	-$446	$285	-$387	$226	-1.8%
SNF standardized allowed amount, 90-day PDP	13,530	13,531	$5,849	$5,211	$5,465	$6,160	-$1,333	-$1,849	-$817	-$1,766	-$900	-20.4%
HHA standardized allowed amount, 90-day PDP	13,530	13,531	$1,190	$1,348	$1,216	$1,293	$82	-$6	$170	$8	$156	6.5%
IRF standardized allowed amount, 90-day PDP	13,530	13,531	$624	$712	$707	$916	-$121	-$336	$95	-$301	$60	-14.5%
Patients discharged to a PAC facility	13,520	13,515	52.7%	52.3%	52.7%	52.6%	-0.3	-2.4	1.7	-2.1	1.4	-0.7%
Patients discharged to institutional PAC of those who were discharged to any PAC setting	7,254	6,970	58.3%	55.6%	56.5%	58.1%	-4.3	-7.6	-1.0	-7.1	-1.6	-7.2%
Number of SNF days, 90-day PDP	4,631	4,345	36.0	29.6	35.9	34.5	-4.9	-7.1	-2.7	-6.8	-3.1	-14.2%
Emergency department use, 90-day PDP	13,379	13,384	23.3%	25.1%	22.2%	24.5%	-0.4	-2.2	1.4	-1.9	1.2	-1.4%
Unplanned readmission rate, 90-day PDP	13,379	13,384	29.8%	29.1%	31.2%	30.0%	0.5	-1.5	2.5	-1.2	2.2	1.8%
All-cause mortality rate, 90-day PDP	13,236	13,244	17.5%	16.2%	17.1%	15.7%	0.1	-1.6	1.9	-1.4	1.6	0.7%

Exhibit E.25: Revision of the Hip or Knee Episodes, Model 2 Hospitals, Q4 2011 – Q3 2018

Outcome	BPCI Episodes (N)	Comparison Episodes (N)	BPCI Baseline	BPCI Intervention	Comparison Baseline	Comparison Intervention	DiD	95% LCI	95% UCI	90% LCI	90% UCI	DiD (%)
Standardized total allowed payment amount, IP through 90-day PDP	2,052	2,054	$35,728	$37,483	$36,277	$37,973	$60	-$2,084	$2,204	-$1,740	$1,859	0.2%
Standardized total amount paid by Medicare, IP through 90-day PDP	2,052	2,054	$32,575	$34,152	$33,025	$34,555	$47	-$1,919	$2,013	-$1,603	$1,697	0.1%
Readmissions standardized allowed amount, 90-day PDP	2,056	2,056	$2,179	$2,781	$2,706	$2,504	$805	$11	$1,599	$139	$1,471	40.7%
SNF standardized allowed amount, 90-day PDP	2,056	2,056	$6,475	$5,678	$6,648	$6,638	-$787	-$2,055	$481	-$1,851	$278	-12.2%
HHA standardized allowed amount, 90-day PDP	2,056	2,056	$2,293	$2,337	$2,235	$2,240	$40	-$368	$448	-$303	$382	1.7%
IRF standardized allowed amount, 90-day PDP	2,056	2,056	$1,233	$1,098	$1,051	$1,002	-$86	-$645	$472	-$555	$382	-7.3%
Patients discharged to a PAC facility	2,056	2,056	84.5%	81.9%	85.5%	80.9%	2.0	-5.9	9.9	-4.6	8.6	2.5%
Patients discharged to institutional PAC of those who were discharged to any PAC setting	1,730	1,620	67.4%	52.1%	59.6%	56.1%	-11.7	-20.1	-3.4	-18.7	-4.7	-18.4%
Number of SNF days, 90-day PDP	886	849	26.4	26.5	27.3	26.7	0.6	-3.5	4.7	-2.8	4.1	2.4%
Emergency department use, 90-day PDP	2,056	2,055	16.9%	21.3%	17.5%	20.6%	1.3	-3.9	6.5	-3.0	5.7	6.6%
Unplanned readmission rate, 90-day PDP	2,056	2,055	16.5%	15.7%	17.1%	16.0%	0.4	-3.4	4.2	-2.7	3.6	2.8%
All-cause mortality rate, 90-day PDP	2,053	2,053	1.1%	1.3%	0.6%	1.2%	-0.4	-1.3	0.5	-1.2	0.3	-24.4%

Exhibit E.26: Sepsis Episodes, Model 2 Hospitals, Q4 2011 – Q3 2018

Outcome	BPCI Episodes (N)	Comparison Episodes (N)	BPCI Baseline	BPCI Intervention	Comparison Baseline	Comparison Intervention	DiD	95% LCI	95% UCI	90% LCI	90% UCI	DiD (%)
Standardized total allowed payment amount, IP through 90-day PDP	52,081	52,063	$31,468	$31,045	$31,680	$31,603	-$345	-$1,203	$513	-$1,066	$375	-1.1%
Standardized total amount paid by Medicare, IP through 90-day PDP	52,051	52,035	$27,974	$27,574	$28,202	$27,930	-$129	-$910	$652	-$784	$526	-0.5%
Readmissions standardized allowed amount, 90-day PDP	52,322	52,331	$4,604	$4,863	$4,636	$4,708	$188	-$74	$450	-$32	$408	4.0%
SNF standardized allowed amount, 90-day PDP	52,322	52,331	$5,974	$5,577	$5,659	$6,037	-$775	-$1,131	-$419	-$1,074	-$476	-12.2%
HHA standardized allowed amount, 90-day PDP	52,322	52,331	$1,057	$1,224	$1,093	$1,142	$118	$59	$177	$68	$167	10.7%
IRF standardized allowed amount, 90-day PDP	52,322	52,331	$669	$689	$736	$798	-$43	-$190	$105	-$167	$81	-5.9%
Patients discharged to a PAC facility	52,203	52,218	55.7%	54.2%	55.7%	53.6%	0.6	-1.2	2.3	-0.9	2.0	1.0%
Patients discharged to institutional PAC of those who were discharged to any PAC setting	29,035	27,253	67.6%	62.7%	66.2%	63.8%	-2.6	-5.0	-0.3	-4.6	-0.7	-4.0%
Number of SNF days, 90-day PDP	18,436	16,890	35.0	30.4	35.1	33.5	-3.0	-4.3	-1.7	-4.1	-1.9	-9.0%
Emergency department use, 90-day PDP	51,755	51,870	18.9%	21.0%	18.7%	21.1%	-0.3	-1.3	0.8	-1.2	0.6	-1.2%
Unplanned readmission rate, 90-day PDP	51,755	51,870	29.5%	28.2%	29.2%	28.2%	-0.3	-1.5	0.9	-1.3	0.7	-1.2%
All-cause mortality rate, 90-day PDP	50,889	51,126	22.3%	20.0%	21.9%	19.6%	-0.1	-1.1	1.0	-0.9	0.8	-0.3%

Exhibit E.27: Simple Pneumonia and Respiratory Infections Episodes, Model 2 Hospitals, Q4 2011 – Q3 2018

Outcome	BPCI Episodes (N)	Comparison Episodes (N)	BPCI Baseline	BPCI Intervention	Comparison Baseline	Comparison Intervention	DiD	95% LCI	95% UCI	90% LCI	90% UCI	DiD (%)
Standardized total allowed payment amount, IP through 90-day PDP	41,481	41,498	$23,224	$22,512	$22,822	$22,933	-$823	-$1,310	-$336	-$1,232	-$415	-3.5%
Standardized total amount paid by Medicare, IP through 90-day PDP	41,454	41,470	$20,440	$19,735	$20,059	$19,986	-$633	-$1,077	-$188	-$1,006	-$260	-3.1%
Readmissions standardized allowed amount, 90-day PDP	41,733	41,771	$3,753	$3,801	$3,698	$3,663	$83	-$116	$281	-$84	$249	2.2%
SNF standardized allowed amount, 90-day PDP	41,733	41,771	$4,698	$4,218	$4,399	$4,673	-$754	-$1,031	-$477	-$986	-$521	-15.2%
HHA standardized allowed amount, 90-day PDP	41,733	41,771	$1,106	$1,272	$1,099	$1,209	$56	$4	$107	$13	$99	4.6%
IRF standardized allowed amount, 90-day PDP	41,733	41,771	$474	$554	$454	$516	$18	-$83	$119	-$67	$103	3.4%
Patients discharged to a PAC facility	41,747	41,752	49.8%	48.6%	49.4%	48.4%	-0.2	-1.6	1.2	-1.4	1.0	-0.4%
Patients discharged to institutional PAC of those who were discharged to any PAC setting	20,988	19,921	58.7%	53.5%	57.2%	53.9%	-2.0	-4.1	0.1	-3.7	-0.2	-3.6%
Number of SNF days, 90-day PDP	12,275	11,517	32.7	27.8	32.7	31.0	-3.3	-4.7	-2.0	-4.4	-2.2	-10.7%
Emergency department use, 90-day PDP	41,428	41,510	20.1%	21.9%	19.8%	21.5%	0.1	-0.9	1.0	-0.7	0.9	0.4%
Unplanned readmission rate, 90-day PDP	41,428	41,510	27.0%	25.1%	26.6%	25.4%	-0.6	-1.6	0.5	-1.4	0.3	-2.2%
All-cause mortality rate, 90-day PDP	40,882	41,106	18.1%	15.1%	17.6%	14.7%	0.0	-1.0	0.9	-0.8	0.7	-0.3%

Exhibit E.28: Spinal Fusion (Non-Cervical) Episodes, Model 2 Hospitals, Q4 2011 – Q3 2018

Outcome	BPCI Episodes (N)	Comparison Episodes (N)	BPCI Baseline	BPCI Intervention	Comparison Baseline	Comparison Intervention	DiD	95% LCI	95% UCI	90% LCI	90% UCI	DiD (%)
Standardized total allowed payment amount, IP through 90-day PDP	6,008	6,001	$40,308	$40,512	$39,841	$41,401	-$1,356	-$2,903	$191	-$2,654	-$57	-3.2%
Standardized total amount paid by Medicare, IP through 90-day PDP	6,003	6,001	$37,243	$37,462	$36,781	$38,228	-$1,229	-$2,679	$222	-$2,446	-$11	-3.2%
Readmissions standardized allowed amount, 90-day PDP	6,053	6,052	$1,883	$1,859	$1,741	$1,874	-$157	-$609	$294	-$536	$222	-7.8%
SNF standardized allowed amount, 90-day PDP	6,053	6,052	$2,928	$2,641	$2,619	$2,762	-$430	-$984	$123	-$895	$34	-14.0%
HHA standardized allowed amount, 90-day PDP	6,053	6,052	$1,290	$1,353	$1,238	$1,464	-$163	-$348	$23	-$319	-$7	-10.7%
IRF standardized allowed amount, 90-day PDP	6,053	6,052	$2,920	$2,252	$2,440	$2,380	-$608	-$1,391	$175	-$1,265	$50	-21.3%
Patients discharged to a PAC facility	6,053	6,051	55.0%	51.2%	53.5%	55.4%	-5.7	-11.2	-0.1	-10.3	-1.0	-10.0%
Patients discharged to institutional PAC of those who were discharged to any PAC setting	3,198	3,271	65.3%	59.0%	63.9%	57.9%	-0.3	-7.4	6.7	-6.3	5.6	-0.6%
Number of SNF days, 90-day PDP	1,335	1,412	24.9	21.2	22.6	21.8	-2.8	-5.6	0.1	-5.2	-0.4	-11.5%
Emergency department use, 90-day PDP	6,051	6,046	17.6%	20.2%	17.8%	19.3%	1.1	-1.6	3.8	-1.2	3.4	5.8%
Unplanned readmission rate, 90-day PDP	6,051	6,046	11.7%	11.2%	11.0%	10.2%	0.2	-1.8	2.2	-1.5	1.8	1.6%
All-cause mortality rate, 90-day PDP	6,050	6,045	1.0%	0.7%	0.6%	0.7%	-0.4	-1.0	0.3	-0.9	0.2	-35.1%

Exhibit E.29: Stroke Episodes, Model 2 Hospitals, Q4 2011 – Q3 2018

Outcome	BPCI Episodes (N)	Comparison Episodes (N)	BPCI Baseline	BPCI Intervention	Comparison Baseline	Comparison Intervention	DiD	95% LCI	95% UCI	90% LCI	90% UCI	DiD (%)
Standardized total allowed payment amount, IP through 90-day PDP	23,288	23,181	$31,542	$31,556	$31,578	$32,410	-$818	-$1,724	$89	-$1,579	-$57	-2.5%
Standardized total amount paid by Medicare, IP through 90-day PDP	23,287	23,176	$28,119	$28,041	$28,128	$28,778	-$728	-$1,544	$87	-$1,413	-$44	-2.5%
Readmissions standardized allowed amount, 90-day PDP	23,369	23,379	$2,965	$2,859	$2,837	$2,792	-$60	-$320	$199	-$278	$158	-2.1%
SNF standardized allowed amount, 90-day PDP	23,369	23,379	$7,815	$7,436	$7,686	$7,565	-$258	-$825	$309	-$733	$218	-3.4%
HHA standardized allowed amount, 90-day PDP	23,369	23,379	$1,483	$1,682	$1,481	$1,617	$62	-$28	$153	-$14	$139	3.9%
IRF standardized allowed amount, 90-day PDP	23,369	23,379	$5,616	$5,847	$5,801	$6,587	-$555	-$1,062	-$48	-$980	-$129	-8.7%
Patients discharged to a PAC facility	23,362	23,358	66.4%	64.1%	65.9%	64.9%	-1.3	-3.2	0.5	-2.9	0.2	-2.0%
Patients discharged to institutional PAC of those who were discharged to any PAC setting	15,238	15,036	77.9%	77.4%	78.3%	78.2%	-0.4	-2.4	1.6	-2.1	1.3	-0.5%
Number of SNF days, 90-day PDP	8,544	7,846	41.0	37.3	41.8	39.3	-1.3	-3.2	0.6	-2.9	0.3	-3.3%
Emergency department use, 90-day PDP	23,224	23,211	20.8%	22.9%	18.6%	21.3%	-0.5*	-2.0	1.0	-1.8	0.8	-2.2%
Unplanned readmission rate, 90-day PDP	23,224	23,211	22.7%	20.5%	22.2%	20.4%	-0.4	-2.0	1.2	-1.7	0.9	-1.9%
All-cause mortality rate, 90-day PDP	23,087	23,073	17.2%	15.4%	17.0%	15.7%	-0.5	-1.9	0.9	-1.7	0.7	-3.3%

Exhibit E.30: Syncope & Collapse Episodes, Model 2 Hospitals, Q4 2011 – Q3 2018

Outcome	BPCI Episodes (N)	Comparison Episodes (N)	BPCI Baseline	BPCI Intervention	Comparison Baseline	Comparison Intervention	DiD	95% LCI	95% UCI	90% LCI	90% UCI	DiD (%)
Standardized total allowed payment amount, IP through 90-day PDP	2,461	2,453	$15,897	$17,054	$16,057	$18,184	-$969	-$2,352	$414	-$2,129	$192	-5.4%
Standardized total amount paid by Medicare, IP through 90-day PDP	2,460	2,449	$13,478	$14,502	$13,633	$15,442	-$786	-$2,046	$475	-$1,843	$272	-5.1%
Readmissions standardized allowed amount, 90-day PDP	2,499	2,499	$2,328	$2,169	$2,597	$2,787	-$350	-$918	$218	-$827	$126	-13.9%
SNF standardized allowed amount, 90-day PDP	2,499	2,499	$3,641	$3,671	$3,422	$4,298	-$846	-$1,686	-$7	-$1,551	-$142	-18.7%
HHA standardized allowed amount, 90-day PDP	2,499	2,499	$1,202	$1,502	$1,199	$1,365	$134	-$93	$361	-$57	$325	9.8%
IRF standardized allowed amount, 90-day PDP												
Patients discharged to a PAC facility	2,499	2,499	42.9%	46.4%	42.4%	44.3%	1.5	-3.8	6.8	-2.9	6.0	3.4%
Patients discharged to institutional PAC of those who were discharged to any PAC setting	1,197	1,093	46.8%	46.1%	43.7%	47.9%	-4.9	-12.7	2.9	-11.5	1.6	-9.6%
Number of SNF days, 90-day PDP	608	585	34.7	28.8	33.9	32.8	-4.8	-9.1	-0.5	-8.4	-1.2	-14.3%
Emergency department use, 90-day PDP	2,453	2,449	22.1%	21.9%	22.5%	22.9%	-0.6*	-3.8	2.7	-3.3	2.2	-2.5%
Unplanned readmission rate, 90-day PDP	2,453	2,449	18.3%	17.5%	20.4%	19.9%	-0.4	-3.9	3.2	-3.3	2.6	-2.0%
All-cause mortality rate, 90-day PDP	2,440	2,440	5.1%	3.4%	5.1%	5.2%	-1.8	-3.8	0.1	-3.5	-0.2	-34.9%

Exhibit E.31: Transient Ischemia Episodes, Model 2 Hospitals, Q4 2011 – Q3 2018

Outcome	BPCI Episodes (N)	Comparison Episodes (N)	BPCI Baseline	BPCI Intervention	Comparison Baseline	Comparison Intervention	DiD	95% LCI	95% UCI	90% LCI	90% UCI	DiD (%)
Standardized total allowed payment amount, IP through 90-day PDP	1,841	1,845	$14,976	$15,645	$14,742	$15,746	-$334	-$1,993	$1,324	-$1,726	$1,057	-2.1%
Standardized total amount paid by Medicare, IP through 90-day PDP	1,841	1,844	$12,695	$13,202	$12,516	$13,199	-$177	-$1,684	$1,331	-$1,442	$1,089	-1.3%
Readmissions standardized allowed amount, 90-day PDP	1,856	1,857	$2,136	$2,062	$2,135	$2,042	$19	-$582	$620	-$485	$523	0.9%
SNF standardized allowed amount, 90-day PDP	1,856	1,857	$2,869	$3,012	$2,467	$3,142	-$532	-$1,322	$258	-$1,195	$131	-15.0%
HHA standardized allowed amount, 90-day PDP	1,856	1,857	$1,029	$1,357	$1,208	$1,198	$338	$111	$564	$147	$528	33.1%
IRF standardized allowed amount, 90-day PDP												
Patients discharged to a PAC facility	1,856	1,857	35.2%	39.7%	37.3%	37.1%	4.7	-0.3	9.6	0.5	8.8	13.3%
Patients discharged to institutional PAC of those who were discharged to any PAC setting	742	679	44.8%	43.6%	36.7%	45.5%	-10.0	-18.4	-1.6	-17.1	-3.0	-18.7%
Number of SNF days, 90-day PDP	357	311	32.9	29.1	32.2	33.7	-5.3	-11.2	0.6	-10.3	-0.4	-15.5%
Emergency department use, 90-day PDP	1,834	1,838	19.7%	23.2%	20.7%	24.2%	0.0	-4.0	3.9	-3.3	3.3	-0.1%
Unplanned readmission rate, 90-day PDP	1,834	1,838	18.3%	18.8%	19.3%	17.3%	2.5*	-1.5	6.5	-0.9	5.9	15.3%
All-cause mortality rate, 90-day PDP	1,829	1,835	3.6%	3.5%	2.9%	3.3%	-0.6	-2.4	1.3	-2.1	1.0	-13.9%

Exhibit E.32: Urinary Tract Infection Episodes, Model 2 Hospitals, Q4 2011 – Q3 2018

Outcome	BPCI Episodes (N)	Comparison Episodes (N)	BPCI Baseline	BPCI Intervention	Comparison Baseline	Comparison Intervention	DiD	95% LCI	95% UCI	90% LCI	90% UCI	DiD (%)
Standardized total allowed payment amount, IP through 90-day PDP	16,011	16,003	$22,225	$21,995	$22,169	$23,288	-$1,349	-$2,179	-$520	-$2,045	-$653	-5.8%
Standardized total amount paid by Medicare, IP through 90-day PDP	15,999	15,986	$19,149	$19,015	$19,122	$19,997	-$1,009	-$1,733	-$286	-$1,616	-$402	-5.0%
Readmissions standardized allowed amount, 90-day PDP	16,261	16,265	$3,361	$3,459	$3,389	$3,404	$83	-$235	$400	-$184	$349	2.5%
SNF standardized allowed amount, 90-day PDP	16,261	16,265	$6,500	$5,886	$6,312	$6,996	-$1,298	-$1,868	-$729	-$1,776	-$820	-18.1%
HHA standardized allowed amount, 90-day PDP	16,261	16,265	$1,299	$1,577	$1,394	$1,562	$111	$22	$200	$36	$186	7.6%
IRF standardized allowed amount, 90-day PDP	16,261	16,265	$806	$804	$657	$756	-$100	-$316	$117	-$282	$82	-11.1%
Patients discharged to a PAC facility	16,265	16,265	57.6%	58.1%	56.4%	57.1%	-0.2	-2.3	1.8	-2.0	1.5	-0.4%
Patients discharged to institutional PAC of those who were discharged to any PAC setting	9,609	9,235	60.4%	56.9%	58.3%	57.7%	-2.9	-5.9	0.2	-5.4	-0.3	-4.8%
Number of SNF days, 90-day PDP	6,103	5,841	37.3	30.4	36.0	34.7	-5.5	-7.5	-3.5	-7.2	-3.8	-15.3%
Emergency department use, 90-day PDP	16,168	16,199	22.6%	25.8%	22.9%	24.9%	1.2	-0.5	3.0	-0.2	2.7	5.1%
Unplanned readmission rate, 90-day PDP	16,168	16,199	26.6%	26.3%	27.8%	27.1%	0.4*	-1.6	2.4	-1.3	2.1	1.5%
All-cause mortality rate, 90-day PDP	15,941	15,994	12.7%	10.8%	11.7%	10.3%	-0.6	-1.9	0.7	-1.7	0.5	-5.4%

Exhibit E.33: Surgical Clinical Episodes, Model 2 Hospitals, Q4 2011 – Q3 2018

Outcome	BPCI Episodes (N)	Comparison Episodes (N)	BPCI Baseline	BPCI Intervention	Comparison Baseline	Comparison Intervention	DiD	95% LCI	95% UCI	90% LCI	90% UCI	DiD (%)
Standardized total allowed payment amount, IP through 90-day PDP	258,254	258,298	$30,312	$29,219	$29,828	$29,931	-$1,195	-$1,549	-$842	-$1,492	-$898	-3.9%
Standardized total amount paid by Medicare, IP through 90-day PDP	258,220	258,274	$27,253	$26,305	$26,820	$26,902	-$1,030	-$1,394	-$666	-$1,335	-$724	-3.8%
Readmissions standardized allowed amount, 90-day PDP	259,551	259,773	$1,744	$1,798	$1,704	$1,720	$38	-$30	$105	-$19	$95	2.1%
SNF standardized allowed amount, 90-day PDP	259,551	259,773	$6,005	$4,650	$5,874	$5,362	-$843	-$1,100	-$587	-$1,059	-$628	-15.4%
HHA standardized allowed amount, 90-day PDP	259,551	259,773	$1,988	$2,094	$2,045	$2,090	$61	-$21	$143	-$8	$130	3.0%
IRF standardized allowed amount, 90-day PDP	259,551	259,773	$1,685	$1,143	$1,498	$1,305	-$349	-$529	-$168	-$500	-$197	-23.4%
Patients discharged to a PAC facility	259,788	259,782	80.2%	74.5%	81.6%	78.0%	-2.1	-4.3	0.1	-4.0	-0.2	-2.7%
Patients discharged to institutional PAC of those who were discharged to any PAC setting	199,419	199,865	63.1%	49.6%	61.4%	52.8%	-5.0	-7.0	-2.9	-6.6	-3.2	-9.1%
Number of SNF days, 90-day PDP	89,042	93,645	28.7	24.4	28.2	26.7	-2.7	-3.3	-2.0	-3.2	-2.1	-9.9%
Emergency department use, 90-day PDP	259,276	259,540	15.0%	16.5%	15.5%	16.6%	0.4	0.0	0.9	0.0	0.8	2.5%
Unplanned readmission rate, 90-day PDP	259,276	259,540	13.0%	11.9%	12.9%	11.8%	0.0	-0.5	0.4	-0.4	0.3	-0.3%
All-cause mortality rate, 90-day PDP	258,303	258,633	2.9%	2.7%	2.9%	2.7%	0.0	-0.2	0.2	-0.2	0.1	-0.7%

Exhibit E.34: Medical Clinical Episodes, Model 2 Hospitals, Q4 2011 – Q3 2018

Outcome	BPCI Episodes (N)	Comparison Episodes (N)	BPCI Baseline	BPCI Intervention	Comparison Baseline	Comparison Intervention	DiD	95% LCI	95% UCI	90% LCI	90% UCI	DiD (%)
Standardized total allowed payment amount, IP through 90-day PDP	313,736	313,460	$24,069	$24,404	$23,976	$24,963	-$652	-$954	-$351	-$905	-$399	-2.6%
Standardized total amount paid by Medicare, IP through 90-day PDP	313,555	313,266	$21,203	$21,469	$21,104	$21,859	-$489	-$761	-$217	-$718	-$260	-2.2%
Readmissions standardized allowed amount, 90-day PDP	316,106	316,236	$4,193	$4,388	$4,174	$4,342	$26	-$72	$125	-$57	$109	0.6%
SNF standardized allowed amount, 90-day PDP	316,106	316,236	$4,645	$4,408	$4,427	$4,769	-$578	-$738	-$418	-$712	-$444	-11.6%
HHA standardized allowed amount, 90-day PDP	316,106	316,236	$1,187	$1,362	$1,183	$1,278	$81	$49	$113	$54	$108	6.3%
IRF standardized allowed amount, 90-day PDP	316,106	316,236	$882	$945	$885	$1,050	-$102	-$185	-$19	-$172	-$32	-9.7%
Patients discharged to a PAC facility	315,871	315,900	50.1%	50.3%	49.2%	49.0%	0.5	-0.3	1.3	-0.2	1.1	1.0%
Patients discharged to institutional PAC of those who were discharged to any PAC setting	163,555	153,068	55.1%	52.3%	54.0%	53.4%	-2.1	-3.3	-1.0	-3.1	-1.2	-3.9%
Number of SNF days, 90-day PDP	92,239	85,067	33.9	29.3	33.9	32.2	-2.9	-3.6	-2.1	-3.5	-2.3	-9.0%
Emergency department use, 90-day PDP	312,684	313,262	21.6%	23.5%	21.3%	23.4%	-0.2	-0.6	0.3	-0.6	0.2	-0.7%
Unplanned readmission rate, 90-day PDP	312,684	313,262	29.3%	28.4%	29.5%	28.8%	-0.1*	-0.6	0.4	-0.5	0.4	-0.3%
All-cause mortality rate, 90-day PDP	309,093	310,387	15.4%	14.1%	15.0%	13.7%	0.0	-0.4	0.4	-0.3	0.4	0.1%

Exhibit E.35: All Clinical Episodes, Model 2 Hospitals, Q4 2011 – Q3 2018

Outcome	BPCI Episodes (N)	Comparison Episodes (N)	BPCI Baseline	BPCI Intervention	Comparison Baseline	Comparison Intervention	DiD	95% LCI	95% UCI	90% LCI	90% UCI	DiD (%)
Standardized total allowed payment amount, IP through 90-day PDP	571,990	571,758	$26,676	$26,450	$26,484	$27,094	-$836	-$1,112	-$561	-$1,068	-$605	-3.1%
Standardized total amount paid by Medicare, IP through 90-day PDP	571,775	571,540	$23,791	$23,508	$23,599	$24,009	-$692	-$945	-$440	-$904	-$481	-2.9%
Readmissions standardized allowed amount, 90-day PDP	575,657	576,009	$3,145	$3,273	$3,121	$3,214	$35	-$33	$103	-$22	$92	1.1%
SNF standardized allowed amount, 90-day PDP	575,657	576,009	$5,198	$4,476	$5,045	$5,023	-$700	-$885	-$515	-$855	-$545	-13.5%
HHA standardized allowed amount, 90-day PDP	575,657	576,009	$1,533	$1,683	$1,543	$1,618	$75	$26	$123	$34	$116	4.6%
IRF standardized allowed amount, 90-day PDP	575,657	576,009	$1,214	$1,015	$1,158	$1,162	-$203	-$311	-$94	-$294	-$111	-16.6%
Patients discharged to a PAC facility	575,659	575,682	62.8%	60.8%	62.9%	61.3%	-0.4	-1.7	1.0	-1.5	0.8	-0.6%
Patients discharged to institutional PAC of those who were discharged to any PAC setting	362,974	352,933	59.4%	50.9%	57.7%	52.8%	-3.6	-5.1	-2.0	-4.9	-2.3	-6.6%
Number of SNF days, 90-day PDP	181,281	178,712	31.3	26.9	30.9	29.5	-2.9	-3.5	-2.3	-3.4	-2.4	-9.6%
Emergency department use, 90-day PDP	571,960	572,802	18.8%	20.4%	18.8%	20.5%	0.0	-0.3	0.4	-0.3	0.3	0.1%
Unplanned readmission rate, 90-day PDP	571,960	572,802	22.2%	21.3%	22.4%	21.5%	0.0*	-0.4	0.4	-0.3	0.3	-0.1%
All-cause mortality rate, 90-day PDP	567,396	569,020	10.0%	9.2%	9.8%	9.0%	0.0	-0.3	0.3	-0.2	0.2	0.0%

Appendix F: Impact of BPCI on Payment, Utilization, and Quality Measures, Baseline to Intervention, Model 2 PGP-initiated Episodes

The following tables display risk-adjusted difference-in-differences results for the payment, utilization, and quality measures assessed in the report. Results are presented by clinical episode. The DiD estimates are also presented as a percentage of what episode payments would have been absent BPCI, which is calculated as the average BPCI baseline payment amount plus the average change in the episode payment amount for the comparison group from baseline to intervention. Please observe the following abbreviations, which are used throughout the appendix:

- PGP = physician group practice
- 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-discharge period
- IP = inpatient hospitalizations
- PAC = post-acute care
- SNF = skilled nursing facility
- IRF = inpatient rehabilitation facility

An asterisk (*) indicates the estimate may be biased because we reject the null hypothesis that BPCI and comparison episodes were on parallel trends for this outcome during the baseline period (with 90% confidence), which is required for an unbiased estimate. Equal trends test was conducted for the total allowed payment amount, mortality, readmission rate, and emergency department visits.

Note that sample sizes reflect the number of episodes initiated during the intervention period that met inclusion criteria for the given outcome. Medicare payments are risk-adjusted and standardized to remove the effect of geographic differences in wages, extra amounts to account for teaching programs and other policy factors. Results reflect Lewin analysis of Medicare claims, assessment, and enrollment data for episodes that began Q4 2011 through Q3 2012 (baseline) and Q4 2013 through Q3 2018 (intervention period) for BPCI episode initiators and the matched comparison providers.

Exhibit F.1: Acute Myocardial Infarction Episodes, Model 2 PGP, Q4 2011 – Q3 2018

Outcome	BPCI Episodes (N)	Comparison Episodes (N)	BPCI Baseline	BPCI Intervention	Comparison Baseline	Comparison Intervention	DiD	95% LCI	95% UCI	90% LCI	90% UCI	DiD (%)
Standardized total allowed payment amount, IP through 90-day PDP	5,913	5,872	$26,147	$25,896	$26,136	$26,719	-$833	-$2,428	$761	-$2,172	$505	-3.1%
Standardized total amount paid by Medicare, IP through 90-day PDP	5,911	5,872	$23,383	$23,071	$23,384	$23,744	-$673	-$2,160	$814	-$1,921	$575	-2.8%
Readmissions standardized allowed amount, 90-day PDP	5,917	5,916	$4,528	$4,948	$4,511	$5,378	-$448	-$1,178	$283	-$1,061	$165	-8.3%
SNF standardized allowed amount, 90-day PDP	5,917	5,916	$3,716	$3,468	$3,786	$3,602	-$64	-$689	$560	-$588	$460	-1.8%
HHA standardized allowed amount, 90-day PDP	5,917	5,916	$1,112	$1,023	$1,062	$1,066	-$93	-$224	$39	-$203	$18	-8.3%
IRF standardized allowed amount, 90-day PDP	5,917	5,916	$534	$550	$696	$732	-$20	-$313	$273	-$266	$226	-3.5%
Patients discharged to a PAC facility	5,881	5,895	44.4%	40.4%	43.1%	40.7%	-1.6	-5.3	2.2	-4.7	1.6	-3.7%
Patients discharged to institutional PAC of those who were discharged to any PAC setting	2,432	2,307	50.8%	51.4%	51.3%	51.3%	0.6	-5.0	6.1	-4.1	5.2	1.1%
Number of SNF days, 90-day PDP	1,381	1,325	29.9	27.5	31.9	29.1	0.4	-2.9	3.7	-2.4	3.2	1.5%
Emergency department use, 90-day PDP	5,813	5,814	23.3%	25.9%	23.8%	25.0%	1.4	-2.1	4.8	-1.5	4.3	5.6%
Unplanned readmission rate, 90-day PDP	5,813	5,814	29.4%	26.9%	30.1%	27.9%	-0.4	-3.4	2.6	-2.9	2.2	-1.3%
All-cause mortality rate, 90-day PDP	5,778	5,777	17.2%	16.9%	17.0%	16.7%	0.0	-2.8	2.9	-2.3	2.4	0.2%

Exhibit F.2: Cardiac Arrhythmia Episodes, Model 2 PGP, Q4 2011 – Q3 2018

Outcome	BPCI Episodes (N)	Comparison Episodes (N)	BPCI Baseline	BPCI Intervention	Comparison Baseline	Comparison Intervention	DiD	95% LCI	95% UCI	90% LCI	90% UCI	DiD (%)
Standardized total allowed payment amount, IP through 90-day PDP	4,755	4,742	$17,035	$19,029	$17,527	$19,124	$398	-$815	$1,610	-$620	$1,415	2.1%
Standardized total amount paid by Medicare, IP through 90-day PDP	4,754	4,738	$14,705	$16,260	$15,148	$16,432	$271	-$837	$1,379	-$659	$1,201	1.7%
Readmissions standardized allowed amount, 90-day PDP	4,775	4,777	$3,211	$3,752	$3,460	$4,067	-$66	-$639	$507	-$547	$415	-1.7%
SNF standardized allowed amount, 90-day PDP	4,775	4,777	$2,437	$2,794	$2,629	$2,710	$275	-$267	$817	-$180	$730	10.9%
HHA standardized allowed amount, 90-day PDP	4,775	4,777	$921	$946	$897	$970	-$48	-$167	$72	-$148	$53	-4.8%
IRF standardized allowed amount, 90-day PDP	4,775	4,777	$295	$550	$432	$419	$268	$49	$486	$84	$451	94.8%
Patients discharged to a PAC facility	4,774	4,774	33.8%	35.2%	32.8%	32.3%	1.8	-1.4	5.1	-0.9	4.6	5.5%
Patients discharged to institutional PAC of those who were discharged to any PAC setting	1,795	1,463	41.3%	43.0%	41.0%	43.9%	-1.2	-7.2	4.8	-6.3	3.8	-2.8%
Number of SNF days, 90-day PDP	863	828	29.1	30.3	32.4	28.5	5.1	1.1	9.1	1.8	8.4	20.2%
Emergency department use, 90-day PDP	4,714	4,740	24.6%	28.3%	23.4%	25.6%	1.4	-1.4	4.2	-0.9	3.8	5.3%
Unplanned readmission rate, 90-day PDP	4,714	4,740	21.7%	23.3%	25.0%	25.2%	1.4	-1.7	4.5	-1.2	4.0	6.4%
All-cause mortality rate, 90-day PDP	4,697	4,714	8.0%	8.5%	7.9%	7.4%	1.0*	-0.9	2.9	-0.6	2.6	13.5%

Exhibit F.3: Cellulitis Episodes, Model 2 PGP, Q4 2011 – Q3 2018

Outcome	BPCI Episodes (N)	Comparison Episodes (N)	BPCI Baseline	BPCI Intervention	Comparison Baseline	Comparison Intervention	DiD	95% LCI	95% UCI	90% LCI	90% UCI	DiD (%)
Standardized total allowed payment amount, IP through 90-day PDP	4,237	4,207	$19,069	$19,904	$19,009	$20,071	-$227	-$1,440	$986	-$1,245	$791	-1.1%
Standardized total amount paid by Medicare, IP through 90-day PDP	4,234	4,203	$16,436	$17,073	$16,415	$17,189	-$137	-$1,221	$946	-$1,047	$772	-0.8%
Readmissions standardized allowed amount, 90-day PDP	4,261	4,259	$3,216	$3,285	$3,308	$3,329	$49	-$481	$579	-$396	$494	1.5%
SNF standardized allowed amount, 90-day PDP	4,261	4,259	$4,108	$4,082	$3,792	$4,218	-$453	-$1,142	$236	-$1,031	$125	-10.0%
HHA standardized allowed amount, 90-day PDP	4,261	4,259	$1,295	$1,366	$1,154	$1,307	-$82	-$246	$82	-$220	$55	-5.7%
IRF standardized allowed amount, 90-day PDP	4,261	4,259	$335	$500	$376	$450	$92	-$149	$333	-$111	$294	22.5%
Patients discharged to a PAC facility	4,260	4,262	48.7%	46.2%	44.7%	44.7%	-2.5	-6.8	1.9	-6.1	1.2	-5.1%
Patients discharged to institutional PAC of those who were discharged to any PAC setting	1,971	1,951	47%	46%	46%	46%	-1.1	-6.9	4.7	-6.0	3.8	-2.3%
Number of SNF days, 90-day PDP	1,049	1,031	34.9	32.4	33.0	32.8	-2.2	-5.9	1.4	-5.3	0.8	-6.4%
Emergency department use, 90-day PDP	4,165	4,208	25.2%	27.0%	22.6%	25.0%	-0.5	-3.9	2.9	-3.3	2.4	-1.7%
Unplanned readmission rate, 90-day PDP	4,165	4,208	22.3%	24.3%	25.2%	23.1%	4.1	1.1	7.1	1.5	6.6	20.2%
All-cause mortality rate, 90-day PDP	4,136	4,191	6.7%	5.3%	6.5%	5.7%	-0.6	-2.6	1.3	-2.3	1.0	-11.0%

Exhibit F.4: Chronic Obstructive Pulmonary Disease Bronchitis Asthma Episodes, Model 2 PGP, Q4 2011 – Q3 2018

Outcome	BPCI Episodes (N)	Comparison Episodes (N)	BPCI Baseline	BPCI Intervention	Comparison Baseline	Comparison Intervention	DiD	95% LCI	95% UCI	90% LCI	90% UCI	DiD (%)
Standardized total allowed payment amount, IP through 90-day PDP	13,321	13,233	$18,519	$19,160	$18,698	$19,443	-$104	-$767	$558	-$660	$451	-0.5%
Standardized total amount paid by Medicare, IP through 90-day PDP	13,316	13,230	$16,150	$16,650	$16,313	$16,852	-$39	-$650	$572	-$552	$474	-0.2%
Readmissions standardized allowed amount, 90-day PDP	13,433	13,438	$4,013	$4,325	$4,249	$4,314	$247	-$99	$593	-$44	$537	6.0%
SNF standardized allowed amount, 90-day PDP	13,433	13,438	$2,508	$2,324	$2,444	$2,509	-$249	-$546	$48	-$498	$0	-9.7%
HHA standardized allowed amount, 90-day PDP	13,433	13,438	$1,087	$1,123	$1,092	$1,170	-$42	-$134	$51	-$119	$36	-3.6%
IRF standardized allowed amount, 90-day PDP	13,433	13,438	$405	$499	$336	$430	$0	-$147	$148	-$124	$124	0.0%
Patients discharged to a PAC facility	13,434	13,435	37.1%	38.0%	37.4%	37.6%	0.7	-1.5	3.0	-1.2	2.7	2.0%
Patients discharged to institutional PAC of those who were discharged to any PAC setting	5,207	4,939	34.5%	33.3%	35.1%	33.8%	0.1	-3.5	3.7	-2.9	3.1	0.4%
Number of SNF days, 90-day PDP	2,263	2,206	30.8	26.7	30.7	29.0	-2.4	-4.8	0.0	-4.4	-0.4	-8.2%
Emergency department use, 90-day PDP	13,243	13,289	26.1%	29.2%	24.3%	27.3%	0.1*	-2.0	2.1	-1.6	1.8	0.2%
Unplanned readmission rate, 90-day PDP	13,243	13,289	31.5%	31.2%	33.7%	31.1%	2.3	0.4	4.2	0.7	3.9	7.9%
All-cause mortality rate, 90-day PDP	13,158	13,194	7.9%	7.2%	8.3%	7.5%	0.1	-1.1	1.2	-0.9	1.0	0.7%

Exhibit F.5: Congestive Heart Failure Episodes, Model 2 PGP, Q4 2011 – Q3 2018

Outcome	BPCI Episodes (N)	Comparison Episodes (N)	BPCI Baseline	BPCI Intervention	Comparison Baseline	Comparison Intervention	DiD	95% LCI	95% UCI	90% LCI	90% UCI	DiD (%)
Standardized total allowed payment amount, IP through 90-day PDP	16,641	16,573	$25,113	$25,471	$24,936	$26,263	-$969	-$1,944	$7	-$1,787	-$150	-3.7%
Standardized total amount paid by Medicare, IP through 90-day PDP	16,641	16,561	$22,346	$22,564	$22,199	$23,258	-$841	-$1,741	$60	-$1,596	-$85	-3.6%
Readmissions standardized allowed amount, 90-day PDP	16,671	16,680	$5,537	$5,709	$5,361	$5,950	-$417	-$894	$59	-$817	-$18	-6.8%
SNF standardized allowed amount, 90-day PDP	16,671	16,680	$4,073	$3,963	$4,029	$4,180	-$261	-$615	$93	-$558	$36	-6.2%
HHA standardized allowed amount, 90-day PDP	16,671	16,680	$1,482	$1,643	$1,482	$1,545	$97	-$31	$225	-$10	$204	6.3%
IRF standardized allowed amount, 90-day PDP	16,671	16,680	$582	$651	$539	$644	-$36	-$246	$174	-$212	$141	-5.2%
Patients discharged to a PAC facility	16,658	16,668	55.3%	55.6%	56.2%	54.3%	2.2	-0.6	5.0	-0.2	4.5	4.1%
Patients discharged to institutional PAC of those who were discharged to any PAC setting	9,608	8,826	43.4%	40.0%	43.0%	42.6%	-3.0	-6.8	0.9	-6.2	0.3	-6.9%
Number of SNF days, 90-day PDP	4,742	4,431	30.2	27.7	30.6	28.5	-0.5	-2.1	1.2	-1.9	0.9	-1.7%
Emergency department use, 90-day PDP	16,542	16,566	23.3%	26.1%	22.4%	24.2%	1.0	-0.8	2.9	-0.5	2.6	4.2%
Unplanned readmission rate, 90-day PDP	16,542	16,566	37.9%	36.2%	37.2%	36.1%	-0.6	-2.9	1.7	-2.5	1.4	-1.6%
All-cause mortality rate, 90-day PDP	16,356	16,418	19.4%	17.0%	18.8%	16.0%	0.4	-1.1	1.9	-0.9	1.7	2.5%

Exhibit F.6: Esophagitis Gastroenteritis and Other Digestive Disorders Episodes, Model 2 PGP, Q4 2011 – Q3 2018

Outcome	BPCI Episodes (N)	Comparison Episodes (N)	BPCI Baseline	BPCI Intervention	Comparison Baseline	Comparison Intervention	DiD	95% LCI	95% UCI	90% LCI	90% UCI	DiD (%)
Standardized total allowed payment amount, IP through 90-day PDP	5,004	4,952	$16,504	$17,369	$16,657	$17,179	$342	-$711	$1,395	-$542	$1,226	2.0%
Standardized total amount paid by Medicare, IP through 90-day PDP	5,002	4,944	$14,121	$14,828	$14,256	$14,626	$336	-$611	$1,283	-$459	$1,131	2.3%
Readmissions standardized allowed amount, 90-day PDP	5,053	5,052	$3,628	$3,656	$3,719	$3,568	$179	-$367	$725	-$280	$637	5.1%
SNF standardized allowed amount, 90-day PDP	5,053	5,052	$2,464	$2,480	$2,471	$2,362	$126	-$359	$610	-$281	$532	5.3%
HHA standardized allowed amount, 90-day PDP	5,053	5,052	$778	$927	$841	$907	$83	-$25	$190	-$7	$173	9.8%
IRF standardized allowed amount, 90-day PDP												
Patients discharged to a PAC facility	5,049	5,050	29.7%	29.9%	28.6%	28.8%	0.1	-2.8	3.0	-2.4	2.5	0.2%
Patients discharged to institutional PAC of those who were discharged to any PAC setting	1,518	1,430	43%	40%	41%	40%	-1.4	-8.0	5.3	-7.0	4.2	-3.3%
Number of SNF days, 90-day PDP	828	778	30.9	28.3	33.1	29.5	1.0	-2.7	4.6	-2.1	4.0	3.5%
Emergency department use, 90-day PDP	4,977	5,009	28.1%	29.7%	26.4%	27.5%	0.5	-2.5	3.6	-2.0	3.1	1.9%
Unplanned readmission rate, 90-day PDP	4,977	5,009	24.4%	24.8%	25.2%	23.8%	1.8	-1.1	4.7	-0.6	4.2	7.9%
All-cause mortality rate, 90-day PDP	4,949	4,985	6.6%	6.3%	5.4%	6.0%	-1.0	-2.5	0.5	-2.2	0.2	-13.8%

Exhibit F.7: Gastrointestinal Hemorrhage Episodes, Model 2 PGP, Q4 2011 – Q3 2018

Outcome	BPCI Episodes (N)	Comparison Episodes (N)	BPCI Baseline	BPCI Intervention	Comparison Baseline	Comparison Intervention	DiD	95% LCI	95% UCI	90% LCI	90% UCI	DiD (%)
Standardized total allowed payment amount, IP through 90-day PDP	3,569	3,549	$19,428	$18,931	$18,373	$20,230	-$2,354*	-$3,550	-$1,158	-$3,358	-$1,350	-11.1%
Standardized total amount paid by Medicare, IP through 90-day PDP	3,569	3,549	$16,968	$16,358	$16,025	$17,514	-$2,100*	-$3,202	-$997	-$3,025	-$1,174	-11.4%
Readmissions standardized allowed amount, 90-day PDP	3,576	3,577	$3,848	$3,239	$3,277	$3,829	-$1,161	-$1,839	-$482	-$1,730	-$591	-26.4%
SNF standardized allowed amount, 90-day PDP	3,576	3,577	$2,744	$2,784	$2,334	$2,948	-$574	-$1,158	$10	-$1,064	-$84	-17.1%
HHA standardized allowed amount, 90-day PDP	3,576	3,577	$735	$859	$771	$841	$53	-$96	$203	-$72	$179	6.6%
IRF standardized allowed amount, 90-day PDP												
Patients discharged to a PAC facility	3,571	3,574	31.4%	32.9%	32.1%	32.9%	0.6	-3.0	4.1	-2.4	3.6	1.8%
Patients discharged to institutional PAC of those who were discharged to any PAC setting	1,236	1,165	53.8%	46.0%	52.3%	46.2%	-1.8	-9.5	5.9	-8.2	4.7	-3.7%
Number of SNF days, 90-day PDP	653	668	29.1	29.6	27.8	29.7	-1.3	-5.8	3.1	-5.0	2.4	-4.3%
Emergency department use, 90-day PDP	3,534	3,540	19.7%	24.0%	19.2%	21.6%	1.9	-1.4	5.1	-0.8	4.6	8.5%
Unplanned readmission rate, 90-day PDP	3,534	3,540	24.4%	21.8%	23.8%	23.7%	-2.5	-5.9	0.9	-5.4	0.3	-10.3%
All-cause mortality rate, 90-day PDP	3,507	3,500	10.2%	8.8%	10.1%	9.0%	-0.3	-2.6	2.0	-2.2	1.6	-3.0%

Exhibit F.8: Gastrointestinal Obstruction Episodes, Model 2 PGP, Q4 2011 – Q3 2018

Outcome	BPCI Episodes (N)	Comparison Episodes (N)	BPCI Baseline	BPCI Intervention	Comparison Baseline	Comparison Intervention	DiD	95% LCI	95% UCI	90% LCI	90% UCI	DiD (%)
Standardized total allowed payment amount, IP through 90-day PDP	2,386	2,362	$18,981	$17,111	$18,048	$17,883	-$1,706	-$3,251	-$160	-$3,003	-$408	-9.1%
Standardized total amount paid by Medicare, IP through 90-day PDP	2,386	2,356	$16,539	$14,672	$15,551	$15,340	-$1,656	-$3,062	-$249	-$2,836	-$475	-10.1%
Readmissions standardized allowed amount, 90-day PDP	2,396	2,397	$4,327	$3,478	$3,668	$3,853	-$1,034	-$1,845	-$224	-$1,714	-$354	-22.9%
SNF standardized allowed amount, 90-day PDP	2,396	2,397	$2,383	$2,125	$2,602	$2,570	-$226	-$908	$457	-$799	$347	-9.6%
HHA standardized allowed amount, 90-day PDP	2,396	2,397	$774	$740	$710	$762	-$86	-$235	$63	-$211	$39	-10.5%
IRF standardized allowed amount, 90-day PDP												
Patients discharged to a PAC facility	2,396	2,394	29.6%	26.6%	27.9%	25.8%	-0.9	-4.8	3.0	-4.2	2.3	-3.4%
Patients discharged to institutional PAC of those who were discharged to any PAC setting	638	623	48%	49%	47%	46%	1.5	-7.8	10.9	-6.3	9.4	3.3%
Number of SNF days, 90-day PDP	348	356	30.8	27.4	33.5	31.2	-1.0	-6.7	4.7	-5.7	3.8	-3.4%
Emergency department use, 90-day PDP	2,353	2,371	19.4%	22.1%	19.2%	20.4%	1.5	-2.1	5.2	-1.5	4.6	7.5%
Unplanned readmission rate, 90-day PDP	2,353	2,371	22.5%	21.9%	23.7%	22.1%	1.1	-2.7	4.9	-2.1	4.3	5.2%
All-cause mortality rate, 90-day PDP	2,333	2,357	10.9%	7.8%	7.9%	8.0%	-3.2	-6.2	-0.2	-5.7	-0.7	-29.1%

Exhibit F.9: Hip & Femur Procedures Except Major Joint Episodes, Model 2 PGP, Q4 2011 – Q3 2018

Outcome	BPCI Episodes (N)	Comparison Episodes (N)	BPCI Baseline	BPCI Intervention	Comparison Baseline	Comparison Intervention	DiD	95% LCI	95% UCI	90% LCI	90% UCI	DiD (%)
Standardized total allowed payment amount, IP through 90-day PDP	8,877	8,862	$43,606	$43,954	$42,551	$44,925	-$2,026*	-$3,226	-$826	-$3,033	-$1,019	-4.4%
Standardized total amount paid by Medicare, IP through 90-day PDP	8,877	8,862	$38,284	$38,574	$37,441	$39,369	-$1,637	-$2,677	-$597	-$2,510	-$764	-4.1%
Readmissions standardized allowed amount, 90-day PDP	8,882	8,882	$2,706	$2,508	$2,852	$2,641	$13	-$330	$356	-$275	$301	0.5%
SNF standardized allowed amount, 90-day PDP	8,882	8,882	$17,767	$18,074	$16,842	$18,378	-$1,229	-$2,316	-$142	-$2,141	-$317	-6.4%
HHA standardized allowed amount, 90-day PDP	8,882	8,882	$1,955	$2,163	$2,027	$2,093	$142	$4	$281	$26	$258	7.0%
IRF standardized allowed amount, 90-day PDP	8,882	8,882	$3,045	$2,379	$2,988	$3,028	-$705	-$1,428	$17	-$1,312	-$99	-22.9%
Patients discharged to a PAC facility	8,882	8,881	93.1%	93.3%	92.5%	93.2%	-0.4	-1.9	1.1	-1.7	0.9	-0.4%
Patients discharged to institutional PAC of those who were discharged to any PAC setting	8,315	8,244	92%	92%	91%	92%	-0.4	-1.9	1.1	-1.7	0.9	-0.4%
Number of SNF days, 90-day PDP	7,116	6,712	45.4	40.5	44.4	43.0	-3.4	-5.3	-1.5	-5.0	-1.8	-7.8%
Emergency department use, 90-day PDP	8,876	8,874	17.7%	19.0%	18.1%	20.1%	-0.7	-2.7	1.3	-2.4	1.0	-3.6%
Unplanned readmission rate, 90-day PDP	8,876	8,874	20.9%	19.1%	21.3%	19.4%	0.0	-2.1	2.1	-1.7	1.8	0.2%
All-cause mortality rate, 90-day PDP	8,693	8,672	9.6%	10.5%	10.6%	10.3%	1.3	-0.3	3.0	-0.1	2.7	14.6%

Exhibit F.10: Major Joint Replacement of the Lower Extremity Episodes, Model 2 PGP, Q4 2011 – Q3 2018

Outcome	BPCI Episodes (N)	Comparison Episodes (N)	BPCI Baseline	BPCI Intervention	Comparison Baseline	Comparison Intervention	DiD	95% LCI	95% UCI	90% LCI	90% UCI	DiD (%)
Standardized total allowed payment amount, IP through 90-day PDP	104,741	104,334	$25,867	$23,038	$25,617	$24,719	-$1,932	-$2,314	-$1,550	-$2,252	-$1,611	-7.7%
Standardized total amount paid by Medicare, IP through 90-day PDP	104,740	104,331	$23,314	$20,506	$23,046	$22,083	-$1,845	-$2,201	-$1,489	-$2,144	-$1,547	-8.3%
Readmissions standardized allowed amount, 90-day PDP	104,760	104,768	$1,124	$1,081	$1,076	$1,088	-$55	-$138	$29	-$125	$15	-4.8%
SNF standardized allowed amount, 90-day PDP	104,760	104,768	$4,718	$2,883	$4,668	$3,844	-$1,010	-$1,307	-$713	-$1,259	-$761	-25.9%
HHA standardized allowed amount, 90-day PDP	104,760	104,768	$2,141	$1,608	$1,917	$1,886	-$501	-$647	-$356	-$623	-$380	-23.8%
IRF standardized allowed amount, 90-day PDP	104,760	104,768	$1,141	$357	$1,206	$1,016	-$594	-$816	-$371	-$780	-$407	-62.4%
Patients discharged to a PAC facility	104,774	104,773	83.1%	64.3%	78.0%	70.8%	-11.7	-15.7	-7.6	-15.1	-8.2	-15.3%
Patients discharged to institutional PAC of those who were discharged to any PAC setting	61,815	78,929	57.3%	42.6%	58.7%	47.6%	-3.6	-6.7	-0.5	-6.2	-1.0	-7.8%
Number of SNF days, 90-day PDP	27,092	31,596	24.2	18.9	24.5	22.9	-3.8	-4.6	-3.0	-4.5	-3.1	-16.7%
Emergency department use, 90-day PDP	104,741	104,745	13.4%	13.6%	13.6%	14.3%	-0.6	-1.3	0.1	-1.2	0.0	-4.0%
Unplanned readmission rate, 90-day PDP	104,741	104,745	8.9%	7.7%	8.7%	7.9%	-0.3*	-0.8	0.2	-0.7	0.2	-3.7%
All-cause mortality rate, 90-day PDP	104,460	104,439	1.7%	1.6%	1.8%	1.7%	0.0	-0.2	0.2	-0.2	0.2	0.6%

Exhibit F.11: Major Joint Replacement of the Upper Extremity Episodes, Model 2 PGP, Q4 2011 – Q3 2018

Outcome	BPCI Episodes (N)	Comparison Episodes (N)	BPCI Baseline	BPCI Intervention	Comparison Baseline	Comparison Intervention	DiD	95% LCI	95% UCI	90% LCI	90% UCI	DiD (%)
Standardized total allowed payment amount, IP through 90-day PDP	4,836	4,814	$22,084	$22,255	$22,486	$24,512	-$1,854	-$3,083	-$626	-$2,886	-$823	-7.7%
Standardized total amount paid by Medicare, IP through 90-day PDP	4,836	4,813	$19,559	$19,788	$20,019	$21,860	-$1,612	-$2,729	-$494	-$2,549	-$674	-7.5%
Readmissions standardized allowed amount, 90-day PDP	4,838	4,838	$742	$804	$689	$921	-$169	-$488	$150	-$437	$98	-17.4%
SNF standardized allowed amount, 90-day PDP	4,838	4,838	$2,856	$1,518	$2,510	$2,548	-$1,376	-$2,076	-$676	-$1,964	-$788	-47.6%
HHA standardized allowed amount, 90-day PDP	4,838	4,838	$1,365	$780	$1,651	$1,401	-$335	-$681	$11	-$625	-$45	-30.1%
IRF standardized allowed amount, 90-day PDP												
Patients discharged to a PAC facility	4,838	4,838	44.9%	28.9%	51.3%	41.3%	-6.0	-15.0	3.0	-13.5	1.6	-17.2%
Patients discharged to institutional PAC of those who were discharged to any PAC setting	1,391	1,964	47.5%	39.0%	43.9%	43.0%	-7.7	-17.1	1.7	-15.6	0.2	-16.4%
Number of SNF days, 90-day PDP	561	813	29.9	21.6	25.5	28.0	-10.7	-15.6	-5.9	-14.8	-6.7	-33.2%
Emergency department use, 90-day PDP	4,837	4,836	12.9%	14.0%	12.3%	13.9%	-0.5	-3.5	2.5	-3.0	2.0	-3.6%
Unplanned readmission rate, 90-day PDP	4,837	4,836	6.5%	6.3%	6.8%	6.5%	0.1	-2.2	2.4	-1.8	2.0	1.9%
All-cause mortality rate, 90-day PDP												

Exhibit F.12: Medical Non-Infectious Orthopedic Episodes, Model 2 PGP, Q4 2011 – Q3 2018

Outcome	BPCI Episodes (N)	Comparison Episodes (N)	BPCI Baseline	BPCI Intervention	Comparison Baseline	Comparison Intervention	DiD	95% LCI	95% UCI	90% LCI	90% UCI	DiD (%)
Standardized total allowed payment amount, IP through 90-day PDP	4,540	4,496	$27,330	$27,275	$26,988	$29,139	-$2,206	-$3,536	-$875	-$3,323	-$1,089	-7.5%
Standardized total amount paid by Medicare, IP through 90-day PDP	4,536	4,493	$23,596	$23,546	$23,420	$25,260	-$1,890	-$3,050	-$730	-$2,864	-$917	-7.4%
Readmissions standardized allowed amount, 90-day PDP	4,593	4,593	$3,543	$3,372	$3,835	$3,716	-$53	-$631	$524	-$538	$432	-1.6%
SNF standardized allowed amount, 90-day PDP	4,593	4,593	$9,994	$10,015	$9,222	$10,236	-$993	-$1,963	-$23	-$1,807	-$179	-9.0%
HHA standardized allowed amount, 90-day PDP	4,593	4,593	$1,539	$1,726	$1,666	$1,870	-$17	-$174	$140	-$148	$115	-1.0%
IRF standardized allowed amount, 90-day PDP	4,593	4,593	$1,296	$1,462	$1,746	$2,038	-$125	-$583	$333	-$510	$260	-7.9%
Patients discharged to a PAC facility	4,588	4,592	69.6%	68.9%	66.8%	70.2%	-4.1	-7.2	-0.9	-6.7	-1.4	-5.6%
Patients discharged to institutional PAC of those who were discharged to any PAC setting	3,165	3,228	75.0%	75.0%	70.8%	74.5%	-3.7	-7.2	-0.1	-6.7	-0.7	-4.7%
Number of SNF days, 90-day PDP	2,394	2,401	38.7	35.4	39.1	36.0	-0.3	-2.7	2.2	-2.3	1.8	-0.8%
Emergency department use, 90-day PDP	4,546	4,556	24.4%	25.5%	22.4%	23.6%	-0.1*	-3.6	3.4	-3.0	2.8	-0.5%
Unplanned readmission rate, 90-day PDP	4,546	4,556	24.3%	22.0%	25.1%	22.8%	-0.1	-3.3	3.2	-2.8	2.6	-0.3%
All-cause mortality rate, 90-day PDP	4,498	4,514	8.3%	8.2%	7.2%	7.4%	-0.2	-2.0	1.6	-1.7	1.3	-2.7%

Exhibit F.13: Nutritional and Metabolic Disorders Episodes, Model 2 PGP, Q4 2011 – Q3 2018

Outcome	BPCI Episodes (N)	Comparison Episodes (N)	BPCI Baseline	BPCI Intervention	Comparison Baseline	Comparison Intervention	DiD	95% LCI	95% UCI	90% LCI	90% UCI	DiD (%)
Standardized total allowed payment amount, IP through 90-day PDP	3,397	3,364	$19,528	$20,646	$20,563	$21,903	-$222	-$1,840	$1,396	-$1,580	$1,136	-1.1%
Standardized total amount paid by Medicare, IP through 90-day PDP	3,394	3,361	$16,883	$17,777	$17,769	$18,853	-$190	-$1,631	$1,251	-$1,399	$1,020	-1.1%
Readmissions standardized allowed amount, 90-day PDP	3,434	3,435	$3,732	$3,571	$3,777	$4,026	-$410	-$1,084	$264	-$975	$156	-10.3%
SNF standardized allowed amount, 90-day PDP	3,434	3,435	$4,638	$4,837	$4,978	$5,307	-$130	-$1,089	$829	-$935	$675	-2.6%
HHA standardized allowed amount, 90-day PDP	3,434	3,435	$1,045	$1,269	$1,141	$1,277	$88	-$80	$256	-$53	$229	7.5%
IRF standardized allowed amount, 90-day PDP	3,434	3,435	$350	$544	$472	$618	$46	-$243	$336	-$196	$289	9.3%
Patients discharged to a PAC facility	3,433	3,432	44.9%	49.3%	47.8%	48.2%	4.0	-1.1	9.0	-0.2	8.2	8.8%
Patients discharged to institutional PAC of those who were discharged to any PAC setting	1,729	1,631	56%	54%	55%	54%	-0.7	-7.6	6.2	-6.5	5.1	-1.3%
Number of SNF days, 90-day PDP	1,054	1,019	32.6	30.9	35.6	33.1	0.7	-3.4	4.8	-2.7	4.2	2.5%
Emergency department use, 90-day PDP	3,384	3,400	24.2%	28.3%	23.9%	23.9%	4.2	0.4	7.9	1.0	7.3	17.2%
Unplanned readmission rate, 90-day PDP	3,384	3,400	25.6%	24.5%	26.2%	26.6%	-1.5	-5.2	2.2	-4.6	1.6	-5.7%
All-cause mortality rate, 90-day PDP	3,358	3,362	14.1%	15.2%	14.4%	13.6%	1.8	-1.3	4.9	-0.8	4.4	13.4%

Exhibit F.14: Other Respiratory Episodes, Model 2 PGP, Q4 2011 – Q3 2018

Outcome	BPCI Episodes (N)	Comparison Episodes (N)	BPCI Baseline	BPCI Intervention	Comparison Baseline	Comparison Intervention	DiD	95% LCI	95% UCI	90% LCI	90% UCI	DiD (%)
Standardized total allowed payment amount, IP through 90-day PDP	6,254	6,218	$26,602	$27,612	$27,600	$28,829	-$219	-$1,780	$1,343	-$1,529	$1,092	-0.8%
Standardized total amount paid by Medicare, IP through 90-day PDP	6,254	6,215	$23,818	$24,664	$24,703	$25,679	-$130	-$1,557	$1,296	-$1,328	$1,067	-0.5%
Readmissions standardized allowed amount, 90-day PDP	6,266	6,266	$5,064	$5,072	$4,875	$5,077	-$193	-$915	$529	-$799	$413	-3.7%
SNF standardized allowed amount, 90-day PDP	6,266	6,266	$3,506	$3,734	$3,836	$4,403	-$339	-$987	$309	-$883	$205	-8.3%
HHA standardized allowed amount, 90-day PDP	6,266	6,266	$1,053	$1,104	$1,087	$1,170	-$33	-$180	$114	-$156	$91	-2.9%
IRF standardized allowed amount, 90-day PDP	6,266	6,266	$417	$546	$580	$774	-$65	-$375	$245	-$325	$195	-10.6%
Patients discharged to a PAC facility	6,255	6,237	45.8%	44.0%	46.0%	46.3%	-2.1	-5.8	1.5	-5.2	0.9	-4.6%
Patients discharged to institutional PAC of those who were discharged to any PAC setting	2,658	2,890	54.2%	52.3%	53.8%	55.2%	-3.3	-9.4	2.8	-8.4	1.8	-5.9%
Number of SNF days, 90-day PDP	1,522	1,635	28.4	27.5	31.2	31.4	-1.2	-4.5	2.2	-3.9	1.6	-4.0%
Emergency department use, 90-day PDP	6,175	6,182	24.9%	26.3%	23.1%	24.7%	-0.2	-3.0	2.5	-2.5	2.1	-0.8%
Unplanned readmission rate, 90-day PDP	6,175	6,182	31.9%	30.6%	33.5%	31.5%	0.8	-2.7	4.3	-2.2	3.8	2.7%
All-cause mortality rate, 90-day PDP	6,117	6,103	20.3%	17.0%	19.0%	16.3%	-0.5	-3.8	2.7	-3.3	2.2	-3.1%

Exhibit F.15: Percutaneous Coronary Intervention Episodes, Model 2 PGP, Q4 2011 – Q3 2018

Outcome	BPCI Episodes (N)	Comparison Episodes (N)	BPCI Baseline	BPCI Intervention	Comparison Baseline	Comparison Intervention	DiD	95% LCI	95% UCI	90% LCI	90% UCI	DiD (%)
Standardized total allowed payment amount, IP through 90-day PDP	3,321	3,292	$24,195	$27,175	$24,249	$27,760	-$531	-$1,943	$882	-$1,716	$655	-1.9%
Standardized total amount paid by Medicare, IP through 90-day PDP	3,321	3,292	$21,793	$24,478	$21,935	$25,095	-$475	-$1,804	$853	-$1,591	$640	-1.9%
Readmissions standardized allowed amount, 90-day PDP	3,332	3,333	$3,013	$3,459	$3,279	$3,819	-$94	-$852	$664	-$730	$542	-2.6%
SNF standardized allowed amount, 90-day PDP	3,332	3,333	$1,090	$1,419	$1,185	$1,482	$33	-$430	$496	-$356	$421	2.4%
HHA standardized allowed amount, 90-day PDP	3,332	3,333	$663	$693	$543	$658	-$84	-$204	$36	-$185	$17	-10.8%
IRF standardized allowed amount, 90-day PDP												
Patients discharged to a PAC facility	3,333	3,332	23.9%	21.6%	19.7%	21.4%	-4.0	-7.2	-0.7	-6.7	-1.2	-15.5%
Patients discharged to institutional PAC of those who were discharged to any PAC setting	742	727	33.2%	40.6%	38.4%	36.8%	9.0	-0.5	18.5	1.0	17.0	28.5%
Number of SNF days, 90-day PDP	353	323	27.5	26.5	28.9	27.7	0.1	-7.3	7.5	-6.1	6.3	0.5%
Emergency department use, 90-day PDP	3,315	3,324	24.6%	25.0%	22.1%	26.5%	-4.0*	-7.9	-0.1	-7.3	-0.8	-13.9%
Unplanned readmission rate, 90-day PDP	3,315	3,324	19.4%	19.9%	19.4%	19.7%	0.2	-3.2	3.7	-2.7	3.1	1.2%
All-cause mortality rate, 90-day PDP	3,309	3,319	3.8%	4.0%	3.7%	3.8%	0.1	-1.6	1.8	-1.3	1.6	3.6%

Exhibit F.16: Renal Failure Episodes, Model 2 PGP, Q4 2011 – Q3 2018

Outcome	BPCI Episodes (N)	Comparison Episodes (N)	BPCI Baseline	BPCI Intervention	Comparison Baseline	Comparison Intervention	DiD	95% LCI	95% UCI	90% LCI	90% UCI	DiD (%)
Standardized total allowed payment amount, IP through 90-day PDP	7,759	7,715	$24,427	$24,747	$24,822	$24,906	$236	-$964	$1,436	-$771	$1,243	1.0%
Standardized total amount paid by Medicare, IP through 90-day PDP	7,756	7,710	$21,466	$21,625	$21,776	$21,708	$227	-$857	$1,311	-$683	$1,137	1.1%
Readmissions standardized allowed amount, 90-day PDP	7,789	7,791	$4,244	$4,404	$4,411	$4,436	$135	-$359	$628	-$280	$549	3.2%
SNF standardized allowed amount, 90-day PDP	7,789	7,791	$5,251	$5,522	$5,404	$5,659	$16	-$599	$631	-$500	$533	0.3%
HHA standardized allowed amount, 90-day PDP	7,789	7,791	$1,127	$1,287	$1,144	$1,281	$24	-$95	$142	-$76	$123	1.9%
IRF standardized allowed amount, 90-day PDP	7,789	7,791	$728	$782	$533	$762	-$174	-$466	$118	-$419	$71	-18.2%
Patients discharged to a PAC facility	7,785	7,781	51.1%	50.2%	50.7%	50.7%	-0.9	-4.0	2.2	-3.5	1.7	-1.8%
Patients discharged to institutional PAC of those who were discharged to any PAC setting	3,953	3,919	58%	57%	58%	59%	-2.2	-6.0	1.7	-5.4	1.1	-3.7%
Number of SNF days, 90-day PDP	2,541	2,477	33.7	32.2	34.4	33.2	-0.3	-2.7	2.1	-2.3	1.7	-0.9%
Emergency department use, 90-day PDP	7,707	7,728	23.0%	26.0%	22.2%	24.6%	0.6	-1.7	3.0	-1.4	2.6	2.4%
Unplanned readmission rate, 90-day PDP	7,707	7,728	29.0%	29.6%	31.4%	29.5%	2.5	0.1	5.0	0.5	4.6	9.4%
All-cause mortality rate, 90-day PDP	7,630	7,647	18.1%	16.6%	18.2%	16.4%	0.4	-1.9	2.7	-1.6	2.3	2.2%

Exhibit F.17: Sepsis Episodes, Model 2 PGP, Q4 2011 – Q3 2018

Outcome	BPCI Episodes (N)	Comparison Episodes (N)	BPCI Baseline	BPCI Intervention	Comparison Baseline	Comparison Intervention	DiD	95% LCI	95% UCI	90% LCI	90% UCI	DiD (%)
Standardized total allowed payment amount, IP through 90-day PDP	34,051	33,884	$30,049	$29,616	$29,981	$30,215	-$668	-$1,569	$233	-$1,424	$88	-2.2%
Standardized total amount paid by Medicare, IP through 90-day PDP	34,039	33,874	$26,745	$26,276	$26,730	$26,713	-$452	-$1,253	$350	-$1,124	$221	-1.7%
Readmissions standardized allowed amount, 90-day PDP	34,099	34,105	$4,333	$4,282	$4,371	$4,515	-$195	-$499	$109	-$450	$60	-4.4%
SNF standardized allowed amount, 90-day PDP	34,099	34,105	$5,590	$5,496	$5,434	$5,786	-$446	-$870	-$22	-$802	-$90	-7.5%
HHA standardized allowed amount, 90-day PDP	34,099	34,105	$1,124	$1,165	$1,131	$1,172	-$1	-$74	$72	-$63	$60	-0.1%
IRF standardized allowed amount, 90-day PDP	34,099	34,105	$676	$749	$546	$683	-$64	-$236	$109	-$209	$81	-7.9%
Patients discharged to a PAC facility	33,987	34,024	54.6%	52.3%	55.5%	52.8%	0.4	-1.7	2.4	-1.3	2.1	0.7%
Patients discharged to institutional PAC of those who were discharged to any PAC setting	17,742	17,923	64%	62%	64%	63%	-1.0	-3.4	1.4	-3.0	1.0	-1.6%
Number of SNF days, 90-day PDP	10,998	11,358	34.3	31.1	33.9	32.7	-1.9	-3.5	-0.4	-3.3	-0.6	-5.9%
Emergency department use, 90-day PDP	33,729	33,863	20.6%	22.5%	19.8%	21.5%	0.2	-1.2	1.6	-1.0	1.4	0.8%
Unplanned readmission rate, 90-day PDP	33,729	33,863	27.9%	25.8%	28.0%	27.0%	-1.1	-2.7	0.4	-2.5	0.2	-4.2%
All-cause mortality rate, 90-day PDP	33,183	33,378	20.4%	18.8%	20.2%	18.4%	0.2	-1.2	1.6	-1.0	1.4	1.1%

Exhibit F.18: Simple Pneumonia and Respiratory Infections Episodes, Model 2 PGP, Q4 2011 – Q3 2018

Outcome	BPCI Episodes (N)	Comparison Episodes (N)	BPCI Baseline	BPCI Intervention	Comparison Baseline	Comparison Intervention	DiD	95% LCI	95% UCI	90% LCI	90% UCI	DiD (%)
Standardized total allowed payment amount, IP through 90-day PDP	16,037	15,966	$22,657	$22,212	$22,985	$22,630	-$90	-$925	$746	-$791	$612	-0.4%
Standardized total amount paid by Medicare, IP through 90-day PDP	16,030	15,959	$19,975	$19,478	$20,262	$19,746	$18	-$730	$766	-$610	$646	0.1%
Readmissions standardized allowed amount, 90-day PDP	16,088	16,088	$3,694	$3,642	$3,762	$3,682	$28	-$304	$360	-$251	$307	0.8%
SNF standardized allowed amount, 90-day PDP	16,088	16,088	$4,130	$4,211	$4,243	$4,349	-$25	-$457	$407	-$387	$337	-0.6%
HHA standardized allowed amount, 90-day PDP	16,088	16,088	$1,033	$1,155	$1,043	$1,182	-$18	-$110	$74	-$95	$60	-1.5%
IRF standardized allowed amount, 90-day PDP	16,088	16,088	$490	$567	$413	$474	$17	-$136	$170	-$111	$146	3.1%
Patients discharged to a PAC facility	16,071	16,079	47.5%	46.5%	48.8%	46.9%	0.9	-1.9	3.6	-1.4	3.2	1.9%
Patients discharged to institutional PAC of those who were discharged to any PAC setting	7,544	7,627	55.5%	52.7%	58.8%	52.4%	3.6	0.4	6.7	0.9	6.2	7.2%
Number of SNF days, 90-day PDP	4,239	4,400	31.6	29.5	31.5	30.8	-1.5	-3.6	0.6	-3.2	0.3	-4.7%
Emergency department use, 90-day PDP	15,945	15,999	22.2%	24.2%	21.5%	22.1%	1.4	-0.4	3.1	-0.1	2.8	6.0%
Unplanned readmission rate, 90-day PDP	15,945	15,999	26.2%	24.8%	27.0%	25.0%	0.7	-1.1	2.4	-0.8	2.1	2.7%
All-cause mortality rate, 90-day PDP	15,764	15,806	18.4%	15.2%	18.1%	14.4%	0.4	-1.0	1.8	-0.7	1.6	2.9%

Exhibit F.19: Spinal Fusion (Non-Cervical) Episodes, Model 2 PGP, Q4 2011 – Q3 2018

Outcome	BPCI Episodes (N)	Comparison Episodes (N)	BPCI Baseline	BPCI Intervention	Comparison Baseline	Comparison Intervention	DiD	95% LCI	95% UCI	90% LCI	90% UCI	DiD (%)
Standardized total allowed payment amount, IP through 90-day PDP	3,510	3,474	$38,894	$37,948	$38,281	$40,041	-$2,706	-$4,548	-$864	-$4,252	-$1,160	-6.7%
Standardized total amount paid by Medicare, IP through 90-day PDP	3,510	3,474	$35,839	$34,895	$35,309	$36,980	-$2,615	-$4,316	-$914	-$4,042	-$1,188	-7.0%
Readmissions standardized allowed amount, 90-day PDP	3,511	3,511	$1,502	$1,593	$1,719	$1,705	$106	-$509	$720	-$410	$621	7.1%
SNF standardized allowed amount, 90-day PDP	3,511	3,511	$2,727	$2,403	$3,011	$2,823	-$136	-$1,002	$729	-$863	$590	-5.4%
HHA standardized allowed amount, 90-day PDP	3,511	3,511	$1,110	$870	$1,186	$1,310	-$364	-$585	-$143	-$550	-$179	-29.5%
IRF standardized allowed amount, 90-day PDP	3,511	3,511	$2,018	$1,092	$1,474	$1,634	-$1,087	-$1,766	-$407	-$1,657	-$517	-49.9%
Patients discharged to a PAC facility	3,512	3,512	46.6%	37.0%	48.9%	49.4%	-10.2	-16.3	-4.0	-15.4	-5.0	-21.6%
Patients discharged to institutional PAC of those who were discharged to any PAC setting	1,204	1,819	68.2%	61.9%	63.0%	57.0%	-0.4	-9.9	9.2	-8.4	7.6	-0.6%
Number of SNF days, 90-day PDP	684	806	22.9	20.9	24.6	21.3	1.3	-2.8	5.4	-2.1	4.7	6.6%
Emergency department use, 90-day PDP	3,509	3,510	19.7%	18.4%	16.1%	17.4%	-2.6	-6.3	1.1	-5.7	0.5	-12.4%
Unplanned readmission rate, 90-day PDP	3,509	3,510	10.2%	9.4%	10.1%	9.4%	-0.1	-3.0	2.9	-2.5	2.4	-0.6%
All-cause mortality rate, 90-day PDP	3,509	3,509	1.1%	0.4%	0.7%	0.6%	-0.6	-1.3	0.2	-1.2	0.0	-58.8%

Exhibit F.20: Stroke Episodes, Model 2 PGP, Q4 2011 – Q3 2018

Outcome	BPCI Episodes (N)	Comparison Episodes (N)	BPCI Baseline	BPCI Intervention	Comparison Baseline	Comparison Intervention	DiD	95% LCI	95% UCI	90% LCI	90% UCI	DiD (%)
Standardized total allowed payment amount, IP through 90-day PDP	4,912	4,905	$30,179	$29,661	$30,197	$30,672	-$993	-$2,798	$812	-$2,508	$522	-3.2%
Standardized total amount paid by Medicare, IP through 90-day PDP	4,912	4,904	$26,860	$26,211	$26,796	$27,184	-$1,037	-$2,655	$581	-$2,395	$321	-3.8%
Readmissions standardized allowed amount, 90-day PDP	4,927	4,926	$2,783	$2,673	$2,698	$2,533	$56	-$425	$537	-$348	$460	2.1%
SNF standardized allowed amount, 90-day PDP	4,927	4,926	$7,678	$7,551	$7,841	$7,471	$244	-$938	$1,425	-$748	$1,235	3.3%
HHA standardized allowed amount, 90-day PDP	4,927	4,926	$1,397	$1,605	$1,527	$1,601	$133	-$36	$302	-$9	$275	9.0%
IRF standardized allowed amount, 90-day PDP	4,927	4,926	$5,439	$5,187	$5,198	$5,968	-$1,021	-$2,008	-$33	-$1,849	-$192	-16.4%
Patients discharged to a PAC facility	4,916	4,920	64.8%	63.4%	65.4%	64.0%	-0.1	-4.4	4.2	-3.7	3.5	-0.1%
Patients discharged to institutional PAC of those who were discharged to any PAC setting	3,130	3,156	78.4%	77.0%	77.4%	77.2%	-1.3	-5.3	2.7	-4.6	2.0	-1.6%
Number of SNF days, 90-day PDP	1,735	1,746	39.6	36.8	42.5	38.3	1.3	-2.3	4.9	-1.7	4.3	3.7%
Emergency department use, 90-day PDP	4,895	4,902	20.9%	23.2%	19.5%	21.9%	0.0	-3.0	3.0	-2.5	2.5	0.0%
Unplanned readmission rate, 90-day PDP	4,895	4,902	20.6%	18.7%	20.6%	18.8%	-0.1	-3.1	2.8	-2.6	2.3	-0.8%
All-cause mortality rate, 90-day PDP	4,863	4,876	18.0%	16.1%	15.5%	14.1%	-0.5	-3.3	2.2	-2.8	1.8	-3.1%

Exhibit F.21: Urinary Tract Infection Episodes, Model 2 PGP, Q4 2011 – Q3 2018

Outcome	BPCI Episodes (N)	Comparison Episodes (N)	BPCI Baseline	BPCI Intervention	Comparison Baseline	Comparison Intervention	DiD	95% LCI	95% UCI	90% LCI	90% UCI	DiD (%)
Standardized total allowed payment amount, IP through 90-day PDP	7,845	7,761	$22,546	$23,059	$22,713	$23,711	-$486	-$1,531	$559	-$1,363	$391	-2.1%
Standardized total amount paid by Medicare, IP through 90-day PDP	7,838	7,753	$19,393	$19,844	$19,651	$20,378	-$276	-$1,199	$646	-$1,051	$498	-1.4%
Readmissions standardized allowed amount, 90-day PDP	7,920	7,919	$3,436	$3,471	$3,769	$3,582	$222	-$169	$613	-$106	$550	6.8%
SNF standardized allowed amount, 90-day PDP	7,920	7,919	$6,971	$6,885	$6,439	$7,310	-$958	-$1,638	-$278	-$1,529	-$387	-12.2%
HHA standardized allowed amount, 90-day PDP	7,920	7,919	$1,317	$1,515	$1,441	$1,522	$117	-$9	$243	$12	$223	8.4%
IRF standardized allowed amount, 90-day PDP	7,920	7,919	$384	$713	$591	$729	$191	-$39	$421	-$2	$384	36.6%
Patients discharged to a PAC facility	7,919	7,919	57.8%	58.3%	57.5%	57.4%	0.6	-2.4	3.6	-1.9	3.1	1.0%
Patients discharged to institutional PAC of those who were discharged to any PAC setting	4,658	4,547	60.4%	58.7%	55.1%	58.5%	-5.2	-9.1	-1.3	-8.5	-1.9	-8.1%
Number of SNF days, 90-day PDP	3,080	2,967	36.8	33.7	37.3	36.0	-1.8	-3.9	0.3	-3.6	0.0	-5.1%
Emergency department use, 90-day PDP	7,875	7,887	24.6%	27.1%	22.9%	25.0%	0.6	-1.9	3.0	-1.5	2.6	2.1%
Unplanned readmission rate, 90-day PDP	7,875	7,887	26.7%	26.4%	28.6%	26.6%	1.7	-0.5	4.0	-0.1	3.6	7.0%
All-cause mortality rate, 90-day PDP	7,766	7,784	13.4%	10.6%	11.1%	11.1%	-2.9	-4.6	-1.1	-4.3	-1.4	-21.3%

Exhibit F.22: Surgical Clinical Episodes, Model 2 PGP, Q4 2011 – Q3 2018

Outcome	BPCI Episodes (N)	Comparison Episodes (N)	BPCI Baseline	BPCI Intervention	Comparison Baseline	Comparison Intervention	DiD	95% LCI	95% UCI	90% LCI	90% UCI	DiD (%)
Standardized total allowed payment amount, IP through 90-day PDP	129,825	129,272	$27,356	$25,246	$27,011	$26,917	-$2,015	-$2,423	-$1,607	-$2,358	-$1,673	-7.4%
Standardized total amount paid by Medicare, IP through 90-day PDP	129,820	129,265	$24,529	$22,430	$24,227	$24,004	-$1,876	-$2,255	-$1,498	-$2,194	-$1,559	-7.7%
Readmissions standardized allowed amount, 90-day PDP	129,916	129,925	$1,399	$1,354	$1,394	$1,402	-$53	-$134	$27	-$121	$14	-3.8%
SNF standardized allowed amount, 90-day PDP	129,916	129,925	$5,734	$4,072	$5,531	$4,969	-$1,100	-$1,395	-$805	-$1,348	-$852	-21.3%
HHA standardized allowed amount, 90-day PDP	129,916	129,925	$1,967	$1,554	$1,850	$1,852	-$415	-$538	-$292	-$519	-$312	-21.1%
IRF standardized allowed amount, 90-day PDP	129,916	129,925	$1,248	$536	$1,319	$1,183	-$575	-$780	-$370	-$747	-$403	-51.7%
Patients discharged to a PAC facility	129,927	129,928	78.7%	62.8%	75.1%	69.9%	-10.6	-13.9	-7.2	-13.4	-7.7	-14.4%
Patients discharged to institutional PAC of those who were discharged to any PAC setting	76,632	94,911	61%	49%	62%	53%	-3.2	-5.9	-0.6	-5.4	-1.0	-6.2%
Number of SNF days, 90-day PDP	38,200	42,651	28.9	23.8	28.7	27.3	-3.6	-4.4	-2.8	-4.2	-2.9	-13.1%
Emergency department use, 90-day PDP	129,824	129,845	14.7%	14.9%	14.5%	15.6%	-0.8	-1.4	-0.1	-1.3	-0.2	-4.8%
Unplanned readmission rate, 90-day PDP	129,824	129,845	10.8%	9.5%	10.6%	9.6%	-0.3*	-0.7	0.2	-0.7	0.2	-2.6%
All-cause mortality rate, 90-day PDP	129,303	129,286	2.6%	2.5%	2.7%	2.5%	0.1*	-0.2	0.3	-0.2	0.3	2.2%

Exhibit F.23: Medical Clinical Episodes, Model 2 PGP, Q4 2011 – Q3 2018

Outcome	BPCI Episodes (N)	Comparison Episodes (N)	BPCI Baseline	BPCI Intervention	Comparison Baseline	Comparison Intervention	DiD	95% LCI	95% UCI	90% LCI	90% UCI	DiD (%)
Standardized total allowed payment amount, IP through 90-day PDP	136,081	135,303	$23,810	$24,212	$23,960	$24,853	-$491	-$873	-$110	-$812	-$171	-2.0%
Standardized total amount paid by Medicare, IP through 90-day PDP	136,036	135,229	$20,986	$21,261	$21,125	$21,784	-$384	-$726	-$42	-$671	-$97	-1.8%
Readmissions standardized allowed amount, 90-day PDP	136,605	136,626	$4,115	$4,205	$4,150	$4,349	-$109	-$240	$22	-$219	$1	-2.5%
SNF standardized allowed amount, 90-day PDP	136,605	136,626	$4,369	$4,407	$4,340	$4,643	-$265	-$470	-$59	-$437	-$92	-5.7%
HHA standardized allowed amount, 90-day PDP	136,605	136,626	$1,123	$1,233	$1,135	$1,230	$15	-$35	$65	-$27	$57	1.2%
IRF standardized allowed amount, 90-day PDP	136,605	136,626	$667	$796	$639	$783	-$14	-$118	$90	-$102	$74	-1.7%
Patients discharged to a PAC facility	136,389	136,444	47.8%	47.6%	47.8%	47.2%	0.3	-1.0	1.6	-0.8	1.4	0.6%
Patients discharged to institutional PAC of those who were discharged to any PAC setting	65,819	64,397	54.4%	52.6%	54.3%	53.6%	-1.1	-2.7	0.6	-2.4	0.3	-2.0%
Number of SNF days, 90-day PDP	37,296	37,225	32.9	30.4	33.5	31.9	-0.9	-1.8	0.0	-1.7	-0.2	-3.0%
Emergency department use, 90-day PDP	135,051	135,498	23.2%	25.5%	22.0%	23.7%	0.6*	-0.2	1.4	0.0	1.3	2.4%
Unplanned readmission rate, 90-day PDP	135,051	135,498	28.1%	27.5%	29.0%	27.8%	0.5	-0.2	1.2	0.0	1.1	2.0%
All-cause mortality rate, 90-day PDP	133,595	134,092	15.4%	14.2%	14.9%	13.8%	-0.1	-0.8	0.5	-0.7	0.4	-1.0%

Exhibit F.24: All Clinical Episodes, Model 2 PGP, Q4 2011 – Q3 2018

Outcome	BPCI Episodes (N)	Comparison Episodes (N)	BPCI Baseline	BPCI Intervention	Comparison Baseline	Comparison Intervention	DiD	95% LCI	95% UCI	90% LCI	90% UCI	DiD (%)
Standardized total allowed payment amount, IP through 90-day PDP	265,906	264,575	$25,363	$24,575	$25,422	$25,893	-$1,260	-$1,634	-$885	-$1,574	-$945	-4.9%
Standardized total amount paid by Medicare, IP through 90-day PDP	265,856	264,494	$22,545	$21,696	$22,606	$22,892	-$1,135	-$1,478	-$793	-$1,423	-$848	-5.0%
Readmissions standardized allowed amount, 90-day PDP	266,521	266,551	$2,853	$2,870	$2,861	$2,965	-$88	-$169	-$7	-$156	-$20	-3.0%
SNF standardized allowed amount, 90-day PDP	266,521	266,551	$5,021	$4,180	$4,943	$4,795	-$693	-$917	-$469	-$881	-$505	-14.2%
HHA standardized allowed amount, 90-day PDP	266,521	266,551	$1,478	$1,347	$1,493	$1,558	-$196	-$269	-$123	-$257	-$135	-12.7%
IRF standardized allowed amount, 90-day PDP	266,521	266,551	$921	$630	$988	$997	-$300	-$423	-$178	-$403	-$197	-32.3%
Patients discharged to a PAC facility	266,316	266,372	60.9%	53.2%	61.1%	59.0%	-5.6	-7.8	-3.3	-7.5	-3.7	-9.4%
Patients discharged to institutional PAC of those who were discharged to any PAC setting	142,451	159,308	58%	51%	58%	53%	-1.8	-3.7	0.2	-3.4	-0.1	-3.4%
Number of SNF days, 90-day PDP	75,496	79,876	30.7	27.0	31.0	29.6	-2.3	-3.0	-1.6	-2.9	-1.8	-7.9%
Emergency department use, 90-day PDP	264,875	265,343	19.2%	20.5%	18.5%	19.9%	-0.1*	-0.6	0.5	-0.5	0.4	-0.2%
Unplanned readmission rate, 90-day PDP	264,875	265,343	20.0%	19.0%	20.4%	19.3%	0.2*	-0.3	0.6	-0.2	0.5	0.9%
All-cause mortality rate, 90-day PDP	262,898	263,378	9.3%	8.7%	9.1%	8.5%	0.0	-0.4	0.3	-0.3	0.3	-0.5%

Appendix G: Impact of BPCI on Payment, Utilization, and Quality Measures, Baseline to Intervention, Model 3 SNF-initiated Episodes

The following tables display risk-adjusted difference-in-differences results for the payment, utilization, and quality measures assessed in the report. Results are presented by clinical episode. The DiD estimates are also presented as a percentage of what episode payments would have been absent BPCI, which is calculated as the average BPCI baseline payment amount plus the average change in the episode payment amount for the comparison group from baseline to intervention. 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-discharge period
- IP = inpatient hospitalizations
- PAC = post-acute care
- SNF = skilled nursing facility
- IRF = inpatient rehabilitation facility

An asterisk (*) indicates the estimate may be biased because we reject the null hypothesis that BPCI and comparison episodes were on parallel trends for this outcome during the baseline period (with 90% confidence), which is required for an unbiased estimate. Equal trends test was conducted for the total allowed payment amount, mortality, readmission rate, and emergency department visits.

A double asterisk (**) indicates there were 10 episodes or fewer per SNF among BPCI-participating SNFs during the baseline period in the analytical sample.

Some clinical episodes under Model 3 SNF suffer from small sample sizes, both overall and per SNF, leading to relatively low statistical power that was insufficient to detect differences in baseline trends. The small sample sizes for some clinical episodes also made it difficult to identify strong matches for potential comparison providers and ascertain whether the statistically significant results for quality measures are a signal or simply noise.

Note that sample sizes reflect the number of episodes initiated during the intervention period that met inclusion criteria for the given outcome. Medicare payments are risk-adjusted and standardized to remove the effect of geographic differences in wages, extra amounts to account for teaching programs and other policy factors. Results reflect Lewin analysis of Medicare claims, assessment, and enrollment data for episodes that began Q4 2011 through Q3 2012 (baseline) and Q4 2013 through Q3 2018 (intervention period) for BPCI episode initiators and the matched comparison providers.

Exhibit G.1: Chronic Obstructive Pulmonary Disease, Bronchitis, Asthma Episodes, Model 3 SNF, Q4 2011 – Q3 2018 **

Outcome	BPCI Episodes (N)	Comparison Episodes (N)	BPCI Baseline	BPCI Intervention	Comparison Baseline	Comparison Intervention	DiD	95% LCI	95% UCI	90% LCI	90% UCI	DiD (%)
Standardized total allowed payment amount, from episode start through 90 days	1,242	1,255	$28,798	$28,773	$28,386	$28,723	-$363	-$2,661	$1,936	-$2,292	$1,567	-1.2%
Standardized total amount paid by Medicare, from episode start through 90 days	1,242	1,255	$25,116	$25,176	$24,764	$25,018	-$194	-$2,155	$1,766	-$1,839	$1,451	-0.8%
Standardized total allowed payment amount, IP through 90-day PDP	1,278	1,270	$37,731	$37,718	$37,347	$37,378	-$45	-$2,622	$2,531	-$2,207	$2,117	-0.1%
Readmissions standardized allowed amount, from episode start through 90 days	1,251	1,270	$5,994	$5,818	$5,803	$5,326	$301	-$906	$1,508	-$712	$1,314	5.5%
SNF standardized allowed amount, from episode start through 90 days	1,251	1,270	$16,122	$15,437	$16,231	$16,432	-$886	-$2,429	$657	-$2,181	$409	-5.4%
HHA standardized allowed amount, from episode start through 90 days	1,251	1,270	$1,656	$1,851	$1,444	$1,675	-$35	-$291	$220	-$250	$179	-1.9%
IRF standardized allowed amount, from episode start through 90 days												
Part B standardized allowed amount, from episode start through 90 days	1,242	1,255	$4,013	$4,287	$3,737	$4,029	-$19	-$424	$387	-$359	$322	-0.4%
Number of SNF days, 90-day PDP	1,285	1,281	32.9	29.2	33.9	30.9	-0.7	-3.7	2.3	-3.2	1.8	-2.3%
Emergency department use, 90-day PDP	1,275	1,274	22.6%	26.7%	22.4%	22.8%	3.7*	-1.7	9.2	-0.8	8.3	16.2%
Unplanned readmission rate, 90-day PDP	1,275	1,274	42.9%	42.6%	43.4%	41.8%	1.3	-5.1	7.7	-4.1	6.6	3.1%
All-cause mortality rate, 90-day PDP	1,268	1,271	18.1%	19.6%	22.0%	16.0%	7.5	2.6	12.4	3.4	11.6	61.6%

Exhibit G.2: Congestive Heart Failure Episodes, Model 3 SNF, Q4 2011 – Q3 2018 **

Outcome	BPCI Episodes (N)	Comparison Episodes (N)	BPCI Baseline	BPCI Intervention	Comparison Baseline	Comparison Intervention	DiD	95% LCI	95% UCI	90% LCI	90% UCI	DiD (%)
Standardized total allowed payment amount, from episode start through 90 days	4,517	4,652	$29,256	$29,040	$28,385	$30,230	-$2,060	-$3,557	-$563	-$3,317	-$803	-6.6%
Standardized total amount paid by Medicare, from episode start through 90 days	4,516	4,651	$25,463	$25,510	$24,566	$26,308	-$1,695	-$2,967	-$424	-$2,763	-$628	-6.2%
Standardized total allowed payment amount, IP through 90-day PDP	4,758	4,761	$39,406	$39,172	$38,992	$40,732	-$1,975	-$3,622	-$327	-$3,357	-$592	-4.8%
Readmissions standardized allowed amount, from episode start through 90 days	4,542	4,690	$6,108	$6,303	$6,329	$6,439	$85	-$689	$858	-$565	$734	1.4%
SNF standardized allowed amount, from episode start through 90 days	4,542	4,690	$16,414	$15,270	$15,529	$16,837	-$2,452	-$3,487	-$1,416	-$3,321	-$1,583	-13.8%
HHA standardized allowed amount, from episode start through 90 days	4,542	4,690	$1,499	$1,930	$1,406	$1,601	$237	$77	$397	$102	$371	14.0%
IRF standardized allowed amount, from episode start through 90 days												
Part B standardized allowed amount, from episode start through 90 days	4,517	4,652	$4,031	$4,348	$3,914	$4,210	$21	-$248	$289	-$204	$246	0.5%
Number of SNF days, 90-day PDP	4,779	4,786	32.5	28.1	32.7	31.3	-3.0	-4.9	-1.1	-4.6	-1.4	-9.6%
Emergency department use, 90-day PDP	4,770	4,764	22.0%	24.0%	22.5%	24.3%	0.2	-3.0	3.5	-2.5	2.9	1.0%
Unplanned readmission rate, 90-day PDP	4,770	4,764	46.4%	43.8%	46.8%	44.6%	-0.3	-4.3	3.6	-3.7	3.0	-0.8%
All-cause mortality rate, 90-day PDP	4,729	4,741	29.4%	26.4%	29.7%	28.2%	-1.5	-4.9	1.9	-4.3	1.4	-5.3%

Exhibit G.3: Hip & Femur Procedures Except Major Joint Episodes, Model 3 SNF, Q4 2011 – Q3 2018

Outcome	BPCI Episodes (N)	Comparison Episodes (N)	BPCI Baseline	BPCI Intervention	Comparison Baseline	Comparison Intervention	DiD	95% LCI	95% UCI	90% LCI	90% UCI	DiD (%)
Standardized total allowed payment amount, from episode start through 90 days	4,669	4,698	$31,921	$28,832	$31,141	$31,557	-$3,505	-$4,840	-$2,169	-$4,625	-$2,384	-10.8%
Standardized total amount paid by Medicare, from episode start through 90 days	4,668	4,697	$27,143	$25,059	$26,489	$26,973	-$2,568	-$3,640	-$1,497	-$3,467	-$1,669	-9.3%
Standardized total allowed payment amount, IP through 90-day PDP	4,728	4,741	$47,585	$45,180	$46,721	$47,852	-$3,536	-$4,970	-$2,102	-$4,740	-$2,332	-7.3%
Readmissions standardized allowed amount, from episode start through 90 days	4,694	4,718	$2,552	$2,505	$2,658	$2,486	$124	-$370	$619	-$291	$539	5.2%
SNF standardized allowed amount, from episode start through 90 days	4,694	4,718	$24,297	$20,264	$23,249	$23,274	-$4,058	-$5,273	-$2,844	-$5,077	-$3,039	-16.7%
HHA standardized allowed amount, from episode start through 90 days	4,694	4,718	$1,870	$2,349	$1,918	$2,110	$287	$112	$462	$140	$434	13.9%
IRF standardized allowed amount, from episode start through 90 days												
Part B standardized allowed amount, from episode start through 90 days	4,669	4,698	$2,667	$2,966	$2,731	$2,913	$118	-$101	$336	-$66	$301	4.1%
Number of SNF days, 90-day PDP	4,747	4,754	46.5	36.5	45.9	41.6	-5.7	-7.9	-3.5	-7.5	-3.9	-13.5%
Emergency department use, 90-day PDP	4,739	4,743	18.8%	19.0%	18.5%	19.0%	-0.3	-3.5	2.9	-3.0	2.4	-1.5%
Unplanned readmission rate, 90-day PDP	4,739	4,743	22.2%	20.5%	23.0%	19.9%	1.4	-1.9	4.8	-1.4	4.2	7.4%
All-cause mortality rate, 90-day PDP	4,682	4,680	9.2%	9.0%	8.9%	9.7%	-1.0	-3.4	1.4	-3.0	1.0	-10.1%

Exhibit G.4: Major Joint Replacement of the Lower Extremity Episodes, Model 3 SNF, Q4 2011 – Q3 2018

Outcome	BPCI Episodes (N)	Comparison Episodes (N)	BPCI Baseline	BPCI Intervention	Comparison Baseline	Comparison Intervention	DiD	95% LCI	95% UCI	90% LCI	90% UCI	DiD (%)
Standardized total allowed payment amount, from episode start through 90 days	10,873	10,929	$19,495	$18,570	$18,603	$19,590	-$1,912	-$2,703	-$1,120	-$2,576	-$1,247	-9.3%
Standardized total amount paid by Medicare, from episode start through 90 days	10,872	10,927	$17,531	$16,898	$16,765	$17,603	-$1,472	-$2,141	-$802	-$2,033	-$910	-8.0%
Standardized total allowed payment amount, IP through 90-day PDP	10,937	10,986	$35,066	$34,211	$34,022	$35,286	-$2,119	-$2,974	-$1,264	-$2,836	-$1,402	-5.8%
Readmissions standardized allowed amount, from episode start through 90 days	10,935	10,965	$1,791	$1,821	$1,559	$1,779	-$190	-$477	$96	-$431	$50	-9.5%
SNF standardized allowed amount, from episode start through 90 days	10,935	10,965	$12,812	$11,251	$12,266	$12,743	-$2,039	-$2,710	-$1,368	-$2,602	-$1,476	-15.3%
HHA standardized allowed amount, from episode start through 90 days	10,935	10,965	$1,981	$2,325	$1,894	$2,029	$209	$73	$346	$95	$324	9.9%
IRF standardized allowed amount, from episode start through 90 days												
Part B standardized allowed amount, from episode start through 90 days	10,874	10,929	$2,583	$2,797	$2,526	$2,728	$10	-$117	$137	-$96	$117	0.4%
Number of SNF days, 90-day PDP	10,987	11,018	25.1	20.3	24.3	23.1	-3.6	-4.7	-2.4	-4.5	-2.6	-14.9%
Emergency department use, 90-day PDP	10,939	10,957	15.5%	16.3%	17.1%	16.8%	1.0	-0.9	3.0	-0.6	2.7	6.7%
Unplanned readmission rate, 90-day PDP	10,939	10,957	13.9%	12.8%	13.6%	12.6%	-0.2	-2.0	1.6	-1.7	1.3	-1.7%
All-cause mortality rate, 90-day PDP	10,940	10,967	3.2%	3.0%	3.0%	3.5%	-0.7	-1.5	0.2	-1.4	0.0	-18.3%

Exhibit G.5: Medical Non-Infectious Orthopedic Episodes, Model 3 SNF, Q4 2011 – Q3 2018

Outcome	BPCI Episodes (N)	Comparison Episodes (N)	BPCI Baseline	BPCI Intervention	Comparison Baseline	Comparison Intervention	DiD	95% LCI	95% UCI	90% LCI	90% UCI	DiD (%)
Standardized total allowed payment amount, from episode start through 90 days	3,360	3,377	$30,627	$29,550	$29,461	$31,009	-$2,625*	-$4,152	-$1,097	-$3,907	-$1,342	-8.2%
Standardized total amount paid by Medicare, from episode start through 90 days	3,360	3,376	$26,397	$25,710	$25,418	$26,731	-$1,999*	-$3,261	-$737	-$3,058	-$940	-7.2%
Standardized total allowed payment amount, IP through 90-day PDP	3,400	3,399	$38,151	$37,388	$37,330	$39,108	-$2,541*	-$4,167	-$915	-$3,906	-$1,176	-6.4%
Readmissions standardized allowed amount, from episode start through 90 days	3,394	3,415	$3,599	$3,448	$3,822	$3,809	-$138	-$853	$576	-$738	$461	-3.9%
SNF standardized allowed amount, from episode start through 90 days	3,394	3,415	$21,212	$19,283	$19,777	$20,911	-$3,063	-$4,277	-$1,849	-$4,082	-$2,044	-13.7%
HHA standardized allowed amount, from episode start through 90 days	3,394	3,415	$1,868	$2,303	$1,837	$2,000	$272	$76	$468	$107	$437	13.4%
IRF standardized allowed amount, from episode start through 90 days												
Part B standardized allowed amount, from episode start through 90 days	3,360	3,377	$3,493	$3,710	$3,468	$3,656	$28	-$252	$309	-$207	$264	0.8%
Number of SNF days, 90-day PDP	3,434	3,437	40.8	35.0	39.2	38.1	-4.7	-6.8	-2.5	-6.5	-2.9	-11.8%
Emergency department use, 90-day PDP	3,407	3,419	19.5%	20.7%	22.1%	22.2%	1.1*	-2.6	4.7	-2.0	4.2	5.4%
Unplanned readmission rate, 90-day PDP	3,407	3,419	26.9%	25.3%	27.1%	25.9%	-0.4	-4.1	3.3	-3.5	2.7	-1.4%
All-cause mortality rate, 90-day PDP	3,413	3,417	9.4%	8.7%	8.9%	9.0%	-0.8	-3.4	1.8	-3.0	1.4	-8.4%

Exhibit G.6: Other Respiratory Episodes, Model 3 SNF, Q4 2011 – Q3 2018 **

Outcome	BPCI Episodes (N)	Comparison Episodes (N)	BPCI Baseline	BPCI Intervention	Comparison Baseline	Comparison Intervention	DiD	95% LCI	95% UCI	90% LCI	90% UCI	DiD (%)
Standardized total allowed payment amount, from episode start through 90 days	1,005	1,010	$30,130	$30,000	$29,959	$31,760	-$1,931	-$5,070	$1,208	-$4,565	$703	-6.0%
Standardized total amount paid by Medicare, from episode start through 90 days	1,005	1,010	$26,335	$26,332	$25,934	$27,622	-$1,691	-$4,404	$1,022	-$3,968	$586	-6.0%
Standardized total allowed payment amount, IP through 90-day PDP	1,029	1,029	$46,058	$47,070	$46,187	$48,684	-$1,484	-$5,365	$2,397	-$4,741	$1,773	-3.1%
Readmissions standardized allowed amount, from episode start through 90 days	1,013	1,019	$6,396	$7,375	$7,311	$7,433	$857	-$844	$2,559	-$571	$2,285	13.2%
SNF standardized allowed amount, from episode start through 90 days	1,013	1,019	$16,365	$14,809	$16,041	$16,977	-$2,492	-$4,350	-$634	-$4,051	-$933	-14.4%
HHA standardized allowed amount, from episode start through 90 days	1,013	1,019	$1,514	$1,782	$1,394	$1,530	$133	-$164	$431	-$116	$383	8.1%
IRF standardized allowed amount, from episode start through 90 days												
Part B standardized allowed amount, from episode start through 90 days	1,005	1,010	$4,114	$4,585	$4,158	$4,377	$252	-$349	$854	-$253	$757	5.8%
Number of SNF days, 90-day PDP	1,035	1,035	32.3	28.2	32.6	31.8	-3.2	-6.7	0.2	-6.1	-0.3	-10.3%
Emergency department use, 90-day PDP	1,029	1,026	21.3%	25.4%	26.5%	22.4%	8.2	2.2	14.2	3.1	13.2	47.4%
Unplanned readmission rate, 90-day PDP	1,029	1,026	42.5%	44.0%	48.5%	44.3%	5.7	-1.4	12.8	-0.3	11.7	14.8%
All-cause mortality rate, 90-day PDP	1,024	1,026	24.9%	23.6%	24.6%	25.9%	-2.6*	-8.8	3.7	-7.8	2.7	-9.9%

Exhibit G.7: Renal Failure Episodes, Model 3 SNF, Q4 2011 – Q3 2018 **

Outcome	BPCI Episodes (N)	Comparison Episodes (N)	BPCI Baseline	BPCI Intervention	Comparison Baseline	Comparison Intervention	DiD	95% LCI	95% UCI	90% LCI	90% UCI	DiD (%)
Standardized total allowed payment amount, from episode start through 90 days	1,846	1,884	$29,776	$29,487	$28,441	$30,316	-$2,164*	-$4,255	-$73	-$3,919	-$409	-6.8%
Standardized total amount paid by Medicare, from episode start through 90 days	1,846	1,883	$25,773	$25,589	$24,624	$26,086	-$1,646*	-$3,395	$103	-$3,114	-$178	-6.0%
Standardized total allowed payment amount, IP through 90-day PDP	1,917	1,909	$39,550	$39,058	$38,653	$39,818	-$1,657	-$3,893	$578	-$3,534	$219	-4.1%
Readmissions standardized allowed amount, from episode start through 90 days	1,860	1,909	$5,541	$5,346	$5,193	$5,143	-$145	-$1,190	$899	-$1,022	$731	-2.6%
SNF standardized allowed amount, from episode start through 90 days	1,860	1,909	$17,199	$16,767	$16,968	$18,371	-$1,835	-$3,344	-$326	-$3,102	-$569	-9.9%
HHA standardized allowed amount, from episode start through 90 days	1,860	1,909	$1,492	$1,759	$1,373	$1,611	$29	-$187	$245	-$152	$210	1.7%
IRF standardized allowed amount, from episode start through 90 days												
Part B standardized allowed amount, from episode start through 90 days	1,846	1,884	$4,178	$4,314	$3,848	$4,042	-$57	-$484	$370	-$415	$301	-1.3%
Number of SNF days, 90-day PDP	1,927	1,928	34.3	31.5	35.2	34.6	-2.3	-5.2	0.7	-4.8	0.2	-6.8%
Emergency department use, 90-day PDP	1,922	1,927	22.7%	23.9%	21.5%	23.6%	-0.9	-5.6	3.8	-4.9	3.0	-3.7%
Unplanned readmission rate, 90-day PDP	1,922	1,927	38.8%	37.8%	37.6%	35.8%	0.9	-4.5	6.2	-3.6	5.4	2.4%
All-cause mortality rate, 90-day PDP	1,903	1,916	23.0%	22.9%	21.7%	20.1%	1.4	-2.8	5.7	-2.1	5.0	6.6%

Exhibit G.8: Sepsis Episodes, Model 3 SNF, Q4 2011 – Q3 2018

Outcome	BPCI Episodes (N)	Comparison Episodes (N)	BPCI Baseline	BPCI Intervention	Comparison Baseline	Comparison Intervention	DiD	95% LCI	95% UCI	90% LCI	90% UCI	DiD (%)
Standardized total allowed payment amount, from episode start through 90 days	7,144	7,291	$30,089	$29,061	$29,382	$30,829	-$2,476*	-$3,729	-$1,223	-$3,528	-$1,424	-7.9%
Standardized total amount paid by Medicare, from episode start through 90 days	7,143	7,288	$25,831	$25,137	$25,116	$26,410	-$1,988*	-$3,035	-$941	-$2,867	-$1,109	-7.3%
Standardized total allowed payment amount, IP through 90-day PDP	7,437	7,419	$44,631	$43,219	$44,308	$45,367	-$2,471*	-$3,910	-$1,032	-$3,679	-$1,263	-5.4%
Readmissions standardized allowed amount, from episode start through 90 days	7,187	7,365	$5,920	$5,765	$5,871	$5,889	-$173	-$821	$475	-$717	$370	-2.9%
SNF standardized allowed amount, from episode start through 90 days	7,187	7,365	$17,663	$16,377	$17,383	$18,421	-$2,325	-$3,266	-$1,384	-$3,114	-$1,535	-12.4%
HHA standardized allowed amount, from episode start through 90 days	7,187	7,365	$1,331	$1,611	$1,106	$1,240	$146	$14	$278	$36	$257	10.0%
IRF standardized allowed amount, from episode start through 90 days												
Part B standardized allowed amount, from episode start through 90 days	7,145	7,292	$3,931	$4,212	$3,793	$4,066	$8	-$228	$244	-$190	$207	0.2%
Number of SNF days, 90-day PDP	7,455	7,471	35.4	30.6	36.8	34.7	-2.8	-4.6	-1.1	-4.3	-1.3	-8.4%
Emergency department use, 90-day PDP	7,436	7,447	21.1%	24.4%	21.4%	22.6%	2.0	-0.8	4.8	-0.3	4.4	9.1%
Unplanned readmission rate, 90-day PDP	7,436	7,447	39.0%	36.6%	38.3%	37.5%	-1.6	-4.9	1.7	-4.3	1.2	-4.1%
All-cause mortality rate, 90-day PDP	7,384	7,398	22.4%	20.7%	24.9%	22.5%	0.7	-2.0	3.4	-1.6	3.0	3.6%

Exhibit G.9: Simple Pneumonia and Respiratory Infections Episodes, Model 3 SNF, Q4 2011 – Q3 2018 **

Outcome	BPCI Episodes (N)	Comparison Episodes (N)	BPCI Baseline	BPCI Intervention	Comparison Baseline	Comparison Intervention	DiD	95% LCI	95% UCI	90% LCI	90% UCI	DiD (%)
Standardized total allowed payment amount, from episode start through 90 days	4,500	4,636	$27,385	$26,407	$26,745	$28,258	-$2,491*	-$3,770	-$1,212	-$3,564	-$1,417	-8.6%
Standardized total amount paid by Medicare, from episode start through 90 days	4,500	4,632	$23,601	$23,025	$23,086	$24,434	-$1,924	-$2,999	-$850	-$2,826	-$1,022	-7.7%
Standardized total allowed payment amount, IP through 90-day PDP	4,830	4,831	$37,501	$36,391	$37,436	$38,481	-$2,155*	-$3,514	-$796	-$3,296	-$1,014	-5.6%
Readmissions standardized allowed amount, from episode start through 90 days	4,538	4,680	$4,629	$4,339	$4,915	$4,764	-$139	-$723	$445	-$629	$351	-3.1%
SNF standardized allowed amount, from episode start through 90 days	4,538	4,680	$17,003	$15,700	$15,983	$17,182	-$2,502	-$3,458	-$1,545	-$3,304	-$1,699	-13.7%
HHA standardized allowed amount, from episode start through 90 days	4,538	4,680	$1,394	$1,720	$1,227	$1,465	$89	-$55	$232	-$32	$209	5.4%
IRF standardized allowed amount, from episode start through 90 days												
Part B standardized allowed amount, from episode start through 90 days	4,500	4,636	$3,260	$3,410	$3,315	$3,552	-$86	-$314	$141	-$277	$105	-2.5%
Number of SNF days, 90-day PDP	4,860	4,858	33.9	28.6	33.8	31.9	-3.3	-5.1	-1.6	-4.8	-1.9	-10.5%
Emergency department use, 90-day PDP	4,850	4,864	20.4%	21.8%	20.2%	21.6%	0.0	-3.0	3.0	-2.5	2.5	-5.2%
Unplanned readmission rate, 90-day PDP	4,850	4,864	36.1%	32.9%	37.3%	34.0%	0.1	-3.1	3.3	-2.6	2.7	17.8%
All-cause mortality rate, 90-day PDP	4,813	4,828	24.7%	23.7%	25.4%	22.5%	1.9	-0.9	4.7	-0.5	4.3	8.7%

Exhibit G.10: Stroke Episodes, Model 3 SNF, Q4 2011 – Q3 2018 **

Outcome	BPCI Episodes (N)	Comparison Episodes (N)	BPCI Baseline	BPCI Intervention	Comparison Baseline	Comparison Intervention	DiD	95% LCI	95% UCI	90% LCI	90% UCI	DiD (%)
Standardized total allowed payment amount, from episode start through 90 days	1,959	1,976	$32,305	$32,494	$32,960	$32,828	$321	-$1,670	$2,313	-$1,350	$1,993	1.0%
Standardized total amount paid by Medicare, from episode start through 90 days	1,959	1,976	$27,589	$28,011	$28,161	$28,139	$444	-$1,150	$2,038	-$894	$1,782	1.6%
Standardized total allowed payment amount, IP through 90-day PDP	2,012	2,008	$45,379	$46,447	$46,683	$47,018	$734	-$1,748	$3,216	-$1,350	$2,817	1.6%
Readmissions standardized allowed amount, from episode start through 90 days	1,964	1,986	$3,490	$4,000	$4,019	$3,784	$744	-$82	$1,571	$51	$1,438	22.9%
SNF standardized allowed amount, from episode start through 90 days	1,964	1,986	$23,211	$21,996	$22,886	$22,817	-$1,145	-$2,891	$600	-$2,611	$320	-4.9%
HHA standardized allowed amount, from episode start through 90 days	1,964	1,986	$1,577	$1,934	$1,376	$1,830	-$98	-$336	$140	-$298	$102	-4.8%
IRF standardized allowed amount, from episode start through 90 days												
Part B standardized allowed amount, from episode start through 90 days	1,959	1,976	$3,166	$3,665	$3,269	$3,375	$393	$64	$722	$117	$669	12.0%
Number of SNF days, 90-day PDP	2,017	2,018	43.0	38.5	42.9	40.2	-1.8	-4.7	1.2	-4.3	0.7	-4.4%
Emergency department use, 90-day PDP	2,007	2,009	23.5%	26.0%	23.3%	23.3%	2.5	-1.6	6.7	-1.0	6.0	10.7%
Unplanned readmission rate, 90-day PDP	2,007	2,009	28.4%	30.2%	33.0%	28.7%	6.1	1.4	10.7	2.2	10.0	25.1%
All-cause mortality rate, 90-day PDP	2,011	2,013	19.8%	16.6%	18.8%	16.4%	-0.9	-5.0	3.2	-4.3	2.5	-5.1%

Exhibit G.11: Urinary Tract Infection Episodes, Model 3 SNF, Q4 2011 – Q3 2018 **

Outcome	BPCI Episodes (N)	Comparison Episodes (N)	BPCI Baseline	BPCI Intervention	Comparison Baseline	Comparison Intervention	DiD	95% LCI	95% UCI	90% LCI	90% UCI	DiD (%)
Standardized total allowed payment amount, from episode start through 90 days	2,853	2,885	$28,916	$28,182	$28,383	$29,845	-$2,195	-$3,669	-$722	-$3,432	-$959	-7.2%
Standardized total amount paid by Medicare, from episode start through 90 days	2,852	2,883	$24,524	$24,230	$24,104	$25,362	-$1,552	-$2,756	-$349	-$2,562	-$542	-6.0%
Standardized total allowed payment amount, IP through 90-day PDP	2,925	2,914	$36,187	$35,375	$35,644	$37,191	-$2,359	-$3,918	-$801	-$3,667	-$1,051	-6.3%
Readmissions standardized allowed amount, from episode start through 90 days	2,875	2,927	$3,814	$3,866	$4,189	$3,816	$425	-$242	$1,091	-$135	$984	12.3%
SNF standardized allowed amount, from episode start through 90 days	2,875	2,927	$19,654	$17,956	$18,702	$20,040	-$3,036	-$4,224	-$1,848	-$4,033	-$2,039	-14.5%
HHA standardized allowed amount, from episode start through 90 days	2,875	2,927	$1,404	$1,853	$1,228	$1,554	$124	-$58	$305	-$28	$276	7.1%
IRF standardized allowed amount, from episode start through 90 days												
Part B standardized allowed amount, from episode start through 90 days	2,853	2,885	$3,212	$3,608	$3,284	$3,466	$214	-$54	$482	-$11	$439	6.3%
Number of SNF days, 90-day PDP	2,945	2,954	39.2	33.5	39.1	37.5	-4.1	-6.3	-1.9	-6.0	-2.2	-10.9%
Emergency department use, 90-day PDP	2,940	2,943	21.4%	23.7%	23.1%	25.1%	0.2	-3.5	4.0	-2.9	3.4	1.0%
Unplanned readmission rate, 90-day PDP	2,940	2,943	32.4%	30.4%	34.5%	29.6%	2.9	-1.2	7.0	-0.5	6.3	10.5%
All-cause mortality rate, 90-day PDP	2,906	2,927	16.5%	14.2%	16.4%	14.4%	-0.4	-3.7	2.9	-3.1	2.4	-2.5%

Exhibit G.12: All Clinical Episodes, Model 3 SNF, Q4 2011 – Q3 2018

Outcome	BPCI Episodes (N)	Comparison Episodes (N)	BPCI Baseline	BPCI Intervention	Comparison Baseline	Comparison Intervention	DiD	95% LCI	95% UCI	90% LCI	90% UCI	DiD (%)
Standardized total allowed payment amount, from episode start through 90 days	43,968	44,593	$27,253	$26,423	$26,485	$27,826	-$2,171	-$2,679	-$1,664	-$2,597	-$1,746	-7.6%
Standardized total amount paid by Medicare, from episode start through 90 days	43,963	44,578	$23,621	$23,152	$22,934	$24,121	-$1,657	-$2,069	-$1,244	-$2,003	-$1,311	-6.7%
Standardized total allowed payment amount, IP through 90-day PDP	45,251	45,267	$39,667	$39,072	$39,095	$40,620	-$2,120	-$2,692	-$1,548	-$2,600	-$1,640	-5.1%
Readmissions standardized allowed amount, from episode start through 90 days	44,253	44,944	$3,988	$4,031	$4,071	$4,072	$42	-$159	$243	-$127	$211	1.1%
SNF standardized allowed amount, from episode start through 90 days	44,253	44,944	$17,270	$15,761	$16,725	$17,603	-$2,387	-$2,825	-$1,948	-$2,755	-$2,019	-13.2%
HHA standardized allowed amount, from episode start through 90 days	44,253	44,944	$1,654	$2,015	$1,520	$1,710	$170	$104	$235	$114	$225	9.2%
IRF standardized allowed amount, from episode start through 90 days	44,253	44,944	$143	$187	$147	$185	$5	-$44	$53	-$36	$46	2.5%
Part B standardized allowed amount, from episode start through 90 days	43,970	44,594	$3,320	$3,595	$3,249	$3,470	$53	-$28	$133	-$15	$120	1.5%
Number of SNF days, 90-day PDP	45,471	45,540	34.3	29.1	34.2	32.6	-3.5	-4.3	-2.7	-4.2	-2.9	-10.8%
Emergency department use, 90-day PDP	45,314	45,373	19.7%	21.3%	20.6%	21.2%	1.0	0.0	2.0	0.2	1.9	5.0%
Unplanned readmission rate, 90-day PDP	45,314	45,373	30.0%	28.5%	30.7%	28.6%	0.6	-0.5	1.7	-0.3	1.5	2.2%
All-cause mortality rate, 90-day PDP	45,073	45,184	15.6%	14.9%	16.0%	15.4%	-0.1	-0.9	0.7	-0.8	0.6	-0.7%

Appendix H: Impact of BPCI on Payment, Utilization, and Quality Measures, Baseline to Intervention, Model 3 HHA-initiated Episodes

The following tables display risk-adjusted difference-in-differences results for the payment, utilization, and quality measures assessed in the report. Results are presented by clinical episode. The DiD estimates are also presented as a percentage of what episode payments would have been absent BPCI, which is calculated as the average BPCI baseline payment amount plus the average change in the episode payment amount for the comparison group from baseline to intervention. 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-discharge period
- IP = inpatient hospital stay
- PAC = post-acute care
- SNF = skilled nursing facility
- HHA = home health agency
- IRF = inpatient rehabilitation facility

An asterisk (*) indicates the estimate may be biased because we reject the null hypothesis that BPCI and comparison episodes were on parallel trends for this outcome during the baseline period (with 90% confidence), which is required for an unbiased estimate. Equal trends test was conducted for the total allowed payment amount, mortality, readmission rate, and emergency department visits.

Note that sample sizes reflect the number of episodes initiated during the intervention period that met inclusion criteria for the given outcome. Medicare payments are risk-adjusted and standardized to remove the effect of geographic differences in wages, extra amounts to account for teaching programs and other policy factors. Results reflect Lewin analysis of Medicare claims, assessment, and enrollment data for episodes that began Q4 2011 through Q3 2012 (baseline) and Q4 2013 through Q3 2018 (intervention period) for BPCI episode initiators and the matched comparison providers.

Exhibit H.1: Congestive Heart Failure Episodes, Model 3 HHA, Q4 2011 – Q3 2018

Outcome	BPCI Episodes (N)	Comparison Episodes (N)	BPCI Baseline	BPCI Intervention	Comparison Baseline	Comparison Intervention	DiD	95% LCI	95% UCI	90% LCI	90% UCI	DiD (%)
Standardized total allowed payment amount, from episode start through 90 days	6,353	6,518	$15,980	$16,128	$14,613	$16,249	-$1,488	-$2,302	-$675	-$2,171	-$806	-8.4%
Standardized total amount paid by Medicare, from episode start through 90 days	6,351	6,514	$14,792	$14,826	$13,452	$14,914	-$1,429	-$2,172	-$685	-$2,053	-$805	-8.8%
Standardized total allowed payment amount, IP through 90-day PDP	6,404	6,535	$25,591	$26,104	$24,317	$26,046	-$1,216	-$2,077	-$354	-$1,939	-$493	-4.5%
Readmissions standardized allowed amount, from episode start through 90 days	6,544	6,583	$6,599	$6,541	$6,107	$6,554	-$505	-$1,205	$194	-$1,093	$82	-7.2%
SNF standardized allowed amount, from episode start through 90 days	6,544	6,583	$1,332	$1,559	$1,220	$1,588	-$141	-$444	$163	-$396	$114	-8.3%
HHA standardized allowed amount, from episode start through 90 days	6,544	6,583	$3,427	$3,280	$3,022	$3,109	-$234	-$459	-$8	-$423	-$44	-6.6%
IRF standardized allowed amount, from episode start through 90 days												
Part B standardized allowed amount, from episode start through 90 days	6,353	6,518	$3,739	$4,013	$3,683	$4,291	-$333	-$709	$43	-$649	-$18	-7.7%
Number of HHA visits, 90-day PDP	6,598	6,602	20.6	16.0	16.6	15.6	-3.7	-7.1	-0.2	-6.6	-0.7	-18.6%
Emergency department use, 90-day PDP	6,411	6,581	20.4%	22.9%	23.7%	24.6%	1.6	-0.9	4.1	-0.5	3.7	7.4%
Unplanned readmission rate, 90-day PDP	6,411	6,581	44.2%	42.1%	39.4%	40.9%	-3.5	-6.3	-0.7	-5.9	-1.1	-7.7%
All-cause mortality rate, 90-day PDP	6,522	6,553	13.3%	12.0%	13.0%	12.8%	-1.1	-3.1	0.9	-2.7	0.6	-8.3%

Exhibit H.2: Major Joint Replacement of the Lower Extremity Episodes, Model 3 HHA, Q4 2011 – Q3 2018

Outcome	BPCI Episodes (N)	Comparison Episodes (N)	BPCI Baseline	BPCI Intervention	Comparison Baseline	Comparison Intervention	DiD	95% LCI	95% UCI	90% LCI	90% UCI	DiD (%)
Standardized total allowed payment amount, from episode start through 90 days	6,715	6,732	$7,322	$7,205	$6,512	$6,935	-$540*	-$1,268	$187	-$1,151	$70	-7.0%
Standardized total amount paid by Medicare, from episode start through 90 days	6,712	6,725	$6,789	$6,669	$6,009	$6,392	-$503*	-$1,176	$169	-$1,068	$61	-7.0%
Standardized total allowed payment amount, IP through 90-day PDP	6,715	6,733	$23,998	$24,204	$23,370	$23,288	$288*	-$498	$1,074	-$371	$948	1.2%
Readmissions standardized allowed amount, from episode start through 90 days	6,791	6,792	$937	$982	$655	$902	-$202	-$448	$44	-$408	$4	-17.1%
SNF standardized allowed amount, from episode start through 90 days	6,791	6,792	$238	$257	$242	$296	-$35	-$215	$145	-$186	$116	-12.0%
HHA standardized allowed amount, from episode start through 90 days	6,791	6,792	$3,616	$3,537	$3,425	$3,404	-$57	-$296	$182	-$258	$143	-1.6%
IRF standardized allowed amount, from episode start through 90 days												
Part B standardized allowed amount, from episode start through 90 days	6,715	6,732	$2,146	$2,186	$2,051	$2,184	-$93	-$343	$156	-$303	$116	-4.1%
Number of HHA visits, 90-day PDP	6,795	6,794	12.2	11.9	12.1	11.4	0.4	-0.5	1.2	-0.3	1.0	3.1%
Emergency department use, 90-day PDP	6,712	6,785	13.3%	13.7%	12.6%	14.1%	-1.1	-3.8	1.7	-3.4	1.2	-7.2%
Unplanned readmission rate, 90-day PDP	6,712	6,785	8.2%	6.6%	5.8%	5.9%	-1.8*	-3.7	0.1	-3.3	-0.2	-21.3%
All-cause mortality rate, 90-day PDP	6,783	6,786	0.5%	0.6%	0.4%	0.5%	0.0	-0.5	0.5	-0.4	0.4	5.0%

Exhibit H.3: Simple Pneumonia and Respiratory Infections Episodes, Model 3 HHA, Q4 2011 – Q3 2018

Outcome	BPCI Episodes (N)	Comparison Episodes (N)	BPCI Baseline	BPCI Intervention	Comparison Baseline	Comparison Intervention	DiD	95% LCI	95% UCI	90% LCI	90% UCI	DiD (%)
Standardized total allowed payment amount, from episode start through 90 days	1,604	1,600	$12,896	$13,834	$12,673	$13,918	-$308	-$1,851	$1,235	-$1,603	$987	-2.2%
Standardized total amount paid by Medicare, from episode start through 90 days	1,604	1,600	$11,955	$12,783	$11,714	$12,820	-$279	-$1,685	$1,128	-$1,459	$902	-2.1%
Standardized total allowed payment amount, IP through 90-day PDP	1,604	1,603	$22,623	$25,458	$22,701	$24,191	$1,345	-$692	$3,382	-$365	$3,054	5.6%
Readmissions standardized allowed amount, from episode start through 90 days	1,635	1,632	$3,783	$4,170	$4,125	$4,402	$111	-$791	$1,013	-$646	$868	2.7%
SNF standardized allowed amount, from episode start through 90 days	1,635	1,632	$1,045	$1,063	$1,170	$1,269	-$81	-$574	$413	-$495	$334	-7.1%
HHA standardized allowed amount, from episode start through 90 days	1,635	1,632	$3,697	$3,980	$3,495	$3,697	$80	-$205	$365	-$159	$320	2.1%
IRF standardized allowed amount, from episode start through 90 days												
Part B standardized allowed amount, from episode start through 90 days	1,604	1,600	$3,032	$3,379	$3,033	$3,490	-$110	-$499	$279	-$436	$217	-3.1%
Number of HHA visits, 90-day PDP	1,635	1,635	17.1	18.1	16.0	16.8	0.3	-1.1	1.6	-0.9	1.4	1.4%
Emergency department use, 90-day PDP	1,612	1,628	28.3%	25.7%	26.2%	28.2%	-4.5	-9.6	0.6	-8.8	-0.2	-14.9%
Unplanned readmission rate, 90-day PDP	1,612	1,628	29.7%	31.2%	28.9%	30.1%	0.3	-4.7	5.4	-3.9	4.5	1.0%
All-cause mortality rate, 90-day PDP	1,620	1,629	12.0%	11.3%	11.0%	11.2%	-0.9	-4.0	2.2	-3.5	1.7	-7.2%

Exhibit H.4: All Clinical Episodes, Model 3 HHA, Q4 2011 – Q3 2018

Outcome	BPCI Episodes (N)	Comparison Episodes (N)	BPCI Baseline	BPCI Intervention	Comparison Baseline	Comparison Intervention	DiD	95% LCI	95% UCI	90% LCI	90% UCI	DiD (%)
Standardized total allowed payment amount, from episode start through 90 days	14,672	14,850	$11,972	$12,103	$10,856	$11,969	-$981	-$1,512	-$451	-$1,426	-$536	-7.5%
Standardized total amount paid by Medicare, from episode start through 90 days	14,667	14,839	$11,093	$11,149	$10,013	$11,008	-$939	-$1,426	-$452	-$1,348	-$530	-7.8%
Standardized total allowed payment amount, IP through 90-day PDP	14,723	14,871	$24,672	$25,246	$23,524	$24,514	-$416	-$996	$164	-$902	$71	-1.6%
Readmissions standardized allowed amount, from episode start through 90 days	14,970	15,007	$3,878	$3,950	$3,574	$3,899	-$253	-$598	$91	-$542	$36	-6.0%
SNF standardized allowed amount, from episode start through 90 days	14,970	15,007	$843	$972	$792	$996	-$74	-$243	$95	-$215	$68	-7.0%
HHA standardized allowed amount, from episode start through 90 days	14,970	15,007	$3,525	$3,454	$3,252	$3,322	-$141	-$332	$51	-$301	$20	-3.9%
IRF standardized allowed amount, from episode start through 90 days	14,970	15,007	$290	$257	$133	$205	-$106	-$195	-$17	-$181	-$31	-29.2%
Part B standardized allowed amount, from episode start through 90 days	14,672	14,850	$2,978	$3,176	$2,876	$3,276	-$203	-$399	-$7	-$367	-$39	-6.0%
Number of HHA visits, 90-day PDP	15,028	15,031	16.8	14.6	14.4	14.0	-1.8	-4.6	1.1	-4.2	0.6	-10.8%
Emergency department use, 90-day PDP	14,735	14,994	18.5%	19.4%	19.7%	20.7%	-0.1	-1.9	1.7	-1.6	1.4	-0.6%
Unplanned readmission rate, 90-day PDP	14,735	14,994	27.0%	25.7%	24.0%	24.8%	-2.1	-3.6	-0.5	-3.4	-0.7	-7.4%
All-cause mortality rate, 90-day PDP	14,925	14,968	7.8%	7.2%	7.4%	7.5%	-0.7	-1.7	0.3	-1.5	0.1	-8.9%

Appendix I: Impact of BPCI on Payment, Utilization, and Quality Measures, Baseline to Intervention, Model 4 Hospital-initiated Episodes

The following tables display risk-adjusted difference-in-differences results for the payment, utilization, and quality measures assessed in the report. Results are presented by clinical episode. The DiD estimates are also presented as a percentage of what episode payments would have been absent BPCI, which is calculated as the average BPCI baseline payment amount plus the average change in the episode payment amount for the comparison group from baseline to intervention. 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-discharge period
- IP = inpatient hospital stay
- PAC = post-acute care
- SNF = skilled nursing facility
- HHA = home health agency
- IRF = inpatient rehabilitation facility

An asterisk (*) indicates the estimate may be biased because we reject the null hypothesis that BPCI and comparison episodes were on parallel trends for this outcome during the baseline period (with 90% confidence), which is required for an unbiased estimate. Equal trends test was conducted for the total allowed payment amount, mortality, readmission rate, and emergency department visits.

Note that sample sizes reflect the number of episodes initiated during the intervention period that met inclusion criteria for the given outcome. Medicare payments are risk-adjusted and standardized to remove the effect of geographic differences in wages, extra amounts to account for teaching programs and other policy factors. Results reflect Lewin analysis of Medicare claims, assessment, and enrollment data for episodes that began Q4 2011 through Q3 2012 (baseline) and Q4 2013 through Q3 2018 (intervention period) for BPCI episode initiators and the matched comparison providers.

Exhibit I.1: Coronary Artery Bypass Graft Episodes, Model 4 Hospitals, Q4 2011 – Q3 2018

Outcome	BPCI Episodes (N)	Comparison Episodes (N)	BPCI Baseline	BPCI Intervention	Comparison Baseline	Comparison Intervention	DiD	95% LCI	95% UCI	90% LCI	90% UCI	DiD (%)
Standardized total allowed payment amount, IP through 30-day PDP	1,119	1,116	$43,741	$44,745	$44,227	$45,041	$190	-$2,706	$3,085	-$2,241	$2,620	0.4%
Standardized total allowed payment amount, IP through 90-day PDP	1,080	1,085	$49,083	$50,624	$50,672	$50,796	$1,417	-$2,671	$5,504	-$2,014	$4,847	2.9%
Readmissions standardized allowed amount, 30-day PDP	1,121	1,121	$1,856	$994	$2,041	$1,868	-$689	-$1,523	$146	-$1,389	$11	-40.9%
Readmissions standardized allowed amount, 90-day PDP	1,082	1,089	$3,500	$2,654	$3,861	$3,091	-$75	-$1,493	$1,344	-$1,265	$1,116	-2.7%
SNF standardized allowed amount, 30-day PDP	1,121	1,121	$1,539	$1,828	$1,190	$1,571	-$92	-$703	$520	-$605	$421	-4.8%
SNF standardized allowed amount, 90-day PDP	1,082	1,089	$2,186	$2,340	$2,202	$2,645	-$289	-$1,324	$745	-$1,157	$578	-11.0%
HHA standardized allowed amount, 30-day PDP	1121	1121	$1,071	$1,280	$922	$1,069	$63	-$183	$308	-$143	$269	5.1%
HHA standardized allowed amount, 90-day PDP	1082	1089	$1,659	$1,772	$1,503	$1,636	-$19	-$341	$303	-$290	$251	-1.1%
IRF standardized allowed amount, 30-day PDP	1121	1121	$1,828	$1,704	$2,945	$2,771	$50	-$1,377	$1,478	-$1,148	$1,249	3.0%
IRF standardized allowed amount, 90-day PDP	1082	1089	$2,008	$1,840	$3,451	$2,945	$338	-$1,220	$1,897	-$970	$1,646	22.5%
Patients discharged to any PAC setting	1,097	1,098	69.4%	74.2%	63.0%	66.6%	1.3	-9.5	12.1	-7.7	10.4	1.8%
Patients discharged to institutional PAC of those discharged to any PAC setting	924	604	43.3%	41.5%	45.5%	47.9%	-4.2	-17.1	8.7	-15.1	6.6	-9.2%
Number of SNF days, 90-day PDP	260	180	21.6	19.9	29.0	27.8	-0.5	-7.7	6.8	-6.6	5.6	-2.4%
Emergency department use, 90-day PDP	1,082	1,089	22.5%	22.6%	20.2%	21.3%	-1.1*	-5.9	3.8	-5.2	3.0	-4.6%
Unplanned readmission rate, 90-day PDP	1,082	1,089	22.2%	15.9%	26.0%	21.4%	-1.7*	-9.5	6.0	-8.2	4.8	-9.8%
All-cause mortality rate, 90-day PDP	1,082	1,088	2.6%	1.4%	2.1%	2.0%	-1.1	-2.6	0.3	-2.4	0.1	-45.1%

Exhibit I.2: Major Joint Replacement of the Lower Extremity Episodes, Model 4 Hospitals, Q4 2011 – Q3 2018

Outcome	BPCI Episodes (N)	Comparison Episodes (N)	BPCI Baseline	BPCI Intervention	Comparison Baseline	Comparison Intervention	DiD	95% LCI	95% UCI	90% LCI	90% UCI	DiD (%)
Standardized total allowed payment amount, IP through 30-day PDP	7,083	7,068	$21,550	$22,014	$22,782	$22,734	$512	-$155	$1,180	-$48	$1,072	2.4%
Standardized total allowed payment amount, IP through 90-day PDP	7,004	6,983	$25,607	$26,057	$27,111	$27,147	$414	-$520	$1,348	-$370	$1,198	1.6%
Readmissions standardized allowed amount, 30-day PDP	7,096	7,104	$506	$406	$538	$580	-$143	-$308	$22	-$282	-$5	-26.1%
Readmissions standardized allowed amount, 90-day PDP	7,016	7,017	$1,230	$1,331	$1,174	$1,321	-$45	-$323	$233	-$278	$188	-3.3%
SNF standardized allowed amount, 30-day PDP	7,096	7,104	$3,689	$3,472	$3,509	$3,316	-$24	-$550	$502	-$465	$417	-0.7%
SNF standardized allowed amount, 90-day PDP	7016	7017	$5,022	$4,490	$4,969	$4,620	-$184	-$890	$522	-$776	$409	-3.9%
HHA standardized allowed amount, 30-day PDP	7096	7104	$1,138	$1,252	$1,325	$1,198	$241	$23	$460	$58	$425	23.9%
HHA standardized allowed amount, 90-day PDP	7016	7017	$1,746	$1,894	$1,953	$1,705	$396	$108	$684	$155	$637	26.4%
IRF standardized allowed amount, 30-day PDP	7096	7104	$1,004	$1,269	$1,852	$1,732	$385	$8	$761	$69	$701	43.5%
IRF standardized allowed amount, 90-day PDP	7,016	7,017	$1,077	$1,338	$1,936	$1,848	$348	-$61	$757	$5	$692	35.2%
Patients discharged to any PAC setting	7,073	7,073	68.4%	70.7%	78.1%	71.0%	9.3	2.4	16.2	3.5	15.1	15.2%
Patients discharged to institutional PAC of those discharged to any PAC setting	5,273	4,678	63.2%	59.6%	61.9%	56.0%	2.4	-5.0	9.7	-3.8	8.5	4.1%
Number of SNF days, 90-day PDP	2,184	2,439	25.1	23.3	26.3	25.6	-1.2	-3.6	1.3	-3.2	0.9	-4.8%
Emergency department use, 90-day PDP	7,012	7,013	11.5%	13.7%	14.2%	15.1%	1.2	-1.5	3.9	-1.1	3.5	9.5%
Unplanned readmission rate, 90-day PDP	7,012	7,013	8.7%	6.6%	9.9%	9.0%	-1.1	-3.0	0.7	-2.7	0.4	-14.7%
All-cause mortality rate, 90-day PDP	6,935	6,977	1.7%	1.8%	1.9%	1.9%	0.0*	-0.9	0.9	-0.7	0.8	1.7%

Exhibit I.3: All Clinical Episodes, Model 4 Hospitals, Q4 2011 – Q3 2018

Outcome	BPCI Episodes (N)	Comparison Episodes (N)	BPCI Baseline	BPCI Intervention	Comparison Baseline	Comparison Intervention	DiD	95% LCI	95% UCI	90% LCI	90% UCI	DiD (%)
Standardized total allowed payment amount, IP through 30-day PDP	8,202	8,184	$24,774	$25,436	$25,636	$25,719	$579	-$138	$1,297	-$23	$1,181	2.3%
Standardized total allowed payment amount, IP through 90-day PDP	8,084	8,068	$29,022	$29,777	$30,131	$30,158	$728	-$291	$1,747	-$128	$1,583	2.5%
Readmissions standardized allowed amount, 30-day PDP	8,217	8,225	$678	$491	$758	$773	-$202	-$390	-$14	-$359	-$44	-29.1%
Readmissions standardized allowed amount, 90-day PDP	8,098	8,106	$1,479	$1,485	$1,563	$1,625	-$56	-$391	$280	-$337	$226	-3.6%
SNF standardized allowed amount, 30-day PDP	8,217	8,225	$3,346	$3,218	$3,228	$3,103	-$3	-$464	$458	-$389	$384	-0.1%
SNF standardized allowed amount, 90-day PDP	8,098	8,106	$4,633	$4,221	$4,596	$4,347	-$164	-$787	$460	-$687	$360	-3.7%
HHA standardized allowed amount, 30-day PDP	8217	8225	$1,140	$1,257	$1,254	$1,182	$188	-$17	$393	$16	$360	17.6%
HHA standardized allowed amount, 90-day PDP	8098	8106	$1,746	$1,874	$1,877	$1,702	$303	$44	$562	$86	$521	19.3%
IRF standardized allowed amount, 30-day PDP	8217	8225	$1,114	$1,350	$1,964	$1,876	$323	-$110	$757	-$40	$687	31.5%
IRF standardized allowed amount, 90-day PDP	8098	8106	$1,207	$1,436	$2,091	$1,984	$336	-$124	$797	-$50	$723	30.6%
Patients discharged to any PAC setting	8,170	8,171	68.8%	70.6%	75.9%	70.6%	7.1	0.5	13.7	1.5	12.7	11.2%
Patients discharged to institutional PAC of those discharged to any PAC setting	6,197	5,282	59.1%	56.1%	61.1%	55.9%	2.2	-4.8	9.2	-3.7	8.1	4.1%
Number of SNF days, 90-day PDP	2,444	2,619	25.2	23.4	26.0	25.4	-1.1	-3.4	1.2	-3.0	0.8	-4.4%
Emergency department use, 90-day PDP	8,094	8,102	13.0%	14.6%	15.4%	16.2%	0.8	-1.5	3.1	-1.2	2.7	5.7%
Unplanned readmission rate, 90-day PDP	8,094	8,102	10.7%	8.1%	11.9%	10.5%	-1.2	-3.2	0.8	-2.9	0.4	-13.2%
All-cause mortality rate, 90-day PDP	8,017	8,065	1.8%	1.8%	1.9%	1.9%	0.0*	-0.9	0.8	-0.7	0.7	-2.0%

Appendix J: Net Savings to the Medicare Program by Clinical Episode and by Surgical and Medical Clinical Episodes

The following tables display estimated net savings to Medicare. Results are presented by clinical episode. Please observe the following abbreviations, which are used throughout the appendix:

- LCI = lower bound of confidence interval at the 5% level
- UCI = upper bound of confidence interval at the 5% level
- SNF = skilled nursing facility
- HHA = home health agency
- PGP = physician group practice

An asterisk (*) indicates the net savings to Medicare per episode was statistically significant at the 5% level.

Note that for Model 2 hospitals and Model 2 PGPs, the decline in total non-standardized paid amounts per episode reflect the total Part A and Part B amounts paid by Medicare to providers (excluding copays and deductibles) for the qualifying inpatient stay plus 90-day post discharge period. For Model 3 SNFs and Model 3 HHAs, the decline in total non-standardized paid amounts per episode reflect the total Part A and Part B amounts paid by Medicare to providers (excluding copays and deductibles) from episode start through 90 days. For all Models and participant types, the payment amounts incorporate geographic and other payment adjustments and exclude beneficiary out-of-pocket expenses. Payments are also risk-adjusted and unstandardized to compare directly with reconciliation payments to calculate net savings.

The decline in total non-standardized paid amounts per episode is based on a difference-in-differences (DiD) model of the standardized paid amounts that were adjusted using a standardized to non-standardized ratio. The ratio differs by clinical episode and is based on claims data from the intervention period. A positive value indicates an estimated decrease in non-standardized paid amounts per episode, while a negative estimate indicates an estimated increase in non-standardized paid amounts per episode. The 95% LCI and UCI indicate the lower and upper limits, respectively, of the confidence interval for the decline in non-standardized paid amounts per episode. The reconciliation payment per episode is calculated as the target price minus the actual Medicare episode payments, divided by the total number of episodes. A positive reconciliation payment is the amount per episode paid by Medicare to participants in excess of FFS payments. A negative reconciliation payment is the amount per episode that participants would have repaid to Medicare as originally designed, if downside risk had not been eliminated. Net savings to Medicare per episode is the difference between the decline in total non-standardized paid amounts and reconciliation payments. The estimates depict savings to Medicare as the model was designed, in which repayment responsibility was not eliminated and theoretical repayments were included in the reconciliation payment amounts, unless otherwise indicated. The sample size of BPCI episodes in the tables below do not necessarily match the number of episodes in the analytical sample used for the impact estimates because it includes all providers and all eligible episodes, whether or not they met the additional criteria for inclusion in the impact estimates.

Results reflect Lewin analysis of Medicare claims and enrollment data for episodes that began Q4 2011 through Q3 2018 for BPCI and comparison providers and CMS data on reconciliation payments from Q4 2013 through Q3 2018.

Exhibit J.1: Overall Estimated Net Savings to Medicare with Downside Risk Eliminated and not Eliminated, by Model, Q4 2013 – Q3 2018

Model	Downside Risk Eliminated (Yes/No)	BPCI Episodes (N)	Decline in Total Non-standardized Paid Amounts per Episode	95% LCI	95% UCI	Reconciliation Payment per Episode	Net Savings to Medicare per Episode
2	Yes	1,260,141	$947	$721	$1,173	$1,279	-$332*
2	No (hypothetical)	1,260,141	$947	$721	$1,173	$946	$1
3	Yes	154,106	$1,503	$1,150	$1,857	$2,217	-$714*
3	No (hypothetical)	154,106	$1,503	$1,150	$1,857	$1,930	-$426*

Exhibit J.2: Estimated Net Savings to Medicare with Downside Risk not Eliminated, by Clinical Episode, Model 2 Hospitals, Q4 2013 – Q3 2018

Clinical Episode	BPCI Episodes (N)	Decline in Total Non-standardized Paid Amounts per Episode	95% LCI	95% UCI	Reconciliation Payment per Episode	Net Savings to Medicare per Episode
Acute myocardial infarction	11,738	$639	-$498	$1,776	$350	$289
Cardiac arrhythmia	10,704	$678	-$60	$1,416	$517	$161
Cardiac valve	8,997	-$388	-$2,343	$1,567	$2,188	-$2,576*
Cellulitis	9,786	$791	-$61	$1,644	$915	-$124
Cervical spinal fusion	3,014	-$397	-$2,533	$1,738	$867	-$1,265
Chronic obstructive pulmonary disease, bronchitis, asthma	37,484	$565	$53	$1,077	$521	$44
Congestive heart failure	65,815	$340	-$149	$830	$209	$131
Coronary artery bypass graft	7,869	$922	-$1,298	$3,141	$2,318	-$1,397
Diabetes	3,247	-$446	-$2,299	$1,406	$851	-$1,297
Esophagitis, gastroenteritis and other digestive disorders	7,922	$920	$6	$1,834	$606	$314
Fractures of the femur and hip or pelvis	2,255	-$420	-$2,541	$1,702	$2,898	-$3,318*
Gastrointestinal hemorrhage	7,626	$804	-$128	$1,735	$997	-$194
Gastrointestinal obstruction	3,245	-$815	-$2,128	$498	$400	-$1,215
Hip & femur procedures except major joint	14,272	$2,105	$1,181	$3,029	$2,815	-$711

Clinical Episode	BPCI Episodes (N)	Decline in Total Non-standardized Paid Amounts per Episode	95% LCI	95% UCI	Reconciliation Payment per Episode	Net Savings to Medicare per Episode
Lower extremity and humerus procedure except hip, foot, femur	2,016	$800	-$1,541	$3,141	$2,492	-$1,691
Major bowel procedure	5,849	$39	-$1,646	$1,724	$748	-$709
Major joint replacement of the lower extremity	218,976	$1,267	$926	$1,609	$1,010	$257
Major joint replacement of the upper extremity	3,459	-$620	-$2,130	$890	$1,362	-$1,982*
Medical non-infectious orthopedic	14,565	$1,868	$856	$2,881	$2,468	-$600
Nutritional and metabolic disorders	5,585	-$1,083	-$2,474	$308	$623	-$1,706*
Other respiratory	10,473	$518	-$809	$1,844	$1,099	-$581
Other vascular surgery	2,702	$533	-$1,874	$2,940	$235	$298
Percutaneous coronary intervention	11,325	-$324	-$1,222	$574	$735	-$1,059*
Renal failure	14,482	$1,364	$514	$2,214	$1,203	$161
Revision of the hip or knee	2,550	-$54	-$2,315	$2,207	$1,253	-$1,307
Sepsis	57,623	$146	-$740	$1,033	$1,330	-$1,184*
Simple pneumonia and respiratory infections	44,409	$712	$212	$1,212	$674	$38
Spinal fusion (non-cervical)	7,031	$1,371	-$248	$2,990	$1,684	-$313
Stroke	24,826	$822	-$99	$1,743	$920	-$98
Syncope & collapse	2,734	$921	-$557	$2,400	$1,217	-$295
Transient ischemia	2,020	$200	-$1,505	$1,904	$1,086	-$887
Urinary tract infection	17,594	$1,144	$324	$1,964	$1,838	-$694
Surgical Clinical Episodes	**309,668[a]**	**$1,150**	**$769**	**$1,532**	**$1,238**	**-$87**
Medical Clinical Episodes	**345,793[a]**	**$534**	**$238**	**$829**	**$807**	**-$273**

[a] The BPCI episodes (N) here do not represent the sum of the clinical episodes because not all clinical episodes are included in the table; only those which we created estimates of savings are included. However, all clinical episodes are included in the calculations for surgical and medical clinical episodes.

Exhibit J.3: Estimated Net Savings to Medicare with Downside Risk not Eliminated, by Clinical Episode, Model 2 PGPs, Q4 2013 – Q3 2018

Clinical Episode	BPCI Episodes (N)	Decline in Total Non-standardized Paid Amounts per Episode	95% LCI	95% UCI	Reconciliation Payment per Episode	Net Savings to Medicare per Episode
Acute myocardial infarction	13,281	$739	-$893	$2,371	$1,036	-$298
Cardiac arrhythmia	12,180	-$302	-$1,533	$930	-$171	-$130
Cellulitis	10,860	$153	-$1,051	$1,357	$156	-$3
Chronic obstructive pulmonary disease, bronchitis, asthma	28,005	$43	-$632	$719	$197	-$154
Congestive heart failure	36,781	$922	-$66	$1,910	$479	$443
Esophagitis, gastroenteritis and other digestive disorders	12,393	-$381	-$1,457	$694	-$9	-$372
Gastrointestinal hemorrhage	9,206	$2,482	$1,178	$3,785	-$112	$2,593*
Gastrointestinal obstruction	4,902	$1,771	$267	$3,275	$393	$1,378
Hip & femur procedures except major joint	16,111	$1,705	$621	$2,788	$957	$748
Major joint replacement of the lower extremity	182,046	$1,947	$1,572	$2,322	$1,458	$489*
Major joint replacement of the upper extremity	8,083	$1,662	$510	$2,815	$1,388	$274
Medical non-infectious orthopedic	10,829	$2,066	$798	$3,334	$201	$1,865*
Nutritional and metabolic disorders	10,686	$209	-$1,379	$1,797	$93	$116
Other respiratory	21,197	$145	-$1,439	$1,728	$900	-$756
Percutaneous coronary intervention	8,250	$517	-$928	$1,962	$177	$340
Renal failure	18,153	-$247	-$1,423	$930	-$83	-$163
Sepsis	80,509	$487	-$377	$1,351	$1,477	-$990*
Simple pneumonia and respiratory infections	41,993	-$20	-$830	$791	$345	-$365
Spinal fusion (non-cervical)	5,141	$2,732	$955	$4,509	$2,317	$415
Stroke	13,970	$1,140	-$639	$2,919	$204	$936
Urinary tract infection	18,295	$294	-$688	$1,277	$236	$58
Surgical Clinical Episodes	**245,808[a]**	**$1,969**	**$1,562**	**$2,376**	**$1,322**	**$647***
Medical Clinical Episodes	**358,872[a]**	**$422**	**$47**	**$797**	**$570**	**-$148**

[a] The BPCI episodes (N) here do not represent the sum of the clinical episodes because not all clinical episodes are included in the table; only those which we created estimates of savings are included. However, all clinical episodes are included in the calculations for surgical and medical clinical episodes.

Exhibit J.4: Estimated Net Savings to Medicare with Downside Risk not Eliminated, by Clinical Episode, Model 3 SNFs, Q4 2013 – Q3 2018

Clinical Episode	BPCI Episodes (N)	Decline in Total Non-standardized Paid Amounts per Episode	95% LCI	95% UCI	Reconciliation Payment per Episode	Net Savings to Medicare per Episode
Chronic obstructive pulmonary disease, bronchitis, asthma	2,956	$203	-$1,849	$2,256	$1,755	-$1,552
Congestive heart failure	6,851	$1,821	$455	$3,186	$1,481	$340
Hip & femur procedures except major joint	7,309	$2,719	$1,585	$3,852	$3,795	-$1,076
Major joint replacement of the lower extremity	15,739	$1,520	$829	$2,210	$2,138	-$619
Medical non-infectious orthopedic	5,568	$2,087	$770	$3,405	$2,820	-$732
Other respiratory	2,775	$1,777	-$1,074	$4,629	$1,774	$3
Renal failure	3,040	$1,720	-$107	$3,547	$1,772	-$52
Sepsis	9,976	$2,171	$1,028	$3,315	$2,078	$93
Simple pneumonia and respiratory infections	6,674	$2,016	$890	$3,141	$2,444	-$428
Stroke	3,750	-$454	-$2,084	$1,176	$1,260	-$1,714*
Urinary tract infection	4,342	$1,607	$361	$2,853	$2,308	-$701

Exhibit J.5: Estimated Net Savings to Medicare with Downside Risk not Eliminated, by Clinical Episode, Model 3 HHAs, Q4 2013 – Q3 2018

Clinical Episode	BPCI Episodes (N)	Decline in Total Non-standardized Paid Amounts per Episode	95% LCI	95% UCI	Reconciliation Payment per Episode	Net Savings to Medicare per Episode
Congestive heart failure	7,273	$1,787	$857	$2,717	$89	$1,698*
Major joint replacement of the lower extremity	7,736	$486	-$163	$1,135	$1,312	-$826*
Simple pneumonia and respiratory infections	1,769	$280	-$1,133	$1,693	$6	$274

Appendix K: Comparison of Medicare FFS Spending Reductions that are Calculated with the Use of Model Benchmarks and that are Estimated by the Evaluation, by Clinical Episode

The following tables and graphs display the Medicare FFS spending reductions that are calculated with the use of model benchmarks and that are estimated by the evaluation for Model 2 hospitals, Model 2 physician group practices, Model 3 skilled nursing facilities, Model 3 home health agencies, and Model 4 hospitals. Results are presented by clinical episode and for each Model and participant type overall. Please observe the following abbreviations, which are used throughout the appendix:

- PGP = physician group practice
- SNF = skilled nursing facility
- HHA = home health agency
- LCI = lower confidence interval
- UCI = upper confidence interval
- FFS = fee-for-service
- COPD = chronic obstructive pulmonary disease
- MJRLE = major joint replacement of the lower extremity
- MJRUE = major joint replacement of the upper extremity
- SPRI = simple pneumonia and respiratory infections

An asterisk (*) indicates the Medicare FFS spending reductions that are calculated with the use of model benchmarks and that are estimated by the evaluation are statistically significantly different from each other at the 5% level.

The Medicare FFS spending reductions that are calculated with the use of model benchmarks are equal to the benchmark price minus aggregated FFS average episode payments. Medicare FFS spending reductions that are estimated by the evaluation are equal to the change in standardized allowed payments covered within the bundle definition from the difference-in-differences (DiD) model, including the 95% confidence interval as an error bar. We consider the Medicare FFS spending reductions that are calculated with the use of model benchmarks and that are estimated by the Evaluation to be statistically significantly different from each other at the 5% level if the Medicare FFS spending reductions that are calculated with the use of model benchmarks fall outside of the 95% confidence interval associated with the evaluation estimate. The evaluation estimate was multiplied by (-1) so that a positive estimate indicates a decline in payments. Both the Medicare FFS spending reductions that are calculated with the use of model benchmarks and that are estimated by the evaluation are divided by the evaluation's estimate of what BPCI episode payments would have been absent the initiative, which is calculated as the average BPCI baseline payment amount plus the average change in the episode payment amount for the comparison group from baseline to intervention. Results are sorted in order of increasing evaluation estimate expressed as a percentage.

Results reflect Lewin analysis of Medicare claims and enrollment data for episodes from Q4 2011 through Q3 2012 (baseline period) and Q4 2013 through Q3 2018 (intervention period) for BPCI and comparison providers, and reconciliation data from Q4 2013 through Q3 2018.

Exhibit K.1: Medicare FFS Spending Reductions That Are Calculated with The Use of Model Benchmarks and That Are Estimated by The Evaluation, Q4 2013 – Q3 2018 (%)

Model and Participant Type	BPCI Episodes (N)	Average Model Benchmark (Mean)	FFS Payments per Episode	Spending Reductions Calculated with The Use of Model Benchmarks (%)	Spending Reductions Estimated by The Evaluation (%)	LCI (95%)	UCI (95%)	LCI (90%)	UCI (90%)	Difference between Spending Reductions Using Model Benchmarks and Evaluation Estimates
Model 2 Hospitals	572,365	$26,675	$25,097	6.0%	3.3%	2.3%	4.3%	2.5%	4.2%	2.7*
Model 2 PGP	265,934	$24,164	$22,790	5.5%	4.7%	3.0%	6.5%	3.3%	6.2%	0.8
Model 3 SNF	45,298	$26,015	$22,915	11.9%	7.6%	5.7%	9.5%	6.0%	9.2%	4.3*
Model 3 HHA	14,730	$11,967	$10,767	10.2%	5.8%	1.6%	10.1%	2.3%	9.4%	4.4*

Exhibit K.2A: Medicare FFS Spending Reductions That Are Calculated with The Use of Model Benchmarks and That Are Estimated by The Evaluation, Model 2 Hospitals, by Clinical Episode, Q4 2013 – Q3 2018 (%)

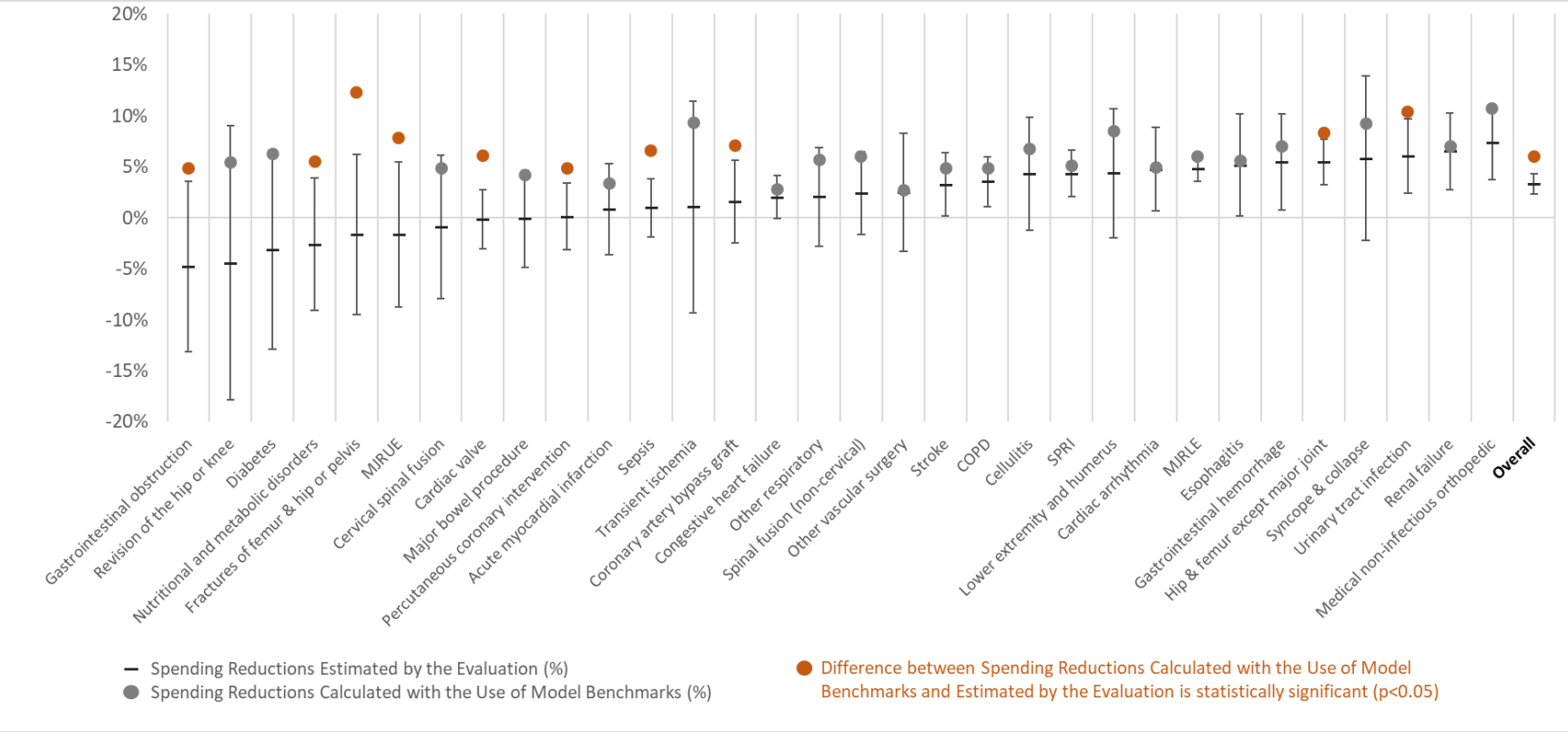


Exhibit K.2B: Medicare FFS Spending Reductions That Are Calculated with The Use of Model Benchmarks and That Are Estimated by The Evaluation, Model 2 Hospitals, by Clinical Episode, Q4 2013 – Q3 2018 (%)

Clinical Episode	BPCI Episodes (N)	Average Model Benchmark (Mean)	FFS Payments per Episode	Spending Reductions Calculated with The Use of Model Benchmarks (%)	Spending Reductions Estimated by The Evaluation (%)	LCI (95%)	UCI (95%)	LCI (90%)	UCI (90%)	Difference between Spending Reductions Using Model Benchmarks and Evaluation Estimates
Gastrointestinal Obstruction	2,934	$318	$15,174	4.8%	-4.8%	-13.1%	3.6%	-11.8%	2.2%	9.6*
Revision of the Hip or Knee	2,052	$798	$37,827	5.5%	-4.4%	-17.9%	9.0%	-15.7%	6.9%	9.9
Diabetes	2,846	$445	$20,927	6.3%	-3.1%	-12.9%	6.6%	-11.3%	5.1%	9.4
Nutritional and Metabolic Disorders	4,947	$438	$20,652	5.5%	-2.6%	-9.1%	3.9%	-8.0%	2.8%	8.1*
Fractures or Femur & Hip or Pelvis	2,052	$650	$28,792	12.3%	-1.6%	-9.5%	6.2%	-8.2%	5.0%	13.9*
MJRUE	2,859	$500	$22,997	7.8%	-1.6%	-8.7%	5.5%	-7.6%	4.4%	9.4*
Cervical Spinal Fusion	2,040	$666	$31,746	4.9%	-0.9%	-7.9%	6.1%	-6.8%	5.0%	5.8
Cardiac Valve	7,041	$1,369	$58,124	6.1%	-0.2%	-3.1%	2.7%	-2.6%	2.3%	6.2*
Major Bowel Procedure	5,331	$721	$33,219	4.2%	-0.1%	-4.9%	4.7%	-4.1%	3.9%	4.3
Percutaneous Coronary Intervention	9,314	$540	$25,732	4.8%	0.1%	-3.1%	3.4%	-2.6%	2.9%	4.7*
Acute Myocardial Infarction	10,197	$524	$24,942	3.4%	0.8%	-3.6%	5.3%	-2.9%	4.6%	2.6
Sepsis	52,096	$636	$29,250	6.6%	1.0%	-1.9%	3.9%	-1.4%	3.4%	5.7*
Transient Ischemia	1,842	$305	$13,844	9.3%	1.1%	-9.3%	11.5%	-7.6%	9.8%	8.3
Coronary Artery Bypass Graft	5,882	$1,075	$46,871	7.1%	1.6%	-2.5%	5.6%	-1.8%	5.0%	5.5*
Congestive Heart Failure	62,842	$487	$22,921	2.9%	2.0%	-0.1%	4.1%	0.2%	3.8%	0.9
Other Respiratory	9,039	$592	$27,919	5.7%	2.1%	-2.8%	6.9%	-2.0%	6.1%	3.6
Spinal Fusion (Non-Cervical)	6,008	$827	$38,828	6.1%	2.4%	-1.6%	6.5%	-0.9%	5.8%	3.6

Clinical Episode	BPCI Episodes (N)	Average Model Benchmark (Mean)	FFS Payments per Episode	Spending Reductions Calculated with The Use of Model Benchmarks (%)	Spending Reductions Estimated by The Evaluation (%)	LCI (95%)	UCI (95%)	LCI (90%)	UCI (90%)	Difference between Spending Reductions Using Model Benchmarks and Evaluation Estimates
Other Vascular Surgery	2,438	$770	$36,591	2.7%	2.5%	-3.3%	8.3%	-2.4%	7.3%	0.2
Stroke	23,298	$631	$29,668	4.9%	3.3%	0.2%	6.4%	0.7%	5.9%	1.6
COPD	35,352	$389	$18,374	4.9%	3.5%	1.1%	6.0%	1.5%	5.6%	1.4
Cellulitis	9,116	$402	$18,751	6.8%	4.3%	-1.2%	9.9%	-0.3%	9.0%	2.5
SPRI	41,519	$448	$20,663	5.1%	4.4%	2.1%	6.6%	2.5%	6.3%	0.8
Lower Extremity and Humerus	1,813	$819	$37,659	8.5%	4.4%	-2.0%	10.7%	-1.0%	9.7%	4.1
Cardiac Arrhythmia	9,954	$372	$17,687	5.0%	4.8%	0.7%	8.8%	1.3%	8.2%	0.2
MJRLE	186,543	$542	$23,690	6.0%	4.8%	3.6%	6.1%	3.8%	5.9%	1.2
Esophagitis	7,086	$338	$15,943	5.7%	5.2%	0.2%	10.2%	1.0%	9.4%	0.5
Gastrointestinal Hemorrhage	6,878	$391	$18,167	7.0%	5.5%	0.8%	10.2%	1.5%	9.4%	1.6
Hip & Femur Except Major Joint	14,255	$947	$43,287	8.3%	5.5%	3.3%	7.7%	3.6%	7.4%	2.8*
Syncope & Collapse	2,461	$357	$16,286	9.2%	5.8%	-2.2%	13.9%	-0.9%	12.6%	3.4
Urinary tract Infection	16,015	$465	$20,838	10.4%	6.1%	2.5%	9.7%	3.0%	9.1%	4.3*
Renal Failure	13,411	$486	$22,406	7.1%	6.5%	2.8%	10.3%	3.4%	9.7%	0.6
Medical Non-Infectious Orthopedic	12,904	$602	$27,020	10.7%	7.4%	3.7%	11.0%	4.3%	10.4%	3.4
Overall	572,365	$26,675	$25,097	6.0%	3.3%	2.3%	4.3%	2.5%	4.2%	2.7*

Exhibit K.3A: Medicare FFS Spending Reductions That Are Calculated with The Use of Model Benchmarks and That Are Estimated by The Evaluation, Model 2 PGPs, by Clinical Episode, Q4 2013 – Q3 2018 (%)

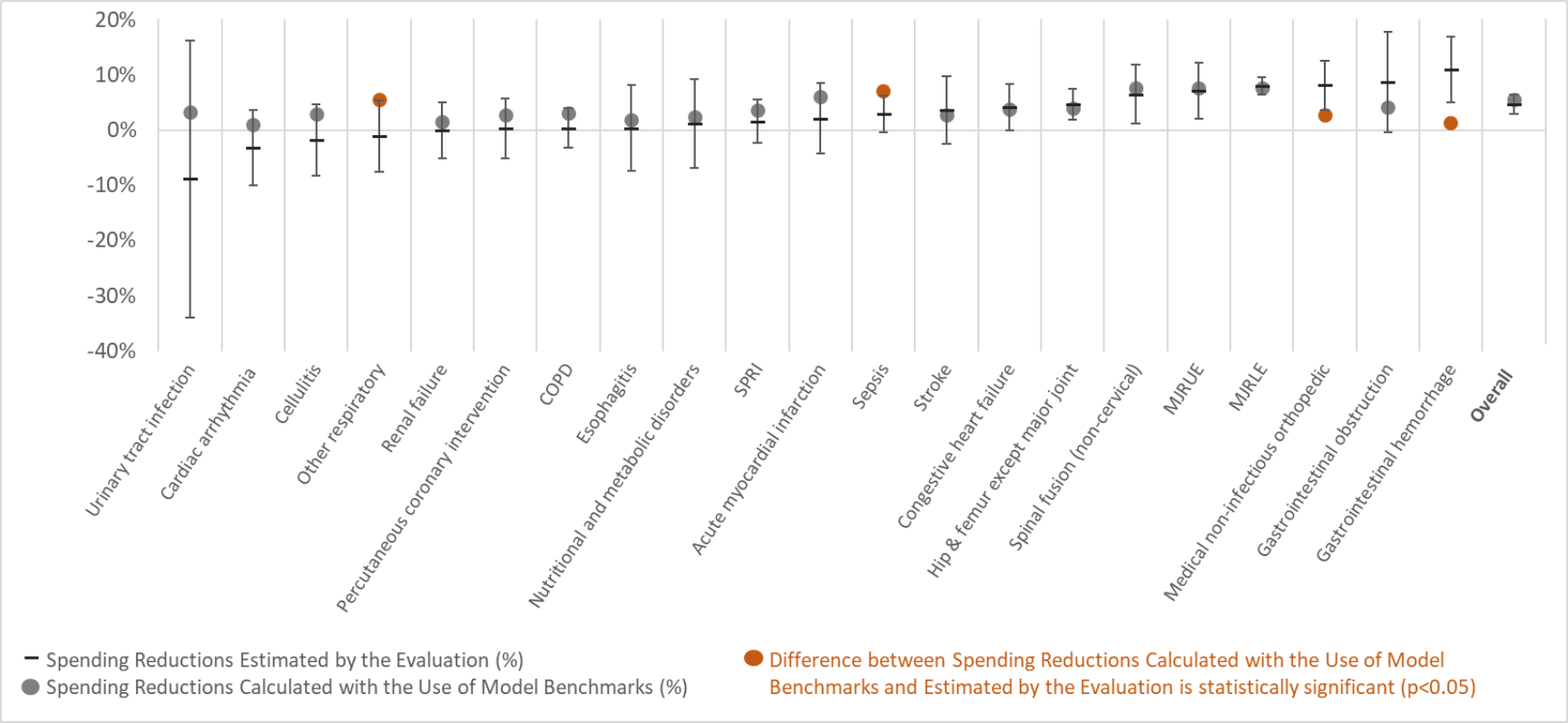


Exhibit K.3B: Medicare FFS Spending Reductions That Are Calculated with The Use of Model Benchmarks and That Are Estimated by The Evaluation, Model 2 PGPs, by Clinical Episode, Q4 2013 – Q3 2018 (%)

Clinical Episode	BPCI Episodes (N)	Average Model Benchmark (Mean)	FFS Payments per Episode	Spending Reductions Calculated with The Use of Model Benchmarks (%)	Spending Reductions Estimated by The Evaluation (%)	LCI (95%)	UCI (95%)	LCI (90%)	UCI (90%)	Difference between Spending Reductions Using Model Benchmarks and Evaluation Estimates
Urinary Tract Infection	7,845	$424	$20,512	3.3%	-8.9%	-33.9%	16.2%	-29.9%	12.1%	12.1
Cardiac Arrhythmia	4,756	$354	$17,522	1.1%	-3.2%	-10.1%	3.6%	-9.0%	2.5%	4.3
Cellulitis	4,238	$381	$18,516	2.8%	-1.8%	-8.2%	4.6%	-7.2%	3.6%	4.6
Other Respiratory	6,254	$556	$26,341	5.5%	-1.1%	-7.5%	5.3%	-6.5%	4.3%	6.6*
Renal Failure	7,759	$448	$22,035	1.6%	-0.1%	-5.2%	5.0%	-4.4%	4.2%	1.7
Percutaneous Coronary Intervention	3,321	$534	$25,996	2.7%	0.3%	-5.1%	5.7%	-4.2%	4.8%	2.4
COPD	13,324	$366	$17,659	3.1%	0.3%	-3.3%	3.9%	-2.7%	3.3%	2.8
Esophagitis	5,004	$318	$15,566	1.9%	0.3%	-7.4%	8.1%	-6.2%	6.8%	1.5
Nutritional and Metabolic Disorders	3,397	$379	$18,458	2.4%	1.1%	-7.0%	9.2%	-5.7%	7.9%	1.3
SPRI	16,038	$424	$20,411	3.5%	1.6%	-2.4%	5.5%	-1.7%	4.9%	2.0
Acute Myocardial Infarction	5,915	$533	$25,088	6.0%	2.1%	-4.3%	8.5%	-3.2%	7.5%	3.9
Sepsis	34,055	$569	$26,379	7.0%	2.9%	-0.4%	6.2%	0.1%	5.6%	4.1*
Stroke	4,912	$593	$28,787	2.7%	3.6%	-2.6%	9.8%	-1.6%	8.8%	-1.0
Congestive Heart Failure	16,648	$505	$24,131	3.8%	4.2%	0.0%	8.4%	0.6%	7.7%	-0.4
Hip & Femur Except Major Joint	8,877	$871	$41,647	4.0%	4.7%	1.9%	7.4%	2.4%	7.0%	-0.7
Spinal Fusion (non-cervical)	3,510	$787	$36,253	7.7%	6.5%	1.2%	11.8%	2.0%	10.9%	1.2
MJRUE	4,836	$437	$20,007	7.7%	7.1%	2.1%	12.1%	2.9%	11.3%	0.6
MJRLE	104,750	$461	$20,948	7.7%	8.0%	6.4%	9.6%	6.7%	9.3%	-0.3

Clinical Episode	BPCI Episodes (N)	Average Model Benchmark (Mean)	FFS Payments per Episode	Spending Reductions Calculated with The Use of Model Benchmarks (%)	Spending Reductions Estimated by The Evaluation (%)	LCI (95%)	UCI (95%)	LCI (90%)	UCI (90%)	Difference between Spending Reductions Using Model Benchmarks and Evaluation Estimates
Medical Non-Infectious Orthopedic	4,540	$562	$27,318	2.7%	8.1%	3.7%	12.5%	4.4%	11.8%	-5.4*
Gastrointestinal Obstruction	2,386	$316	$15,112	4.1%	8.7%	-0.4%	17.8%	1.0%	16.3%	-4.6
Gastrointestinal Hemorrhage	3,569	$377	$18,581	1.3%	11.0%	5.0%	16.9%	6.0%	15.9%	-9.7*
Overall	**265,934**	**$24,164**	**$22,790**	**5.5%**	**4.7%**	**3.0%**	**6.5%**	**3.3%**	**6.2%**	**0.8**

Exhibit K.4A: Medicare FFS Spending Reductions That Are Calculated with The Use of Model Benchmarks and That Are Estimated by The Evaluation, Model 3 SNFs, by Clinical Episode, Q4 2013 – Q3 2018 (%)

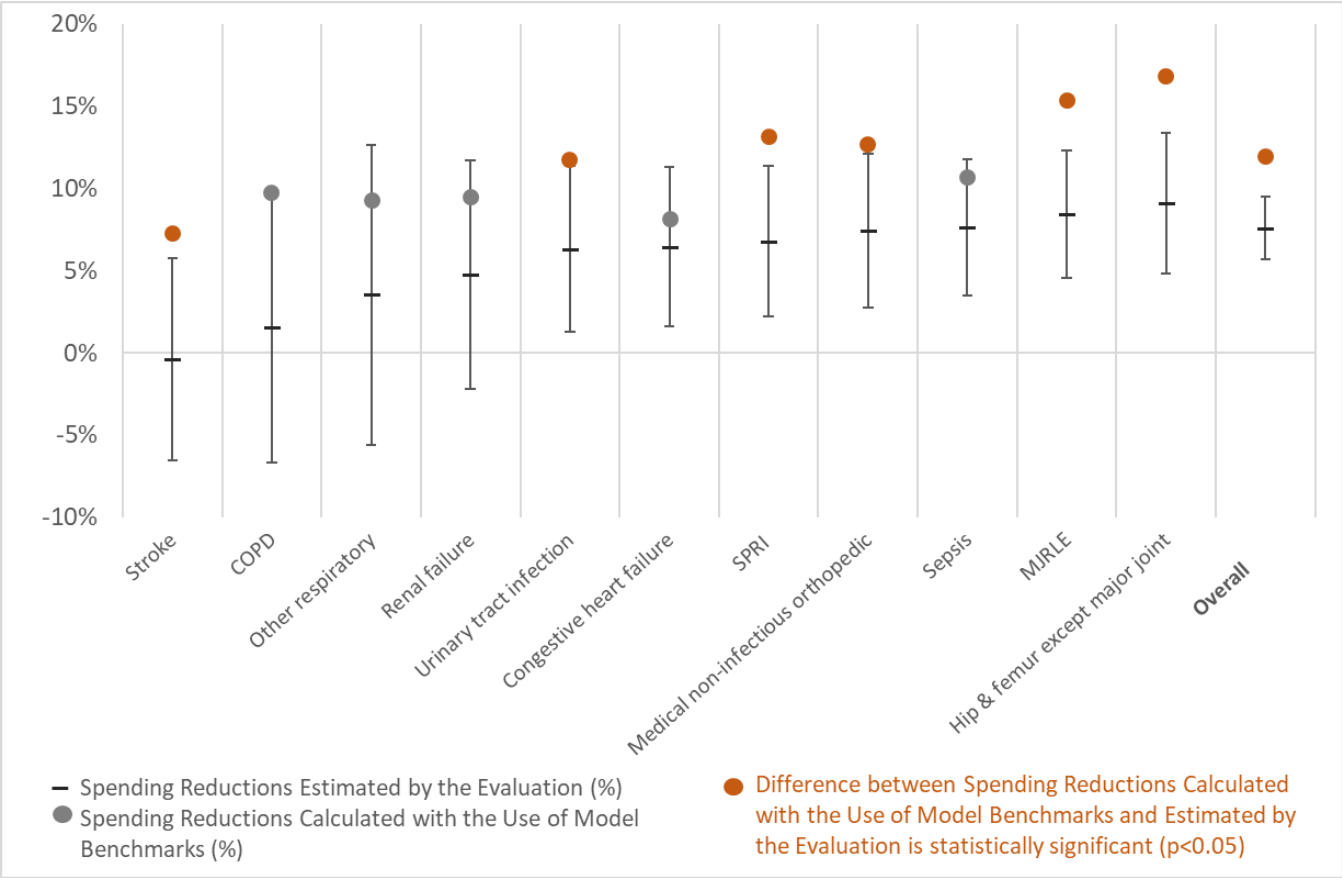


Exhibit K.4B: Medicare FFS Spending Reductions That Are Calculated with The Use of Model Benchmarks and That Are Estimated by The Evaluation, Model 3 SNFs, by Clinical Episode, Q4 2013 – Q3 2018 (%)

Clinical Episode	BPCI Episodes (N)	Average Model Benchmark (Mean)	FFS Payments per Episode	Spending Reductions Calculated with The Use of Model Benchmarks (%)	Spending Reductions Estimated by The Evaluation (%)	LCI (95%)	UCI (95%)	LCI (90%)	UCI (90%)	Difference between Spending Reductions Using Model Benchmarks and Evaluation Estimates
Stoke	2,013	$29,928	$27,756	7.2%	-0.4%	-6.5%	5.8%	-5.5%	4.8%	7.6*
COPD	1,278	$25,714	$23,162	9.7%	1.5%	-6.7%	9.8%	-5.4%	8.4%	8.2
Other Respiratory	1,030	$28,081	$25,424	9.3%	3.5%	-5.6%	12.7%	-4.1%	11.2%	5.7
Renal Failure	1,917	$27,576	$24,954	9.5%	4.8%	-2.2%	11.7%	-1.1%	10.6%	4.8
Urinary tract Infection	2,929	$26,746	$23,592	11.7%	6.3%	1.3%	11.4%	2.1%	10.5%	5.4*
Congestive Heart Failure	4,763	$26,899	$24,636	8.1%	6.4%	1.6%	11.3%	2.4%	10.5%	1.7
SPRI	4,838	$25,269	$22,034	13.1%	6.8%	2.2%	11.3%	2.9%	10.6%	6.4*
Medical Non-Infectious Orthopedic	3,405	$30,046	$26,262	12.7%	7.4%	2.7%	12.1%	3.5%	11.4%	5.3*
Sepsis	7,445	$28,247	$25,256	10.7%	7.6%	3.5%	11.8%	4.1%	11.1%	3.1
MJRLE	10,949	$19,219	$16,352	15.3%	8.5%	4.6%	12.3%	5.2%	11.7%	6.9*
Hip & Femur Except Major Joint	4,731	$30,633	$27,705	16.8%	9.1%	4.8%	13.3%	5.5%	12.7%	7.7*
Overall	**45,298**	**$26,015**	**$22,915**	**11.9%**	**7.6%**	**5.7%**	**9.5%**	**6.0%**	**9.2%**	**4.3***

Exhibit K.5A: Medicare FFS Spending Reductions that are Calculated with the use of Model Benchmarks and that are Estimated by the Evaluation, Model 3 HHAs, by Clinical Episode, Q4 2013 – Q3 2018 (%)

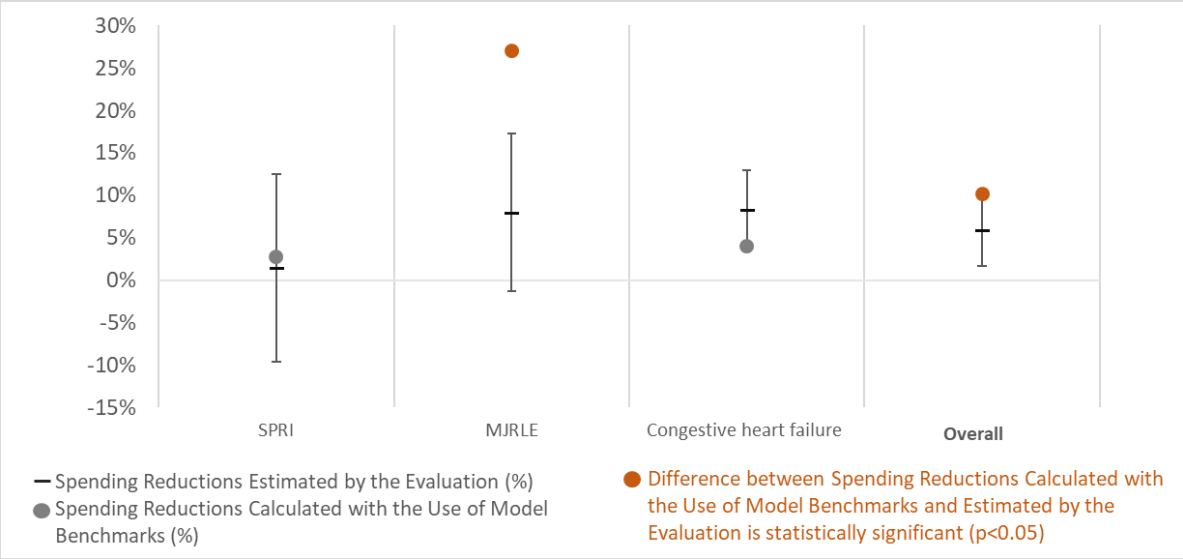


Exhibit K.5B: Medicare FFS Spending Reductions That Are Calculated with The Use of Model Benchmarks and That Are Estimated by The Evaluation, Model 3 HHAs, by Clinical Episode, Q4 2013 – Q3 2018 (%)

Clinical Episode	BPCI Episodes (N)	Average Model Benchmark (Mean)	FFS Payments per Episode	Spending Reductions Calculated with The Use of Model Benchmarks (%)	Spending Reductions Estimated by The Evaluation (%)	LCI (95%)	UCI (95%)	LCI (90%)	UCI (90%)	Difference between Spending Reductions Using Model Benchmarks and Evaluation Estimates
SPRI	1,605	$11,878	$11,530	2.7%	1.4%	-9.7%	12.5%	-7.9%	10.7%	1.3
MJRLE	6,717	$8,020	$6,085	27.0%	8.0%	-1.3%	17.3%	0.2%	15.8%	19.0*
Congestive Heart Failure	6,408	$16,188	$15,562	4.0%	8.3%	3.7%	12.9%	4.4%	12.2%	-4.3
Overall	**14,730**	**$11,967**	**$10,767**	**10.2%**	**5.8%**	**1.6%**	**10.1%**	**2.3%**	**9.4%**	**4.4***

Appendix L: Comparison Group Selection for Model 2 Physician Group Practices

This appendix includes further details about the Model 2 physician group practice (PGP) sample; the number and percentage of intervention episodes excluded due to exclusion criteria during comparison group selection for Model 2 PGPs, and the standardized difference in the mean of each of the matching variables between Model 2 BPCI PGP hospitals and Model 2 PGP comparison hospitals. The statistics are presented by clinical episode. Please observe the following abbreviations, which are used throughout the appendix:

- PGP = physician group practice
- SNF = skilled nursing facility
- HHA = home health agency

Please observe the following complete definitions of the types of exclusions described in Exhibits L.1 and L.2.

- Exclusion 1: The hospital has no PGP episodes during the baseline period (Q4 2011 through Q3 2012) because the PGP did not exist in the baseline period.
- Exclusion 1a: The hospital has no PGP episodes during the baseline period for all other reasons, such as a physician at the PGP changed hospitals they operate/attend in, or a new physician that previously operated/attended in other hospitals joined the PGP.
- Exclusion 2: The PGP only participated in a clinical episode for one quarter. In order to be defined as a provider in the BPCI PGP treatment group, a PGP must participate in a clinical episode for more than one quarter.
- Exclusion 3: The hospital where the PGP episode was initiated is missing matching characteristic data. See Exhibit C.9 in Appendix C for the key variables used for matching BPCI providers to their comparison group.
- Exclusion 4: The hospital where the PGP episode was initiated had less than five discharges in both 2011 and 2012. We limited the PGP treatment group to hospitals that had at least five discharges in both 2011 and 2012 in order to calculate baseline outcomes for matching.
- Exclusion 5: There is no match for the hospital where the PGP episode was initiated within the caliper. There are no comparison hospitals within the established maximum difference in absolute value in the estimated propensity score from the hospital where the PGP episode was initiated.

A. Intervention Episodes Excluded During Comparison Group Selection for BPCI-participating Model 2 Physician Group Practices

Exhibit L.1: Number of Intervention Episodes Excluded During Comparison Group Selection for BPCI-participating Model 2 Physician Group Practices

Clinical Episode	Total BPCI Intervention Episodes	Exclusion 1: PGP did not Exist in Baseline	Exclusion 1a: PGP Existed in Baseline but did not Initiate any Episodes	Exclusion 2: PGP Participated for One Quarter	Exclusion 3: Missing Matching Characteristic Data	Exclusion 4: Less than Five Discharges in 2011 or 2012	Exclusion 5: No Match within the Caliper	Total BPCI Intervention Episodes Excluded
Major joint replacement of the upper extremity	7,838	0	2,049	9	21	342	192	2,613
Urinary tract infection	15,023	1,129	4,059	84	9	0	1,101	6,382
Stroke	11,391	1,576	4,098	30	0	0	534	6,238
Chronic obstructive pulmonary disease, bronchitis, asthma	23,290	1,116	6,113	120	4	0	1,165	8,518
Major joint replacement of the lower extremity	170,013	2,979	19,802	46	4,955	1,129	16,079	44,990
Percutaneous coronary intervention	7,007	18	2,532	108	7	7	635	3,307
Congestive heart failure	30,969	1,258	10,508	199	12	0	491	12,468
Acute myocardial infarction	11,528	683	3,863	44	0	15	376	4,981
Cardiac arrhythmia	9,927	1,327	3,009	188	0	0	376	4,900
Gastrointestinal hemorrhage	7,532	726	2,489	266	0	0	246	3,727
Medical non-infectious orthopedic	8,978	433	2,937	98	0	2	371	3,841
Spinal fusion (non-cervical)	4,955	0	658	97	131	13	284	1,183
Hip & femur procedures except major joint	13,853	1,158	2,279	43	51	110	926	4,567
Sepsis	68,079	4,398	22,540	262	0	0	3,076	30,276
Simple pneumonia and respiratory infections	35,090	3,179	10,888	138	11	0	3,115	17,331

Clinical Episode	Total BPCI Intervention Episodes	Exclusion 1: PGP did not Exist in Baseline	Exclusion 1a: PGP Existed in Baseline but did not Initiate any Episodes	Exclusion 2: PGP Participated for One Quarter	Exclusion 3: Missing Matching Characteristic Data	Exclusion 4: Less than Five Discharges in 2011 or 2012	Exclusion 5: No Match within the Caliper	Total BPCI Intervention Episodes Excluded
Other respiratory	18,329	2,625	8,314	82	0	0	277	11,298
Gastrointestinal obstruction	4,240	123	1,330	23	3	16	198	1,693
Renal failure	14,732	395	4,890	49	4	0	866	6,204
Nutritional and metabolic disorders	8,784	971	2,831	55	4	59	747	4,667
Cellulitis	8,821	788	2,944	13	0	0	619	4,364
Esophagitis, gastroenteritis and other digestive disorders	10,255	630	2,873	72	0	0	171	3,746
Total	490,634	25,512	121,006	2,026	5,212	1,693	31,845	187,294

Exhibit L.2: Percent of Intervention Episodes Excluded During Comparison Group Selection for BPCI-participating Model 2 Physician Group Practices

Clinical Episode	Total BPCI Intervention Episodes	Exclusion 1: PGP did not Exist in Baseline	Exclusion 1a: PGP Existed in Baseline but did not Initiate any Episodes	Exclusion 2: PGP Participated for One Quarter	Exclusion 3: Missing Matching Characteristic Data	Exclusion 4: Less than Five Discharges in 2011 or 2012	Exclusion 5: No Match within the Caliper	Total BPCI Intervention Episodes Excluded
Major joint replacement of the upper extremity	7,838	0.0%	26.1%	0.1%	0.3%	4.4%	2.4%	33.3%
Urinary tract infection	15,023	7.5%	27.0%	0.6%	0.1%	0.0%	7.3%	42.5%
Stroke	11,391	13.8%	36.0%	0.3%	0.0%	0.0%	4.7%	54.8%
Chronic obstructive pulmonary disease, bronchitis, asthma	23,290	4.8%	26.2%	0.5%	0.0%	0.0%	5.0%	36.6%
Major joint replacement of the lower extremity	170,013	1.8%	11.6%	0.0%	2.9%	0.7%	9.5%	26.5%
Percutaneous coronary intervention	7,007	0.3%	36.1%	1.5%	0.1%	0.1%	9.1%	47.2%
Congestive heart failure	30,969	4.1%	33.9%	0.6%	0.0%	0.0%	1.6%	40.3%
Acute myocardial infarction	11,528	5.9%	33.5%	0.4%	0.0%	0.1%	3.3%	43.2%
Cardiac arrhythmia	9,927	13.4%	30.3%	1.9%	0.0%	0.0%	3.8%	49.4%
Gastrointestinal hemorrhage	7,532	9.6%	33.0%	3.5%	0.0%	0.0%	3.3%	49.5%
Medical non-infectious orthopedic	8,978	4.8%	32.7%	1.1%	0.0%	0.0%	4.1%	42.8%
Spinal fusion (non-cervical)	4,955	0.0%	13.3%	2.0%	2.6%	0.3%	5.7%	23.9%
Hip & femur procedures except major joint	13,853	8.4%	16.5%	0.3%	0.4%	0.8%	6.7%	33.0%
Sepsis	68,079	6.5%	33.1%	0.4%	0.0%	0.0%	4.5%	44.5%
Simple pneumonia and respiratory infections	35,090	9.1%	31.0%	0.4%	0.0%	0.0%	8.9%	49.4%
Other respiratory	18,329	14.3%	45.4%	0.4%	0.0%	0.0%	1.5%	61.6%
Gastrointestinal obstruction	4,240	2.9%	31.4%	0.5%	0.1%	0.4%	4.7%	39.9%

Clinical Episode	Total BPCI Intervention Episodes	Exclusion 1: PGP did not Exist in Baseline	Exclusion 1a: PGP Existed in Baseline but did not Initiate any Episodes	Exclusion 2: PGP Participated for One Quarter	Exclusion 3: Missing Matching Characteristic Data	Exclusion 4: Less than Five Discharges in 2011 or 2012	Exclusion 5: No Match within the Caliper	Total BPCI Intervention Episodes Excluded
Renal failure	14,732	2.7%	33.2%	0.3%	0.0%	0.0%	5.9%	42.1%
Nutritional and metabolic disorders	8,784	11.1%	32.2%	0.6%	0.0%	0.7%	8.5%	53.1%
Cellulitis	8,821	8.9%	33.4%	0.1%	0.0%	0.0%	7.0%	49.5%
Esophagitis, gastroenteritis and other digestive disorders	10,255	6.1%	28.0%	0.7%	0.0%	0.0%	1.7%	36.5%
Total	490,634	5.2%	24.7%	0.4%	1.1%	0.3%	6.5%	38.2%

B. Standardized Mean Differences of Matching Characteristics Before and After Matching for Model 2 Physician Group Practices

Exhibit L.3: Standardized Differences Before and After Matching, Model 2 Physician Group Practices, Acute Myocardial Infarction

Variable	Standardized Difference Before Matching	Standardized Difference After Matching**
Ownership - Non-Profit	0.04	-0.02
Ownership - Government	-0.21	-0.02
Ownership - For Profit*	0.16	0.04
Urban	0.65	-0.01
Bed Count	0.45	-0.04
Chain Indicator	-0.06	0.00
Medicare Days as a Percent of Total Inpatient Days	-0.08	-0.01
Resident-Bed Ratio	-0.16	0.02
Disproportionate Share Percent	-0.27	-0.01
Teaching Status	0.09	0.01
Population Size of Market Area	0.01	-0.02
Median Household Income	0.20	-0.01
Medicare Advantage Penetration	0.17	0.07
Primary Care Providers per 10,000 in Market	-0.09	0.03
SNF Beds per 10,000 in Market	-0.52	-0.07
Inpatient Rehabilitation Facility in Market	0.21	-0.01
Provider Market Share of the 48 potential BPCI episodes	-0.16	-0.10
Herfindahl Index of Hospital Market Shares	-0.31	-0.08
Percentage of total discharges in the 48 clinical episodes in 2011	-0.07	-0.02
Number of discharges for clinical episode in 2011	0.57	-0.08
Percent of patients in 2011 that went home with no post-acute care by clinical episode	0.05	-0.01
Percent of patients in 2011 that used an inpatient rehabilitation facility as first post-acute care setting by clinical episode	0.22	0.04
Percent of patients in 2011 that used a SNF as first post-acute care setting by clinical episode	-0.31	-0.01
Percent of patients in 2011 that used a long-term care hospital as first post-acute care setting by clinical episode*	-0.04	0.00
Percent of patients in 2011 that went home with HHA services as first post-acute care setting by clinical episode*	0.24	0.01
Unplanned readmission rate by clinical episode in 2011	-0.01	0.03
Change in unplanned readmission rate by clinical episode from 2011 to 2012	0.03	0.01
All-cause mortality rate in 2011 by clinical episode	0.02	0.06
Change in all-cause mortality rate by clinical episode from 2011 to 2012	0.06	0.02

Variable	Standardized Difference Before Matching	Standardized Difference After Matching**
Average 90-day standardized Medicare Part A payment amount by clinical episode in 2011	-0.21	0.04
Change in average 90-day standardized Medicare Part A payment amount by clinical episode from 2011 to 2012	0.07	0.00
Emergency Room rate by clinical episode in 2011	-0.14	0.02
Change in Emergency room rate by clinical episode from 2011 to 2012	-0.07	-0.03

* These variables were not included for this model.

** Caliper was 1/10th of the standard deviation of the log-odds propensity score. The mean log-odds propensity score was -1.93 and the standard deviation was 1.42.

Exhibit L.4: Standardized Differences Before and After Matching, Model 2 Physician Group Practices, Cardiac Arrhythmia

Variable	Standardized Difference Before Matching	Standardized Difference After Matching**
Ownership - Non-Profit	0.33	0.00
Ownership - Government	-0.39	0.00
Ownership - For Profit*	-0.03	0.01
Urban	0.70	0.03
Bed Count	0.55	-0.10
Chain Indicator	0.06	0.02
Medicare Days as a Percent of Total Inpatient Days	-0.33	-0.04
Resident-Bed Ratio	-0.26	-0.13
Disproportionate Share Percent	-0.36	-0.07
Teaching Status	0.10	-0.15
Population Size of Market Area	0.08	-0.05
Median Household Income	0.57	-0.11
Medicare Advantage Penetration	0.21	0.09
Primary Care Providers per 10,000 in Market	0.07	-0.08
SNF Beds per 10,000 in Market	-0.55	-0.03
Inpatient Rehabilitation Facility in Market	0.28	0.02
Provider Market Share of the 48 potential BPCI episodes	-0.09	0.00
Herfindahl Index of Hospital Market Shares	-0.30	0.02
Percentage of total discharges in the 48 clinical episodes in 2011	-0.20	0.03
Number of discharges for clinical episode in 2011	0.68	-0.13
Percent of patients in 2011 that went home with no post-acute care by clinical episode	-0.02	0.00
Percent of patients in 2011 that used an inpatient rehabilitation facility as first post-acute care setting by clinical episode	0.30	0.07
Percent of patients in 2011 that used a SNF as first post-acute care setting by clinical episode	-0.19	-0.04

Variable	Standardized Difference Before Matching	Standardized Difference After Matching**
Percent of patients in 2011 that used a long-term care hospital as first post-acute care setting by clinical episode*	0.07	0.02
Percent of patients in 2011 that went home with HHA services as first post-acute care setting by clinical episode*	0.13	0.01
Unplanned readmission rate by clinical episode in 2011	-0.18	-0.03
Change in unplanned readmission rate by clinical episode from 2011 to 2012	0.17	0.01
All-cause mortality rate in 2011 by clinical episode	0.02	0.01
Change in all-cause mortality rate by clinical episode from 2011 to 2012	-0.01	0.04
Average 90-day standardized Medicare Part A payment amount by clinical episode in 2011	-0.23	-0.03
Change in average 90-day standardized Medicare Part A payment amount by clinical episode from 2011 to 2012	0.17	0.01
Emergency Room rate by clinical episode in 2011	-0.13	-0.05
Change in Emergency room rate by clinical episode from 2011 to 2012	-0.05	0.04

* These variables were not included for this model.

** Caliper was 1/20th of the standard deviation of the log-odds propensity score. The mean log-odds propensity score was -2.89 and the standard deviation was 1.70.

Exhibit L.5: Standardized Differences Before and After Matching, Model 2 Physician Group Practices, Cellulitis

Variable	Standardized Difference Before Matching	Standardized Difference After Matching**
Ownership - Non-Profit	0.32	-0.04
Ownership - Government	-0.37	0.01
Ownership - For Profit*	-0.03	0.05
Urban	0.65	-0.04
Bed Count	0.52	-0.06
Chain Indicator	-0.05	-0.01
Medicare Days as a Percent of Total Inpatient Days	-0.42	0.07
Resident-Bed Ratio	-0.29	-0.09
Disproportionate Share Percent	-0.30	0.02
Teaching Status	0.09	-0.09
Population Size of Market Area	0.15	0.01
Median Household Income	0.47	-0.04
Medicare Advantage Penetration	0.24	-0.05
Primary Care Providers per 10,000 in Market	0.13	-0.07
SNF Beds per 10,000 in Market	-0.67	-0.04
Inpatient Rehabilitation Facility in Market	0.03	0.05
Provider Market Share of the 48 potential BPCI episodes	-0.03	-0.02
Herfindahl Index of Hospital Market Shares	-0.21	0.01

Variable	Standardized Difference Before Matching	Standardized Difference After Matching**
Percentage of total discharges in the 48 clinical episodes in 2011	-0.14	0.14
Number of discharges for clinical episode in 2011	0.62	-0.04
Percent of patients in 2011 that went home with no post-acute care by clinical episode	-0.07	-0.01
Percent of patients in 2011 that used an inpatient rehabilitation facility as first post-acute care setting by clinical episode	0.09	-0.04
Percent of patients in 2011 that used a SNF as first post-acute care setting by clinical episode	-0.13	0.01
Percent of patients in 2011 that used a long-term care hospital as first post-acute care setting by clinical episode*	0.14	0.03
Percent of patients in 2011 that went home with HHA services as first post-acute care setting by clinical episode*	0.16	-0.01
Unplanned readmission rate by clinical episode in 2011	-0.12	0.00
Change in unplanned readmission rate by clinical episode from 2011 to 2012	0.06	0.01
All-cause mortality rate in 2011 by clinical episode	0.19	0.03
Change in all-cause mortality rate by clinical episode from 2011 to 2012	-0.07	0.01
Average 90-day standardized Medicare Part A payment amount by clinical episode in 2011	0.01	0.04
Change in average 90-day standardized Medicare Part A payment amount by clinical episode from 2011 to 2012	-0.01	-0.05
Emergency Room rate by clinical episode in 2011	-0.01	-0.06
Change in Emergency room rate by clinical episode from 2011 to 2012	0.06	0.04

* These variables were not included for this model.

** Caliper was 1/10th of the standard deviation of the log-odds propensity score. The mean log-odds propensity score was -2.53 and the standard deviation was 1.85.

Exhibit L.6: Standardized Differences Before and After Matching, Model 2 Physician Group Practices, Chronic Obstructive Pulmonary Disease, Bronchitis, Asthma

Variable	Standardized Difference Before Matching	Standardized Difference After Matching**
Ownership - Non-Profit	0.19	-0.12
Ownership - Government	-0.36	0.01
Ownership - For Profit*	0.13	0.13
Urban	0.88	0.00
Bed Count	0.74	-0.02
Chain Indicator	-0.16	-0.01
Medicare Days as a Percent of Total Inpatient Days	-0.32	0.04
Resident-Bed Ratio	-0.09	-0.02
Disproportionate Share Percent	-0.24	0.00
Teaching Status	0.21	0.04

Variable	Standardized Difference Before Matching	Standardized Difference After Matching**
Population Size of Market Area	0.21	0.01
Median Household Income	0.36	-0.07
Medicare Advantage Penetration	0.33	0.06
Primary Care Providers per 10,000 in Market	0.24	0.01
SNF Beds per 10,000 in Market	-0.57	-0.05
Inpatient Rehabilitation Facility in Market	0.36	0.00
Provider Market Share of the 48 potential BPCI episodes	-0.15	-0.13
Herfindahl Index of Hospital Market Shares	-0.42	-0.12
Percentage of total discharges in the 48 clinical episodes in 2011	-0.34	0.00
Number of discharges for clinical episode in 2011	0.96	-0.01
Percent of patients in 2011 that went home with no post-acute care by clinical episode	-0.35	-0.08
Percent of patients in 2011 that used an inpatient rehabilitation facility as first post-acute care setting by clinical episode	0.25	0.02
Percent of patients in 2011 that used a SNF as first post-acute care setting by clinical episode	-0.12	0.03
Percent of patients in 2011 that used a long-term care hospital as first post-acute care setting by clinical episode	0.04	0.03
Percent of patients in 2011 that went home with HHA services as first post-acute care setting by clinical episode*	0.52	0.06
Unplanned readmission rate by clinical episode in 2011	0.25	0.02
Change in unplanned readmission rate by clinical episode from 2011 to 2012	0.04	-0.04
All-cause mortality rate in 2011 by clinical episode	-0.03	0.02
Change in all-cause mortality rate by clinical episode from 2011 to 2012	0.12	-0.02
Average 90-day standardized Medicare Part A payment amount by clinical episode in 2011	0.27	0.04
Change in average 90-day standardized Medicare Part A payment amount by clinical episode from 2011 to 2012	0.06	-0.07
Emergency Room rate by clinical episode in 2011	-0.11	-0.05
Change in Emergency room rate by clinical episode from 2011 to 2012	-0.20	0.04

* These variables were not included for this model.

** Caliper was 1/10th of the standard deviation of the log-odds propensity score. The mean log-odds propensity score was -2.10 and the standard deviation was 1.87.

Exhibit L.7: Standardized Differences Before and After Matching, Model 2 Physician Group Practices, Congestive Heart Failure

Variable	Standardized Difference Before Matching	Standardized Difference After Matching**
Ownership - Non-Profit	0.34	-0.04
Ownership - Government	-0.52	0.00
Ownership - For Profit*	0.07	0.05
Urban	0.91	-0.03
Bed Count	0.62	0.01
Chain Indicator	-0.13	0.05
Medicare Days as a Percent of Total Inpatient Days	-0.19	0.04
Resident-Bed Ratio	-0.03	0.00
Disproportionate Share Percent	-0.34	0.01
Teaching Status	0.27	0.06
Population Size of Market Area	0.34	0.04
Median Household Income	0.68	0.00
Medicare Advantage Penetration	0.13	-0.03
Primary Care Providers per 10,000 in Market	0.25	0.02
SNF Beds per 10,000 in Market	-0.57	-0.02
Inpatient Rehabilitation Facility in Market	0.50	0.08
Provider Market Share of the 48 potential BPCI episodes	-0.35	-0.09
Herfindahl Index of Hospital Market Shares	-0.60	-0.07
Percentage of total discharges in the 48 clinical episodes in 2011	-0.29	0.04
Number of discharges for clinical episode in 2011	0.81	0.02
Percent of patients in 2011 that went home with no post-acute care by clinical episode	-0.42	0.00
Percent of patients in 2011 that used an inpatient rehabilitation facility as first post-acute care setting by clinical episode	0.28	-0.02
Percent of patients in 2011 that used a SNF as first post-acute care setting by clinical episode	-0.04	0.04
Percent of patients in 2011 that used a long-term care hospital as first post-acute care setting by clinical episode*	0.04	0.01
Percent of patients in 2011 that went home with HHA services as first post-acute care setting by clinical episode*	0.51	-0.04
Unplanned readmission rate by clinical episode in 2011	-0.03	0.08
Change in unplanned readmission rate by clinical episode from 2011 to 2012	0.14	-0.05
All-cause mortality rate in 2011 by clinical episode	-0.01	0.07
Change in all-cause mortality rate by clinical episode from 2011 to 2012	0.06	-0.07
Average 90-day standardized Medicare Part A payment amount by clinical episode in 2011	0.26	0.01
Change in average 90-day standardized Medicare Part A payment amount by clinical episode from 2011 to 2012	-0.03	0.02

Variable	Standardized Difference Before Matching	Standardized Difference After Matching**
Emergency Room rate by clinical episode in 2011	-0.41	-0.04
Change in Emergency room rate by clinical episode from 2011 to 2012	-0.04	0.02

* These variables were not included for this model.

** Caliper was 1/10th of the standard deviation of the log-odds propensity score. The mean log-odds propensity score was -2.63 and the standard deviation was 1.85.

Exhibit L.8: Standardized Differences Before and After Matching, Model 2 Physician Group Practices, Esophagitis, Gastroenteritis and Other Digestive Disorder

Variable	Standardized Difference Before Matching	Standardized Difference After Matching**
Ownership - Non-Profit	0.25	-0.13
Ownership - Government	-0.36	0.05
Ownership - For Profit*	0.05	0.11
Urban	0.68	0.07
Bed Count	0.53	-0.03
Chain Indicator	-0.02	0.00
Medicare Days as a Percent of Total Inpatient Days	-0.35	0.04
Resident-Bed Ratio	-0.26	-0.08
Disproportionate Share Percent	-0.29	0.06
Teaching Status	0.08	-0.07
Population Size of Market Area	0.10	-0.03
Median Household Income	0.58	-0.04
Medicare Advantage Penetration	0.24	-0.01
Primary Care Providers per 10,000 in Market	0.10	-0.02
SNF Beds per 10,000 in Market	-0.75	-0.05
Inpatient Rehabilitation Facility in Market	0.07	0.05
Provider Market Share of the 48 potential BPCI episodes	-0.03	-0.07
Herfindahl Index of Hospital Market Shares	-0.23	-0.05
Percentage of total discharges in the 48 clinical episodes in 2011	-0.20	0.03
Number of discharges for clinical episode in 2011	0.54	-0.02
Percent of patients in 2011 that went home with no post-acute care by clinical episode	-0.24	0.03
Percent of patients in 2011 that used an inpatient rehabilitation facility as first post-acute care setting by clinical episode	0.14	0.10
Percent of patients in 2011 that used a SNF as first post-acute care setting by clinical episode	0.00	-0.03
Percent of patients in 2011 that used a long-term care hospital as first post-acute care setting by clinical episode*	0.08	0.16
Percent of patients in 2011 that went home with HHA services as first post-acute care setting by clinical episode*	0.29	-0.05
Unplanned readmission rate by clinical episode in 2011	-0.02	0.08

Variable	Standardized Difference Before Matching	Standardized Difference After Matching**
Change in unplanned readmission rate by clinical episode from 2011 to 2012	0.10	0.00
All-cause mortality rate in 2011 by clinical episode	0.16	-0.02
Change in all-cause mortality rate by clinical episode from 2011 to 2012	-0.15	-0.02
Average 90-day standardized Medicare Part A payment amount by clinical episode in 2011	0.12	0.05
Change in average 90-day standardized Medicare Part A payment amount by clinical episode from 2011 to 2012	-0.04	0.00
Emergency Room rate by clinical episode in 2011	-0.06	-0.02
Change in Emergency room rate by clinical episode from 2011 to 2012	0.06	-0.03

* These variables were not included for this model.

** Caliper was 1/10th of the standard deviation of the log-odds propensity score. The mean log-odds propensity score was -2.67 and the standard deviation was 1.83.

Exhibit L.9: Standardized Differences Before and After Matching, Model 2 Physician Group Practices, Gastrointestinal Hemorrhage

Variable	Standardized Difference Before Matching	Standardized Difference After Matching**
Ownership - Non-Profit	0.25	-0.06
Ownership - Government	-0.37	0.00
Ownership - For Profit*	0.05	0.07
Urban	0.65	0.02
Bed Count	0.34	0.00
Chain Indicator	-0.09	-0.04
Medicare Days as a Percent of Total Inpatient Days	-0.35	0.04
Resident-Bed Ratio	-0.29	0.03
Disproportionate Share Percent	-0.31	0.02
Teaching Status	0.08	0.03
Population Size of Market Area	0.05	0.00
Median Household Income	0.48	-0.03
Medicare Advantage Penetration	0.28	0.03
Primary Care Providers per 10,000 in Market	0.04	-0.03
SNF Beds per 10,000 in Market	-0.62	-0.01
Inpatient Rehabilitation Facility in Market	-0.05	0.03
Provider Market Share of the 48 potential BPCI episodes	0.00	-0.03
Herfindahl Index of Hospital Market Shares	-0.14	-0.02
Percentage of total discharges in the 48 clinical episodes in 2011	-0.07	0.04
Number of discharges for clinical episode in 2011	0.57	0.03
Percent of patients in 2011 that went home with no post-acute care by clinical episode	0.07	-0.09

Variable	Standardized Difference Before Matching	Standardized Difference After Matching**
Percent of patients in 2011 that used an inpatient rehabilitation facility as first post-acute care setting by clinical episode	0.16	0.01
Percent of patients in 2011 that used a SNF as first post-acute care setting by clinical episode	-0.17	0.06
Percent of patients in 2011 that used a long-term care hospital as first post-acute care setting by clinical episode*	-0.12	0.02
Percent of patients in 2011 that went home with HHA services as first post-acute care setting by clinical episode*	0.08	0.06
Unplanned readmission rate by clinical episode in 2011	0.00	0.05
Change in unplanned readmission rate by clinical episode from 2011 to 2012	-0.03	-0.01
All-cause mortality rate in 2011 by clinical episode	-0.05	0.00
Change in all-cause mortality rate by clinical episode from 2011 to 2012	0.00	0.07
Average 90-day standardized Medicare Part A payment amount by clinical episode in 2011	-0.12	0.09
Change in average 90-day standardized Medicare Part A payment amount by clinical episode from 2011 to 2012	-0.06	-0.03
Emergency Room rate by clinical episode in 2011	-0.18	-0.02
Change in Emergency room rate by clinical episode from 2011 to 2012	-0.01	0.02

* These variables were not included for this model.

** Caliper was 1/10th of the standard deviation of the log-odds propensity score. The mean log-odds propensity score was -3.03 and the standard deviation was 1.61.

Exhibit L.10: Standardized Differences Before and After Matching, Model 2 Physician Group Practices, Gastrointestinal Obstruction

Variable	Standardized Difference Before Matching	Standardized Difference After Matching**
Ownership - Non-Profit	0.19	-0.17
Ownership - Government	-0.37	0.05
Ownership - For Profit*	0.13	0.16
Urban	0.82	0.01
Bed Count	0.63	-0.10
Chain Indicator	-0.17	-0.04
Medicare Days as a Percent of Total Inpatient Days	-0.27	0.09
Resident-Bed Ratio	-0.34	-0.08
Disproportionate Share Percent	-0.41	0.01
Teaching Status	-0.03	-0.02
Population Size of Market Area	0.15	0.01
Median Household Income	0.23	-0.03
Medicare Advantage Penetration	0.32	-0.04
Primary Care Providers per 10,000 in Market	0.07	0.00

Variable	Standardized Difference Before Matching	Standardized Difference After Matching**
SNF Beds per 10,000 in Market	-0.58	-0.08
Inpatient Rehabilitation Facility in Market	0.44	0.00
Provider Market Share of the 48 potential BPCI episodes	-0.31	-0.06
Herfindahl Index of Hospital Market Shares	-0.45	-0.04
Percentage of total discharges in the 48 clinical episodes in 2011	-0.26	-0.03
Number of discharges for clinical episode in 2011	0.70	0.00
Percent of patients in 2011 that went home with no post-acute care by clinical episode	0.08	-0.04
Percent of patients in 2011 that used an inpatient rehabilitation facility as first post-acute care setting by clinical episode	0.14	-0.07
Percent of patients in 2011 that used a SNF as first post-acute care setting by clinical episode	-0.21	-0.04
Percent of patients in 2011 that used a long-term care hospital as first post-acute care setting by clinical episode*	-0.11	0.15
Percent of patients in 2011 that went home with HHA services as first post-acute care setting by clinical episode*	0.14	0.09
Unplanned readmission rate by clinical episode in 2011	-0.09	0.04
Change in unplanned readmission rate by clinical episode from 2011 to 2012	-0.01	-0.05
All-cause mortality rate in 2011 by clinical episode	0.03	-0.04
Change in all-cause mortality rate by clinical episode from 2011 to 2012	0.04	0.02
Average 90-day standardized Medicare Part A payment amount by clinical episode in 2011	-0.09	0.05
Change in average 90-day standardized Medicare Part A payment amount by clinical episode from 2011 to 2012	0.00	-0.06
Emergency Room rate by clinical episode in 2011	-0.24	-0.01
Change in Emergency room rate by clinical episode from 2011 to 2012	0.10	-0.04

* These variables were not included for this model.

** Caliper was 1/20th of the standard deviation of the log-odds propensity score. The mean log-odds propensity score was -2.69 and the standard deviation was 2.38.

Exhibit L.11: Standardized Differences Before and After Matching, Model 2 Physician Group Practices, Hip and Femur Procedures Except Major Joint

Variable	Standardized Difference Before Matching	Standardized Difference After Matching**
Ownership - Non-Profit	-0.12	-0.07
Ownership - Government	-0.13	0.02
Ownership - For Profit*	0.30	0.06
Urban	0.73	0.02
Bed Count	0.42	-0.04
Chain Indicator	-0.19	-0.07

Variable	Standardized Difference Before Matching	Standardized Difference After Matching**
Medicare Days as a Percent of Total Inpatient Days	-0.21	0.02
Resident-Bed Ratio	-0.29	0.01
Disproportionate Share Percent	-0.20	0.02
Teaching Status	0.00	-0.11
Population Size of Market Area	0.21	0.08
Median Household Income	0.29	-0.01
Medicare Advantage Penetration	0.11	0.03
Primary Care Providers per 10,000 in Market	-0.06	0.04
SNF Beds per 10,000 in Market	-0.65	-0.03
Inpatient Rehabilitation Facility in Market	0.30	0.09
Provider Market Share of the 48 potential BPCI episodes	-0.49	-0.09
Herfindahl Index of Hospital Market Shares	-0.60	-0.08
Percentage of total discharges in the 48 clinical episodes in 2011	-0.13	0.04
Number of discharges for clinical episode in 2011	0.60	-0.04
Percent of patients in 2011 that went home with no post-acute care by clinical episode	-0.10	-0.05
Percent of patients in 2011 that used an inpatient rehabilitation facility as first post-acute care setting by clinical episode	0.10	0.05
Percent of patients in 2011 that used a SNF as first post-acute care setting by clinical episode	-0.09	-0.03
Percent of patients in 2011 that used a long-term care hospital as first post-acute care setting by clinical episode	-0.03	0.04
Percent of patients in 2011 that went home with HHA services as first post-acute care setting by clinical episode*	0.09	-0.01
Unplanned readmission rate by clinical episode in 2011	0.13	0.08
Change in unplanned readmission rate by clinical episode from 2011 to 2012	-0.07	-0.04
All-cause mortality rate in 2011 by clinical episode	-0.01	0.00
Change in all-cause mortality rate by clinical episode from 2011 to 2012	0.01	0.04
Average 90-day standardized Medicare Part A payment amount by clinical episode in 2011	0.08	0.05
Change in average 90-day standardized Medicare Part A payment amount by clinical episode from 2011 to 2012	0.10	-0.03
Emergency Room rate by clinical episode in 2011	-0.16	0.05
Change in Emergency room rate by clinical episode from 2011 to 2012	0.01	-0.04

* These variables were not included for this model.

** Caliper was 1/20th of the standard deviation of the log-odds propensity score. The mean log-odds propensity score was -1.79 and the standard deviation was 1.78.

Exhibit L.12: Standardized Differences Before and After Matching, Model 2 Physician Group Practices, Major Joint Replacement of the Lower Extremity

Variable	Standardized Difference Before Matching	Standardized Difference After Matching**
Ownership - Non-Profit	0.03	-0.09
Ownership - Government	-0.20	-0.01
Ownership - For Profit*	0.15	0.11
Urban	0.74	0.04
Bed Count	0.54	-0.05
Chain Indicator	-0.07	-0.08
Medicare Days as a Percent of Total Inpatient Days	-0.19	-0.06
Resident-Bed Ratio	-0.24	-0.04
Disproportionate Share Percent	-0.17	0.10
Teaching Status	0.05	-0.07
Population Size of Market Area	0.10	0.07
Median Household Income	0.32	-0.07
Medicare Advantage Penetration	0.19	0.10
Primary Care Providers per 10,000 in Market	-0.04	-0.07
SNF Beds per 10,000 in Market	-0.61	-0.10
Inpatient Rehabilitation Facility in Market	0.37	0.08
Provider Market Share of the 48 potential BPCI episodes	-0.49	-0.10
Herfindahl Index of Hospital Market Shares	-0.69	-0.07
Percentage of total discharges in the 48 clinical episodes in 2011	-0.19	0.07
Number of discharges for clinical episode in 2011	0.59	-0.03
Percent of patients in 2011 that went home with no post-acute care by clinical episode	-0.16	0.02
Percent of patients in 2011 that used an inpatient rehabilitation facility as first post-acute care setting by clinical episode	-0.03	0.07
Percent of patients in 2011 that used a SNF as first post-acute care setting by clinical episode	-0.04	-0.07
Percent of patients in 2011 that used a long-term care hospital as first post-acute care setting by clinical episode	-0.12	0.05
Percent of patients in 2011 that went home with HHA services as first post-acute care setting by clinical episode*	0.24	0.01
Unplanned readmission rate by clinical episode in 2011	-0.02	-0.05
Change in unplanned readmission rate by clinical episode from 2011 to 2012	-0.01	0.07
All-cause mortality rate in 2011 by clinical episode	0.01	-0.03
Change in all-cause mortality rate by clinical episode from 2011 to 2012	0.01	0.04
Average 90-day standardized Medicare Part A payment amount by clinical episode in 2011	-0.06	-0.01
Change in average 90-day standardized Medicare Part A payment amount by clinical episode from 2011 to 2012	0.00	0.03

Variable	Standardized Difference Before Matching	Standardized Difference After Matching**
Emergency Room rate by clinical episode in 2011	-0.14	-0.04
Change in Emergency room rate by clinical episode from 2011 to 2012	-0.01	-0.05

* These variables were not included for this model.

** Caliper was 1/20th of the standard deviation of the log-odds propensity score. The mean log-odds propensity score was -1.25 and the standard deviation was 1.84.

Exhibit L.13: Standardized Differences Before and After Matching, Model 2 Physician Group Practices, Major Joint Replacement of the Upper Extremity

Variable	Standardized Difference Before Matching	Standardized Difference After Matching**
Ownership - Non-Profit	-0.15	0.00
Ownership - Government	0.04	-0.06
Ownership - For Profit*	0.14	0.05
Urban	0.54	-0.03
Bed Count	0.35	-0.01
Chain Indicator	-0.11	-0.04
Medicare Days as a Percent of Total Inpatient Days	-0.16	-0.12
Resident-Bed Ratio	-0.42	0.00
Disproportionate Share Percent	0.08	0.00
Teaching Status	-0.19	-0.10
Population Size of Market Area	0.16	0.02
Median Household Income	0.08	0.05
Medicare Advantage Penetration	0.14	0.17
Primary Care Providers per 10,000 in Market	-0.20	-0.01
SNF Beds per 10,000 in Market	-0.52	-0.17
Inpatient Rehabilitation Facility in Market	0.40	-0.11
Provider Market Share of the 48 potential BPCI episodes	-0.58	-0.01
Herfindahl Index of Hospital Market Shares	-0.78	0.02
Percentage of total discharges in the 48 clinical episodes in 2011	0.12	0.08
Number of discharges for clinical episode in 2011	0.36	0.04
Percent of patients in 2011 that went home with no post-acute care by clinical episode	-0.18	0.16
Percent of patients in 2011 that used an inpatient rehabilitation facility as first post-acute care setting by clinical episode	0.15	-0.12
Percent of patients in 2011 that used a SNF as first post-acute care setting by clinical episode	0.07	-0.05
Percent of patients in 2011 that used a long-term care hospital as first post-acute care setting by clinical episode*		
Percent of patients in 2011 that went home with HHA services as first post-acute care setting by clinical episode*	0.10	-0.10
Unplanned readmission rate by clinical episode in 2011	-0.01	0.02

Variable	Standardized Difference Before Matching	Standardized Difference After Matching**
Change in unplanned readmission rate by clinical episode from 2011 to 2012	0.12	0.01
All-cause mortality rate in 2011 by clinical episode	-0.18	0.04
Change in all-cause mortality rate by clinical episode from 2011 to 2012	0.21	-0.01
Average 90-day standardized Medicare Part A payment amount by clinical episode in 2011	0.16	-0.14
Change in average 90-day standardized Medicare Part A payment amount by clinical episode from 2011 to 2012	-0.10	0.10
Emergency Room rate by clinical episode in 2011	-0.14	-0.04
Change in Emergency room rate by clinical episode from 2011 to 2012	0.13	0.10

* These variables were not included for this model.

** Caliper was 1/10th of the standard deviation of the log-odds propensity score. The mean log-odds propensity score was -2.30 and the standard deviation was 2.11.

Exhibit L.14: Standardized Differences Before and After Matching, Model 2 Physician Group Practices, Medical Non-infectious Orthopedic

Variable	Standardized Difference Before Matching	Standardized Difference After Matching**
Ownership - Non-Profit	0.11	-0.10
Ownership - Government	-0.25	0.03
Ownership - For Profit*	0.11	0.09
Urban	0.71	-0.02
Bed Count	0.57	-0.01
Chain Indicator	-0.04	-0.05
Medicare Days as a Percent of Total Inpatient Days	-0.31	0.08
Resident-Bed Ratio	-0.37	-0.08
Disproportionate Share Percent	-0.32	0.05
Teaching Status	-0.07	0.00
Population Size of Market Area	0.03	0.03
Median Household Income	0.26	-0.05
Medicare Advantage Penetration	0.29	0.01
Primary Care Providers per 10,000 in Market	0.04	0.00
SNF Beds per 10,000 in Market	-0.62	-0.01
Inpatient Rehabilitation Facility in Market	0.22	0.02
Provider Market Share of the 48 potential BPCI episodes	-0.17	-0.06
Herfindahl Index of Hospital Market Shares	-0.34	-0.04
Percentage of total discharges in the 48 clinical episodes in 2011	-0.09	0.03
Number of discharges for clinical episode in 2011	0.58	0.03
Percent of patients in 2011 that went home with no post-acute care by clinical episode	-0.19	0.00

Variable	Standardized Difference Before Matching	Standardized Difference After Matching**
Percent of patients in 2011 that used an inpatient rehabilitation facility as first post-acute care setting by clinical episode	0.24	-0.02
Percent of patients in 2011 that used a SNF as first post-acute care setting by clinical episode	-0.03	-0.01
Percent of patients in 2011 that used a long-term care hospital as first post-acute care setting by clinical episode	-0.02	0.04
Percent of patients in 2011 that went home with HHA services as first post-acute care setting by clinical episode*	0.11	0.04
Unplanned readmission rate by clinical episode in 2011	-0.06	0.07
Change in unplanned readmission rate by clinical episode from 2011 to 2012	0.06	-0.06
All-cause mortality rate in 2011 by clinical episode	0.16	-0.06
Change in all-cause mortality rate by clinical episode from 2011 to 2012	-0.04	0.07
Average 90-day standardized Medicare Part A payment amount by clinical episode in 2011	0.26	0.08
Change in average 90-day standardized Medicare Part A payment amount by clinical episode from 2011 to 2012	-0.06	-0.10
Emergency Room rate by clinical episode in 2011	-0.17	-0.04
Change in Emergency room rate by clinical episode from 2011 to 2012	0.09	0.03

* These variables were not included for this model.

** Caliper was 1/10th of the standard deviation of the log-odds propensity score. The mean log-odds propensity score was -2.22 and the standard deviation was 2.03.

Exhibit L.15: Standardized Differences Before and After Matching, Model 2 Physician Group Practices, Nutritional and Metabolic Disorders

Variable	Standardized Difference Before Matching	Standardized Difference After Matching**
Ownership - Non-Profit	0.17	-0.18
Ownership - Government	-0.39	-0.01
Ownership - For Profit*	0.17	0.22
Urban	0.82	0.02
Bed Count	0.63	-0.14
Chain Indicator	-0.07	-0.11
Medicare Days as a Percent of Total Inpatient Days	-0.40	0.01
Resident-Bed Ratio	-0.32	-0.13
Disproportionate Share Percent	-0.24	0.09
Teaching Status	0.11	-0.08
Population Size of Market Area	0.10	0.01
Median Household Income	0.43	-0.10
Medicare Advantage Penetration	0.49	0.03
Primary Care Providers per 10,000 in Market	0.13	-0.06

Variable	Standardized Difference Before Matching	Standardized Difference After Matching**
SNF Beds per 10,000 in Market	-0.72	-0.12
Inpatient Rehabilitation Facility in Market	0.11	0.07
Provider Market Share of the 48 potential BPCI episodes	-0.13	-0.10
Herfindahl Index of Hospital Market Shares	-0.31	-0.06
Percentage of total discharges in the 48 clinical episodes in 2011	-0.28	0.01
Number of discharges for clinical episode in 2011	0.48	-0.12
Percent of patients in 2011 that went home with no post-acute care by clinical episode	-0.05	0.02
Percent of patients in 2011 that used an inpatient rehabilitation facility as first post-acute care setting by clinical episode	0.15	-0.01
Percent of patients in 2011 that used a SNF as first post-acute care setting by clinical episode	-0.21	-0.05
Percent of patients in 2011 that used a long-term care hospital as first post-acute care setting by clinical episode*	-0.08	0.04
Percent of patients in 2011 that went home with HHA services as first post-acute care setting by clinical episode*	0.30	0.03
Unplanned readmission rate by clinical episode in 2011	-0.18	-0.03
Change in unplanned readmission rate by clinical episode from 2011 to 2012	0.15	0.08
All-cause mortality rate in 2011 by clinical episode	0.10	-0.05
Change in all-cause mortality rate by clinical episode from 2011 to 2012	-0.09	0.00
Average 90-day standardized Medicare Part A payment amount by clinical episode in 2011	-0.02	0.04
Change in average 90-day standardized Medicare Part A payment amount by clinical episode from 2011 to 2012	-0.01	0.00
Emergency Room rate by clinical episode in 2011	-0.19	-0.03
Change in Emergency room rate by clinical episode from 2011 to 2012	0.02	0.04

* These variables were not included for this model.

** Caliper was 1/10th of the standard deviation of the log-odds propensity score. The mean log-odds propensity score was -2.97 and the standard deviation was 2.41.

Exhibit L.16: Standardized Differences Before and After Matching, Model 2 Physician Group Practices, Other Respiratory

Variable	Standardized Difference Before Matching	Standardized Difference After Matching**
Ownership - Non-Profit	0.26	-0.11
Ownership - Government	-0.18	0.11
Ownership - For Profit*	-0.15	0.03
Urban	0.53	-0.06
Bed Count	0.37	-0.02
Chain Indicator	0.02	0.00

Variable	Standardized Difference Before Matching	Standardized Difference After Matching**
Medicare Days as a Percent of Total Inpatient Days	-0.24	0.04
Resident-Bed Ratio	-0.31	0.05
Disproportionate Share Percent	-0.40	0.02
Teaching Status	0.07	0.14
Population Size of Market Area	0.01	0.01
Median Household Income	0.27	0.00
Medicare Advantage Penetration	0.15	-0.02
Primary Care Providers per 10,000 in Market	0.07	0.00
SNF Beds per 10,000 in Market	-0.32	0.06
Inpatient Rehabilitation Facility in Market	-0.04	-0.04
Provider Market Share of the 48 potential BPCI episodes	0.06	-0.03
Herfindahl Index of Hospital Market Shares	-0.08	-0.02
Percentage of total discharges in the 48 clinical episodes in 2011	0.02	0.10
Number of discharges for clinical episode in 2011	0.66	0.08
Percent of patients in 2011 that went home with no post-acute care by clinical episode	-0.13	-0.01
Percent of patients in 2011 that used an inpatient rehabilitation facility as first post-acute care setting by clinical episode	0.23	-0.04
Percent of patients in 2011 that used a SNF as first post-acute care setting by clinical episode	-0.03	-0.02
Percent of patients in 2011 that used a long-term care hospital as first post-acute care setting by clinical episode*	-0.01	0.04
Percent of patients in 2011 that went home with HHA services as first post-acute care setting by clinical episode*	0.13	0.03
Unplanned readmission rate by clinical episode in 2011	-0.05	0.00
Change in unplanned readmission rate by clinical episode from 2011 to 2012	0.17	0.01
All-cause mortality rate in 2011 by clinical episode	0.17	-0.02
Change in all-cause mortality rate by clinical episode from 2011 to 2012	0.00	0.07
Average 90-day standardized Medicare Part A payment amount by clinical episode in 2011	-0.09	0.07
Change in average 90-day standardized Medicare Part A payment amount by clinical episode from 2011 to 2012	-0.01	-0.09
Emergency Room rate by clinical episode in 2011	0.02	0.03
Change in Emergency room rate by clinical episode from 2011 to 2012	-0.01	-0.06

* These variables were not included for this model.

** Caliper was 1/20th of the standard deviation of the log-odds propensity score. The mean log-odds propensity score was -2.61 and the standard deviation was 1.46.

Exhibit L.17: Standardized Differences Before and After Matching, Model 2 Physician Group Practices, Percutaneous Coronary Intervention

Variable	Standardized Difference Before Matching	Standardized Difference After Matching**
Ownership - Non-Profit	0.17	0.07
Ownership - Government	-0.37	-0.03
Ownership - For Profit*	0.16	-0.06
Urban	0.41	0.03
Bed Count	0.16	-0.05
Chain Indicator	-0.27	-0.01
Medicare Days as a Percent of Total Inpatient Days	0.02	-0.02
Resident-Bed Ratio	-0.43	-0.02
Disproportionate Share Percent	-0.24	-0.02
Teaching Status	-0.19	0.01
Population Size of Market Area	0.12	0.07
Median Household Income	0.03	0.00
Medicare Advantage Penetration	0.09	0.10
Primary Care Providers per 10,000 in Market	-0.19	0.10
SNF Beds per 10,000 in Market	-0.23	-0.09
Inpatient Rehabilitation Facility in Market	0.29	-0.09
Provider Market Share of the 48 potential BPCI episodes	-0.43	-0.01
Herfindahl Index of Hospital Market Shares	-0.45	-0.02
Percentage of total discharges in the 48 clinical episodes in 2011	0.33	-0.05
Number of discharges for clinical episode in 2011	-0.08	-0.04
Percent of patients in 2011 that went home with no post-acute care by clinical episode	-0.42	-0.07
Percent of patients in 2011 that used an inpatient rehabilitation facility as first post-acute care setting by clinical episode	0.11	0.01
Percent of patients in 2011 that used a SNF as first post-acute care setting by clinical episode	0.22	0.10
Percent of patients in 2011 that used a long-term care hospital as first post-acute care setting by clinical episode*	-0.12	0.01
Percent of patients in 2011 that went home with HHA services as first post-acute care setting by clinical episode*	0.38	0.02
Unplanned readmission rate by clinical episode in 2011	0.15	0.06
Change in unplanned readmission rate by clinical episode from 2011 to 2012	-0.06	-0.04
All-cause mortality rate in 2011 by clinical episode	-0.04	0.04
Change in all-cause mortality rate by clinical episode from 2011 to 2012	0.09	0.00
Average 90-day standardized Medicare Part A payment amount by clinical episode in 2011	0.05	0.01
Change in average 90-day standardized Medicare Part A payment amount by clinical episode from 2011 to 2012	-0.02	0.00

Variable	Standardized Difference Before Matching	Standardized Difference After Matching**
Emergency Room rate by clinical episode in 2011	-0.25	-0.14
Change in Emergency room rate by clinical episode from 2011 to 2012	-0.13	0.13

* These variables were not included for this model.

** Caliper was 1/20th of the standard deviation of the log-odds propensity score. The mean log-odds propensity score was -1.48 and the standard deviation was 1.83.

Exhibit L.18: Standardized Differences Before and After Matching, Model 2 Physician Group Practices, Renal Failure

Variable	Standardized Difference Before Matching	Standardized Difference After Matching**
Ownership - Non-Profit	0.06	-0.14
Ownership - Government	-0.28	0.07
Ownership - For Profit*	0.19	0.11
Urban	0.93	0.01
Bed Count	0.70	-0.15
Chain Indicator	-0.29	-0.04
Medicare Days as a Percent of Total Inpatient Days	-0.35	-0.03
Resident-Bed Ratio	-0.31	-0.14
Disproportionate Share Percent	-0.28	-0.05
Teaching Status	0.06	-0.07
Population Size of Market Area	0.27	0.00
Median Household Income	0.33	-0.09
Medicare Advantage Penetration	0.28	0.07
Primary Care Providers per 10,000 in Market	0.08	-0.03
SNF Beds per 10,000 in Market	-0.68	-0.06
Inpatient Rehabilitation Facility in Market	0.40	0.01
Provider Market Share of the 48 potential BPCI episodes	-0.27	-0.13
Herfindahl Index of Hospital Market Shares	-0.49	-0.07
Percentage of total discharges in the 48 clinical episodes in 2011	-0.28	0.12
Number of discharges for clinical episode in 2011	0.90	-0.13
Percent of patients in 2011 that went home with no post-acute care by clinical episode	-0.23	-0.04
Percent of patients in 2011 that used an inpatient rehabilitation facility as first post-acute care setting by clinical episode	0.34	0.08
Percent of patients in 2011 that used a SNF as first post-acute care setting by clinical episode	-0.12	-0.03
Percent of patients in 2011 that used a long-term care hospital as first post-acute care setting by clinical episode	-0.08	0.08
Percent of patients in 2011 that went home with HHA services as first post-acute care setting by clinical episode*	0.45	0.04
Unplanned readmission rate by clinical episode in 2011	0.11	0.06

Variable	Standardized Difference Before Matching	Standardized Difference After Matching**
Change in unplanned readmission rate by clinical episode from 2011 to 2012	-0.02	-0.02
All-cause mortality rate in 2011 by clinical episode	-0.07	0.09
Change in all-cause mortality rate by clinical episode from 2011 to 2012	0.07	-0.05
Average 90-day standardized Medicare Part A payment amount by clinical episode in 2011	0.18	0.03
Change in average 90-day standardized Medicare Part A payment amount by clinical episode from 2011 to 2012	-0.10	0.10
Emergency Room rate by clinical episode in 2011	-0.28	-0.08
Change in Emergency room rate by clinical episode from 2011 to 2012	-0.07	0.06

* These variables were not included for this model.

** Caliper was 1/20th of the standard deviation of the log-odds propensity score. The mean log-odds propensity score was -2.94 and the standard deviation was 2.54.

Exhibit L.19: Standardized Differences Before and After Matching, Model 2 Physician Group Practices, Sepsis

Variable	Standardized Difference Before Matching	Standardized Difference After Matching**
Ownership - Non-Profit	0.15	-0.06
Ownership - Government	-0.33	0.00
Ownership - For Profit*	0.14	0.07
Urban	0.85	0.01
Bed Count	0.69	-0.12
Chain Indicator	-0.22	-0.13
Medicare Days as a Percent of Total Inpatient Days	-0.22	0.05
Resident-Bed Ratio	-0.11	-0.12
Disproportionate Share Percent	-0.24	0.01
Teaching Status	0.12	-0.01
Population Size of Market Area	0.15	0.00
Median Household Income	0.30	-0.05
Medicare Advantage Penetration	0.25	0.06
Primary Care Providers per 10,000 in Market	0.15	0.02
SNF Beds per 10,000 in Market	-0.60	-0.10
Inpatient Rehabilitation Facility in Market	0.42	0.03
Provider Market Share of the 48 potential BPCI episodes	-0.22	-0.10
Herfindahl Index of Hospital Market Shares	-0.44	-0.09
Percentage of total discharges in the 48 clinical episodes in 2011	-0.27	0.04
Number of discharges for clinical episode in 2011	0.71	-0.05
Percent of patients in 2011 that went home with no post-acute care by clinical episode	-0.20	0.02

Variable	Standardized Difference Before Matching	Standardized Difference After Matching**
Percent of patients in 2011 that used an inpatient rehabilitation facility as first post-acute care setting by clinical episode	0.32	-0.05
Percent of patients in 2011 that used a SNF as first post-acute care setting by clinical episode	-0.12	-0.03
Percent of patients in 2011 that used a long-term care hospital as first post-acute care setting by clinical episode	0.08	0.05
Percent of patients in 2011 that went home with HHA services as first post-acute care setting by clinical episode*	0.30	-0.02
Unplanned readmission rate by clinical episode in 2011	0.09	0.01
Change in unplanned readmission rate by clinical episode from 2011 to 2012	0.01	0.00
All-cause mortality rate in 2011 by clinical episode	0.33	0.07
Change in all-cause mortality rate by clinical episode from 2011 to 2012	-0.01	-0.05
Average 90-day standardized Medicare Part A payment amount by clinical episode in 2011	0.22	0.05
Change in average 90-day standardized Medicare Part A payment amount by clinical episode from 2011 to 2012	-0.03	-0.01
Emergency Room rate by clinical episode in 2011	-0.18	-0.03
Change in Emergency room rate by clinical episode from 2011 to 2012	-0.07	0.00

* These variables were not included for this model.

** Caliper was 1/20th of the standard deviation of the log-odds propensity score. The mean log-odds propensity score was -1.89 and the standard deviation was 1.92.

Exhibit L.20: Standardized Differences Before and After Matching, Model 2 Physician Group Practices, Simple Pneumonia and Respiratory Infections

Variable	Standardized Difference Before Matching	Standardized Difference After Matching**
Ownership - Non-Profit	0.28	-0.07
Ownership - Government	-0.37	0.06
Ownership - For Profit*	0.03	0.04
Urban	0.71	0.01
Bed Count	0.54	-0.01
Chain Indicator	-0.05	0.03
Medicare Days as a Percent of Total Inpatient Days	-0.34	0.10
Resident-Bed Ratio	-0.31	-0.05
Disproportionate Share Percent	-0.30	0.05
Teaching Status	0.10	0.00
Population Size of Market Area	0.12	0.03
Median Household Income	0.48	-0.03
Medicare Advantage Penetration	0.14	-0.12
Primary Care Providers per 10,000 in Market	0.09	-0.04

Variable	Standardized Difference Before Matching	Standardized Difference After Matching**
SNF Beds per 10,000 in Market	-0.50	-0.02
Inpatient Rehabilitation Facility in Market	0.14	0.02
Provider Market Share of the 48 potential BPCI episodes	0.00	-0.05
Herfindahl Index of Hospital Market Shares	-0.22	-0.04
Percentage of total discharges in the 48 clinical episodes in 2011	-0.25	0.03
Number of discharges for clinical episode in 2011	0.77	0.02
Percent of patients in 2011 that went home with no post-acute care by clinical episode	-0.32	-0.02
Percent of patients in 2011 that used an inpatient rehabilitation facility as first post-acute care setting by clinical episode	0.27	0.03
Percent of patients in 2011 that used a SNF as first post-acute care setting by clinical episode	-0.08	0.01
Percent of patients in 2011 that used a long-term care hospital as first post-acute care setting by clinical episode	0.17	0.07
Percent of patients in 2011 that went home with HHA services as first post-acute care setting by clinical episode*	0.42	-0.05
Unplanned readmission rate by clinical episode in 2011	-0.11	0.10
Change in unplanned readmission rate by clinical episode from 2011 to 2012	0.19	-0.05
All-cause mortality rate in 2011 by clinical episode	0.11	-0.01
Change in all-cause mortality rate by clinical episode from 2011 to 2012	0.14	0.03
Average 90-day standardized Medicare Part A payment amount by clinical episode in 2011	0.24	0.04
Change in average 90-day standardized Medicare Part A payment amount by clinical episode from 2011 to 2012	-0.03	-0.01
Emergency Room rate by clinical episode in 2011	-0.20	-0.04
Change in Emergency room rate by clinical episode from 2011 to 2012	-0.02	0.09

* These variables were not included for this model.

** Caliper was 1/20th of the standard deviation of the log-odds propensity score. The mean log-odds propensity score was -2.51 and the standard deviation was 1.91.

Exhibit L.21: Standardized Differences Before and After Matching, Model 2 Physician Group Practices, Spinal Fusion (Non-Cervical)

Variable	Standardized Difference Before Matching	Standardized Difference After Matching**
Ownership - Non-Profit	0.04	0.04
Ownership - Government	0.03	-0.05
Ownership - For Profit*	-0.09	0.00
Urban		
Bed Count	0.04	0.13
Chain Indicator	-0.23	0.02

Variable	Standardized Difference Before Matching	Standardized Difference After Matching**
Medicare Days as a Percent of Total Inpatient Days	-0.05	-0.08
Resident-Bed Ratio	-0.36	0.08
Disproportionate Share Percent	-0.13	0.10
Teaching Status	-0.27	0.04
Population Size of Market Area	-0.16	0.05
Median Household Income	0.16	0.01
Medicare Advantage Penetration	0.01	0.06
Primary Care Providers per 10,000 in Market	-0.01	0.07
SNF Beds per 10,000 in Market	-0.19	-0.03
Inpatient Rehabilitation Facility in Market	-0.11	-0.02
Provider Market Share of the 48 potential BPCI episodes	-0.21	0.04
Herfindahl Index of Hospital Market Shares	-0.27	-0.02
Percentage of total discharges in the 48 clinical episodes in 2011	0.21	-0.07
Number of discharges for clinical episode in 2011	0.40	0.05
Percent of patients in 2011 that went home with no post-acute care by clinical episode	0.05	0.01
Percent of patients in 2011 that used an inpatient rehabilitation facility as first post-acute care setting by clinical episode	-0.05	-0.01
Percent of patients in 2011 that used a SNF as first post-acute care setting by clinical episode	0.05	0.16
Percent of patients in 2011 that used a long-term care hospital as first post-acute care setting by clinical episode*	0.10	0.00
Percent of patients in 2011 that went home with HHA services as first post-acute care setting by clinical episode*	-0.08	-0.15
Unplanned readmission rate by clinical episode in 2011	-0.01	-0.15
Change in unplanned readmission rate by clinical episode from 2011 to 2012	-0.09	0.10
All-cause mortality rate in 2011 by clinical episode	0.02	0.03
Change in all-cause mortality rate by clinical episode from 2011 to 2012	-0.07	-0.01
Average 90-day standardized Medicare Part A payment amount by clinical episode in 2011	0.10	-0.05
Change in average 90-day standardized Medicare Part A payment amount by clinical episode from 2011 to 2012	-0.03	-0.01
Emergency Room rate by clinical episode in 2011	-0.09	0.06
Change in Emergency room rate by clinical episode from 2011 to 2012	-0.03	-0.01

* These variables were not included for this model.

** Caliper was 1/20th of the standard deviation of the log-odds propensity score. The mean log-odds propensity score was -2.44 and the standard deviation was 1.23.

Exhibit L.22: Standardized Differences Before and After Matching, Model 2 Physician Group Practices, Stroke

Variable	Standardized Difference Before Matching	Standardized Difference After Matching**
Ownership - Non-Profit	0.19	-0.09
Ownership - Government	-0.22	0.09
Ownership - For Profit*	0.00	0.03
Urban	0.52	-0.06
Bed Count	0.33	0.01
Chain Indicator	-0.01	0.00
Medicare Days as a Percent of Total Inpatient Days	-0.07	0.06
Resident-Bed Ratio	-0.34	0.02
Disproportionate Share Percent	-0.33	0.05
Teaching Status	0.07	0.04
Population Size of Market Area	-0.12	-0.07
Median Household Income	0.24	-0.10
Medicare Advantage Penetration	0.25	-0.04
Primary Care Providers per 10,000 in Market	0.00	-0.10
SNF Beds per 10,000 in Market	-0.43	0.01
Inpatient Rehabilitation Facility in Market	-0.07	-0.01
Provider Market Share of the 48 potential BPCI episodes	0.17	-0.01
Herfindahl Index of Hospital Market Shares	0.05	0.00
Percentage of total discharges in the 48 clinical episodes in 2011	0.01	0.01
Number of discharges for clinical episode in 2011	0.56	0.08
Percent of patients in 2011 that went home with no post-acute care by clinical episode	-0.04	-0.03
Percent of patients in 2011 that used an inpatient rehabilitation facility as first post-acute care setting by clinical episode	0.15	-0.01
Percent of patients in 2011 that used a SNF as first post-acute care setting by clinical episode	-0.21	0.04
Percent of patients in 2011 that used a long-term care hospital as first post-acute care setting by clinical episode	-0.09	0.00
Percent of patients in 2011 that went home with HHA services as first post-acute care setting by clinical episode*	0.21	-0.02
Unplanned readmission rate by clinical episode in 2011	-0.06	-0.01
Change in unplanned readmission rate by clinical episode from 2011 to 2012	0.05	-0.01
All-cause mortality rate in 2011 by clinical episode	0.02	0.02
Change in all-cause mortality rate by clinical episode from 2011 to 2012	-0.03	0.02
Average 90-day standardized Medicare Part A payment amount by clinical episode in 2011	-0.09	0.00
Change in average 90-day standardized Medicare Part A payment amount by clinical episode from 2011 to 2012	0.03	-0.02

Variable	Standardized Difference Before Matching	Standardized Difference After Matching**
Emergency Room rate by clinical episode in 2011	0.00	-0.02
Change in Emergency room rate by clinical episode from 2011 to 2012	-0.05	-0.01

* These variables were not included for this model.

**Caliper was 1/20th of the standard deviation of the log-odds propensity score. The mean log-odds propensity score was -2.82 and the standard deviation was 1.60.

Exhibit L.23: Standardized Differences Before and After Matching, Model 2 Physician Group Practices, Urinary Tract Infection

Variable	Standardized Difference Before Matching	Standardized Difference After Matching**
Ownership - Non-Profit	0.15	-0.17
Ownership - Government	-0.41	0.03
Ownership - For Profit*	0.21	0.17
Urban	0.99	0.00
Bed Count	0.81	-0.15
Chain Indicator	-0.33	-0.09
Medicare Days as a Percent of Total Inpatient Days	-0.37	0.04
Resident-Bed Ratio	-0.04	-0.17
Disproportionate Share Percent	-0.25	0.03
Teaching Status	0.17	-0.09
Population Size of Market Area	0.21	-0.06
Median Household Income	0.35	-0.09
Medicare Advantage Penetration	0.44	0.04
Primary Care Providers per 10,000 in Market	0.19	-0.08
SNF Beds per 10,000 in Market	-0.65	-0.11
Inpatient Rehabilitation Facility in Market	0.39	-0.02
Provider Market Share of the 48 potential BPCI episodes	-0.33	-0.11
Herfindahl Index of Hospital Market Shares	-0.60	-0.08
Percentage of total discharges in the 48 clinical episodes in 2011	-0.35	0.02
Number of discharges for clinical episode in 2011	0.90	-0.06
Percent of patients in 2011 that went home with no post-acute care by clinical episode	-0.44	0.02
Percent of patients in 2011 that used an inpatient rehabilitation facility as first post-acute care setting by clinical episode	0.27	-0.04
Percent of patients in 2011 that used a SNF as first post-acute care setting by clinical episode	0.09	0.06
Percent of patients in 2011 that used a long-term care hospital as first post-acute care setting by clinical episode	-0.01	0.03
Percent of patients in 2011 that went home with HHA services as first post-acute care setting by clinical episode*	0.42	-0.11
Unplanned readmission rate by clinical episode in 2011	0.03	-0.01

Variable	Standardized Difference Before Matching	Standardized Difference After Matching**
Change in unplanned readmission rate by clinical episode from 2011 to 2012	-0.01	0.10
All-cause mortality rate in 2011 by clinical episode	-0.02	0.09
Change in all-cause mortality rate by clinical episode from 2011 to 2012	0.01	-0.06
Average 90-day standardized Medicare Part A payment amount by clinical episode in 2011	0.43	-0.02
Change in average 90-day standardized Medicare Part A payment amount by clinical episode from 2011 to 2012	-0.17	0.12
Emergency Room rate by clinical episode in 2011	-0.25	-0.08
Change in Emergency room rate by clinical episode from 2011 to 2012	-0.02	0.04

* This variable was not included for this model.

**Caliper was 1/10th of the standard deviation of the log-odds propensity score. The mean log-odds propensity score was -2.33 and the standard deviation was 2.01.