Medicare Payment Bundling: Insights from Claims Data and Policy Implications

PREPARED FOR:

American Hospital Association (AHA) and Association of American Medical Colleges (AAMC)

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Presentation Overview

- **Purpose and Study Objectives**
- **Incentives and Risks in Payment Bundling**
- **Research Questions**
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- **Key Findings**
  - Defining the Bundle
  - Pricing the Bundle
  - Managing the Bundle
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- **Conclusion**
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Purpose and Study Objectives

- **Payment bundling represents a significant deviation from the current volume-driven, fee-for-service payment system**
  - Has the potential to bridge the US health care system to a more population-based model that better serves both patients and providers
  - Offers providers the flexibility and financial incentives to redesign care delivery, encouraging cost effective and high quality care
  - Supports CMS triple aim: better care, better population health, lower costs
  - Could extend the solvency of the Medicare Hospital Insurance Trust Fund
- **The American Hospital Association (AHA) and the Association of American Medical Colleges (AAMC) commissioned Dobson DaVanzo & Associates, LLC (Dobson | DaVanzo) to conduct quantitative analyses of a set of episode-based payment bundles**
  - Purpose of this study is to highlight considerations for policymakers and providers using descriptive statistics and multivariate regression analyses

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Incentives and Risks in Payment Bundling

- **Provider incentives under a bundled payment system:**
  - Provide care that is medically necessary and evidence-based
  - Better manage care transitions and reduce the utilization of providers outside of the affiliated network
  - Reduce internal hospital costs (supplies, drugs, medical devices, etc.) because gainsharing features can allow physicians to share in the savings
- **Major risks for providers under a bundled payment system:**
  - Size of the discount that providers will be required to offer CMS
  - Ability to manage care across the continuum, including services rendered by providers outside of the affiliated network
  - Providers who manage more complex populations should be reimbursed according to risk in order to promote their full engagement in caring for the sickest patients

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Research Questions

- **Defining the Bundle**
  - What are the characteristics of conditions that make attractive options for bundling? Which conditions meet those characteristics?
  - What are the determinants of ideal episode length?
  - Should episode length be uniform across bundles, or vary based on the service or condition?
  - What services or patients should be included in the bundle?

- **Pricing the Bundle**
  - How should the bundle be priced? How should add-on payments be addressed?
  - What factors should be considered for risk adjustment?
  - Should there be an outlier policy?

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Research Questions (cont'd)

- **Managing the Bundle**
  - What is the impact of patient pathways on episode payments?
  - How do hospital readmissions affect the payment bundle?
  - What is the role of the first post-acute care setting to which a patient is admitted post-discharge?
  - What are the key capabilities needed by organizations accepting payment bundles?

- **Other Program Design Issues**
  - What protections can be built in to guard against stinting, over-utilization of bundles, and adverse selection? How should regional variation in practice patterns be addressed?
  - Should there be a minimum volume requirement?

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Data Methodology

- **Dobson | DaVanzo received patient-identifiable claims data from CMS**
- **Claims were linked across all sites of service over time by unique patient identifier**
  - Unit of observation is patient episode over a finite period of time (e.g., 30 days), not stay, encounter, or annual capitated amount
- **Episodes are similar in construction to the Bundled Payments for Care Improvement (BPCI) initiative**
  - Episodes are fixed in length, and end seven, 15, 30, 60 or 90 days following discharge from the "index" acute care hospital admission ("index hospitalization" or "anchor hospital stay")
    - Episode datasets are all built separately from each other
  - Include beneficiaries who die any time during episode
  - Exclude Medicare end-stage renal disease (ESRD) beneficiaries or beneficiaries with at least one month of claims under Medicare Advantage

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Data Methodology (cont'd)

- **We performed a series of multivariate regression analyses to simulate a nationwide bundled payment system**
  - *Dependent Variable:* Current Medicare allowed payment per episode (including patient copayments, Indirect Medical Education [IME], disproportionate share hospital [DSH] payments, and capital)
  - *Independent Variables:* Beneficiary, facility, and episode characteristics (e.g. age, sex, chronic conditions, functional ability, IME, DSH, first post-acute care setting after hospital discharge)
- **Simulated bundled payments are the "predicted" Medicare allowed payments under the various models for each patient episode**
- **We then applied an outlier model comparable to the Inpatient Prospective Payment System (IPPS) outlier policy**

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What Services Could be Included in a Bundle?

- **Index Hospitalization:** the acute care hospital stay that initiates an episode
- **First-setting:** the first-setting immediately following discharge from the index hospitalization
  - STACH – short term acute care hospital (readmissions)
  - HHA – home health agency
  - SNF – skilled nursing facility
  - IRF – inpatient rehabilitation facility
  - LTCH – long-term care hospital
  - Community – physician and hospital outpatient visits (excluding therapy)
  - ER – emergency room
  - OP Therapy – outpatient therapy
  - Hospice
  - Other IP – other inpatient hospitals: psychiatric hospitals, critical access, and cancer hospitals
- **All other Medicare Part A and B services provided within fixed-length episodes following index hospitalization (excluding Part D prescription drugs)**
  - DME services are included but not considered to be a first-setting

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Key Findings: Defining the Bundle

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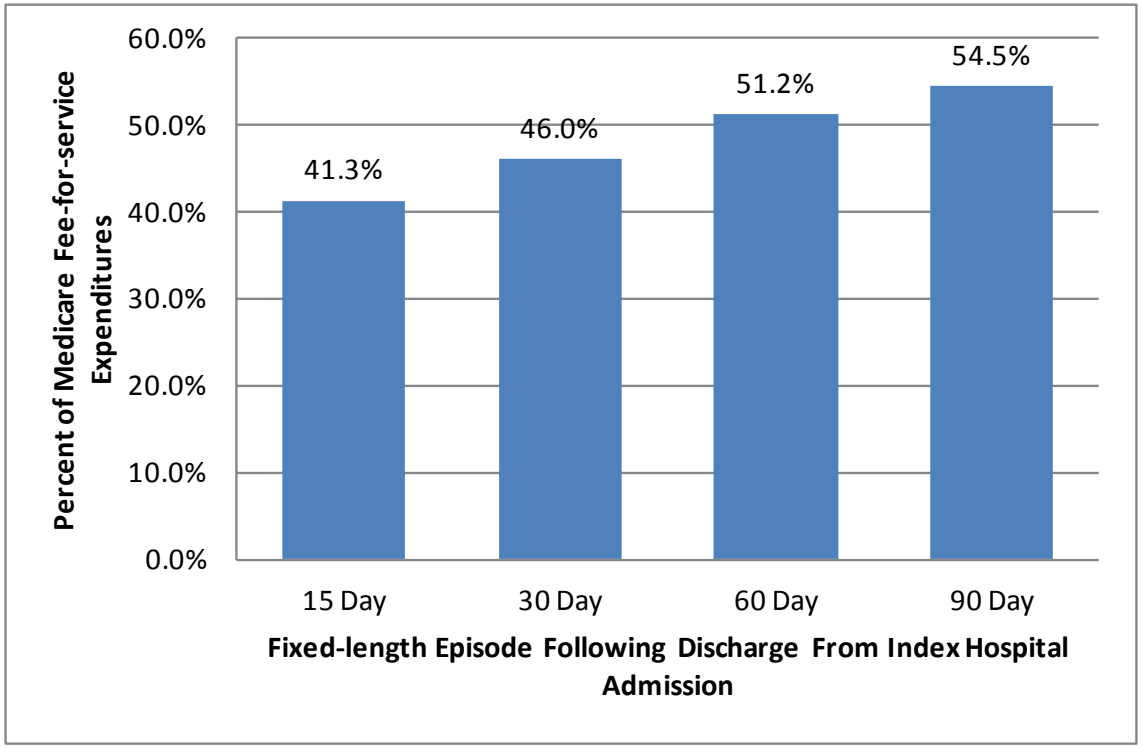
Medicare Payments Captured by 60-day Episodes Could Represent 51 Percent of Medicare Fee-for-service Expenditures

Medicare Episode Payments by Episode Length as a Percent of Total Medicare Fee-for-service Expenditures (2008)



Source: Dobson | DaVanzo analysis of research-identifiable 5 percent SAF for all sites of service, 2008, wage index adjusted by setting and geographic region, and standardized to 2009 dollars; Medicare Payment Advisory Commission (2009). A Databook: Healthcare spending and the Medicare program. All episodes have been extrapolated to reflect the universe of Medicare beneficiaries, and exclude dialysis and other services for end-stage renal disease (ESRD) patients.

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Top 20 Percent of MS-DRGs Represent 80 Percent of Medicare Episodes and Episode Payments Across First-settings

Percent of Medicare Episodes and Medicare Episode Payments Represented by Top 20 Percent of MS-DRGs (n=148) Ranked by Total Medicare Episode Payments for 30-day Fixed-length Episodes (2007-2009)

First-setting	Percent of Episodes in Top 20 Percent of MS-DRGs	Percent of Medicare Episode Payment in Top 20 Percent of MS-DRGs
HHA	77.9%	77.0%
SNF	80.2%	79.8%
IRF	81.8%	79.9%
LTCH	77.1%	81.8%
STACH	76.3%	76.0%
Community	75.6%	75.3%
…		
Overall	**76.7%**	**77.4%**

Source: Dobson | DaVanzo analysis of research-identifiable 5 percent SAF for all sites of service, 2007-2009, wage index adjusted by setting and geographic region, and standardized to 2009 dollars. All episodes have been extrapolated to reflect the universe of Medicare beneficiaries. Medicare Episode Payment includes care from all facility-based and ambulatory care settings and excludes beneficiary co-payments. IME, DSH, copay, capital, and other third party have been removed from payments. HH PPS payments do not include payments for Part D drug or DME services that are provided under SNF, IRF, and LTCH PPS payments.

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Characteristics of Clinical Conditions Best Suited to Payment Bundling

- **Adequate prevalence, with sufficient sample size to predict costs and show the effect of clinical interventions**
- **Significant resource consumption for the Medicare program, either from being expensive on a per-episode basis or because of high case volume**
- **Adequate variation in Medicare payment to allow for efficiency gains, but not so much variation that the risk of multiple outlier cases outweighs the reward**
- **Availability of clear, evidence-based clinical care guidelines**

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Cardiac and Orthopedic MS-DRGs, Stroke, and Heart Failure Meet Several Characteristics Important for Payment Bundling

Select MS-DRG Families by Criteria for Payment Bundling*

MS-DRG Family	Prevalent in Medicare Population	High Total Episode Payments	High Average Episode Payment	Low Variance in Episode Payments	Evidence-Based Practice Guidelines
Acute ischemic stroke w use of thrombolytic agent (61, 62, 63)			x		x
Intracranial hemorrhage or cerebral infarction (64, 65, 66)	x	x			x
Nonspecific cva & precerebral occlusion w/o infarct (67,68)					x
Chronic obstructive pulmonary disease (190, 191, 192)	x	x			x
Simple pneumonia & pleurisy (193, 194, 195)	x	x			x
Cardiac valve & oth maj cardiothoracic proc (216, 217, 218, 219, 220, 221)			x	x	x
Coronary bypass (231, 232, 233, 234, 235, 236)			x	x	x
Perc cardiovasc proc w drug-eluting stent (247)	x		x	x	x
Heart failure & shock (291, 292, 293)	x	x			x
Bilateral or multiple major joint procedures of lower extremity (461, 462)			x	x	x
Revision of hip or knee replacement (466, 467, 468)			x	x	x
Major joint replacement or reattachment of lower extremity (469, 470)	x	x		x	x
Hip & femur procedures except major joint (480, 481, 482)	x	x	x	x	x

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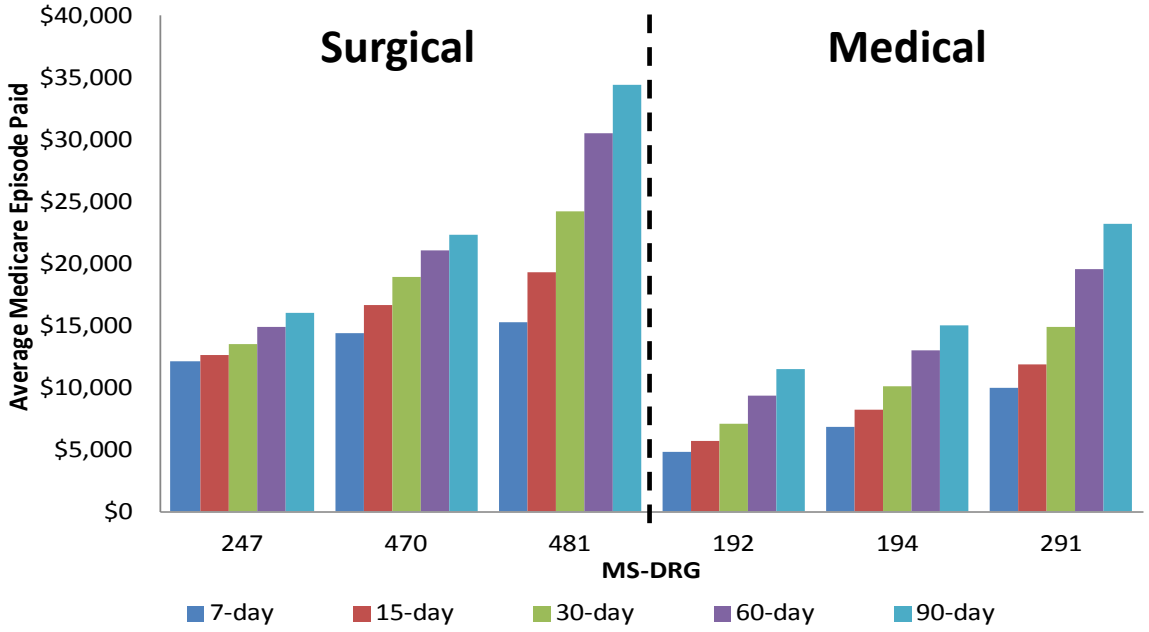
*Criteria include prevalence in the Medicare population (>1% of episodes), high total episode payments (>2% of total payments) or average episode payments (>$20,000), low variance in episode payments (CV<0.50), and have evidence-based clinical guidelines (maintained by the American Academy of Orthopaedic Surgeons [AAOS] or in Agency for Healthcare Research and Quality [AHRQ] National Guideline Clearinghouse).

Surgical MS-DRGs Tend to be More Expensive, but Medical MS-DRGs Have More Variation in Medicare Payment as Episode Length Increases

Average Medicare Episode Payment (Including Index Hospital Admission) for Select MS-DRGs across Seven-, 15-, 30-, 60-, and 90-day Fixed-length Episodes (2007-2009)



247: Percutaneous cardiovascular procedure with drug-eluting stent w/ MCC
470: Major joint replacement or reattachment of lower extremity w/o MCC
481: Hip & femur procedures except major joint w CC

192: Chronic obstructive pulmonary disease without CC/MCC
194: Simple pneumonia & pleurisy w CC
291: Heart failure & shock w MCC

Source: Dobson | DaVanzo analysis of research-identifiable 5 percent SAF for all sites of service, 2007-2009, wage index adjusted by setting and geographic region, and standardized to 2009 dollars. All episodes have been extrapolated to reflect the universe of Medicare beneficiaries. Medicare Episode Payment includes care from all facility-based and ambulatory care settings and excludes beneficiary co-payments. IME, DSH, copay, capital, and other third party have been removed from payments. HH PPS payments do not include payments for Part D drug or DME services that are provided under SNF, IRF, and LTCH PPS payments.

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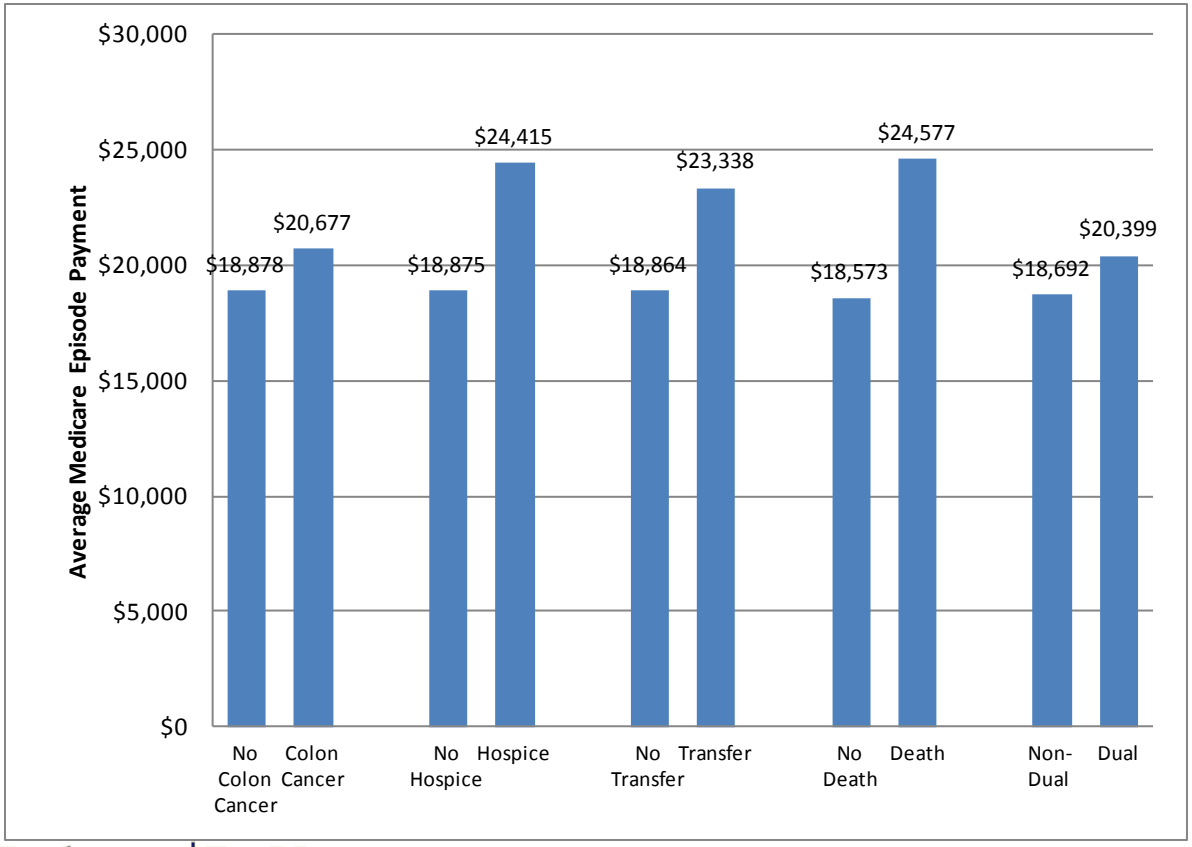
Some Patients May Be Considered for Exclusion or Adjustment Based on a Characteristic that Affects Average Medicare Episode Payment

Average Medicare Episode Payment by Clinical and Demographic Characteristics for Exclusion or Adjustment for MS-DRG 470 for 30-day Fixed-length Episodes (2007-2009)



Source: Dobson | DaVanzo analysis of research-identifiable 5 percent SAF for all sites of service, 2007-2009, wage index adjusted by setting and geographic region, and standardized to 2009 dollars. Medicare Episode Payment includes care from all facility-based and ambulatory care settings and excludes beneficiary co-payments. IME, DSH, copay, capital, and other third party have been removed from payments. HH PPS payments do not include payments for Part D drug or DME services that are provided under SNF, IRF, and LTCH PPS payments.

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Key Findings: Pricing the Bundle

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Payment Bundles Should be Priced Based in Part on Drivers of Medicare Episode Payment

- **Our descriptive statistics identify numerous drivers of Medicare episode payments, including:**
  - MS-DRG
  - Number of comorbid conditions (measured by HCCs)
  - Beneficiary demographic characteristics, such as age, sex, and race, and clinical characteristics, such as chronic conditions and functional ability
  - Hospital characteristics, such as IME and DSH payments received
  - Number and type of "sequence stops" in the care pathway (e.g., whether the "stops" are facility-based or ambulatory-based)
  - The number of unique physicians seen
  - The first post-acute care setting after hospital discharge within the episode
  - Prior utilization in 60-day look-back period

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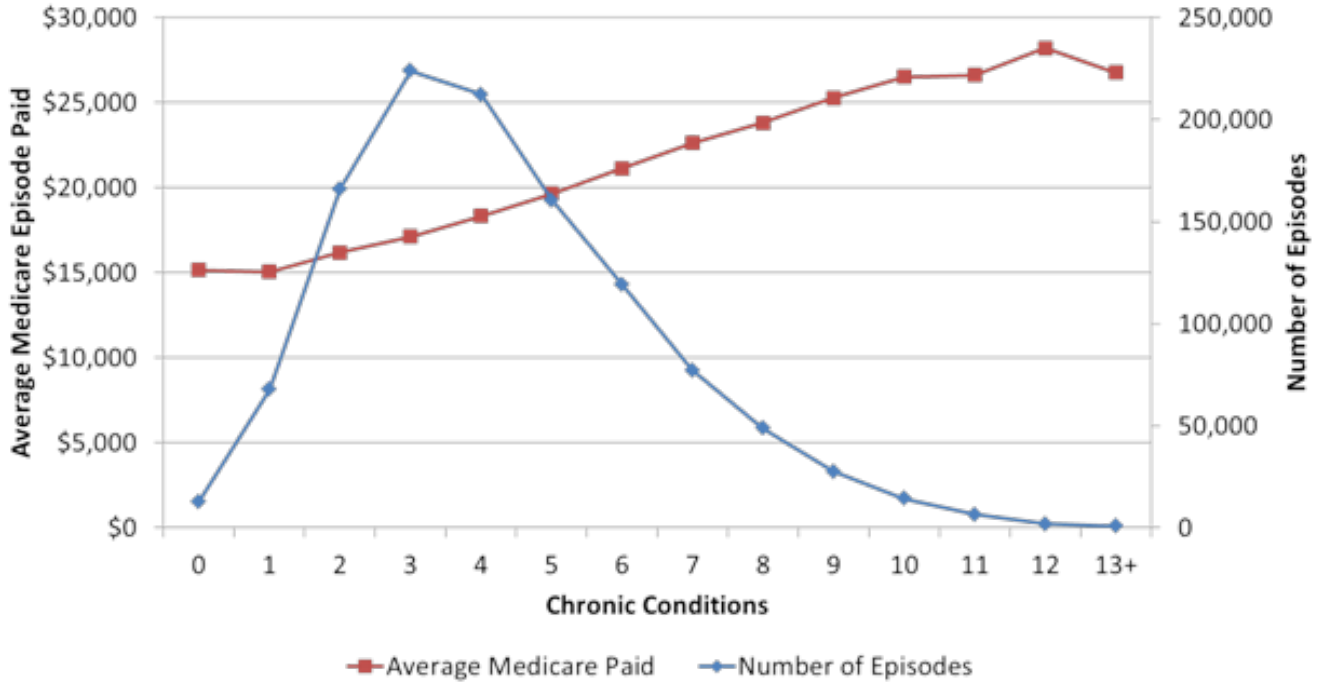
Medicare Episode Payments Increase with Number of Chronic Conditions

Number of Episodes and Average Medicare Episode Payment by Number of Chronic Conditions for MS-DRG 470 for 30-day Fixed-length Episodes (2007-2009)



Source: Dobson | DaVanzo analysis of research-identifiable 5 percent SAF for all sites of service, 2007-2009, wage index adjusted by setting and geographic region, and standardized to 2009 dollars. All episodes have been extrapolated to reflect the universe of Medicare beneficiaries. Medicare Episode Payment includes care from all facility-based and ambulatory care settings and excludes beneficiary co-payments. IME, DSH, copay, capital, and other third party have been removed from payments. HH PPS payments do not include payments for Part D drug or DME services that are provided under SNF, IRF, and LTCH PPS payments.

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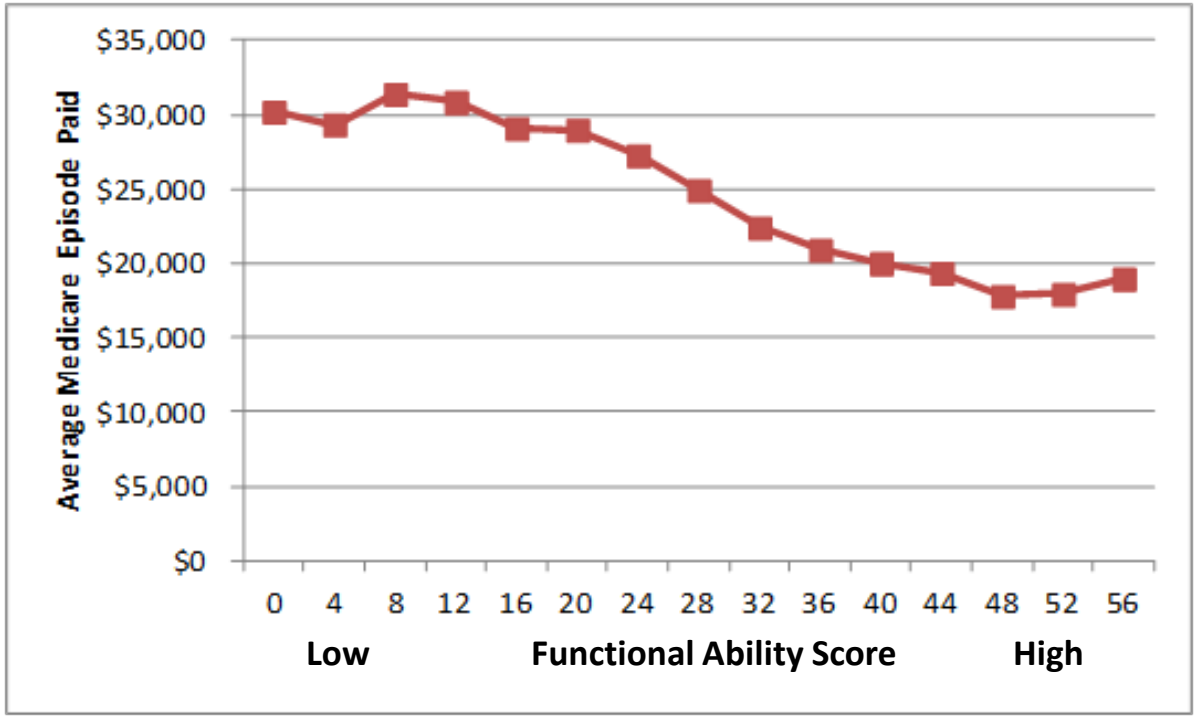
Average Medicare Episode Payments Fall as Patient Functional Ability Increases (Measured by Composite Scale across Post-Acute Care Assessment Tools)

Distribution of Episodes and Average Medicare Episode Payment by Functional Ability Score for 30-day Fixed-length Episodes (2007-2009)



Source: Dobson | DaVanzo analysis of research-identifiable 5 percent SAF for all sites of service, 2007-2009, wage index adjusted by setting and geographic region, and standardized to 2009 dollars. Medicare Episode Paid is the Medicare "allowed" amount, and includes care from all facility-based and ambulatory care settings, as well as IME, DSH, beneficiary co-payments, capital, and other third party payments. HH PPS payments do not include payments for Part D drug or DME services that are provided under SNF, IRF, and LTCH PPS payments.

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Description of Payment Models

- **Naïve Model**
  - Sets episode payments based on the national average for a specific MS-DRG, independent of beneficiary and facility characteristics
- **Model A**
  - Base regression model that predicts episode payments based on beneficiary demographic and clinical characteristics as well as facility characteristics
- **Model B**
  - Regression model that adds to Model A select beneficiary clinical and facility characteristics (e.g. death during episode, bed size, unique physician count) previously shown to predict Medicare payments
- **Model C**
  - Exploratory regression model that also controls for first post-acute care setting after hospital discharge

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Regression Models Used to Simulate a Payment System Include Variables that Influence Episode Payment

Variables Included in Each Episode Payment Model

	Naïve Model	Model A	Model B	Model C
MS-DRGs	x	x	x	x
Age		x	x	x
Sex		x	x	x
Race		x	x	x
Chronic Conditions		x	x	x
HCC Count		x	x	x
Functional Ability Score		x	x	x
Live Alone		x	x	x
Dual Eligibility		x	x	x
IME		x	x	x
DSH		x	x	x
Index Outlier Payment		x	x	x
Look Back CCU			x	x
Look Back ICU			x	x
Episode Death			x	x
Region			x	x
Rural			x	x
Bed Size			x	x
Unique Physician Count			x	x
First PAC Setting				x

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Model A Explains Approximately 70 Percent of Variation in Medicare Episode Payment

(Without Outlier Payments)

Progression of R^2 Value with Addition of Variables in Model A, Model B, and Model C

All MS-DRGs (Number of Observations = 1,292,352)			
Regression Model	**Variables**	**Cumulative R^2***	
Model A	**MS-DRG**	**0.511**	✓
	Age, Sex, Race	0.514	
	Chronic Conditions	0.528	
	HCC Count	0.534	
	Functional Ability and Live Alone	**0.647**	✓
	Dual Eligibility	0.647	
	IME, DSH, Index Outlier Payment	***0.669***	✓
Model B	Look Back CCU, ICU, and Episode Death	0.669	
	Region	0.669	
	Rural	0.669	
	Bed Size	0.670	
	Unique Physician Count	***0.762***	✓
Model C	**First PAC**	***0.781***	✓

✓ = Contribution to Explained Variance

Source: Dobson | DaVanzo analysis of research-identifiable 5 percent SAF for all sites of service, 2007-2009, wage index adjusted by setting and geographic region, and standardized to 2009 dollars. Medicare Episode Payment is the Medicare "allowed" amount, and includes care from all facility-based and ambulatory care settings, as well as IME, DSH, beneficiary co-payments, capital, and other third party payments. HH PPS payments do not include payments for Part D drug or DME services that are provided under SNF, IRF, and LTCH PPS payments.

* The adjusted-R^2, which accounts for degrees of freedom, was nearly identical to the R^2 values presented and follows the same trend.

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Outlier Model to Account for Episodes with High "Costs"

- **Simulated bundled payments are the "predicted" Medicare allowed payments under the various models for each patient episode**

- **After the multivariate regression produces a predicted episode payment, we applied an outlier model comparable to the IPPS outlier policy as follows:**
  - 10 percent of modeled episode payments are moved into a shared outlier pool, and actual episode payments in excess of a fixed loss threshold (FLT) are paid at 80 percent (the FLT was chosen to achieve budget neutrality)

- **Predictive ratio is a measure of payment accuracy, and compares the predicted episode payment from the multivariate regression to the actual episode payment (e.g., values close to 1.0 are more accurate)**

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Outlier Model Redistributes Payments and Improves Accuracy of Predicted Episode Payments at Bottom and Top Five Percent

Predictive Ratio Before and After the Outlier Model is Applied to the Bottom and Top Five Percent of Episodes

	Predictive Ratio			
	Bottom 5% of Episodes		Top 5% of Episodes	
Model	Before Outlier	After Outlier	Before Outlier	After Outlier
Naïve Model	2.11	1.90	0.71	1.04
Model A	1.65	1.49	0.81	1.10
Model B	1.41	1.27	0.84	1.15
Model C	1.42	1.27	0.90	1.19

- Our outlier payment model indicates that outliers pay more than the current Medicare allowed amount (but may not be higher than provider costs)
- The outlier model reduces payment compression in the top and bottom five percent of episodes

Source: Dobson | DaVanzo analysis of research-identifiable 5 percent SAF for all sites of service, 2007-2009, wage index adjusted by setting and geographic region, and standardized to 2009 dollars. Medicare Episode Payments the Medicare "allowed" amount, and includes care from all facility-based and ambulatory care settings, as well as IME, DSH, beneficiary co-payments, capital, and other third party payments. HH PPS payments do not include payments for Part D drug or DME services that are provided under SNF, IRF, and LTCH PPS payments.

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Risk Adjustment Based on Current Payment Systems Is Not Sufficient to Protect Many Providers Against Substantial Financial Risk

Percent of Providers by Ratio of Predicted Payment to Actual Payment

Ratio of Predicted Payment to Actual Payment	Naïve Model	Model A
< 0.90	11.4%	14.6%
0.90-0.95	13.4%	18.1%
0.95-1.00	22.0%	28.3%
1.00-1.05	24.9%	23.0%
1.05-1.10	15.2%	9.9%
> 1.10	13.1%	6.0%
Total*	**100%**	**100%**

Source: Dobson | DaVanzo analysis of research-identifiable 5 percent SAF for all sites of service, 2007-2009, wage index adjusted by setting and geographic region, and standardized to 2009 dollars. Medicare Episode Payment is the Medicare "allowed" amount, and includes care from all facility-based and ambulatory care settings, as well as IME, DSH, beneficiary co-payments, capital, and other third party payments. HH PPS payments do not include payments for Part D drug or DME services that are provided under SNF, IRF, and LTCH PPS payments.
* Totals may not add to 100.0% due to rounding error.

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Risk Adjustment Based on Current Payment Systems Is Not Sufficient to Protect Many Providers Against Substantial Financial Risk (cont'd)

- **Based on provider payments, current risk adjustment approaches as represented in Model A—including patient case-mix and an episode-level outlier payment system—leave approximately 20 percent of providers with a predicted change in revenue greater than 10 percent in absolute value**

- **These findings suggest that implementing a national system for bundled payments would require strategies to mitigate provider financial risk, such as payment rate blends, a transition period, and other protective policies**

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Key Findings: Managing the Bundle

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Average Medicare Episode Payment Varies by Patient Pathway and Depends on Mix of Post-Acute Care Following Hospital Discharge

Top 10 Patient Pathways Ranked by Number of Episodes for 30-day Fixed-length Episodes (2007-2009)

MS-DRG 470

Pathway	Percent of Episodes	Average Medicare Episode Paid
A-H-C	20.7%	$14,519
A-S-H-C	10.2%	$20,039
A-S	7.8%	$23,396
A-C	7.4%	$12,078
A-I-H-C	4.4%	$26,925
A-S-C	4.3%	$18,786
A-S-H	3.9%	$21,481
A-H-C-P	3.0%	$14,649
A-H	2.4%	$14,145
A-P-P	2.2%	$12,317
Subtotal	**66.2%**	**$17,575**
Other	33.8%	$21,501
Total	**100.0%**	**$18,901**

MS-DRG 291

Pathway	Percent of Episodes	Average Medicare Episode Paid
A-C	25.8%	$8,853
A-H-C	8.6%	$10,550
A	8.2%	$9,939
A-S	7.7%	$17,497
A-T	2.5%	$11,002
A-C-H-C	2.5%	$10,760
A-C-A	2.3%	$19,244
A-C-A-C	2.3%	$18,647
A-S-C	1.9%	$16,058
A-T-T	1.6%	$13,380
Subtotal	**63.4%**	**$11,500**
Other	36.6%	$20,868
Total	**100.0%**	**$14,928**

Facility-Based Sequence Stops:
A=STACH (Index or Readmission)
H=HHA
I=IRF
L=LTCH
S=SNF

Ambulatory-Based Sequence Stops:
C=Community (Physician and Outpatient)
E=ER
P=OP Therapy
T=Hospice
Z=Other IP

Source: Dobson | DaVanzo analysis of research-identifiable 5 percent SAF for all sites of service, 2007-2009, wage index adjusted by setting and geographic region, and standardized to 2009 dollars. All episodes have been extrapolated to reflect the universe of Medicare beneficiaries. Medicare Episode Payment includes care from all facility-based and ambulatory care settings and excludes beneficiary co-payments. IME, DSH, copay, capital, and other third party have been removed from payments. HH PPS payments do not include payments for Part D drug or DME services that are provided under SNF, IRF, and LTCH PPS payments.

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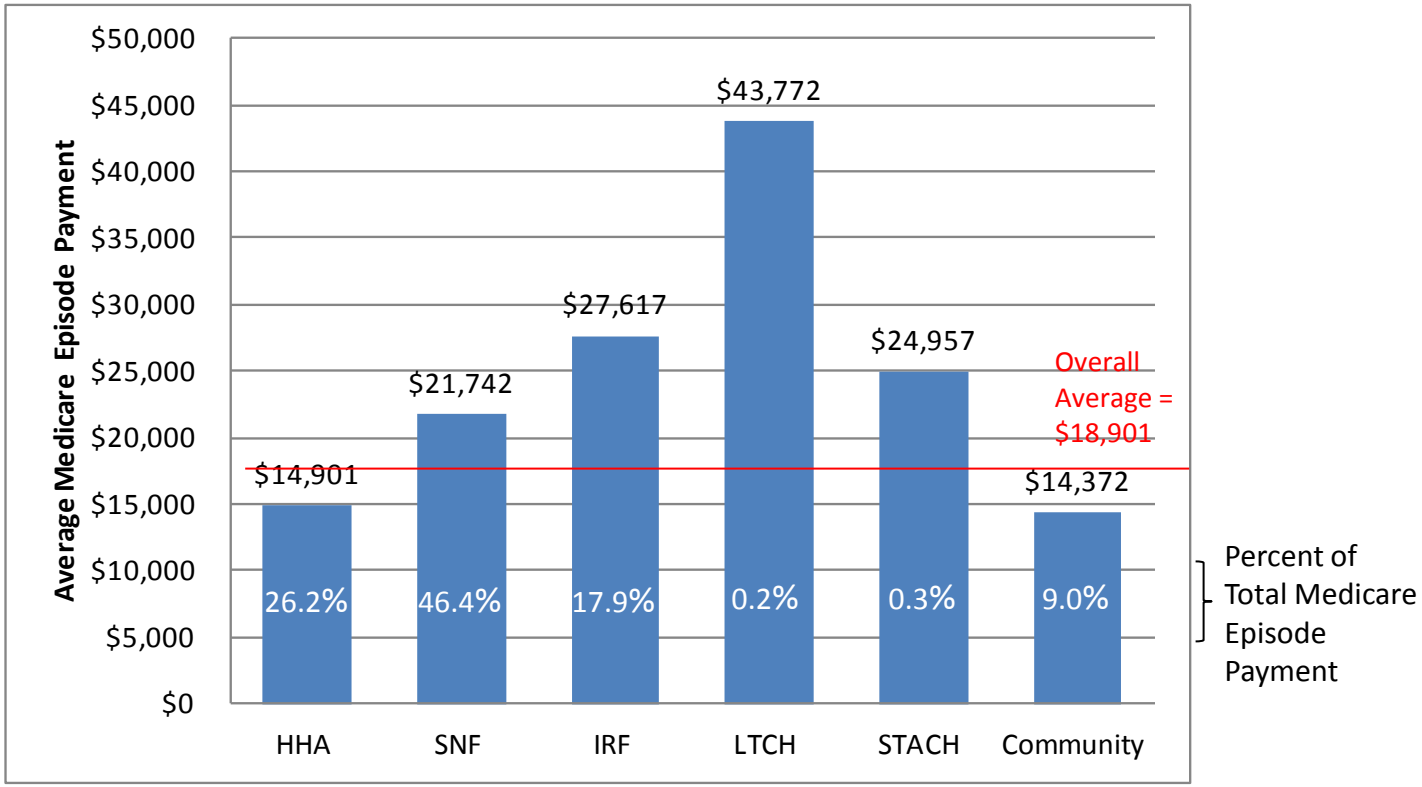
First-setting after Hospital Discharge Has Substantial Effect on Medicare Episode Payments for Joint Replacement (MS-DRG 470)

Average Medicare Episode Payment for MS-DRG 470 by First-setting for 30-day Fixed-length Episodes (2007-2009)



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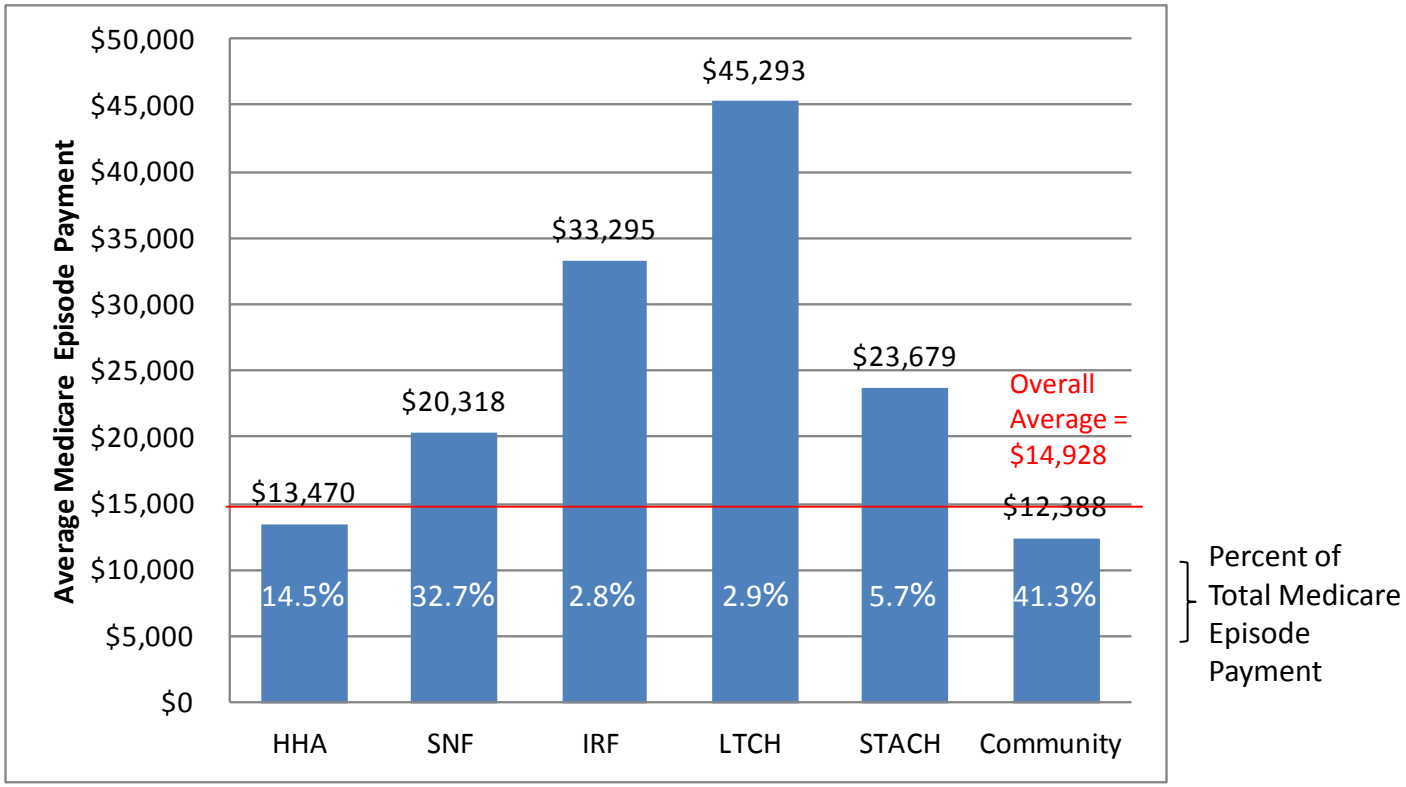
First-setting after Hospital Discharge Has Substantial Effect on Medicare Episode Payments for Heart Failure (MS-DRG 291)

Average Medicare Episode Payment for MS-DRG 291 by First-setting for 30-day Fixed-length Episodes (2007-2009)



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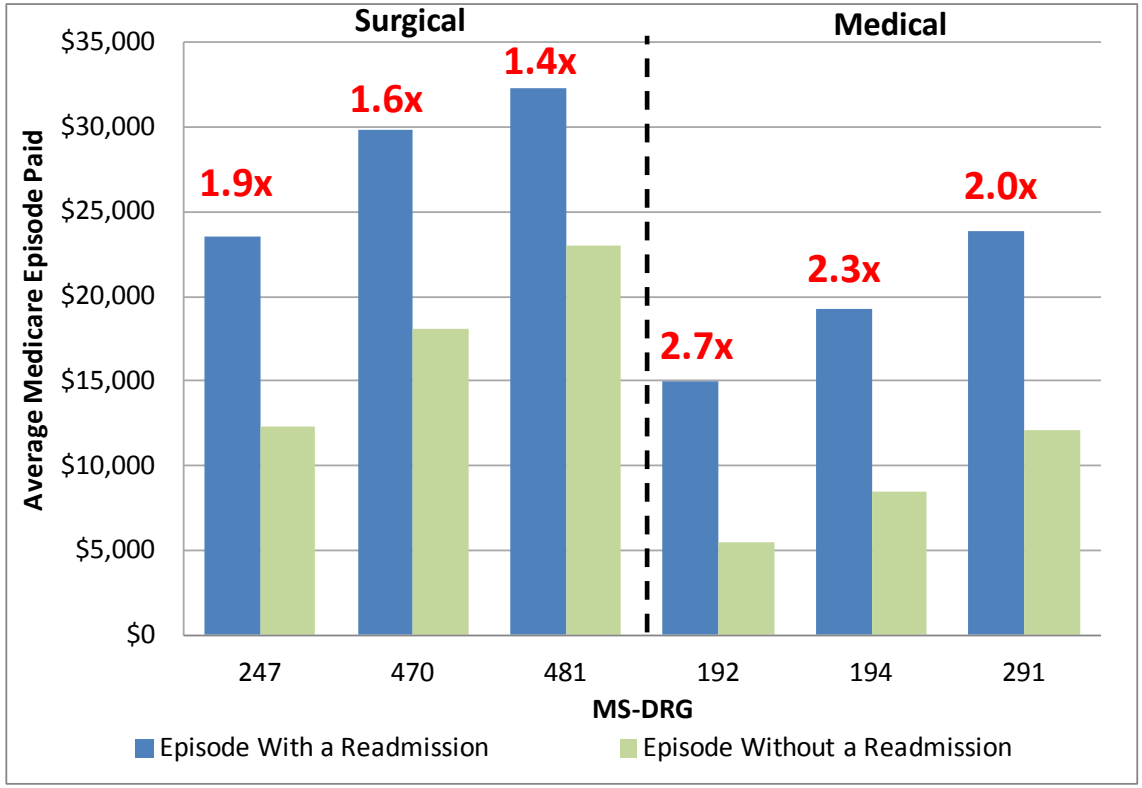
Readmissions Double Episode Payments, with a Greater Percent Impact on Medical than Surgical MS-DRGs

Average Medicare Episode Payment by Readmission Status for Select MS-DRGs for 30-day Fixed-length Episodes (2007-2009)



Source: Dobson | DaVanzo analysis of research-identifiable 5 percent SAF for all sites of service, 2007-2009, wage index adjusted by setting and geographic region, and standardized to 2009 dollars. All episodes have been extrapolated to reflect the universe of Medicare beneficiaries. Medicare Episode Payment includes care from all facility-based and ambulatory care settings and excludes beneficiary co-payments. IME, DSH, copay, capital, and other third party have been removed from payments. HH PPS payments do not include payments for Part D drug or DME services that are provided under SNF, IRF, and LTCH PPS payments.

247: Percutaneous cardiovascular procedure with drug-eluting stent w/ MCC
470: Major joint replacement or reattachment of lower extremity w/o MCC
481: Hip & femur procedures except major joint w CC

192: Chronic obstructive pulmonary disease without CC/MCC
194: Simple pneumonia & pleurisy w CC
291: Heart failure & shock w MCC

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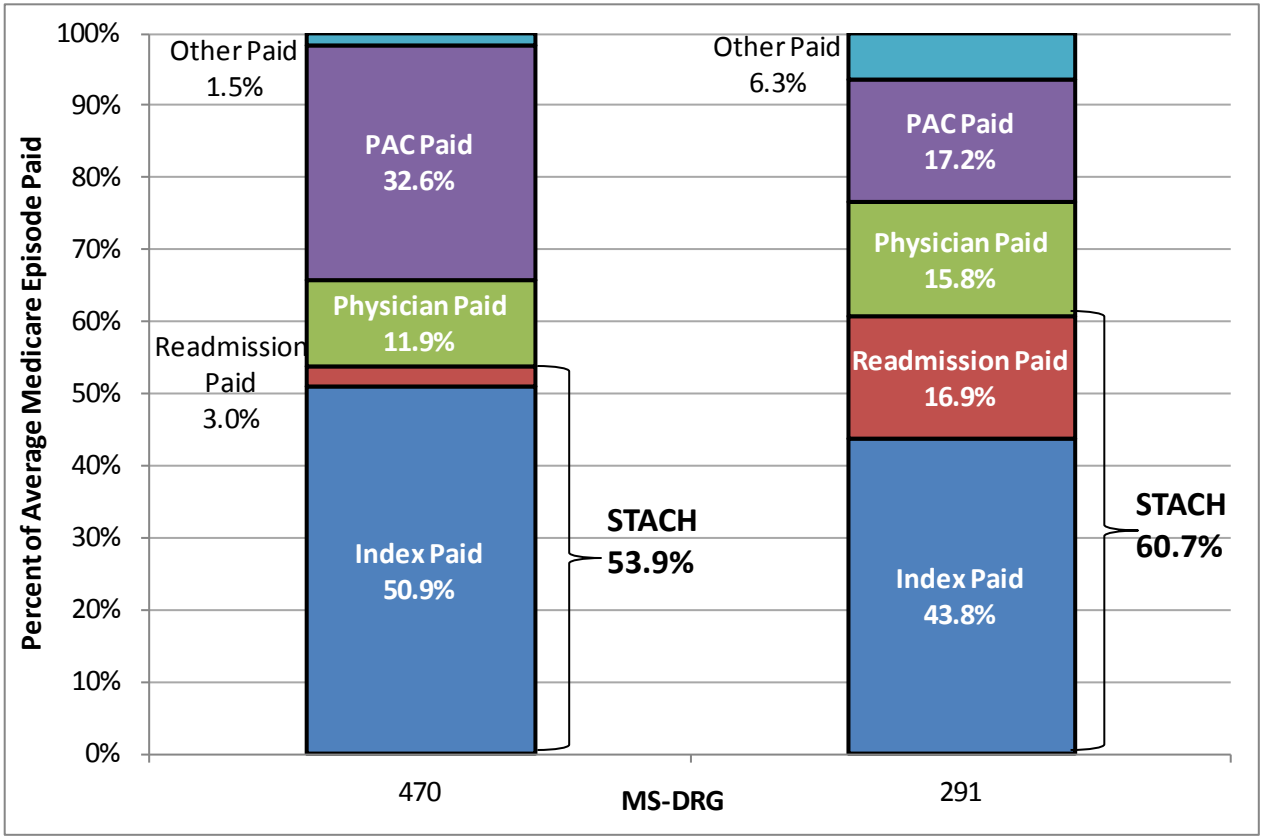
Distribution of Medicare Episode Payments by Care Setting Varies Across MS-DRGs

Percent of Medicare Payment by Setting for MS-DRG 470 and MS-DRG 291 for 30-day Fixed-length Episodes (2007-2009)



470: Major joint replacement or reattachment of lower extremity w/o MCC

291: Heart failure & shock w MCC

Source: Dobson | DaVanzo analysis of research-identifiable 5% SAF for all sites of service, 2007-2009, wage index adjusted by setting and geographic region, and standardized to 2009 dollars. Medicare Episode Payment includes care from all facility-based and ambulatory care settings and excludes beneficiary co-payments. IME, DSH, copay, capital, and other third party have been removed from payments. HH PPS payments do not include payments for Part D drug or DME services that are provided under SNF, IRF, and LTCH PPS payments.

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Capabilities Required by Organizations Managing Payment Bundles

- **We explored the experience of private-sector bundled payment initiatives, participants in Medicare demonstrations on payment bundling, and prospective BPCI applicants**

- **The following capabilities are important to providers in preparing for or implementing a bundled payment program:**
  - Designation of a single responsible entity
  - Risk management
  - Clinical and administrative processes
  - Network formation
  - Data analytic capabilities

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Across All Medicare Episodes, There is Wide Variation in the Size of Provider Networks that Hospitals Interact with after Patient Discharge

Count of Unique Providers: Distribution by Type Based on Index Hospital (2007-2009)

	Physicians	HHA	SNF	IRF	LTCH
Number of Index Hospitals	3,635	3,635	3,635	3,635	3,635
Minimum	1	0	0	0	0
25th Percentile	234	4	6	1	0
50th Percentile	477	9	12	1	1
75th Percentile	853	18	22	2	2
Maximum	6,598	168	140	28	20
Mean	**636**	**14**	**16**	**2**	**1**
Std. Deviation	589	16	16	2	1
CV	0.93	1.14	0.98	1.19	1.36

Source: Dobson | DaVanzo analysis of research-identifiable 5 percent SAF for all sites of service, 2007-2009, wage index adjusted by setting and geographic region, and standardized to 2009 dollars. All episodes have been extrapolated to reflect the universe of Medicare beneficiaries. Medicare Episode Payment includes care from all facility-based and ambulatory care settings and excludes beneficiary co-payments. IME, DSH, copay, capital, and other third party have been removed from payments. HH PPS payments do not include payments for Part D drug or DME services that are provided under SNF, IRF, and LTCH PPS payments.

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Other Program Design Issues

- **Stinting, adverse selection and over-utilization**
  - Risk adjustment
  - Outlier policy
  - Phase-in or transition
  - Gainsharing
  - Pay for performance
  - Quality measurement
  - Waivers
- **Geographic considerations**
- **Volume of procedures**
  - Due to variability in procedure volume, bundled payments could pose a substantial financial risk to providers without the protections noted above

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There is Substantial Variability in Episode Volume Across Providers

Distribution of Provider Episode Volume by MS-DRG Family for 30-day Fixed-length Episodes (2007-2009)

	Number of Episodes			
MS-DRG Family	**None**	**1 to 49**	**… 200 to 249**	**250+**
Acute ischemic stroke w use of thrombolytic agent (61, 62, 63)	83.7%	14.2%	0.0%	0.0%
Intracranial hemorrhage or cerebral infarction (64, 65, 66)	15.9%	14.9%	8.4%	24.1%
Nonspecific cva & precerebral occlusion w/o infarct (67,68)	71.5%	24.5%	0.0%	*
Chronic obstructive pulmonary disease (190, 191, 192)	10.9%	8.6%	9.7%	41.0%
Simple pneumonia & pleurisy (193, 194, 195)	8.4%	6.6%	11.5%	45.9%
Cardiac valve & oth maj cardiothoracic proc w card cath (216, 217, 218)	80.6%	12.5%	0.1%	0.3%
Coronary bypass w ptca (231, 232)	93.1%	6.6%	0.0%	0.0%
Perc cardiovasc proc w drug-eluting stent (247)	60.1%	6.1%	4.3%	14.9%
Heart failure & shock (291, 292, 293)	9.4%	6.7%	9.6%	49.1%
Revision of hip or knee replacement (466,467,468)	59.4%	24.1%	0.8%	1.2%
Major joint replacement or reattachment of lower extremity (469, 470)	19.5%	9.5%	6.8%	42.9%
Hip & femur procedures except major joint (480, 481, 482)	25.7%	16.9%	8.1%	12.6%

- This distribution should be interpreted with caution, as it is extrapolated to the full Medicare program based on a 5% sample of *beneficiaries* and may not be representative at the provider level

Source: Dobson | DaVanzo analysis of research-identifiable 5 percent SAF for all sites of service, 2007-2009, wage index adjusted by setting and geographic region, and standardized to 2009 dollars. All episodes have been extrapolated to reflect the universe of Medicare beneficiaries. Medicare Episode Payment includes care from all facility-based and ambulatory care settings and excludes beneficiary co-payments. IME, DSH, copay, capital, and other third party have been removed from payments. HH PPS payments do not include payments for Part D drug or DME services that are provided under SNF, IRF, and LTCH PPS payments.

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Limitations on Payment System Simulations

- **To implement a national payment bundling program, policymakers will need to design a complete framework that takes into account:**
  - Patient and population risk
  - Teaching and uninsured costs
  - Special services offered for vulnerable populations
  - Geography

- **Our regression models predict a beneficiary and facility level risk-adjusted payment based on r*evenues* rather than costs**

- **Determining the *cost* to providers of delivering care within an episode is needed to effectively design a cost-based prospective payment system consistent with other Medicare payment policies**

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Conclusion

- **Payment bundling is a logical next step toward a more comprehensive system of population health management and health care finance with the potential to increase quality and reduce costs**
- **Consideration should be given to program design risks and challenges (issues in defining and pricing the payment bundle should be carefully considered)**
- **Defining the bundle**
  - Conditions well-suited to payment bundling should be prevalent and expensive to the Medicare program, have limited variation in episode payments, and clear, evidence-based clinical guidelines
  - Optimal episode length is linked to the nature of the clinical condition, and balances risk to providers with opportunity for care improvement
  - Providers and services should be included in the episode that are clinically related and cause limited variation in episode payments

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Conclusion (cont'd)

- **Pricing the bundle**
  - Payment bundles should be risk-adjusted for factors that cause substantial variation in episode payment, such as beneficiary demographic and clinical characteristics, as well as facility characteristics
  - Episode payment likely will require an outlier policy to protect patient quality of care and mitigate financial risk, and may require risk corridors, stop-loss provisions, and other protections in order to succeed
  - Many providers do not have the volume of services likely needed to manage the risk of bundled payments at an individual MS-DRG level, but risk may be manageable across MS-DRGs

- **Managing the bundle**
  - Providers should examine patient pathways to understand care across the continuum to better target clinical interventions

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Conclusion (cont'd)

- **Managing the bundle (cont'd)**
  - Providers will need to target readmission reduction efforts under payment bundling, as the risk of readmission differs across beneficiary demographic and clinical characteristics as well as condition
  - Providers will need to carefully consider patient placement in discharge planning efforts and understand the distribution of Medicare episode payments across settings to better focus care management efforts
  - Providers need to consider issues such as designation of a single entity to accept the payment bundle, risk management, clinical and administrative processes, network formation and data capabilities in preparing for payment bundling
- **While the BPCI initiative adjusts for risk by using historical, provider-specific benchmarks for payment, a national bundled payment system likely would use a comprehensive risk adjustment policy**

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Appendix: Methodology

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Appendix: Methodology

- **Claims data comprised all Part A & B claims for a 5% sample of Medicare beneficiaries, 2007-2009 (DUA #21842)**

- **Data were linked to other approved data sources:**
  - Chronic Conditions Warehouse (CCW): Provided by CMS, flags each Medicare beneficiary for the presence of 21 common pre-defined chronic conditions based on claims data
  - Assessment data for home health (OASIS), skilled nursing facilities (MDS), and inpatient rehabilitation facilities (IRF-PAI)
  - Area Resource File (ARF): Provided by HRSA, contains information on health facilities and professions, measures of resource scarcity, health status, and economic activity
  - Provider of Services (POS) file

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Appendix: Methodology (cont'd)

- **To incorporate functional ability, we used eight variables from OASIS, MDS, and IRF-PAI that measure beneficiary functional ability**
  - Each variable was linearly rescaled to a 0-7 scale consistent across measures
    - Any variable that was missing from a patient's assessment was assigned a value equal to the average of all other variables
  - We then added together the variables to make a single scale ranging from 0-56

- **After the multivariate regression produces a "predicted" episode payment, we applied an outlier model as follows:**
  - 10 percent of modeled episode payments are moved into a shared outlier pool, and actual episode payments in excess of a fixed loss threshold (FLT) are paid at 80 percent (the FLT was chosen to achieve budget neutrality)

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