Clinically Appropriate and Cost-Effective Placement (CACEP) Project

Working Paper Series: Use of Home Health Care and Other Services Among Medicare Beneficiaries

Working Paper #4: Hospital Readmissions

PREPARED FOR AND PRESENTED TO:

The Alliance for Home Health Quality & Innovation (AHHQI)

PRESENTED BY:

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Presentation Overview

- **Purpose of Clinically Appropriate and Cost-Effective Placement (CACEP) Project**
- **CACEP Episodes of Care**
- **CACEP Working Paper Series**
- **Key Findings Addressed by CACEP Working Papers**
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- **Episode Type 3: Non-Post-Acute Care Community-Based Episodes**
- **Discussion on Relevance of Working Paper Series to Ongoing Policy Developments**

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Purpose of Clinically Appropriate and Cost-Effective Placement (CACEP) Project

- **The overall purpose of the CACEP project is to determine how the Medicare home health benefit can better meet beneficiary needs and improve the quality and efficiency of care provided within the U.S. health care system**
- **CACEP is a data driven study that aims to answer a wide variety of research questions**
- **In order to do so, CACEP focuses on three episode definitions to capture the following uses of home health care:**
  - Episode Type 1: Use of home health as a post-acute care provider
  - Episode Type 2: Use of home health as a pre-acute care provider
  - Episode Type 3: Use of home health as a non-post-acute care community-based provider

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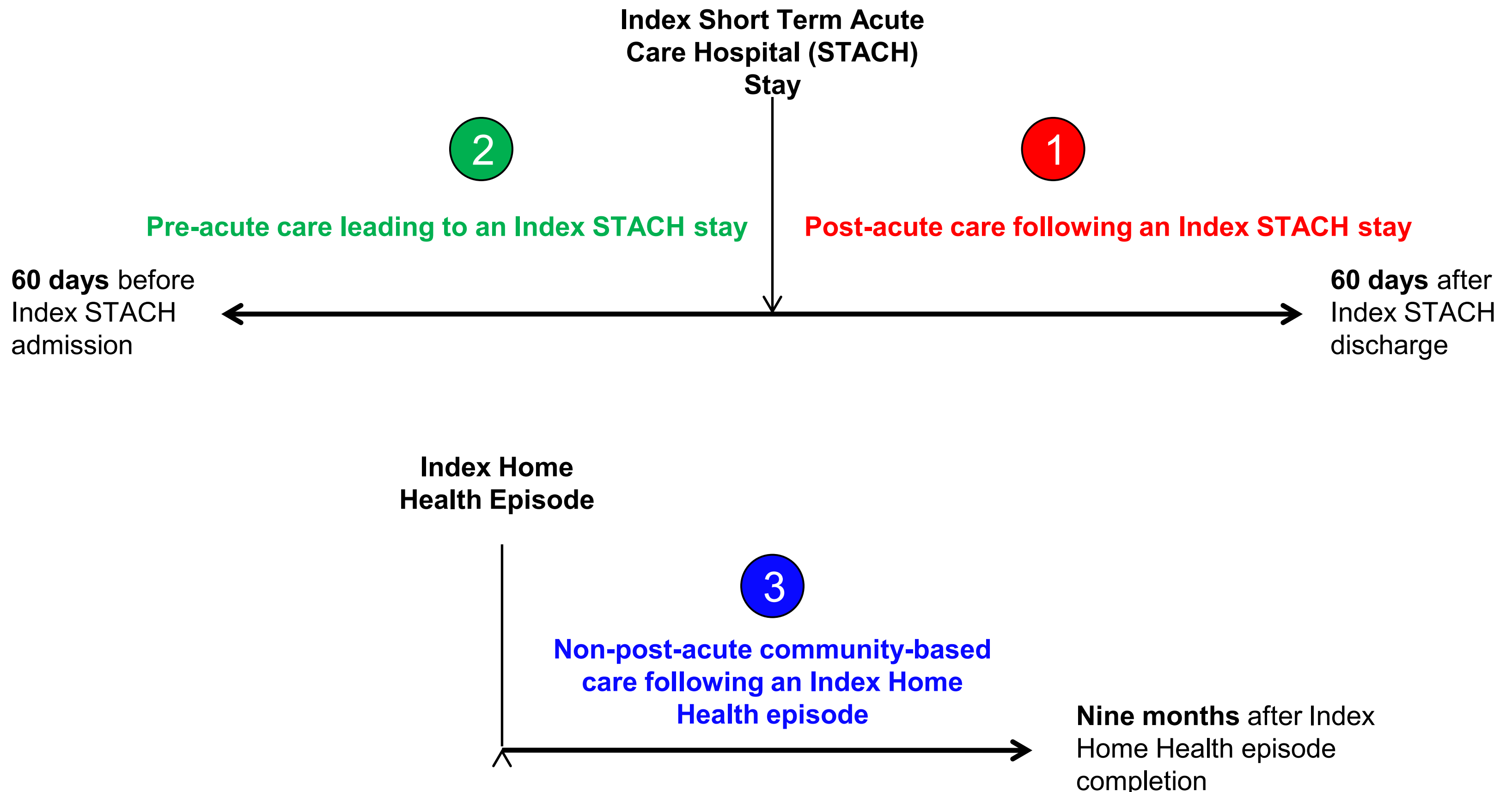
CACEP Episodes of Care



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Key Findings Addressed by CACEP Working Papers

- **Episode Definitions**
- **Episode Frequency**
- **Episode Expenditures**
- **Patient Pathways**
- **Readmissions**

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Key Findings:
Episode Definitions

- **Post-acute care episodes are clinically defined by MS-DRG and by first setting**
  - First setting is the setting the patient goes to after the index or anchor hospital stay, e.g., home health
- **Pre-acute care and non-post-acute care community-based episodes are defined by "primary" chronic condition[2]**
  - "Primary" chronic condition is based on chronic condition warehouse (CCW) designation and ranked in order of severity (community-risk) by most comparable hierarchical condition category (HCC)
- **Inclusions and exclusions complicate episode definitions**
- **Episode definitions should be mutually exclusive to avoid double counting**

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Key Findings:

Episode Frequency

- **Episode frequency is highly concentrated in a relatively few MS-DRGs**
- **Patient overlap across first settings may be considerable**
  - Expenditure (and frequency) ranking of MS-DRGs is highly comparable across first settings (1th MS-DRG in one setting is also 1th MS-DRG in another setting)
  - Expenditure (and frequency) ranking of primary chronic conditions is highly consistent across first settings
    - There is considerable overlap in patients across facility-based and home health setting, e.g. home health patients have many of the same primary chronic conditions as SNF and IRF patients
    - Therefore, chronic conditions will not meaningfully risk-adjust payment episodes

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Key Findings:

Episode Expenditures

- **Post-acute care episodes represent a significant portion (50% - 60%) of Medicare fee-for-service expenditures**
- **Beneficiary demographic (e.g. age, gender) and clinical (e.g. number of chronic conditions) characteristics affect Medicare expenditures differentially across MS-DRGs**
- **The index hospitalization represents about 50% of the overall episode expenditures**
- **First settings (after index STACH stay) have very different expenditure levels, ordered from HHA as the lowest to SNF, IRF, and then LTCH as the highest**
- **Given the potential for patient overlap, substituting lower cost for higher cost post-acute care providers may be possible to optimize care, both clinically and economically**
- **From the perspective of a given provider, financial risk associated with bundling is driven by the number of cases and proportion of payment under its control**
  - Provider risk might be spread across MS-DRGs

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Key Findings:
Patient Pathways

- **Comprise the number of sequence “stops” a patient makes across various providers over time once patient leaves the index STACH**
  - Providers are not accustomed to thinking in terms of pathways, as patients leave the hospital and visit numerous providers over a period of time; siloed PPSs encourage this behavior
- **There are <u>many</u> patient pathways within each MS-DRG**
  - More complex pathways are associated with higher Medicare payments
- **Provider financial risk in episode-based payments is determined in part by expenditure (complexity) variance due to patient pathways**
- **Financial risk of MS-DRG episode bundles is driven by:**
  - Number of cases and proportion of episode payment under providers’ control
  - Variance in number and sequence of pathway stops
  - Number of different providers in the network (e.g., a single hospital may send patients to 30 different SNFs)
  - Possibility of expenditure “outliers”

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Key Findings:
Patient Pathways (cont'd)

- **Numerous pathways exist within a given MS-DRG, correlated with:**
  - Patient demographics
  - Patient clinical need
  - First setting (e.g., HHA vs. SNF vs. IRF vs. LTCH)
  - Presence of a readmission
  - Number of patient comorbidities
  - MS-DRG type
    - Medical
    - Surgical

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CACEP Working Paper Series

- **The working paper series investigates the relationships between the various post-acute care providers and the different payment systems within patient episodes of care**
  - ✓ Working Paper #1: **Frequencies** of episode types for select MS-DRGs and chronic conditions
  - ✓ Working Paper #2: Medicare **expenditures** by episode type and select MS-DRGs and chronic conditions
  - ✓ Working Paper #3: **Patient pathways** by episode type and select MS-DRGs and chronic conditions
  - ✓ Working Paper #4: **Acute care hospital (re)admissions** by episode type and select MS-DRGs and chronic conditions
- **We expect that our working paper statistics will also be useful to policymakers as they consider various Medicare reform strategies**
- **Descriptive statistics comprise a point of departure for subsequent quantitative analyses that will be presented in the final report**

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Data Methodology in Brief

- **Dobson | DaVanzo received patient-identifiable claims data from CMS (All Part A & B claims for a 5% sample of Medicare beneficiaries, 2007-2009) (DUA #21007)**
- **Claims were linked across all sites of service by unique patient identifier according to each person-level episode definition**
  - ✓ Unit of observation is patient episode over a finite period of time (e.g., 60 days), not stay, encounter, or annual capitation
- **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 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 Service (POS) file
- **Episode databases were periodically updated, modified, or rebuilt during project based on analytic needs (multiple refinements over 2 years)**

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Importance of Studying Hospital Admissions and Readmissions

- **Controlling hospital (re)admissions have been identified by policymakers as an opportunity to increase the quality of care and decrease unnecessary health care cost and utilizations**
- **CMS' current initiative requiring participating hospitals to report 30-day all-cause readmission rates for select conditions will move to "pay for performance," linking financial incentives to reduced hospitalizations**
  - Studies suggest that coordination of care between physicians and other providers can improve quality, reduce avoidable hospitalizations, and reduce health care expenditures
- **Since hospital (re)admissions are directly correlated with about twice as many pathway sequence stops (Working Paper #3), avoiding the hospital (re)admission can control avoidable Medicare spending across all care settings**
- **Home health could provide care to the appropriate patients with ambulatory care sensitive conditions to avoid the unplanned admission**

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Medicare FFS Payments Captured in CACEP Episodes

Number of Episodes and Percent of Total Medicare Fee-for-Service Expenditures Represented by Episode Type

Episode Type	Year	Number of Episodes	Percent of Total Medicare Fee-for-Service Expenditures
Episode Type 1: Post-Acute Care Episodes (60-Day Including Index STACH)	2008	9,173,580	58.0%
Episode Type 2: Pre-Acute Care Episodes (60-Day Excluding Index STACH)	2008	9,173,580	12.6%
Episode Type 3: Non-Post-Acute Care Community-Based Episodes (Nine-Month)	2008	1,506,320	12.1%

Source: Dobson | DaVanzo analysis of research-identifiable 5% SAF for all sites of service, 2007-2009, wage index adjusted by setting and geographic region.

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EPISODE TYPE 1: POST-ACUTE CARE EPISODES

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Post-Acute Care Episodes:

Definition of Terms

- **Post-acute care episodes are clinically defined by Index STACH MS-DRG**
- **Index STACH – the acute care hospital stay that initiates an episode (referred to as "anchor admission" in Bundled Payment for Care Improvement initiatives)**
- **First setting – the first setting from which a patient receives care after discharge from the Index STACH**
  - STACH – short term acute care hospital (readmission)
  - HHA – home health agency
  - SNF – skilled nursing facility
  - IRF – inpatient rehabilitation facility
  - LTCH – long-term care hospital
  - Community – physician and outpatient visits
  - ER – emergency room visit that does not lead to an inpatient admission
  - OP Therapy – outpatient therapy
  - Hospice – hospice
  - Other IP – other inpatient (mainly psychiatric)

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Post-Acute Care Episodes:

Key Findings

- **Across all first settings and MS-DRGs, about one-quarter (22.4 percent) of episodes contain at least one hospital readmission (slide 18-19)**
    - 17 percent of episodes contain one readmission, four percent of episodes contain two readmissions, and one percent contains three or more readmissions during the episode
- **Episodes with at least one hospital readmission have a Medicare episode payment that is more than twice (2.21 times) the payment for those without readmissions (slide 18)**
- **Surgical MS-DRGs generally have lower readmission rates (17.6 percent) than medical MS-DRGs (25.6 percent) (slide 20)**
- **The relative increase in the Medicare episode payment for episodes containing readmissions to those without readmissions varies by first setting, MS-DRG, primary chronic condition, and patient demographic characteristics (slides 18-24)**
    - Episodes with a high reliance on facility-based care tend to have a smaller relative increase in payments for episodes containing a readmission, as the overall hospital payment represents a smaller proportion of total Medicare episode payments
- **The proportion of episodes containing a readmission increases with the number of chronic conditions per episode. Therefore, as primary chronic conditions increase in severity, the proportion of episodes that contain a readmission increases as well (slide 21)**
- **Across all first settings, 62 percent of episodes are readmitted directly from the Community (antecedent source), while 13.7 percent are from HHA and 12.8 percent are from SNFs**

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Post-Acute Care Episodes:

Readmission Rates by First Setting and Average Episode Payments by Readmission Status

Distribution of Episodes and Average Medicare Episode Payments by Readmission Status by First Setting (2007-2009)

First Setting	Percent of Episodes	Percent of Episodes with Readmission	Average Medicare Episode Paid: All Episodes	Average Medicare Episode Paid: Without Readmission	Average Medicare Episode Paid: Contains Readmission	Ratio of Average Medicare Episode Paid
HHA	12.4%	23.3%	$20,345	$16,291	$33,694	2.07
SNF	16.2%	25.8%	$29,218	$24,628	$42,390	1.72
IRF	2.8%	22.7%	$44,193	$39,191	$61,273	1.56
LTCH	0.6%	29.2%	$89,869	$83,121	$106,247	1.28
STACH	2.7%	100.0%	$29,713	N/A	$29,713	N/A
Community	52.7%	19.9%	$14,478	$10,768	$29,377	2.73
ER	3.0%	28.9%	$16,364	$11,558	$28,203	2.44
OP Therapy	1.4%	19.3%	$15,233	$11,890	$29,210	2.46
Hospice	2.0%	4.6%	$17,651	$16,983	$31,380	1.85
Other IP	0.4%	21.7%	$23,572	$20,587	$34,325	1.67
No Care[b]	5.8%	N/A	$14,761	$14,761	N/A	N/A
Overall Average	**100.0%**	**22.4%**	**$19,505**	**$15,335**	**$33,926**	**2.21**

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. All episodes have been extrapolated to reflect the universe of Medicare beneficiaries. Average Medicare Episode Paid includes care from all facility-based and ambulatory care settings and excludes beneficiary co-payments and Part D payments.

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Post-Acute Care Episodes:

Distribution of Episodes and Average Medicare Episode Payments by Number of Readmissions

Distribution of Episodes and Average Medicare Episode Payments by Number of Readmissions (2007-2009)

Number of Readmissions	Number of Episodes	Percent of Episodes	Average Medicare Episode Paid	Percent of Total Medicare Episodes Paid
0	18,802,460	77.6%	$15,336	61.0%
1	4,211,700	17.4%	$30,762	27.4%
2	976,620	4.0%	$42,752	8.8%
3+	248,300	1.0%	$52,868	2.8%
Total	**24,239,080**	**100.0%**	**$19,505**	**100.0%**

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. All episodes have been extrapolated to reflect the universe of Medicare beneficiaries. Average Medicare Episode Paid includes care from all facility-based and ambulatory care settings and excludes beneficiary co-payments.

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Post-Acute Care Episodes:

Readmission Rates by MS-DRG and Average Medicare Episode Payments by Readmission Status

Top 20 MS-DRGs (Ranked by Medicare Episode Paid) by Readmission Status (2007-2009)

MS-DRG	Med/Surg	Percent Episodes w/ Readmission	Average Medicare Episode Paid: All Episodes	Average Medicare Episode Paid: Without Readmission	Average Medicare Episode Paid: Contains Readmission	Ratio
470: Major joint replacement or reattachment of lower extremity w/o MCC	Surgical	9.5%	$22,986	$21,319	$38,871	1.82
871: Septicemia or severe sepsis w/o MV 96+ hours w MCC	Medical	23.7%	$23,383	$18,319	$39,662	2.17
291: Heart failure & shock w MCC	Medical	35.0%	$21,572	$14,784	$34,198	2.31
003: ECMO or trach w MV 96+ hrs or PDX exc face, mouth & neck w maj O.R.	Surgical	24.8%	$182,116	$174,085	$206,455	1.19
194: Simple pneumonia & pleurisy w CC	Medical	22.6%	$14,210	$10,441	$27,129	2.60
481: Hip & femur procedures except major joint w CC	Surgical	19.1%	$32,869	$29,980	$45,136	1.51
292: Heart failure & shock w CC	Medical	33.9%	$16,744	$10,922	$28,093	2.57
065: Intracranial hemorrhage or cerebral infarction w CC	Medical	20.2%	$24,522	$20,899	$38,814	1.86
392: Esophagitis, gastroent & misc digest disorders w/o MCC	Medical	21.0%	$10,016	$6,611	$22,831	3.45
690: Kidney & urinary tract infections w/o MCC	Medical	22.5%	$13,355	$9,963	$25,032	2.51
247: Perc cardiovasc proc w drug-eluting stent w/o MCC	Surgical	16.6%	$17,878	$15,306	$30,758	2.01
641: Nutritional & misc metabolic disorders w/o MCC	Medical	23.4%	$12,461	$8,761	$24,547	2.80
329: Major small & large bowel procedures w MCC	Surgical	24.4%	$47,808	$42,454	$64,378	1.52
460: Spinal fusion except cervical w/o MCC	Surgical	11.1%	$33,198	$30,917	$51,430	1.66
287: Circulatory disorders except AMI, w card cath w/o MCC	Medical	21.1%	$15,604	$10,486	$34,791	3.32
293: Heart failure & shock w/o CC/MCC	Medical	30.0%	$13,657	$8,608	$25,445	2.96
683: Renal failure w CC	Medical	28.7%	$18,075	$12,928	$30,855	2.39
193: Simple pneumonia & pleurisy w MCC	Medical	26.4%	$19,137	$13,994	$33,474	2.39
312: Syncope & collapse	Medical	16.9%	$10,650	$7,850	$24,439	3.11
280: Acute myocardial infarction, discharged alive w MCC	Medical	33.7%	$28,135	$21,610	$40,975	1.90
Subtotal (Top 20 MS-DRGs)		**21.5%**	**$19,530**	**$15,875**	**$32,836**	**2.07**
Other		22.8%	$19,495	$15,113	$34,344	2.27
Overall Average		**22.4%**	**$19,505**	**$15,335**	**$33,926**	**2.21**

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. All episodes have been extrapolated to reflect the universe of Medicare beneficiaries. Average Medicare Episode Paid includes care from all facility-based and ambulatory care settings and excludes beneficiary co-payments.

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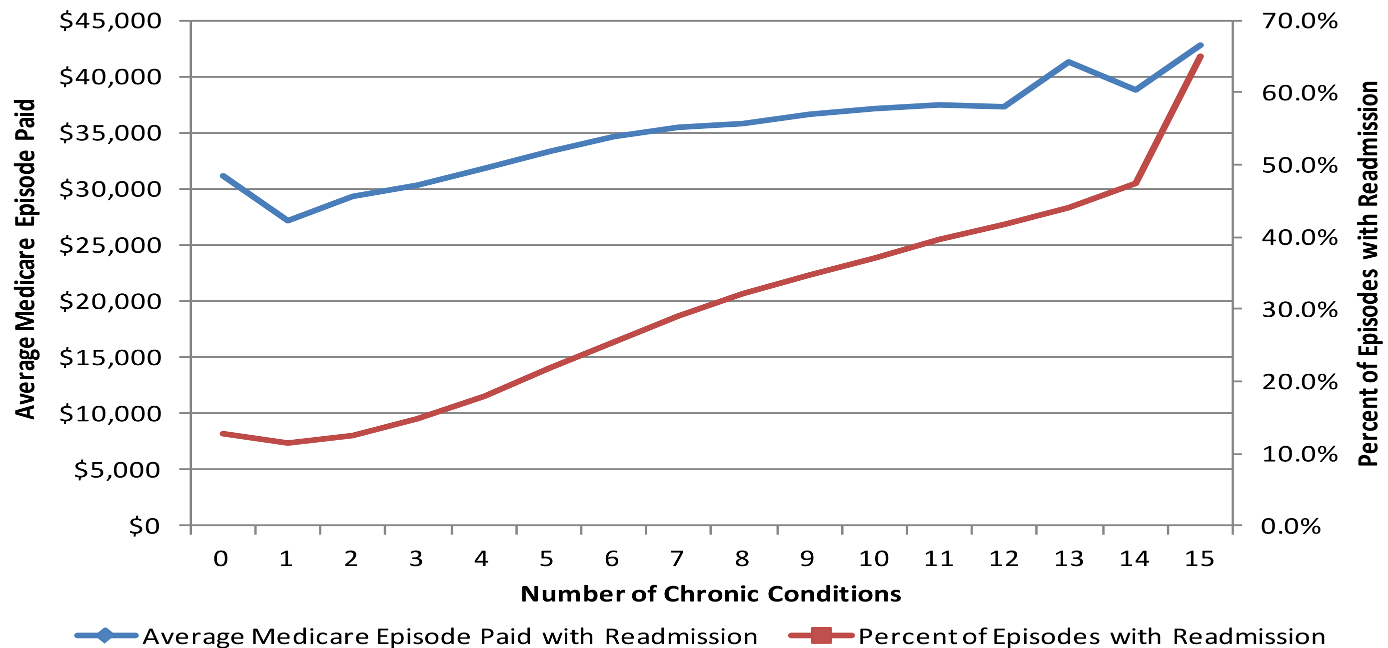
Post-Acute Care Episodes:

Percent of Episodes with Readmissions and Average Medicare Episode Payments by Number of Chronic Conditions



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Post-Acute Care Episodes:

Readmission Rates by Primary Chronic Condition and Average Episode Payments by Readmission Status

Distribution of Episodes, Average Medicare Episode Payments by Readmission Status by Primary Chronic Condition (2007-2009)

			Average Medicare Episode Paid			
Primary Chronic Conditions	**Percent of Episodes**	**Percent of Episodes w/ Readmission**	**All Episodes**	**Without Readmission**	**Contains Readmission**	**Ratio**
CHF*COPD	25.0%	33.3%	$22,754	$16,534	$35,206	2.13
DIABETES*CHF	13.4%	27.0%	$22,842	$17,357	$37,684	2.17
CHF*RENAL	5.6%	27.9%	$22,863	$17,720	$36,156	2.04
Lung Cancer	2.0%	27.7%	$21,903	$17,407	$33,650	1.93
Osteoporosis	15.0%	15.4%	$17,226	$14,808	$30,463	2.06
COPD	7.7%	19.4%	$16,879	$13,770	$29,796	2.16
Rheumatoid Arthritis/Osteoarthritis	11.0%	13.5%	$17,118	$15,023	$30,568	2.03
Hip/Pelvic Fracture	0.6%	16.9%	$25,379	$22,726	$38,397	1.69
Heart Failure	2.6%	17.2%	$17,923	$15,127	$31,401	2.08
Alzheimer’s Disease	1.3%	15.3%	$16,182	$13,743	$29,648	2.16
Alzheimer’s Disease and Related	1.4%	18.3%	$17,948	$14,618	$32,825	2.25
Stroke / Transient Ischemic Attack	1.7%	16.1%	$17,862	$14,603	$34,860	2.39
Colorectal Cancer	0.5%	22.8%	$22,057	$18,173	$35,228	1.94
Depression	3.1%	17.8%	$14,422	$11,582	$27,500	2.37
Acute Myocardial Infarction	0.4%	13.0%	$19,331	$17,277	$33,080	1.91
Ischemic Heart Disease	3.4%	12.1%	$14,827	$12,697	$30,299	2.39
Other	3.2%	12.0%	$13,986	$11,688	$30,880	2.64
None	2.0%	12.9%	$14,037	$11,514	$31,102	2.70
Overall Average	**100.0%**	**22.4%**	**$19,505**	**$15,335**	**$33,926**	**2.21**

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. All episodes have been extrapolated to reflect the universe of Medicare beneficiaries. Average Medicare Episode Paid includes care from all facility-based and ambulatory care settings and excludes beneficiary co-payments.

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Post-Acute Care Episodes:

Percent of Episodes with Readmissions by Antecedent Setting

Percent of Episodes with a Readmission by Antecedent Setting (2007-2009)

Antecedent Setting	Percent of Episodes Directly Readmitted by Setting
HHA	12.5%
SNF	14.2%
IRF	8.3%
LTCH	9.0%
Community	16.9%
ER	10.8%
OP Therapy	4.8%
Hospice	2.5%
Other IP	6.9%
Overall Average	**N/A**

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. All episodes have been extrapolated to reflect the universe of Medicare beneficiaries. Average Medicare Episode Paid includes care from all facility-based and ambulatory care settings and excludes beneficiary co-payments.

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Post-Acute Care Episodes:

Readmission Rate and Average Medicare Episode Payment by Patient Demographic Characteristics

Percent of Episodes with Readmissions and Average Medicare Episode Paid by Demographic Characteristic for 60-day Fixed-Length Post-Acute Episode (2007-2009)

Demographics	Percent of Episodes with Readmission	Average Medicare Episode Paid		Ratio of Average Medicare Episode Paid
		Without Readmission	Contains Readmission	
Live Alone	27.5%	$18,159	$35,263	1.94
Died during Episode	33.9%	$18,647	$37,670	2.02
Dual Eligible	26.5%	$15,173	$33,441	2.20
Female	21.6%	$15,032	$32,830	2.18
Rural	21.7%	$14,562	$31,897	2.19
85 and Older	22.5%	$15,352	$31,544	2.05
Non-white	26.3%	$15,835	$36,537	2.31
Overall Average	**22.4%**	**$15,335**	**$33,926**	**2.21**

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. All episodes have been extrapolated to reflect the universe of Medicare beneficiaries. Average Medicare Episode Paid includes care from all facility-based and ambulatory care settings and excludes beneficiary co-payments.

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Post-Acute Care Episodes:

Index and Readmission Days of Care per 1,000 FFS Beneficiaries by CMS Region

Days of Care (DOC) per 1,000 Fee-for-Service Beneficiaries for the Index Hospital Stay and Readmission by CMS Region (2007-2009)

CMS Region	Index Hospital Stay DOC per 1,000 FFS Beneficiaries	Episode Readmission DOC per 1,000 FFS Beneficiaries
Region I-Boston	150.5	53.4
Region II-New York	214.3	84.2
Region III-Philadelphia	181.9	68.9
Region IV-Atlanta	166.8	59.1
Region V-Chicago	166.7	62.2
Region VI-Dallas	146.8	50.7
Region VII-Kansas City	163.3	59.4
Region VIII-Denver	130.0	41.2
Region IX-San Francisco	148.2	51.1
Region X-Seattle	119.6	35.8
Overall Average	**164.2**	**59.3**

179%

235%

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. All episodes have been extrapolated to reflect the universe of Medicare beneficiaries. Average Medicare Episode Paid includes care from all facility-based and ambulatory care settings and excludes beneficiary co-payments.

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Post-Acute Care Episodes:

Readmission Rates by First Setting and Average Episode Payments by Readmission Status (MS-DRG 470)

Distribution of Episodes and Average Medicare Episode Payments by Readmission Status by First Setting (2007-2009)

First Setting	Percent of Episodes	Percent of Episodes with Readmission	Average Medicare Episode Paid: All Episodes	Average Medicare Episode Paid: Without Readmission	Average Medicare Episode Paid: Contains Readmission	Ratio of Average Medicare Episode Paid
HHA	32.4%	6.2%	$18,068	$17,254	$30,438	1.76
SNF	38.0%	12.2%	$26,861	$24,921	$40,885	1.64
IRF	11.4%	12.4%	$33,538	$31,142	$50,410	1.62
LTCH	0.1%	27.8%	$57,896	$53,823	$68,484	1.27
STACH	0.2%	100.0%	$30,302	N/A	$30,302	N/A
Community	11.9%	7.3%	$17,340	$16,020	$34,208	2.14
ER	0.6%	10.5%	$17,766	$16,407	$29,311	1.79
OP Therapy	4.8%	5.6%	$15,103	$14,368	$27,410	1.91
Hospice	0.1%	10.0%	$25,569	$23,253	$46,409	2.00
Other IP	0.0%	17.4%	$30,574	$29,175	$37,216	1.28
No Care[b]	0.5%	N/A	$11,290	$11,290	N/A	N/A
Overall Average	**100.0%**	**9.5%**	**$22,986**	**$21,319**	**$38,871**	**1.82**

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. All episodes have been extrapolated to reflect the universe of Medicare beneficiaries.
Average Medicare Episode Paid includes care from all facility-based and ambulatory care settings and excludes beneficiary co-payments.

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Post-Acute Care Episodes:

Readmission Rates by First Setting and Average Episode Payments by Readmission Status (MS-DRG 291)

Distribution of Episodes and Average Medicare Episode Payments by Readmission Status by First Setting (2007-2009)

First Setting	Percent of Episodes	Percent of Episodes with Readmission	Average Medicare Episode Paid: All Episodes	Average Medicare Episode Paid: Without Readmission	Average Medicare Episode Paid: Contains Readmission	Ratio of Average Medicare Episode Paid
HHA	15.2%	37.2%	$20,211	$13,652	$31,290	2.29
SNF	17.8%	37.7%	$28,551	$21,964	$39,438	1.80
IRF	1.0%	45.7%	$45,426	$40,753	$50,986	1.25
LTCH	0.7%	29.8%	$62,123	$58,934	$69,619	1.18
STACH	3.6%	100.0%	$35,030	N/A	$35,030	N/A
Community	48.0%	34.8%	$19,127	$12,169	$32,176	2.64
ER	2.3%	44.6%	$22,124	$13,143	$33,264	2.53
OP Therapy	1.1%	43.4%	$20,004	$12,359	$29,980	2.43
Hospice	3.8%	5.2%	$15,412	$14,438	$33,091	2.29
Other IP	0.1%	41.7%	$41,459	$36,102	$48,958	1.36
No Care[b]	6.6%	N/A	$12,024	$12,024	N/A	N/A
Overall Average	**100.0%**	**35.0%**	**$21,572**	**$14,784**	**$34,198**	**2.31**

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. All episodes have been extrapolated to reflect the universe of Medicare beneficiaries.
Average Medicare Episode Paid includes care from all facility-based and ambulatory care settings and excludes beneficiary co-payments.

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EPISODE TYPE 2: PRE-ACUTE CARE EPISODES

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Pre-Acute Care Episodes:

Definition of Terms

- **Pre-acute care episodes are clinically defined by a "primary chronic condition," which is ranked by severity**
  - **Primary chronic condition was determined by mapping each chronic condition identified in the patients' CCW claims to the corresponding HCC with the highest community-risk score**
  - **This hierarchical design allows for mutually exclusive categorization of episodes, allowing for analyses across primary chronic conditions**
- **The Medicare episode payments include both payments for the care provided during the fixed-length episode prior to the Index STACH as well as the Index STACH itself**
  - **Therefore, Medicare episode payments for the Index STACH are duplicated across the pre-acute and post-acute care episodes**

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Pre-Acute Care Episodes:

Key Findings

- **Across all primary chronic conditions, 10.6 percent of episodes contain at least one hospital admission prior to the index acute care hospitalization (slides 31-32)**
  - 9 percent of episodes contain only one prior admission, while the remaining 1.5 percent of episodes contain two or more prior hospital admissions during the episode
- **As the primary chronic condition increases in severity, the proportion of episodes that contain a hospital admission prior to the index generally increases (slide 31)**
- **Episodes with at least one prior hospital admission have a Medicare episode payment that is more than twice (2.13 times) the payment for those without prior admissions (slide 31)**
- **The proportion of episodes containing a prior admission increases with the number of chronic conditions contained in an episode; however, the average Medicare episode payment for episodes with a prior admission is relatively constant regardless of the number of chronic conditions per episode (slide 33)**
  - Therefore, among pre-acute care episodes, Medicare episode payment for episodes with a prior admission is not greatly impacted by the number of chronic conditions
- **Prior hospital admissions are concentrated among select beneficiary demographic characteristics**
  - Episodes for beneficiaries who died during the index, are dual eligible, or are non-white have a higher than average prior admission rate, while those who are 85 years old and older have lower than average rates

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Pre-Acute Care Episodes:

Admission Rates by Primary Chronic Condition and Average Episode Payments by Prior Admission Status

Distribution of Episodes and Average Medicare Episode Payments by Prior Admission Status by Primary Chronic Condition (2007-2009)

Primary Chronic Conditions	Percent of Episodes	Percent of Episodes with Prior Admission	Average Medicare Episode Paid: All Episodes	Average Medicare Episode Paid: Without Prior Admission	Average Medicare Episode Paid: Contains Prior Admission	Ratio
CHF*COPD	24.9%	16.5%	$14,717	$12,571	$25,578	2.03
DIABETES*CHF	13.3%	12.6%	$15,367	$13,470	$28,509	2.12
CHF*RENAL	5.6%	11.7%	$15,060	$13,419	$27,493	2.05
Lung Cancer	2.0%	13.9%	$16,649	$14,767	$28,339	1.92
Osteoporosis	15.0%	6.6%	$11,414	$10,668	$22,056	2.07
COPD	7.7%	10.1%	$12,322	$11,155	$22,716	2.04
Rheumatoid Arthritis/Osteoarthritis	11.0%	5.8%	$12,160	$11,486	$23,150	2.02
Hip/Pelvic Fracture	0.6%	4.4%	$13,488	$12,918	$25,767	1.99
Heart Failure	2.6%	8.0%	$13,279	$12,229	$25,406	2.08
Alzheimer's Disease	1.3%	5.3%	$9,672	$9,068	$20,514	2.26
Alzheimer's Disease and Related	1.4%	7.5%	$11,274	$10,287	$23,529	2.29
Stroke / Transient Ischemic Attack	1.7%	7.7%	$12,419	$11,246	$26,516	2.36
Colorectal Cancer	0.5%	11.4%	$18,249	$16,729	$30,090	1.80
Depression	3.1%	10.4%	$11,571	$10,323	$22,284	2.16
Acute Myocardial Infarction	0.4%	7.1%	$16,264	$15,198	$30,203	1.99
Ischemic Heart Disease	3.4%	6.6%	$12,978	$12,034	$26,405	2.19
Other	3.2%	6.2%	$11,884	$10,888	$26,962	2.48
None	2.20%	6.9%	$11,698	$10,629	$26,180	2.46
Overall Average	**100.0%**	**10.6%**	**$13,411**	**$11,972**	**$25,494**	**2.13**

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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. All episodes have been extrapolated to reflect the universe of Medicare beneficiaries. Average Medicare Episode Paid includes care from all facility-based and ambulatory care settings and excludes beneficiary co-payments.

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Pre-Acute Care Episodes:

Distribution of Episodes and Average Episode Payments by Number of Prior Admissions

Distribution of Episodes and Average Medicare Episode Payments by Number of Prior Admissions (2007-2009)

Number of Prior Admission	Number of Episodes	Percent of Episodes	Average Medicare Episode Paid	Percent of Total Medicare Episodes Paid
0	22,934,100	89.4%	$11,972	79.8%
1	2,322,800	9.1%	$23,842	16.1%
2	345,340	1.3%	$33,470	3.4%
3+	62,400	0.2%	$42,872	0.8%
Total	**25,664,640**	**100.0%**	**$13,411**	**100.0%**

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. All episodes have been extrapolated to reflect the universe of Medicare beneficiaries. Average Medicare Episode Paid includes care from all facility-based and ambulatory care settings and excludes beneficiary co-payments.

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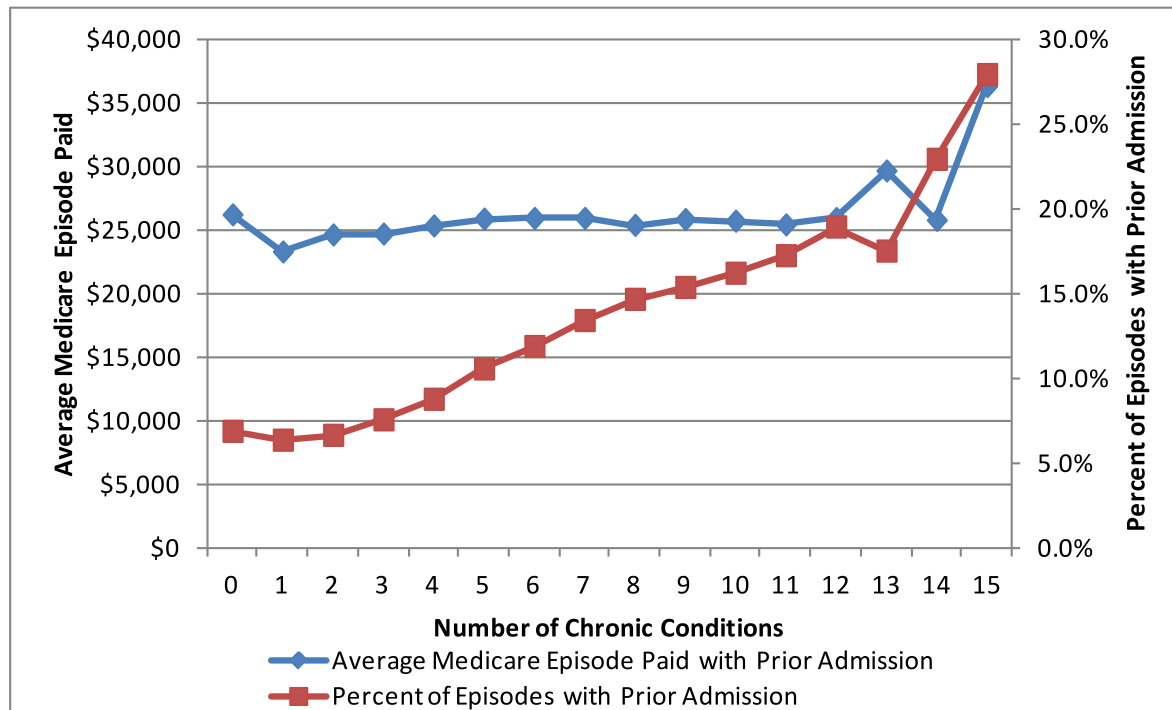
Pre-Acute Care Episodes:

Percent of Episodes with Prior Admissions and Average Medicare Episode Payment by Number of Chronic Conditions



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. All episodes have been extrapolated to reflect the universe of Medicare beneficiaries. Average Medicare Episode Paid includes care from all facility-based and ambulatory care settings and excludes beneficiary co-payments.

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EPISODE TYPE 3: NON-POST-ACUTE CARE COMMUNITY-BASED EPISODES

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Non-Post-Acute Care Community-Based Episodes:

Definition of Terms

- **Similar to pre-acute care episodes, non-post-acute care community-based episodes are clinically defined by a "primary chronic condition"**
  - **Primary chronic condition was determined by mapping each chronic condition identified in the patients' CCW claims to the HCC with the highest community-risk score**
  - **This hierarchical design allows for mutually exclusive categorization of episodes, allowing for analyses across primary chronic conditions**
- **Non-post-acute care community-based episodes can contain both pre- and post-acute care episodes**

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Non-Post-Acute Care Community-Based Episodes:

Key Findings

- **Across all primary chronic conditions, 43.2 percent of episodes contain at least one hospital admission (slides 37-38)**
  - About one-quarter of episodes contain one admission, 10 percent of episodes contain two, and another 8 percent contains three or more admissions during the episode
- **As the primary chronic condition increases in severity, the proportion of episodes that contain a hospital admission generally increases (slide 37)**
- **Episodes with at least one prior hospital admission have a Medicare episode payment that is almost four times (3.75) that of episodes without admissions (slide 37)**
- **As the number of chronic conditions contained in an episode increases, the proportion of episodes containing a prior admission increases (slide 39)**
- **Similar to the pre-acute care episodes, the average Medicare episode payment for episodes with an admission increases slower than the increase in the percent of episodes with an admission (slide 39)**
- **Admission are concentrated among select beneficiary demographic characteristics**
  - Episodes for beneficiaries who died during the episode have a higher than average admission rate, while those who are non-white have lower than average admission rates

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Non-Post-Acute Care Episodes:

Admission Rates by Primary Chronic Condition and Average Episode Payments by Admission Status

Distribution of Episodes and Average Medicare Episode Payments by Admission Status by Primary Chronic Condition (2007-2009)

		Percent of	Average Medicare Episode Paid			
Primary Chronic Conditions	Percent of Episodes	Episodes with Admissions	All Episodes	Without Admission	Contains Admission	Ratio
CHF*COPD	23.4%	61.4%	$35,256	$13,849	$48,691	3.52
DIABETES*CHF	15.5%	49.9%	$29,913	$12,897	$47,031	3.65
CHF*RENAL	5.3%	59.5%	$28,088	$10,711	$39,914	3.73
Lung Cancer	1.3%	54.6%	$26,814	$14,366	$37,171	2.59
Osteoporosis	18.9%	34.4%	$18,988	$10,496	$35,176	3.35
COPD	6.2%	37.3%	$21,151	$11,814	$36,857	3.12
Rheumatoid Arthritis/Osteoarthritis	12.9%	29.6%	$17,316	$10,347	$33,856	3.27
Hip/Pelvic Fracture	0.5%	54.1%	$25,598	$9,658	$39,111	4.05
Heart Failure	2.4%	34.2%	$16,519	$9,505	$30,033	3.16
Alzheimer's Disease	3.0%	32.3%	$16,458	$9,755	$30,514	3.13
Alzheimer's Disease and Related	2.1%	30.9%	$16,898	$9,274	$33,939	3.66
Stroke / Transient Ischemic Attack	0.9%	34.4%	$18,094	$9,495	$34,518	3.64
Colorectal Cancer	0.2%	40.3%	$29,712	$19,720	$44,494	2.26
Depression	2.1%	26.2%	$16,868	$9,585	$37,381	3.90
Acute Myocardial Infarction	0.0%	52.5%	$18,266	$6,888	$28,544	4.14
Ischemic Heart Disease	1.7%	20.0%	$13,337	$8,671	$32,011	3.69
Other	2.1%	16.1%	$11,607	$7,845	$31,262	3.98
None	1.4%	13.0%	$10,210	$6,708	$33,692	5.02
Overall Average	**100.0%**	**43.2%**	**$24,444**	**$11,162**	**$41,933**	**3.76**

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. All episodes have been extrapolated to reflect the universe of Medicare beneficiaries. Average Medicare Episode Paid includes care from all facility-based and ambulatory care settings and excludes beneficiary co-payments.

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Non-Post-Acute Care Episodes:

Distribution of Episodes and Average Episode Payments by Number of Admissions

Distribution of Episodes and Average Medicare Episode Payments by Number of Admissions (2007-2009)

Number of Admissions	Number of Episodes	Percent of Episodes	Average Medicare Episode Paid	Percent of Total Medicare Episodes Paid
0	1,699,720	56.8%	$11,162	26.0%
1	734,620	24.6%	$28,377	28.5%
2	313,500	10.5%	$46,394	19.9%
3+	242,700	8.1%	$77,203	25.6%
Total	**2,990,540**	**100.0%**	**$24,444**	**100.0%**

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. All episodes have been extrapolated to reflect the universe of Medicare beneficiaries. Average Medicare Episode Paid includes care from all facility-based and ambulatory care settings and excludes beneficiary co-payments.

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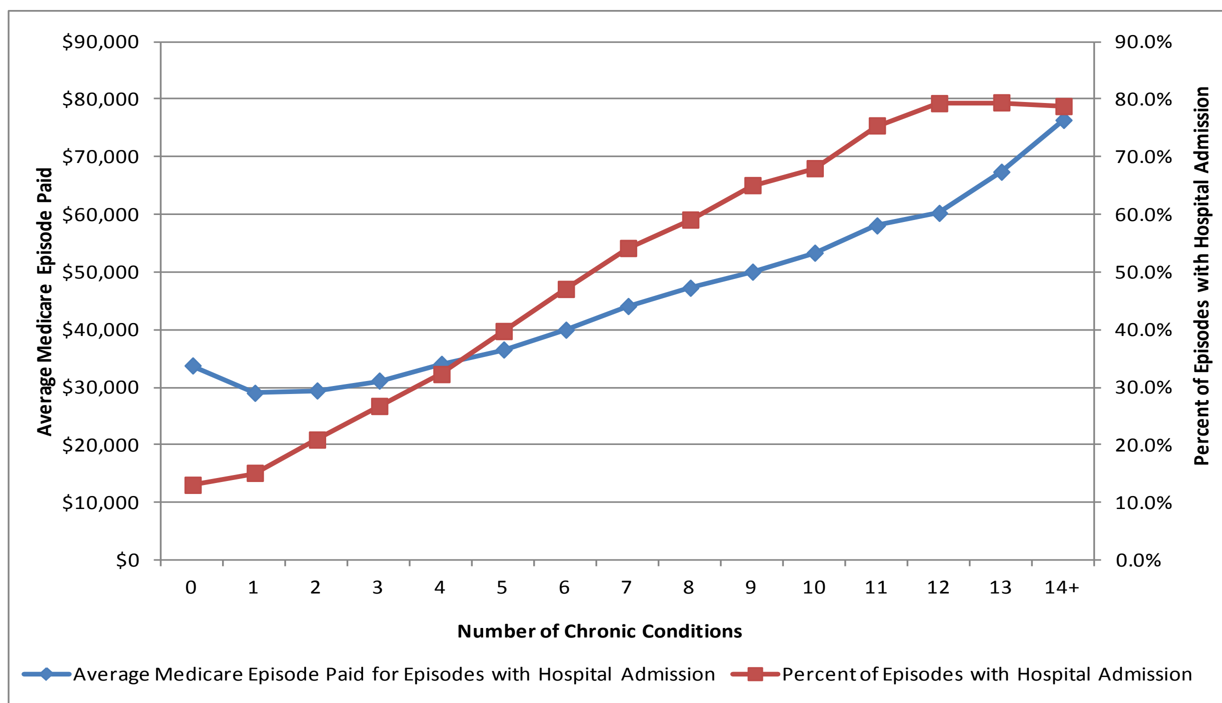
Non-Post-Acute Care Episodes:

Percent of Episodes with Admissions and Average Medicare Episode Payment by Number of Chronic Conditions

Percent of Episodes and Average Medicare Episode Paid for Episodes with Admissions by Number of Chronic Conditions (2007-2009)



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. All episodes have been extrapolated to reflect the universe of Medicare beneficiaries. Average Medicare Episode Paid includes care from all facility-based and ambulatory care settings and excludes beneficiary co-payments.

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Discussion on Relevance of Working Paper Series to Ongoing Policy Developments

- **The variance in (re)admission rates is primarily a function of MS-DRG, primary chronic conditions, and select patient demographic characteristics**
- **Not only does the presence of readmissions double the average number of sequence stops contained in an episode (Working Paper #3), it also increases the average Medicare episode payment**
- **The final CACEP report will consider the potential impact of streamlining patient pathways through transitional care and care coordination on hospital readmissions and Medicare episode payments**
  - Regional variation
  - Substitution of low-cost for high-cost care settings when clinically appropriate
  - Reducing care for high cost individuals
  - Estimating savings to Medicare for various approaches

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