Alliance for Home Health Quality and Innovation

Clinically Appropriate and Cost-Effective Placement Project

Executive Summary: Working Paper #3

Use of Home Health Care and Other Services Among Medicare Beneficiaries – Baseline Statistics of Patient Pathways by Episode Type for Select MS-DRGs and Chronic Conditions

The Alliance for Home Health Quality and Innovation commissioned Dobson DaVanzo & Associates, LLC to conduct a study, entitled the *Clinically Appropriate and Cost-Effective Placement (CACEP) Project,* 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. healthcare system. As a part of the CACEP Project, the Alliance is issuing a series of Working Papers examining patient-level Medicare claims data to determine how clinically appropriate changes in the use of care settings across Medicare providers can result in greater efficiency and reduced healthcare costs at the same or better quality. The first two working papers presented data on the frequency and Medicare payments across three patient episode types.

This third working paper offers descriptive statistics on patient pathways by episode type for select MS-DRGs and primary chronic conditions. This working paper uses the same three episode types as were analyzed in the first two working papers:

- Home health as a post-acute care provider within 60 days of discharge from an index acute care hospitalization;
- Home health as a pre-acute care provider for 60 days preceding admission to the index acute care hospitalization; and
- Home health as a non-post-acute care community-based provider for 9 months following discharge from a community home health admission.

These three episode types comprise a significant portion of Medicare fee-for-service expenditures. Post-acute care episodes represent approximately one-half of all Medicare fee-for-service expenditures, while pre-acute (excluding the index acute care hospitalization) and non-post-acute care (community-based) episodes each represent about 12 percent.

What is a patient pathway?

A patient pathway is the care process or path experienced by each individual patient across all care settings within an episode. A patient pathway may include, for example, a discharge from the acute care hospital, followed by an admission to a formal post-acute care setting (i.e., a home health agency, skilled nursing facility, inpatient rehabilitation facility or long-term acute care hospital). The patient may then proceed to outpatient therapy, eventually returning to the community to receive care from their primary care physician. Each of these settings would be a "sequence stop" in the pathway.

Why are patient pathways relevant?

By understanding patient pathways within each episode type (by MS-DRG for post-acute care episodes, and by primary chronic condition for pre-acute and non-post-acute/community-based episodes), we can learn how care is currently being delivered across episodes. This information provides a baseline from which to consider how patient care can be re-engineered and streamlined to improve quality and efficiency. Moreover, as policy makers consider payment reforms structured around episodes of care, patient care pathways describe the mix of services that a given episode-based payment would potentially need to include.

Post-Acute Care Episodes: Patients who use home health care immediately following hospital discharge typically have more ambulatory-based services and fewer facility-based services in their care pathway, making home health care a cost-effective provider for post-acute care.

Patients who receive home health as the first care setting following hospital discharge tend to have lower overall Medicare episode payments (despite having more sequence stops), compared to patients who receive care from facility-based settings. More of those sequence stops for home health patients tend to be for ambulatory-based services–most notably physician and outpatient visits–as compared with more costly facility-based services. **Strong coordination of care efforts by physicians and home health care professionals could help to improve quality of care and keep overall episode payments low.**

Patients who use home healthcare immediately following hospital discharges have, on average, 4.37 total sequence stops, compared to 4.12 for patients who are admitted to SNFs from the acute care hospital. However, a larger proportion of these sequence stops for home health patients are ambulatory-based (1.60 compared to 1.13), and the overall average episode payment for HHA first setting episodes is, on average, lower than other formal first setting episodes (SNF, IRF, LTCH) (Exhibit 1).

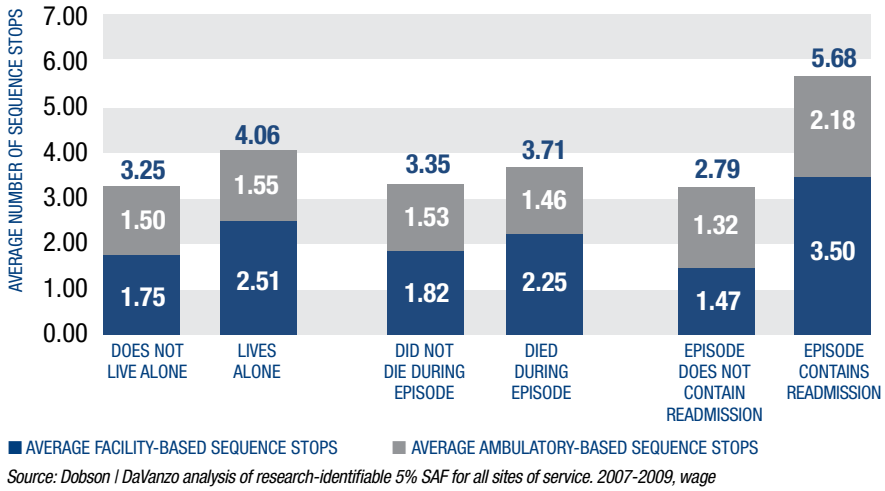
The relatively low episode payments associated with home healthcare first setting episodes and the longer patient care pathways that are ambulatory in nature suggest that using physician visits and other outpatient care may be helping to reduce more costly facility-based care.

EXHIBIT 1: Distribution of Medicare Episode Payments and Sequence Stops by Select First Setting for 60-Day Fixed-Length Post-Acute Care Episode (2007-2009)

FIRST SETTING	AVERAGE MEDICARE EPISODE PAID	AVERAGE SEQUENCE STOPS	AVERAGE FACILITY-BASED (OR HOME HEALTH) SEQUENCE STOPS	AVERAGE AMBULATORY-BASED SEQUENCE STOPS
HHA	$20,345	4.37	2.77	1.60
SNF	$29,218	4.12	2.99	1.13
IRF	$44,193	4.88	3.33	1.55
LTCH	$89,869	4.03	3.20	0.83
STACH	$29,713	4.43	2.96	1.47
Overall Average	**$28,405**	**4.29**	**2.94**	**1.35**

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. Average Medicare Episode Paid includes care from all facility-based and ambulatory care settings and excludes beneficiary co-payments. Prescription drugs provided under facility-based prospective payment systems (SNF, IRF, LTCH) are included in the average Medicare episode payment, but payments for prescription drugs provided outside the facility are not.

EXHIBIT 2: Average Facility-and Ambulatory-Based Sequence Stops by Select Demographic Characteristics



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

If, however, there is a readmission to the acute care hospital, regardless of acute care hospital MS-DRG or first setting, the average patient pathway contains almost twice as many sequence stops compared with episodes that do not have a readmission (total episode stops of 5.68 compared to 2.79) (Exhibit 2). Moreover, of these additional sequence stops, most are facility-based (2.03), as opposed to ambulatory-based (0.86). Thus, when efforts to keep patients stable post-discharge are unsuccessful, it is reflected in increased use of facility-based services and doubling of Medicare episode expenditures. Some of these discrepancies may be due to planned readmissions and more severe patient populations, while others may be unplanned.

Exhibit 2 also indicates that patient demographics are correlated with the number of sequence stops in an episode. Episodes for patients who live alone have 0.81 more stops than those who live with a spouse or caregiver (total sequence stops of 4.06 compared to 3.25). On average, episodes for patients who live alone have 0.76 more facility-based stops and 0.05 more ambulatory-based stops than episodes for those who do not live alone.

In addition, having more chronic conditions is associated with a greater number of sequence stops and higher average Medicare episode payments. Episodes for patients with no chronic conditions have, on average, 2.64 total sequence stops, while patients with 10 chronic conditions have an average of 4.33 sequence stops (Exhibit 3). By way of example, MS-DRG 470 patients with no chronic conditions have an average of 3.70 sequence stops. Patients with 13 chronic conditions have an average of 5.26 sequence stops (data not shown).

EXHIBIT 3: Average Medicare Episode Paid and Average Sequence Stops by Number of Chronic Conditions for 60-day Fixed-Length Post-Acute Episode (2007-2009)

NUMBER OF CHRONIC CONDITIONS	PERCENT OF EPISODES	AVERAGE MEDICARE EPISODE PAID	AVERAGE EPISODE STOPS	AVERAGE FACILITY-BASED SEQUENCE STOPS	AVERAGE AMBULATORY BASED SEQUENCE STOPS
0	2.0%	$14,037	2.64	1.40	1.24
1	4.9%	$13,545	2.73	1.40	1.33
2	8.8%	$15,174	2.89	1.51	1.38
3	12.2%	$16,429	3.04	1.62	1.42
4	14.4%	$17,971	3.20	1.74	1.46
5	15.0%	$19,502	3.39	1.88	1.51
6	13.9%	$20,991	3.58	2.04	1.54
7	11.4%	$22,400	3.80	2.20	1.60
8	8.0%	$23,390	4.00	2.35	1.65
9	4.9%	$24,530	4.16	2.48	1.68
10	2.7%	$25,469	4.33	2.60	1.73
11-15	1.8%	$26,607	4.59	2.77	1.82
Overall Average	**100%**	**$19,505**	**3.44**	**1.92**	**1.52**

Source: Dobson | DaVanzo analysis of research-identifiable 5% SAF for all sites of service, 2007-2009, wage index adjusted by setting and geographic region. Medicare Episode Paid includes care from all facility-based and ambulatory care settings. Note: All episodes have been extrapolated to reflect the universe of Medicare beneficiaries.

Most Frequent Patient Pathways for Post-Acute Care Episodes Across All MS-DRGs

PATHWAY PATTERNS	PERCENT OF EPISODES	AVERAGE MEDICARE PAID
A-C	34.5%	$10,003
A-H-C	7.1%	$16,048
A	5.8%	$14,761
A-C-A-C	2.8%	$22,395
A-S	2.8%	$25,568
Subtotal	**52.9%**	**$12,799**
Other	47.1%	$27,039
Total	**100.0%**	**$19,505**

The five most frequent pathways for post-acute care episodes represent more than half of all episodes and have an average Medicare episode payment of $12,799 – nearly $15,000 less than the average payment for all other pathways. This suggests that efforts to streamline patient pathways based on clinical guidelines could result in Medicare savings.

Most Frequent Patient Pathways for Post-Acute Care Episodes for MS-DRG 470

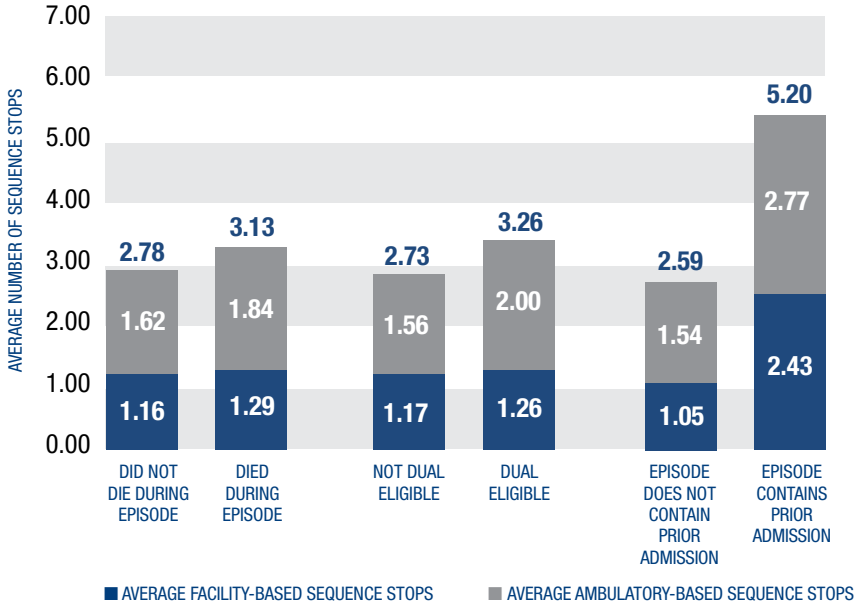
PATHWAY PATTERNS	PERCENT OF EPISODES	AVERAGE MEDICARE PAID
A-H-C	19.6%	$17,172
A-S-H-C	12.4%	$25,073
A-C	7.4%	$14,003
A-S-C	5.0%	$22,517
A-I-H-C	4.0%	$31,839
Subtotal	**48.4%**	**$20,483**
Other	51.6%	$25,333
Total	**100.0%**	**$22,986**

Almost half of all episodes with an acute care hospitalization for MS-DRG 470, are contained in the top five patient pathways, again, with a lower average Medicare episode payment compared to the remaining pathways. Almost one-fifth of all episodes have the most frequent pathway consisting of home health and community-based care following discharge from the hospital.

Facility-Based (or Home Health) 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

EXHIBIT 4: Average Facility-Based (or Home Health) and Ambulatory-Based Sequence Stops by Select Demographic Characteristics



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

Most Frequent Patient Pathways for Pre-Acute Care Episodes

PATHWAY PATTERNS	PERCENT OF EPISODES	AVERAGE MEDICARE PAID
C-A	64.5%	$11,535
C-E-C-A	7.3%	$12,488
C-A-C-A	3.3%	$23,797
E-C-A	2.5%	$11,195
C-E-A	1.6%	$12,863
Subtotal	**79.2%**	**$12,146**
Other	20.8%	$18,214
Total	**100.0%**	**$13,411**

The five most frequent pathways for pre-acute care episodes represent more than three-quarters of all episodes and have an average Medicare episode payment of $12,146 – lower than the average payment for all other pathways. The most frequent patient pathway only includes community care (physician and outpatient visits) prior to the index hospitalization. Pre-acute care episode pathways are more concentrated than those for post-acute care.

Pre-Acute Care Episodes: Investing in better coordination of care, including use of home healthcare could prevent avoidable index hospitalizations.

Similar to the patient pathways for post-acute episodes, pre-acute episodes that contain a hospital admission prior to the index hospitalization have twice as many sequence stops as episodes that do not. Episodes with a prior hospitalization have an average of 5.20 stops, while those without a prior hospitalization have an average of 2.59 stops (Exhibit 4).

Patient demographics also continue to be correlated with patient pathway trends for pre-acute episodes. For example, beneficiaries who die during the index hospitalization have slightly more facility-based sequence stops and ambulatory-based sequence stops than those who survive the episode. Additionally, patients who are dually-eligible for Medicare and Medicaid have more average sequence stops per episode compared to those who do not. *(Note that this analysis only includes Medicare Part A and Part B services; therefore, long-term care support services for dual eligible patients are not included.)*

Non-Post-Acute Care (Community-Based) Episodes: Home healthcare providers can and do help to manage patients with varying degrees of severity and multiple chronic conditions.

Due to the nine-month episode length, non-post-acute care (community-based) episodes have significantly more sequence stops than the pre- and post-acute care episodes. There appears to be a correlation between the severity of a patient's primary chronic condition and the average number of sequence stops

EXHIBIT 5: Average Medicare Episode Paid and Average Sequence Stops by Select Primary Chronic Conditions for 9-Month Fixed-Length Non-Post-Acute Episode (2007-2009)

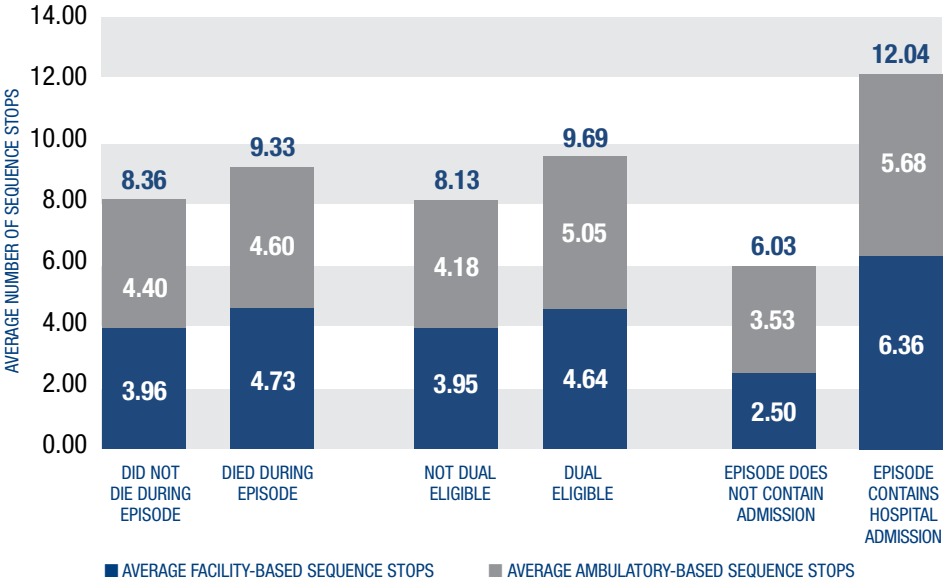
PRIMARY CHRONIC CONDITIONS	AVERAGE MEDICARE EPISODE PAID	AVERAGE SEQUENCE STOPS	AVERAGE FACILITY-BASED (OR HOME HEALTH) SEQUENCE STOPS	AVERAGE AMBULATORY-BASED SEQUENCE STOPS
CHF*COPD	$35,256	11.07	5.63	5.44
DIABETES*CHF	$29,913	9.54	4.74	4.80
CHF*RENAL	$28,088	9.15	4.62	4.53
Lung Cancer	$26,814	7.90	3.68	4.22
Osteoporosis	$18,988	7.69	3.47	4.22

contained within the episode. For example, episodes for patients with CHF*COPD have, on average, 11.07 sequence stops (5.63 facility-based or home health and 5.44 ambulatory-based) while patients with a primary chronic condition of osteoporosis have an average of 7.69 sequence stops (3.47 facility-based or home health and 4.22 ambulatory-based) (Exhibit 5). The average number of sequence stops also increases with the number of chronic conditions contained within the episode for non-post-acute care episodes (data not shown).

As with the post-acute care and pre-acute care episodes, the presence of a hospital admission has a strong impact on the average number of sequence stops in a community-based episode. Episodes with a hospital admission contain 12.04 sequence stops, which is twice as many sequence stops as episodes without a hospital admission (6.03) (Exhibit 6). This is a significant finding, as it indicates that even a single hospitalization within a nine-month period greatly impacts the patient pathway for the remainder of the episode.

As in the pre-acute care episodes, non-post acute care episodes for dual eligible patients have a slightly higher average number of sequence stops per episode.

EXHIBIT 6: Average Facility-Based (or Home Health) and Ambulatory-Based Sequence Stops by Select Demographic Characteristics



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

In the non-post-acute care episodes, the ten most common pathways consist solely of home healthcare and community (physician and outpatient) care. The data shown here illustrate that while there are more sequence stops per episode, the average Medicare episode payment still remains lower than for episodes involving facility-based stops. Further, these pathways rarely involve hospital admission, suggesting that home and community-based services are effectively keeping patients from entering facility-based care.

Conclusion

Working Paper #3 presents unprecedented information on patient pathways by episode type, select MS-DRGs, and primary chronic conditions to illustrate how and where patients are receiving care within their episode. Further, the data show that while home healthcare may lead to increased stops along a patient's pathway, these episodes are less costly to the Medicare program than episodes with facility-based care and shorter patient pathways.

In examining these data, we have learned that the variance in patient pathways is partially a function of select patient demographics and the presence of acute care hospital (re)admissions.

Patient pathways allow us to understand the clinical composition of episodes, which is critical to the success of episode-based payment as it allows for better care coordination and the provision of a cost-effective mix of patient services within an episode.

Implications for Home Health

The implications of pathway analyses for providers, including home health agencies, is that there is a clear need for improved efforts to address readmissions and potentially to streamline pathways with fewer transitions. As possible, this may mean less reliance on more expensive care in facilities. Pathways are not just about where the patient is in the pathway, but also what is the patient's next stop in the pathway. On average, 50 percent of post-acute care episode payments are for care provided after the index acute care hospitalization. Decisions about post-acute care placement are therefore critical not only to the quality of the patient's care, but also have profound implications on overall health care expenditures.

Non-Post-Acute Care Community-Based Episodes: Most Frequent Patient Pathways Overall

PATHWAY PATTERNS	PERCENT OF EPISODES	AVERAGE MEDICARE PAID
H-C	17%	$5,273
H-C-H-C	5%	$8,915
H-C-E-C	2%	$6,794
H-C-H-C-H-C	2%	$12,710
H-C-H-C-H-C-H-C-H-C-H-C	2%	$23,792
H-C-H-C-H-C-H-C	2%	$15,930
H-C-H-C-H-C-H-C-H-C	1%	$20,182
H-C-A-C	1%	$15,087
H	1%	$2,192
H-C-A-H-C	1%	$17,030
SUBTOTAL	**35%**	**$9,096**
OTHER	65%	$32,617
GRAND TOTAL	**100%**	**$24,444**

Source: Dobson | DaVanzo analysis of research-identifiable 5% SAF for all sites of service. 2007-2009, wage adjusted by setting and geographic region and standardized to 2009 dollars. All episodes have been extrapolated to reflect the univers of Medicare beneficiaries. Average Medicare Episode Paid includes care from all facility-based and ambulatory care settings and excludes beneficiary co-payments.

Note: Home health sequence stops ("H") separated by the community ("C") (i.e., H-C-H) represents two home health segments. These segments are not necessarily consistent with the home health episode defined under the Home Health Prospective Payment System.

Facility-Based (or Home Health) 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

The descriptive statistics in this working paper indicate the need for further research on, among other topics:

- Identifying best practices for clinically appropriate patient care and placement, and determining whether there may be corresponding patient pathways that reflect those best practices; and
- Determining what factors may underlie the demographic and clinical trends seen in the data as we continue to explore patient pathways.