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Implementing a unified payment system for post-acute care

1-A

Methodology to model the impacts of transition to a PAC PPS

In June 2016, we reported that a single prospective payment system (PPS) for post-acute care (PAC) was feasible using administrative data to predict the costs of and establish payments for all PAC stays (Medicare Payment Advisory Commission 2016).[1] This appendix summarizes the methodology used in that work to estimate the costs of PAC stays, predict the cost of stays using patient and stay characteristics, and then use these predicted costs to establish payments for each stay. A full description of that methodology is found at http://www.medpac.gov/docs/default-source/reports/chapter-3-mandated-report-developing-a-unified-payment-system-for-post-acute-care-june-2016-report-.pdf?sfvrsn=0. This appendix then describes the approach taken to update the cost and payments of the 2013 PAC stays to 2017. The last section includes definitions of the patient groups used to evaluate the design and impacts of a PAC PPS.

Estimate the actual costs of 2013 PAC stays

The analysis of the 2013 PAC stays was based on 8.9 million stays across the four settings (about 10 percent of stays had missing data and were dropped). The costs per stay include all Medicare-allowed expenses, including overhead costs and the costs associated with teaching programs and treating low-income patients (in inpatient rehabilitation facilities (IRFs)). We estimated the costs of therapy and nontherapy ancillary (NTA) services (such as drugs) by converting the charges for these services (from claims data) to costs using facility-specific and department-specific cost-to-charge ratios (from the facility's cost report).[2] All costs were standardized using the provider's wage index.

We did not have measures of routine relative resource use at the patient or stay level for the PAC stays in 2013. Since we had estimates of routine costs for the stays included in CMS's Post-Acute Care Payment Reform Demonstration (PAC–PRD), which we were required to use for the June 2016 report, we developed a model to predict routine costs using patient and stay characteristics. We then applied this model to the 2013 PAC stays to predict their routine costs. We calculated an average routine cost per stay from each provider's Medicare cost report and used the model prediction to adjust a stay's routine cost up or down relative to the facility average.[3] We expect the Secretary

would use a full year of PAC claims and a recent cost reporting period to establish the design of a PAC PPS.

Predict the cost of 2013 stays using patient and stay characteristics

The PAC PPS design relies on models that predict the cost of stays using patient and stay characteristics and Poisson regression models.[4] We developed one model to predict the costs of routine and therapy care for stays in the four PAC settings and a separate model to predict NTA costs for stays in skilled nursing facilities (SNFs), IRFs, and long-term care hospitals (LTCHs). We developed a separate model for NTA services because the home health care benefit does not cover these services. Because routine and therapy costs are so much lower for stays treated by home health agencies (HHAs) compared with stays treated in the institutional settings (SNFs, IRFs, and LTCHs), we included a home-health indicator in the model predicting routine and therapy costs. Without this adjustment, the model would predict costs that are too high for HHA stays and too low for stays in institutional PAC settings; if used to establish payments, the model would substantially overpay HHAs and underpay the other PAC providers. Our analyses suggest that this adjustment would be substantial (Medicare Payment Advisory Commission 2016).

We used the following information to predict the cost of stays (for both models):

- patient age and disability status;

- primary reason to treat (approximated by the Medicare severity–diagnosis related groups (MS–DRGs))[5];

- patient comorbidities;

- days spent in the intensive and coronary care units during the prior hospital stay;

- the patient's severity of illness using the all-patient refined–diagnosis related groups (APR–DRGs);

- the number of body systems involved with the patient's comorbidities;

- the patient's risk score;

- the patient's frailty[6];

- the patient's cognitive status; and

- other aspects of care (bowel incontinence, severe wounds or pressure ulcers, use of certain high-cost service items, and difficulty swallowing).[7]

We included these factors because they captured different dimensions of a patient that could influence the cost of care. The Secretary may consider other dimensions or other measures of the same dimensions in the final design.

We avoided including in the model indicators of service use that might be manipulated by providers (such as the amount of rehabilitation therapy, the number of therapy disciplines, or the use of oxygen without a link to a respiratory diagnosis). However, we did include indicators for ventilator care, tracheostomy care, and continuous positive airflow pressure because the cost of these services is significant, and use is much less likely to be influenced by payment policy.

Estimate payments that include outlier policies for 2013 PAC stays

The predicted costs for routine and therapy services and the predicted costs for NTA services were combined for a total predicted cost per stay. The total predicted cost of each stay was then adjusted by a uniform multiplier to ensure that aggregate payments under the new design equaled those under the current PPS (that is, the new payment system is "budget neutral" and does not raise or lower aggregate spending).

Because some patients' care needs are considerably higher or lower than expected, we developed two outlier policies that would adjust payments for these stays. A high-cost outlier policy would protect providers from incurring exceptionally large losses from treating unusually high-cost stays and would help ensure beneficiary access to services. We modeled an illustrative high-cost outlier policy setting two pools (one for home health care stays and one for institutional PAC stays) at 5 percent of spending. Providers would receive the PAC PPS payment plus 80 percent of the difference between the fixed loss amount and the remaining cost of the stay.

A short-stay policy protects the program and taxpayers from excessive payments that would otherwise result for unusually short stays. Instead of being paid a full stay amount, short stays are paid a daily rate for the duration of the stay. We calculated the average cost per day for short stays across all institutional PAC stays and this amount for the number of days in the stay. Similarly, for home health

stays, we calculated an average per visit cost for short stays and attributed this amount for the duration of the short stay. We added 20 percent to the first day (or visit) to acknowledge the higher costs typically incurred the first day of the stay.

Update the costs and payments for 2013 PAC stays to 2017

To evaluate the need for a transition and the level of payments, we first updated the costs and payments of the 2013 stays to the level of costs and payments in 2017. This updating provides a more current picture of the need for a transition and whether payments in 2017 are aligned to the cost of stays. The estimated costs and payments in 2017 are the starting point for all analyses included in this chapter.

To update the costs to 2017, we inflated our estimates of the costs of 2013 stays using the average cost increases by PAC setting. For the institutional PAC settings, we used the market basket increases estimated by CMS for each setting. Because HHAs typically hold their cost increases to significantly below market basket, we conservatively assumed cost growth slightly higher than the average actual changes in the cost per visit over the 2011 to 2015 period. Because we are estimating the 2017 costs for the same 2013 PAC stays, we do not factor in any change in case mix. We also factored in estimates of any additional costs projected for 2016 and 2017 such as the costs of implementing the long-term care regulations that SNFs will incur beginning in 2017.

To estimate payments in 2017, we updated each stay's payment by the update included in each setting's final rules between 2013 and 2017 (based on the end date of the stay). These factors include the market basket updates, the reductions to payments to IRFs and LTCHs mandated by the Patient Protection and Affordable Care Act of 2010, forecast error corrections, required rebasing, coding adjustments, or other changes to payments.

Definitions of the patient groups used in our analyses

We evaluated the design and considered the impacts of the PAC PPS using over 30 different patient groups. Stays

were assigned to one or more groups based on the stays' characteristics. The groups we examined included clinical conditions, medically complex stays, patient frailty and cognitive status, and other stay and patient characteristics.

Clinical conditions

Twenty of the 22 clinical conditions we examined were based on information (diagnosis and procedure codes) from claims for the preceding hospital stay and, where there was no prior acute hospital stay within 30 days, from claims for the PAC stay. Two clinical conditions, ventilator care and severe wound care, were based on information from the PAC claim. For stays without a prior hospital stay, the MS–DRG assignment was simulated using information from the PAC claim. Except for stays for patients with serious mental illness, the clinical condition groups were mutually exclusive, with stays first assigned to ventilator care, then severe wound care; all other stays were assigned to a major diagnostic category (MDC) based on the MS–DRG.

We report on the following 13 clinical conditions because they accounted for at least 2 percent of stays or were of particular interest:

- Ventilator care;

- Severe wound care;

- Stroke;

- Other neurology medical—medical stays assigned to MDC 1, excluding stroke;

- Orthopedic medical—medical stays assigned to MDC 8;

- Orthopedic surgical—surgical stays assigned to MDC 8;

- Respiratory medical—medical stays assigned to MDC 4;

- Cardiovascular medical—medical stays assigned to MDC 5;

- Cardiovascular surgical—surgical stays assigned to MDC 5;

- Infection medical—medical stays assigned to MDC 18;

- Hematology medical—medical stays assigned to MDC 16;

- Cardiovascular medical—medical stays assigned to MDC 5;

- Skin medical—medical stays assigned to MDC 9; and

- Serious mental illness—includes stays for beneficiaries with schizophrenia, bipolar disorder, or severe depression, identified using the hierarchical condition code indicators 57 or 58; this group and the other clinical groups are not mutually exclusive (a stay can be assigned to another clinical group and to the serious mental illness group).

Medically complex stays

- Multiple body systems—stays in institutional PAC settings for patients with diagnoses involving five or more body systems. About 5 percent of stays are included in this group;

- Chronically critically ill—stays for patients who spent eight or more days in the intensive care or coronary care unit during the preceding hospital stay or were on a ventilator in the PAC setting. About 5 percent of stays are included in this group; and

- Severity of illness Level 4 (the highest level)—stays in institutional PAC settings for patients assigned to the highest severity group (Group 4, indicating extreme severity) using the APR–DRG based on the diagnostic information from the immediately preceding hospital stay (or simulated for patients admitted directly from the community). About 4 percent of stays are included in this group.

Patient frailty and cognitive status

- Patient frailty—We used the JEN Frailty Index to assign stays to the top (most frail) and bottom (least frail) quartiles of the distribution of the frailty scores; and

- Impaired cognition—patients who were in a coma or had dementia or Alzheimer's disease.

Other stay and patient characteristics

- Low and high therapy—Stays with the lowest (bottom quartile) and highest (top quartile) therapy costs as a share of total stay costs. For home health stays, the low group includes the 40 percent of HHA stays with no therapy costs.);

- Community admissions—Patients with no hospital stay within the 30 days preceding the PAC stay, identified by the lack of a matching hospital claim;

- Patients with a prior hospitalization;

- Patients with disabilities;

- Patients dually eligible for Medicare and Medicaid;

- Patients with end-stage renal disease; and

- Patients age 85 years and older. ∎

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Endnotes

1 PAC includes home health agencies (HHAs), skilled nursing facilities (SNFs), inpatient rehabilitation facilities (IRFs), and long-term care hospitals (LTCHs).

2 Nontherapy ancillary services include drugs, respiratory care, ventilator services, and other miscellaneous ancillary services such as laboratory tests and radiological exams. They account for 13 percent of SNF and IRF stay costs and 35 percent of LTCH stay costs.

3 An alternative approach could have simply estimated the average routine cost per day (readily available from the cost report) and then multiplied that figure by each stay's length. In the case of HHA, the cost per visit (by visit type) for nontherapy visits could be multiplied by the number of nontherapy visits. However, these approaches would ignore that patient care costs vary by more than length of stay, which our chosen approach attempts to capture.

4 Compared with ordinary least squares regression, the Poisson regression gives less emphasis to infrequent but exceptionally high-cost stays. In addition, Poisson models can more easily handle dependent variables with zero values (such as stays with no NTA or therapy costs).

5 The diagnosis related group, comorbidities, severity of illness, and number of body systems were calculated from the hospital claim when there was a preceding hospital stay or simulated from PAC claims for stays without a preceding hospitalization.

6 The measure of frailty we used was the JEN frailty index, an algorithm developed by JEN Associates Inc. to identify frail older adults who may be at risk of institutionalization. The index is based on 13 grouped categories of diseases or signs found to be significantly related to concurrent or future need for long-term care services. The algorithm uses diagnosis codes from claims. We included the 13 components in the index in the administrative models because functional status information was not available.

7 Severe wound care includes patients with a nonhealing surgical wound; an infected wound; a wound for a patient who is morbidly obese; a fistula; osteomyelitis; or a Stage III, Stage IV, or an unstageable pressure wound.

References

Medicare Payment Advisory Commission. 2016. *Report to the Congress: Medicare and the health care delivery system.* Washington, DC: MedPAC.

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