Modeling Episode-Based Payments for Cancer Using Commercial Claims Data

Michael Polson, PharmD, MS; Todd Lord, PharmD, AE-C, CDOE; Themmi Evangelatos, PharmD, MSBA; Anne Kangethe, PharmD, MPH, PhD; Lindsay C. Speicher, JD; Servi Barrientos, BS; and Christopher Zacker, RPh, PhD

ABSTRACT

BACKGROUND: Innovative health care reimbursement models are gaining attention as a way to move away from a payment system that rewards quantity of service over quality of care. One such alternative payment model is episode-based payment, such as the Oncology Care Model (OCM) being piloted by the Center for Medicare & Medicaid Innovation.

OBJECTIVE: To adapt the OCM methodology to a commercially insured population to understand the challenges and potential implications of implementing an episode-based payment model in a commercial health plan.

METHODS: Administrative claims databases from 3 regional commercial health plans were used to identify continually eligible patients (aged ≥ 18 years) with breast cancer, lung cancer, melanoma, or chronic myelogenous leukemia (CML). Episode triggers were identified using the OCM methodology. In calculating the episode-based payments, adjustments to the OCM methodology were necessary to adapt the methodology to a commercial population, since not all Medicare data elements used in the OCM algorithm are available in commercial claims data.

RESULTS: The adapted OCM-like model was applied to data from 39,967 patients with 1 of 4 cancer types. Approximately 13% of patients had at least 1 episode per year and the average number of episodes per patient per year for patients with at least 1 episode ranged from 1.42 for patients with melanoma to 1.94 for patients with CML. The percentage of total annual costs included in episodes was 49%, 60%, 34%, and 52% for breast cancer, lung cancer, melanoma, and CML, respectively.

CONCLUSIONS: As health care financing shifts to alternative payment models, insurers may look to adopt episode-based payments for oncology, similar to the OCM. This study shows that implementing an OCM-like model in a commercial health plan is feasible but will require adjustments to the OCM algorithm to make it implementable and applicable to populations beyond Medicare.

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What this study adds

- Using administrative claims data, this study provides insight into the implications of implementing an episode-based model, based loosely on OCM methodology, at a commercial plan.
- This study provides an assessment of the required adjustments that can make the OCM algorithm applicable and valuable to populations beyond Medicare.

Over 1.6 million people are diagnosed with cancer each year in the United States, and the cost of treating these patients is steadily increasing, with projected growth of treatment costs between 7.5% and 10.5% through 2020.^{1,2} Given this rapid increase in costs, refining the payment system is a growing priority. Innovative health care reimbursement models aimed at shifting focus from the quantity of services provided to the quality of outcomes achieved have been implemented by several payers, including the Anthem/WellPoint Cancer Care Quality Program, Aetna's medical home system, and the Center for Medicare & Medicaid Innovation (CMS Innovation Center) Oncology Care Model (OCM).³ Due to the prevalence of cancer in elderly patients, Medicare pays for a large share of oncologic care.⁴ To address rising costs of care, the CMS Innovation Center implemented the OCM, an episode-based payment pilot program that combines fee-for-service, per-beneficiary-per month payments (i.e., monthly enhanced oncology services), and performance-based incentives.⁵ In the OCM, an episode is defined as a 6-month period that begins with a qualifying chemotherapy claim.⁵ Episode-based payment arrangements aim to reduce unnecessary care, avoidable hospitalizations, complications of treatment, and inefficient resource use.^{5,6} While the OCM is still in its infancy, other episode-of-care payment initiatives, such as the UnitedHealthcare episode-based payment program have been studied and demonstrate the potential benefits of an episode-based payment model.⁷

Episode-based payment mechanisms have been promoted as a means to reduce incentives to overuse unnecessary health care services and improve efficiency by optimizing care coordination.^{5,6,8,9} By including quality metrics, episode-based payments are intended to promote greater patient focus and

What is already known about this subject

- Innovative health care reimbursement models are trending as a way to move away from payment systems that incentivize quantity of service over quality of care.
- The Oncology Care Model (OCM), an episode-based payment model, has been piloted in Medicare.

avoid incentives for clinicians to undertreat.^{10,11} In addition, episode-based payments give health care providers the flexibility to decide the level and types of services to be delivered, rather than constrain their decision making by fee codes and utilization management tools.¹² By removing the need to adhere to a “correct” treatment, physicians are given freedom to choose the most appropriate care for individual patients.

In February 2018, the CMS Innovation Center released the first annual report evaluating the OCM. The report indicated that baseline analyses provided a strong foundation for future evaluation of OCM impact.¹³ Thus, interest is anticipated to develop among commercial insurers for implementing similar payment models for commercially insured patients, since 11% of the health care spend for commercial insurers is accounted for by oncologic care provided to less than 1% of covered lives.⁴ While episode-based payment models similar to the OCM present opportunities for commercial payers, they also present a significant challenge.⁴ Defining episodes and quantifying episode payments will require significant data analytic capabilities, development of appropriate quality and performance measures, and alignment of incentives for payers and providers, which will challenge even the most sophisticated insurers. To date, research on the OCM has focused on Medicare plans and has not assessed its implementation by commercial health plans.¹⁴

The goals of this project were to (a) approximate the OCM algorithm and methodology to commercial claims data; (b) understand how episode-based payments for selected cancer types may be affected by episode-based payments; and (c) evaluate the feasibility and challenges of implementing an episode-based payment model in a commercially insured population.

Methods

Development of the model involved 2 phases. First, a retrospective study of 4 cancers (breast cancer, lung cancer, melanoma, and chronic myelogenous leukemia [CML]) was conducted to define episodes of care and establish baseline spending measures. These 4 tumor types were chosen to represent a mix of cancers in terms of prevalence, treatment patterns, innovation, and solid and hematologic tumors. Second, an episode-based model was developed, with consideration of the data limitations of commercial claims data.

Phase 1: Retrospective Claims Analysis

Medical and pharmacy administrative claims data from 3 regional commercial health plans were used to identify eligible patients. Data consisted of all medical billing for inpatient and outpatient or professional health services (UB04 and HCFA1500) and National Council for Prescription Drug Programs claim transmissions submitted by the health plans, representing more than 3.5 million commercial lives in the northeastern United States.

Patients included in the study were aged 18 years and older, continuously enrolled for 6 months before and throughout the study period (July 1, 2012-June 30, 2015), and had at least 2 diagnosis codes for breast cancer, lung cancer, melanoma, or CML occurring more than 30 days apart (Appendix A, available in online article). Analyses were performed individually for each tumor type using SAS version 9.4 (SAS Institute, Cary, NC).

The retrospective evaluation assessed overall utilization and costs, as well as cancer-specific costs for the various cancers. Oncology-related costs were determined by identifying the billing provider type and area of specialization through taxonomy codes.

Phase 2: Development of an Episode-Based Payment Model

Administrative claims data from the 3 regional commercial health plans were used to develop the model. Since not all aspects of the OCM methodology could be directly translated to a commercial plan, a crosswalk was developed to map OCM data elements to commercial claims data, proposing reasonable proxies when commercial data did not include variables available in Medicare data. This crosswalk, which was adapted from the OCM's methodology report, highlights each step of the development of an episode-based model that must be considered for a commercial adaptation of the OCM and includes rationale for suggested adaptations to commercial data.¹⁴ The full list of adaptations and the rationale for such adaptations can be found in Appendix B (available in online article). Development of the episode-based model involved the following steps:

Steps 1 and 2: Identification of Trigger Events and Episode Eligibility. In the OCM, a Part B (medical) claim for a chemotherapy drug and a cancer diagnosis or Part D (pharmacy) claim for a chemotherapy drug with a medical claim including a cancer diagnosis within the preceding 59 days triggers the start of an episode. For the study model, the Parts B and C requirements were substituted with any chemotherapy claim billed to the medical or pharmacy plans and adjudicated as paid. This episode identification process was an iterative one that is highly resource intensive when applied to a large dataset or long time period. Each potential trigger claim was checked against the remainder of the episode requirements. For an episode to be valid, it must have had a valid trigger event, and the patient must have remained eligible for medical and pharmacy benefits for the entire 6-month episode duration. All claims that occurred in the 6-month window were attributed to an episode, then the process was repeated for claims incurred more than 6 months from the previous valid trigger claim.

Steps 3 and 4: Assignment of Cancer Type and Episode Attribution. The CMS Innovation Center provides a diagnosis code list to use in assigning a cancer type to each episode in the OCM. An episode can have only 1 cancer type no matter

TABLE 1 Results from Retrospective Claims Analysis in a Commercial Regional Health Plan

Baseline Characteristics	All (N=80,748)			Breast (n=51,859)			Lung (n=15,969)			Melanoma (n=11,393)			CML (n=1,527)		
Age, years, mean (SD) [median]	62.33	(12.98)	[62]	61.01	(12.72)	[60]	67.43	(11.04)	[68]	61.75	(14.51)	[62]	58.40	(14.58)	[59]
Age range, n (%)															
18-20	39	(0.05)		8	(0.02)		2	(0.01)		25	(0.22)		4	(0.26)	
21-30	585	(0.72)		250	(0.48)		23	(0.14)		267	(2.34)		45	(2.95)	
31-40	2,879	(3.57)		2,004	(3.86)		139	(0.87)		604	(5.30)		132	(8.64)	
41-50	11,430	(14.16)		8,858	(17.08)		836	(5.24)		1,474	(12.94)		262	(17.16)	
51-60	21,381	(26.48)		14,886	(28.70)		3,341	(20.92)		2,773	(24.34)		381	(24.95)	
61-70	22,250	(27.55)		13,805	(26.62)		5,058	(31.67)		3,004	(26.37)		383	(25.08)	
71-80	15,034	(18.62)		8,076	(15.57)		4,643	(29.08)		2,103	(18.46)		212	(13.88)	
81+	7,150	(8.85)		3,972	(7.66)		1,927	(12.07)		1,143	(10.03)		108	(7.07)	
Gender, n (%)															
Female	65,783	(81.47)		51,472	(99.25)		8,491	(53.17)		5,164	(45.33)		656	(42.96)	
Male	14,965	(18.53)		387	(0.75)		7,478	(46.83)		6,229	(54.67)		871	(57.04)	
Elixhauser Comorbidity Index score,^a n (%)															
0	61,590	(76.27)		40,388	(77.88)		10,617	(66.49)		9,304	(81.66)		1,281	(83.89)	
1	10,971	(13.59)		7,104	(13.70)		2,404	(15.05)		1,307	(11.47)		156	(10.22)	
2	5,221	(6.47)		2,965	(5.72)		1,693	(10.60)		510	(4.48)		53	(3.4%)	
3+	2,966	(3.67)		1,402	(2.70)		1,255	(7.86)		272	(2.39)		37	(2.42)	
Three-year follow-up analyses															
Annual medical utilization,^b mean (SD) [median]															
Inpatient admissions	0.01	(0.15)	[0]	0.01	(0.12)	[0]	0.03	(0.25)	[0]	0.01	(0.11)	[0]	0.01	(0.12)	[0]
ALOS	0.04	(0.89)	[0]	0.03	(0.92)	[0]	0.10	(1.03)	[0]	0.02	(0.34)	[0]	0.06	(0.77)	[0]
ED visits	0.48	(1.24)	[0]	0.40	(1.13)	[0]	0.75	(1.63)	[0]	0.42	(1.03)	[0]	0.54	(1.50)	[0]
Outpatient visits	15.77	(17.85)	[10]	14.82	(16.73)	[9]	16.96	(20.15)	[10]	18.57	(18.46)	[14]	17.13	(22.31)	[9]
Laboratory tests	7.26	(18.54)	[2]	6.83	(16.22)	[2]	8.65	(21.53)	[2]	5.37	(14.47)	[2]	20.61	(49.90)	[6]
Surgical procedures	5.87	(8.20)	[3]	5.29	(7.46)	[3]	5.91	(8.93)	[3]	8.45	(9.41)	[6]	6.41	(10.67)	[3]
Radiology (imaging and/or treatment)	9.41	(14.15)	[4]	9.69	(15.35)	[4]	11.82	(17.10)	[6]	5.04	(9.52)	[2]	2.84	(5.72)	[1]
Annual medical cost,^{c,d} mean (SD) [median]															
Overall medical	12,367	(33,577)	[3,630]	14,549	(37,915)	[4,062]	7,330	(20,387)	[2,199]	10,148	(26,791)	[4,679]	4,589	(8,928)	[1,645]
Inpatient	3,526	(5,376)	[1,926]	4,323	(5,722)	[2,341]	2,404	(2,916)	[1,538]	5,112	(10,388)	[2,045]	2,861	(3,031)	[1,589]
ED	665	(1,373)	[206]	857	(1,545)	[314]	252	(481)	[96]	878	(1,838)	[252]	408	(723)	[172]
Outpatient	210	(803)	[84]	256	(923)	[113]	124	(466)	[41]	176	(716)	[94]	82	(182)	[45]
Laboratory	1,006	(6,986)	[158]	1,240	(2,834)	[193]	464	(15,047)	[71]	672	(1,489)	[198]	989	(2,118)	[245]
Surgical	3,195	(8,517)	[640]	3,891	(9,869)	[739]	929	(2,452)	[278]	3,238	(6,814)	[1,126]	977.97	(3,458)	[194.23]
Radiology	4,425	(14,468)	[693]	5,615	(17,103)	[813]	2,299	(6,836)	[601]	2,180	(7,058)	[514]	618	(1,992)	[174]
Annual pharmacy cost,^c mean (SD) [median]															
Overall Rx cost	5,781	(20,079)	[1,011]	4,944	(15,247)	[1,048]	3,623	(9,344)	[890]	4,488	(12,643)	[795]	71,822	(88,446)	[35,072]
Oncology Rx cost	5,827	(24,852)	[400]	2,356	(9,484)	[357]	7,984	(15,177)	[1,877]	7,168	(16,829)	[611]	96,426	(90,292)	[73,721]

Note: Values were calculated as per-patient averages over the study period.

^aElixhauser Comorbidity Index scores were calculated from claims incurred during the baseline period and based on HCUP software.²⁰

^bPatients with no utilization in a particular category were counted as zero.

^cAll cost information was risk adjusted.

^dOncology-related costs are determined by taxonomy of the billing provider. For mean (SD) [median], oncology-related medical costs = 1,948 (8,367) [279]; nononcology-related costs = 10,418 (19,787) [3,350].

ALOS = average length of stay; CML = chronic myelogenous leukemia; ED = emergency department; HCUP = Healthcare Cost and Utilization Project; Rx = prescription; SD = standard deviation.

the clinical condition of the patient. For commercial adaptation, *International Classification of Diseases, Ninth/Tenth Revision, Clinical Modification* (ICD-9/10-CM) codes were used to identify the cancer type (Appendix A). Each episode was assigned

to only 1 provider according to OCM methodology, which defines the attributable physician as the one with the most evaluation and management (E&M) codes during the episode. Presumably this is the provider who is the primary oncology

FIGURE 1 Episode Attribution

CML = chronic myelogenous leukemia.

physician treating the patient's cancer and coordinating care during the episode.

Step 5: Calculation of Episode Expenditures. After identification and attribution of episodes, the OCM model sums the Medicare fee-for-service payments incurred during each episode. In the commercial adaptation, all medical and pharmacy reimbursements were included as episode expenditures. In order to remove the bias introduced by deductibles, copays, and coinsurance, the commercially adopted model used the allowed amount from the claims data to represent the expenditures for each visit/utilization. The allowed amount is the amount that the insurer pays for each covered procedure and is usually the amount they have deemed the services received to be worth. These amounts were used to generate the baseline price that was risk-adjusted using age, gender, and comorbidity index score to achieve the target amount. In the OCM, baseline prices are calculated using a prediction model, calibrated using the national set of baseline episodes and baseline episode expenditures.¹⁴ The CMS Innovation Center estimates the prediction model by regressing baseline episode expenditures on a list of covariates determined to influence episode

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TABLE 2 Results from Retrospective Claims Analysis in a Commercial Regional Health Plan^a

Cancer Type	Patients in Study	Proportion of Patients with ≥ 1 Qualifying Episode in a Given Year	Proportion of Total Annual Cost Included in Episodes ^b	Average Number of Episodes Per Patient Per Year ^b
Breast	27,577	12%	49%	1.53
Lung	5,935	24%	60%	1.46
Melanoma	5,776	4%	34%	1.42
CML	679	21%	52%	1.94

^aMetrics based on data from a 3.5 million-member commercial regional health plan.

^bFor patients with a valid episode.

CML = chronic myelogenous leukemia.

expenditures; some of these covariates are as follows: cancer type, age, sex, dual eligibility, episode length, type of chemotherapy drugs used during episodes, participation in clinical trials, and receipt of radiation therapy.¹⁵ Target price is calculated after adjustments for trends and novel therapies by applying the OCM discount, which is 4% for one-sided risk-sharing arrangements and 2.75% for two-sided risk arrangements.¹⁵

The model variables were changed from the OCM to the commercially adapted version, since Medicare uses national metrics not available to a commercial health plan. If implemented in a commercial plan, the modeling would need to be structured in an actuarially sound manner, preferably with a commercially available risk grouper. The modeling step must be validated for actuarial soundness before use in an episode-based payment program, since the variables and coefficients will vary from plan to plan. In the commercial adaptation, the risk adjustments and modeling were based on 5 years of data, which led to more reasonable risk adjustments than models based on a shorter time span.

Results

Phase 1: Retrospective Claims Analysis

A total of 80,748 patients were identified and included in the study. Table 1 displays patient baseline characteristics, medical utilization, and costs measured, segmented by cancer type. Overall, 81% of patients were female, and the average age across all cohorts was 62 years. The majority of patients were diagnosed with breast cancer (64%), while 20%, 14%, and 2% were diagnosed with lung cancer, melanoma, and CML, respectively. Average total (median) annual medical cost for all patients was \$12,367 (\$3,630), of which oncology-related costs, determined by taxonomy of the billing provider, represented about 16%.

Phase 2: Development of an Episode-Based Payment Model

A total of 39,967 patients qualified for episode analysis. The adapted OCM model was applied to data from 5,764 patients,

TABLE 3 Predicted and Benchmark Prices

Tumor Type	Actual Episode Expenditure, \$	Baseline Expenditure, \$	Predicted Expenditure, \$	Target Amount, \$
Breast	352,534,455	187,709,628	186,965,983	187,497,747
Lung	143,138,779	88,584,602	90,895,915	90,097,363
Melanoma	28,863,617	12,949,867	12,093,762	12,521,814
CML	17,844,846	8,319,666	8,954,749	8,637,207

CML = chronic myelogenous leukemia.

representing 9,553 episodes meeting the analysis criteria. Figure 1 depicts the adjudication process. The number of patients with each cancer type, percentage of patients with at least 1 qualifying episode, percentage of total annual cost included in the episodes, and average number of episodes per patient per year are presented in Table 2. The final sample consisted of 6,241 episodes, 2,498 episodes, 442 episodes, and 372 episodes, for breast cancer, lung cancer, melanoma, and CML, respectively.

Overall, actual 6-month episode expenditures for these patients across all 4 cancer types were \$542M, while the episode-eligible calculated target amount for the same population was \$299M (Table 3). The percentage of total annual costs included in episodes was 49%, 60%, 34%, and 52% for breast cancer, lung cancer, melanoma, and CML, respectively (Table 2). In all 4 cancers types, the actual episode expenditure was higher than the target amount.

Discussion

In this study, an episode-based payment model was developed for commercial health plans based on the CMS Innovation Center's OCM. In doing so, several learnings that highlight the challenges of adapting the OCM methodology to commercially insured patients were identified.

Identification of Trigger Events and Episode Eligibility

The retrospective claims analysis revealed that the exclusion and adjustment rules outlined in the OCM methodology had a large effect on results. Given that episodes are triggered by claims for chemotherapy, patients who are in remission, undergoing surgery or radiation therapies, or are erratic with therapy often do not meet criteria to trigger an episode. Although a patient can have a maximum of 2 episodes in a year, the majority of patients in our study had no qualifying episodes (less than 25% of cancer patients qualified for episode-based payments under the OCM definition, representing 49% of total costs).

Assignment of Cancer Type and Episode Attribution

This model focused on 4 cancer types. In a broader adaptation of the model, a plan must expand the diagnosis code list to include all neoplasia of interest. At the time of this writing, it was necessary to use both ICD-9/10-CM codes in order to

have sufficient data to accurately calculate model adjustments. Application of this model to real-world data also revealed that it is possible for episodes to be attributed to providers whose specialty is not related to oncology, if that provider submits claims for the most E&M codes. Health plans will need to determine how to handle such cases and whether they should be disqualified. An alternative approach could be to attribute the episode to the provider meeting predefined oncology specialty codes, as is done in the OCM, where the attributable physician must be an oncology-related practitioner.

Calculation of Baseline Episode Expenditures

For Medicare plans, reimbursement rates are set by the CMS Innovation Center and are not subject to negotiation. Commercial plans may negotiate rates with individual providers, and the negotiated rates are kept confidential. To minimize some of the differences in baseline episode expenditure calculations between the OCM and our model, standardized pricing can be developed at the procedure code level by using the median price per unit for each procedure code. An argument can be made that this adjustment is not necessary, since the economic effect of negotiated reimbursement rates is largely ignored in the calculated episode expenditures. Not adjusting the rates may lead to more incentive payments for providers with lower reimbursement rates and more risk sharing with providers, who have higher negotiated reimbursement rates, thus narrowing the gap between the 2 models.

Accounting for Model Overlap in the Baseline

In a commercial implementation, the actuarial effect of concomitant alternative payment models will have to be carefully considered for the plan and providers before a decision can be reached on how to deal with overlapping initiatives, such as episode-based programs and other risk-sharing arrangements. In the OCM, providers are excluded if they are participating in certain other demonstration projects or alternative payment models. For plans that are new to episode-based payment models, other operational considerations should be recognized, such as frequency of episode review (e.g., code lists) and communication of episode details and financials to providers. Additional details on general operational considerations of an episode-based payment initiative are readily available in the literature.^{8,16,17}

Predictive Model Development and Data Requirements

Estimating the economic effect of an OCM-like episode-based payment model in a commercial population requires considerable analysis and planning. The development of a predictive model is an important step in the calculation of the episode prices and adapting the generalized linear model of the OCM for implementation in a commercial health plan may be the most intricate and involved part of the process. Care must be

taken to ensure that this model generates results that are actuarially sound for the plan and participating providers.

Generation and use of this model is an iterative process that must be periodically revisited to ensure that the included covariates remain significant in the model and new covariates that may affect the model are evaluated for inclusion. A plan to review and update the model should be established concomitantly with model development. Also, transparency regarding the development, implementation, and maintenance of the predictive model may help alleviate provider concerns regarding how baseline costs and target amounts are calculated. In this simple model, we only included age, gender, and comorbidity index scores. In a real-world setting, the health plan would need to consult actuarial experts for accurate variable selection and calculations. The CMS Innovation Center publishes details of its prediction model and code lists in the OCM provider portal.^{15,18}

Adjustment for Novel Therapies

Including accommodations to incorporate novel therapies is important, since the rate of innovation in oncology is resulting in frequent new product launches, often at significantly higher prices than the current standard of care. Predicted episode expenditures based on historic data will always lag episode costs that include expensive, novel therapies. A different approach may be to discount the baseline price by the median proportion of utilization of the novel agent across the provider population. Careful consideration should be given to reimbursement mechanisms for novel therapies such that use of an agent that has a clinical advantage over previous therapies is not discouraged. The CMS Innovation Center's methodology document discusses how this adjustment may be altered in the future for the OCM.¹⁵

Performance-Based Payments

In the OCM, actual expenditures are reconciled against a target price for episodes of care. Depending on the risk-sharing arrangement, this model provides insights into the possible implications for performance-based payments to providers. The model in this study directly affects the target amount and thus performance-based payment or recoupment. Typically, in episode-based payment models, discounts are applied to the benchmark amounts depending on whether the provider chooses a one-sided or two-sided risk arrangement. In the one-sided risk arrangement, the provider is eligible for gain sharing if the episodes are less than the target amount but is not responsible to pay a risk share amount if the episode prices exceed the target amounts. In the two-sided risk agreement, the provider is eligible for gain share payments from the plan and risk share payments to the plan if episode costs exceed the target amounts. The discount amounts specified in the OCM differ for these 2 risk arrangements, with the deeper discount applied to the one-sided risk arrangement. It may be optimal

for a plan, depending on analysis of internal data, to alter the discount percentages from those used in the OCM.

The CMS Innovation Center also specifies how performance bonuses are calculated by using the performance multiplier, which is based on results from claims data analyses and a practice's performance on quality and practice transformation activities. This multiplier has the potential to reduce or eliminate the performance bonus paid to providers. Therefore, payers must review the elements of the performance multiplier, and their respective weights, and modify as necessary to ensure appropriate and fair assessment. In addition, the CMS Innovation Center pays principle accounting providers a flat fee of \$160 per patient per month to offset costs of coordinating care for patients during the episode. For commercial plans implementing episode payments, paying a similar fee is anticipated for the program to be successful. Consideration should be given, however, to varying the fee based on the complexity of the episode and overall coordination needs of patients while they are in an episode.

Effect of Episode-Based Payments on Providers

Reviewing and implementing criteria for this model provided information valuable for providers. Since payment is attributed to only 1 provider for each episode, the provider who receives this payment is identified by the episode adjudication rules. These rules rely on counting E&M Current Procedural Terminology codes, as detailed in the OCM methodology. In evaluating episodes, it is clear that not all oncologists are consistent in billing E&M codes. Providers should be encouraged to review the technical details of episode calculations to ensure that proper codes are being billed, leading to accurate identification of the attributable physician.

Effect of Episode-Based Payments on the Health Care Continuum

Although episode-based payment methodologies have direct and visible consequences for payers and providers, the effect can reach other areas of the health care continuum. The increasing need for pharmacoeconomic data and information will become apparent as providers are incentivized to make value-based choices involving diagnostic and treatment decisions. According to 2018 guidelines for drug and device manufacturers put forth by the U.S. Department of Health and Human Services, individual providers are considered “a payor, formulary committee, or other similar entity with knowledge and expertise in the area of health care economic analysis carrying out its responsibilities for the selection of drugs for coverage or reimbursement.”¹⁹ Thus, moving forward, individual providers participating in these episode-based payment models and making value-based treatment decisions will require additional training on pharmacoeconomics.

A therapy with a higher acquisition cost, but near-term economic benefit in avoiding costly adverse outcomes, can

result in financial savings for the provider and possibly a better clinical experience for the patient. Pharmaceutical and device manufacturers will experience new contracting challenges, since rebates and incentives negotiated with health plans may not affect providers' episode calculations. This may place emphasis on the “list price,” such as the average sales price, of a product, which directly affects episode costs. Providers will have greater incentive to choose products based on their effect on total cost of care, and the duty will rest on manufacturers to help inform this decision.

Limitations

This project has some limitations to consider. The study model was developed based on data from 3 regional health plans representing more than 3.5 million commercial lives in the northeastern United States. Trends and patterns regarding utilization and cost may differ in other plans, geographies, or lines of business. We tried to reduce the bias introduced by payments incurred by patients, such as deductibles, copays, and coinsurance, in the commercially adopted model by using the allowed amount from the claims data. However, if patients steered away from care due to higher than affordable payments, their services were not captured and therefore not included in the analysis. Plans with high deductibles, for example, will need to be cognizant of patients not receiving services due to such constraints.

Results presented are an estimate of possible outcomes for a health plan using an episodic-payment method. OCM adjustments require use of a generalized linear model. Variables used in the linear model included gender, age, and Elixhauser Comorbidity Index scores as integer values. In implementation, additional variables may be required to make results of the model applicable to specific health plans, and other changes may be necessary to ensure that an episode-based payment arrangement is actuarially sound.

Conclusions

This project assessed the feasibility of implementing an episode-based payment system in a commercial health plan. From the exploration, OCM-like methodology can be implemented in commercial plans, while accounting for the potential challenges and effect. The development process led to numerous learnings that may be of interest to commercial payers seeking to implement an innovative payment model based on the OCM. Of note, given that episodes are triggered by claims for chemotherapy, future evaluations of other trigger events may be warranted to assess effect on results. As commercial payers look for ways to control growth in oncology spending, episode-based payment models similar to the OCM may represent a viable option, albeit with adjustments required to the OCM methodology to be applicable to populations beyond Medicare.

Authors

MICHAEL POLSON, PharmD, MS; TODD LORD, PharmD, AE-C, CDOE; THEMMI EVANGELATOS, PharmD, MSBA; ANNE KANGETHE, PharmD, MPH, PhD; LINDSAY C. SPEICHER, JD; and SERVI BARRIENTOS, BS, Magellan Rx Management, Middletown, Rhode Island. CHRISTOPHER ZACKER, RPh, PhD, Novartis, East Hanover, New Jersey.

AUTHOR CORRESPONDENCE: Lindsay C. Speicher, JD, Magellan Rx Management, 88 Silva Ln., Tech 4, Ste. 110, Middletown, RI 02842. Tel.: 401.344.1105; E-mail: lspeicher@magellanhealth.com.

DISCLOSURES

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APPENDIX A Diagnosis Definitions

Condition	ICD-9-CM Codes	ICD-10-CM Codes
Breast cancer	<i>Female:</i> 174.0, 174.1, 174.2, 174.3, 174.4, 174.5, 174.6, 174.8, 174.9 <i>Male:</i> 175.0, 175.9	<i>Female:</i> C50.019 C50.119 C50.219 C50.319 C50.419 C50.519 C50.619 C50.819 C50.919 <i>Male:</i> C50.029, C50.929
Lung cancer	62.0, 162.2, 162.3, 162.4, 162.5, 162.8, 162.9 <i>Pleura:</i> 163.0, 163.1, 163.8, 163.9	C33, C34.00, C34.10, C34.2, C34.30, C34.80, C34.90 <i>Pleura:</i> C38.4
Melanoma	172.1, 172.2, 172.3, 172.4, 172.5, 172.6, 172.7, 172.8, 172.9	C43.0, D03.0, C43.10, D03.10, D03.11, D03.12, C43.20, D03.20, D03.21, D03.22, C43.30, C43.31, C43.39, D03.30, D03.39, C43.4, D03.4, C43.59, D03.51, D03.52, D03.59, C43.60, D03.60, D03.61, D03.62, C43.70, D03.70, D03.71, D03.72, C43.8, D03.8, C43.9, D03.9
CML	205.10, 205.11, 205.12	C92.10, C92.11, C92.12

CML=chronic myelogenous leukemia; ICD-9/10-CM=International Classification of Diseases, Ninth/Tenth Revision, Clinical Modification.

APPENDIX B CMS OCM Crosswalk for Adaptation to Commercial Data

Section	CMS Documentation	Commercial Adaptation	Rationale for Transition
1.1.1	Episodes are triggered via Part B or Part D claims for chemotherapy	Use all medical (CMS-1500/UB-04) claims in place of Part B and all ambulatory pharmacy (NCPDP) claims in place of Part D.	Commercial insurance does not have Part B or Part D claim types designed in the same way as Medicare. Medical (e.g., CMS-1500, UB-04) and pharmacy claims (NCPDP) are an appropriate alternative.
1.1.1	Qualifying codes are listed in the OCM portal	Use J9000-J9999 (drug codes) or 96400, 96408, 96425, 96520, and 96530 (chemotherapy admin codes) for medical chemotherapy claims and FDB Standard Therapeutic Class 30 for a list of NDC numbers until the CMS code sets are available.	Only OCM providers can access the portal that contains the specific procedure and drug codes required for identification of trigger events, and receipt of the exact code list will not take place until official enrollment in the OCM program. Procedure codes used for medical chemotherapy claims and FDB Standard Therapeutic Class 30 were used for a list of NDC numbers.
1.1.2	Beneficiary is enrolled in Medicare Parts A and B	Member is eligible for both medical and pharmacy benefit.	Eligibility criteria must be modified for commercial adoption.
1.1.2	Beneficiary does not receive the Medicare ESRD benefit	N/A	Eligibility criteria must be modified for commercial adoption.
1.1.2	Beneficiary has Medicare as his or her primary payer	Exclude patients for whom the plan is a secondary payer.	Eligibility criteria must be modified for commercial adoption.
1.1.2	Beneficiary is not covered under Medicare Advantage or any other group health program	N/A	Eligibility criteria must be modified for commercial adoption.
1.1.2	[No mention of continuous eligibility]	Exclude episodes in which the member loses eligibility before the end of the 6-month episode.	Eligibility criteria must be modified for commercial adoption. As in OCM, if the patient dies or elects to receive hospice care before the end of 6 months, he or she is still considered episode eligible. Also, in accordance with the OCM methodology, this implementation allowed for an episode to be shorter than 6 months in duration only if the patient died during the episode.
1.1.3	Assignment of cancer type	This adaptation of the OCM model was concerned with 4 cancer types: breast, lung, melanoma, and CML. Therefore, 1 of these 4 cancer types was assigned based on the number of diagnosis codes accumulated over claims with E&M codes.	The cancer type is assigned using claim diagnosis codes occurring on claims with E&M procedure codes. The E&M code range considered for this purpose is 99201-99205 or 99211-99215. As with the other code listings, the exact diagnosis coding specified by CMS is only available to entities participating in OCM via the provider portal.

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APPENDIX B CMS OCM Crosswalk for Adaptation to Commercial Data *(continued)*

Section	CMS Documentation	Commercial Adaptation	Rationale for Transition
1.2	Use the Part B carrier file to identify E&M visits	Use medical claims (CMS-1500/UB-04) with the exception of inpatient claims. Episodes that can be attributed to providers whose specialty does not necessarily lend itself to being included in oncology episodes (e.g., a patient sees a psychiatrist several times during an episode period resulting in that provider having the highest number of E&M claims and having reported the cancer diagnosis, since it is a major contributor to the patient's mental health) should be disqualified. The remainder of this section of the OCM methodology should be implementable in a commercial setting.	Although the terminology is not used in the OCM documentation, this implementation referred to the provider for which an episode is attributed to as the principally accountable provider. Episodes are attributed by tax ID to the practice associated with the most E&M visits with a cancer diagnosis during the 6-month episode with details included on how to break ties.
1.2	[Data errors not addressed]	If no attributable provider can be found then delete the episode	OCM states a methodology to attribute a particular provider to an episode. There were a few cases in which executing those rules did not identify a provider but identified a provider ID for a large practice. Further rules could be developed to account for these rare circumstances.
2.1	Parts A and B expenditures come from the Inpatient, SNF, Outpatient, Carrier, DMEPOS, HHA, and Hospice claims files. Medicare expenditures will be adjusted to exclude indirect medical education and disproportionate share hospital payments, as well as inpatient pass through amounts, which include direct graduate medical education, capital-related costs, and bad debt.	Use medical (CMS-1500/UB-04) claims. Significant adaptations were necessary to implement this methodology in a commercial population.	Most of these types of expenditures are not directly related to services provided; therefore, this does not pose a problem when using commercial administrative medical and pharmacy claims data.
2.1	Part D expenditures come from the Part D claims files and include only the LICS amount and 80% of the GDCA threshold.	Use pharmacy (NCPDP) claims	These populations and calculations are not applicable to a commercial population.
2.1	Parts A and B expenditures will be sourced from CMS standardized payment files	Standardize payments to remove geographic variation. One way is to calculate the median cost per unit for all CPT/revenue codes and use this as the standardized calculation.	In this implementation, regional health plans were used to minimize these differences. There are also differences in contracted rates in commercial data that may lead to similar bias in the results. In order to minimize some of these differences, standardized pricing was developed at the procedure code level by using the median price per unit for each procedure code.
2.1		A safeguard needs to be in place to account for misbilling of J-code units as well as miscellaneous J-code billing.	J-code units are inconsistently reported, which can substantially affect calculated baseline prices.
2.2	In the event that an OCM beneficiary was aligned with other CMS models during the baseline period, baseline expenditures will be adjusted accordingly.	Consider excluding episodes that conflict with other payment initiatives.	Patients who had overlapping alternative payment models from the data were removed to account for oncology episode-based payments that overlap with other active payment models, such as accountable care organizations.
2.3	Sequestration adjustment	N/A	This adjustment does not apply to the commercial population.

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APPENDIX B CMS OCM Crosswalk for Adaptation to Commercial Data (continued)

Section	CMS Documentation	Commercial Adaptation	Rationale for Transition
3.1.1	Predictive model	Differences exist in reimbursement structure between Medicare and commercial plans and even between commercial plans. An actuarially sound model unique to each commercial plan based on its data plus perhaps a national benchmark should be considered.	The particular model used in this study <i>cannot</i> be used for other commercial data in a way that is fair to providers. The CMS model is generated using a file of national Medicare data. This model used data from the entire commercial health plan as an alternative, since it should be representative of the universe of patients and physicians that would participate in oncology episodes. CMS performed modeling on the national data in order to choose a list of significant covariates to include in the predictive model. CMS included variables such as age, sex, select noncancer comorbidities, and receipt of bone marrow transplant. In this study, administrative medical claims were used. After analyzing several years of data, only sex, age, cancer type, and comorbidity index were included as the covariates in the predictive model. Each health plan would need to adapt actuarially developed covariates. This study performed weighting in the same manner as described in the OCM methodology document.
3.2.1	Trend factor	This model assumed participation of all providers and this adjustment was not performed; however, if there are nonparticipating providers in an episode-based payment initiative, covariates from the generalized linear model can be applied to calculate the trend factor as detailed in the OCM methodology document.	Nonparticipating providers do not exist for purposes of this analysis and may not if a plan forces all providers to participate in the OCM. If it is decided that all practices must participate in the episode-based payment model, this section will not be applicable.
3.2.2	Novel therapy adjustment	Individual plans must determine how to handle novel therapies.	If the drug meets criteria to be considered a new agent and the proportion of the practice's new drug expenditures to total expenditures is higher than nonparticipating providers, the baseline prices will be adjusted. If, in a commercial adaptation of OCM, the plan has nonparticipating providers and has data for the providers, CMS methodology may be used.

CML=chronic myelogenous leukemia; CMS=Center for Medicare & Medicaid Innovation; CPT=Current Procedural Terminology; DMEPOS=Durable Medical Equipment, Prosthetics, Orthotics, and Supplies; E&M=evaluation and management; ESRD=end-stage renal disease; FDB=First Data Bank; GDCA=Gross Drug Cost above the Catastrophic; HHA=Home Health Agency; ID=identification; LICs=low-income cost-sharing subsidy; NA=not available; NCPDP=National Council for Prescription Drug Programs; NDC=National Drug Code; OCM=Oncology Care Model; SNF=skilled nursing facility.