Healthcare Systems and Services Practice

Extending the use of episode analytics beyond alternative payment models

A scalable architecture for improving payer performance

Adi Kumar, Paul Kamel, Raymond Dong, Christa Moss, Tom Latkovic, and David Nuzum

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Payers (and providers) that have dismissed bundled payments or treated it as a narrow part of their strategies may under-appreciate the value of episode analytics in improving core business functions.

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Episode-based payment (or bundled payment) has been adopted by a large number of public and private payers over the past five to seven years because it holds the potential to achieve faster and more consistent impact than other alternative payment models.[1,2] For example, Horizon Blue Cross reported that its episodes program reduced the hospital readmission rate after hip replacement by 37% and the rate of C-sections among pregnant women by 32%.[3] In Tennessee, episode-based payment lowered the cost of managing asthma exacerbations in the Medicaid population by 9%.[4]

Yet, despite its demonstrated effectiveness, many payers have under-invested in episode analytic capabilities, believing that total-cost-of-care payment models and other strategies eliminate the need to measure performance for clinical episodes of care. Our perspective (and experience) is to the contrary—we believe that episode analytics are foundational for efforts to improve the quality and efficiency of healthcare, whether in the context of fee-for-service reimbursement, total-cost-of-care models, or other alternative payment approaches.

Furthermore, as the use of episode-based payment has expanded, the analytic capabilities to support it have become more scalable, efficient, and sophisticated. Advances in technical proficiency (e.g., risk adjustment)—enabled by big data, more sophisticated analytical methods, and better visualization technologies—have made episode analytics a more flexible tool and improved the comparisons it can make. These advances have increased the scalability of episode analytics and made it possible to extend the tool's use to other applications beyond payment.

Below, we summarize recent experience with episode-based payment and then discuss six ways payers—and risk-bearing providers—can use episode analytics for applications other than payment. These additional applications include:

- Enhancing network design

- Sharing provider performance transparency

- Directing efficient referral management

- Enabling consumer shopping

- Improving utilization management initiatives

- Optimizing case management strategies

Like episode-based payment, each of these strategies can improve the quality and affordability of healthcare (Exhibit 1).

[1]Caffrey M. NJ's Horizon BCBS pays $3M in shared savings for episodes of care; readmissions, C-sections reduced. *American Journal of Managed Care* blog. February 18, 2016.

[2]Tennessee Division of Health Care Finance and Administration. TennCare's new approach to payment shows savings. October 26, 2016.

[3]Caffrey M. NJ's Horizon BCBS pays $3M in shared savings for episodes of care, C-sections reduced. *American Journal of Managed Care* blog. February 18, 2016.

[4]Tennessee Division of Health Care Finance and Administration. TennCare's new approach to payment shows savings. October 26, 2016.
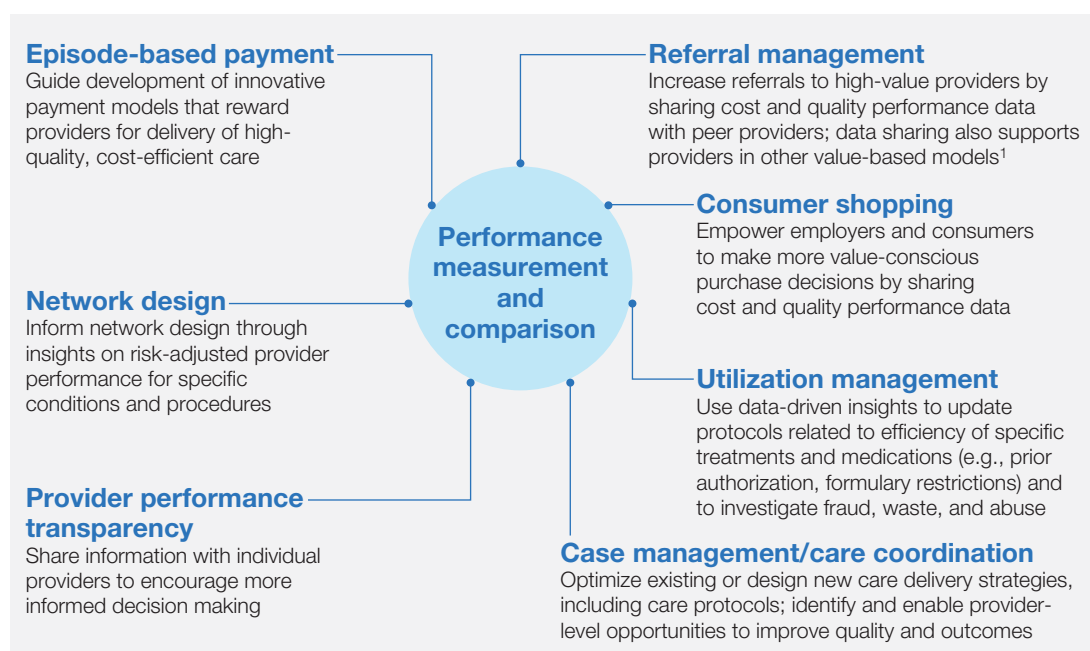
Episode-based payment

The concept of payment based on "episodes of care" has been around for decades and has slowly gained traction in the United States. Episode-based payment was initially piloted in the private sector; examples include Geisinger's ProvenCare bundles and the Prometheus® Payment program. Its use increased after the Centers for Medicare and Medicaid Services (CMS) launched the Bundled Payment for Care Improvement (BPCI) initiative and several states instituted multi-health insurer episode programs using State Innovation Model grants. For example, Ohio has implemented 40+ episodes and has also made public the details behind

each episode design. While CMS has currently halted the adoption of mandatory payment models, certain leaders have expressed a willingness to revisit this decision.[5] Moreover, CMS has confirmed the introduction of a new voluntary payment model, BPCI Advanced, which will qualify as an Advanced Alternative Payment Model under CMS's Quality Payment Program. This could further fuel the adoption of episode-based payment.

Many early adopters—not just Horizon Blue Cross and Tennessee—are seeing results. For example, Baptist Health System in Texas found that the use of episodes for total joint replacement decreased average post-acute care
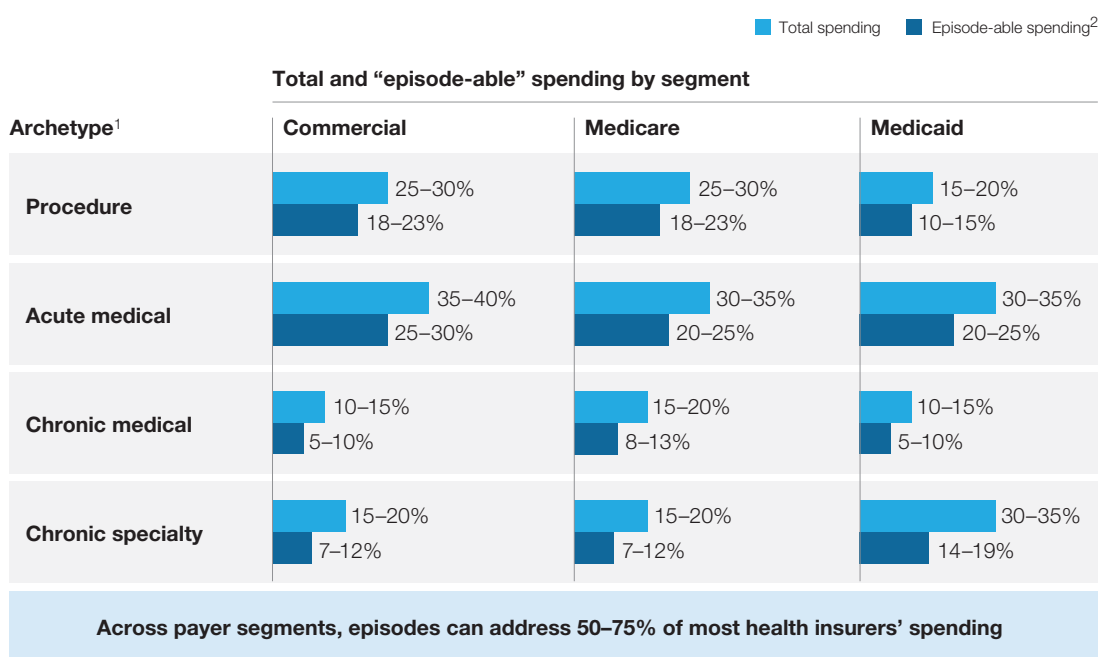

EXHIBIT 1 **Health insurers can benefit from episode analytics in at least 7 different ways**

Episode-based payment
Guide development of innovative payment models that reward providers for delivery of high-quality, cost-efficient care

Referral management
Increase referrals to high-value providers by sharing cost and quality performance data with peer providers; data sharing also supports providers in other value-based models[1]

Consumer shopping
Empower employers and consumers to make more value-conscious purchase decisions by sharing cost and quality performance data

Performance measurement and comparison

Network design
Inform network design through insights on risk-adjusted provider performance for specific conditions and procedures

Utilization management
Use data-driven insights to update protocols related to efficiency of specific treatments and medications (e.g., prior authorization, formulary restrictions) and to investigate fraud, waste, and abuse

Provider performance transparency
Share information with individual providers to encourage more informed decision making

Case management/care coordination
Optimize existing or design new care delivery strategies, including care protocols; identify and enable provider-level opportunities to improve quality and outcomes

[1]For example, a primary care provider eligible for shared savings could use performance data to inform referrals to lower the total cost of care.

[5]CMS. Final rule: Medicare program; cancellation of advancing care coordination through episode payment and cardiac rehabilitation incentive payment models; changes to comprehensive care for joint replacement payment model: extreme and uncontrollable circumstances policy for the comprehensive care for joint replacement payment model. *Federal Register*. December 1, 2017.

EXHIBIT 2 **Episode analytics could potentially address up to three-quarters
of most health insurers' spending**

■ Total spending   ■ Episode-able spending[2]

Total and "episode-able" spending by segment

Archetype[1]	Commercial		Medicare		Medicaid	
Procedure	25–30%	18–23%	25–30%	18–23%	15–20%	10–15%
Acute medical	35–40%	25–30%	30–35%	20–25%	30–35%	20–25%
Chronic medical	10–15%	5–10%	15–20%	8–13%	10–15%	5–10%
Chronic specialty	15–20%	7–12%	15–20%	7–12%	30–35%	14–19%

Across payer segments, episodes can address 50–75% of most health insurers' spending

[1] Example of each archetype: procedure (joint replacement), acute medical (asthma exacerbation), chronic medical (chronic pain), chronic specialty (cancer).
[2] "Episode-able spending" excludes the costs incurred by patients with atypical clinical journeys.

Source: Multiple blinded claims data sources

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spending by 27%, largely because of fewer inpatient rehabilitation and skilled nursing facility (SNF) admissions. At Baptist, spending decreased without any harm to patient outcomes; in fact, there was a slight decline in the readmission rate.[6] After the Arkansas Medicaid program applied the episode construct to the management of attention deficit hyperactivity disorder, average episode costs dropped 22%.[7]

Despite the effectiveness of episode-based payment, some healthcare industry stakeholders have been reluctant to fully embrace the model. Often-cited reasons include:

• The misperception that the model applies only to acute procedural episodes

• The experience (now dated) of some industry stakeholders that episodes are complex to design and administer

• A concern that episode-based payment would conflict with the movement toward capitation or another total-cost-of-care payment model

In reality, episode-based payment approaches have been successfully deployed for a wide range of acute medical, chronic medical, and behavioral health

[6]Navathe AS et al. Cost of joint replacement using bundled payment models. *JAMA Internal Medicine*. 2017;177:214-22.
[7]Arkansas Health Care Payment Improvement Initiative. *Second Annual Statewide Tracking Report*. January 2016.

conditions. When episodes for different conditions are aggregated, we have found that episode-based payment can affect at least half, and perhaps three-quarters, of a health insurer's total spending (Exhibit 2). We estimate that the use of episode analytics for payment innovation can result in 6% to 18% savings on an insurer's total book of business.

Furthermore, improvements in episode analytic capabilities have made possible successful deployments at a scale greater than the number of accountable care organizations (ACOs) would suggest (we estimate that more than 10,000 providers in the United States currently receive episode-based performance reports, compared with fewer than 1,000 ACOs.) In some cases, episode-based payment has been deployed in concert with total-cost-of-care arrangements—an ACO or primary care group is held responsible for managing a population of patients effectively (including, but not limited to, specialist referrals); the specialists are rewarded for managing an episode of care effectively.

We have found that the efficacy of episode-based payment can be attributed primarily to the approach's specificity in isolating actionable opportunities for improvement (e.g., decisions about high-tech imaging, treatment substitutions, or sites of care). Not only can such decisions be isolated within an episode of care, they can also be placed in a clinical context that is intuitive to providers and matches what patients experience when they then engage with the healthcare system. As we outline, this advantage can be extended to performance improvement levers beyond incentive design.

Network design

Health plans based on narrow provider networks are becoming more prevalent and more acceptable to both consumers and employers.[8] More than half of the health plans offered through the public exchanges in 2017 were based on narrow networks, and employers are showing increased interest in narrow networks to help manage health benefits spending.[9,10] The provider-performance comparisons made possible through episode analytics can be used to design narrow "value" networks that focus on care quality as well as costs—avoiding the trap that can result if providers (especially specialists) are assessed only on the unit cost of single billed services. Episode analytics also make it possible to examine the total costs incurred for a specific condition or procedure—not just what is paid directly to a single provider.[11] Insurers or clinically integrated networks can use these comparisons to determine which providers to include in a network (or in different tiers of a network) so they can steer members to high-value practitioners.

Exhibit 3 illustrates how different the results can be if a health insurer were to judge provider performance based on total risk-adjusted episode costs across multiple patients rather than the amount each provider charges for a given procedure (in this case, bypass surgery). Initially, surgeon A (in blue) appears to be the lowest-cost provider; surgeon T (in orange) seems to be one of the most expensive. However, a range of factors—the choice of facility for the procedure, length of stay, and post-acute site of care, among

[8] Narrow networks include no more than 70% of the hospitals in a rating area; broad networks typically include many more local hospitals.

[9] Hutchins Coe E et al. Hospital networks: Perspective from four years of the individual market exchanges. McKinsey Center for U.S. Health System Reform. May 2017.

[10] Finn P et al. Growing employer interest in innovative ways to control healthcare costs. McKinsey white paper. April 2017.

[11] Episode analytics also allow insurers to assess a specialist's performance during multiple similar episodes to derive an aggregate, weighted, risk-adjusted metric that can then be compared with similar metrics for other providers. The performance of cardiothoracic surgeons, for example, can be analyzed based on total costs for stent placement and valve surgery, as well as bypass surgery.

others—influence total bypass surgery costs.[12] Most of these factors are under a surgeon's control. When total risk-adjusted costs are calculated, surgeon A turns out to be much more expensive than surgeon T.

Admittedly, total risk-adjusted costs should not be the only factor used when health insurers are deciding which providers to include in their networks. Rather, this information should be considered along with other factors, such as provider concentration by service line in a geographic area. However, episode analytics can provide a more relevant comparison amongst providers than other methods often employed.

Provider performance transparency

Health insurers can share quality and cost data with providers to help them better understand their current practice patterns and enable them to benchmark their performance against others. Although some providers view this type of information sharing simply as a precursor to payment incentives, research has shown that it can change provider behaviors even in the absence of financial incentives. In a recent study, primary care clinicians were evaluated based on how often they prescribed antibiotics according to guide-
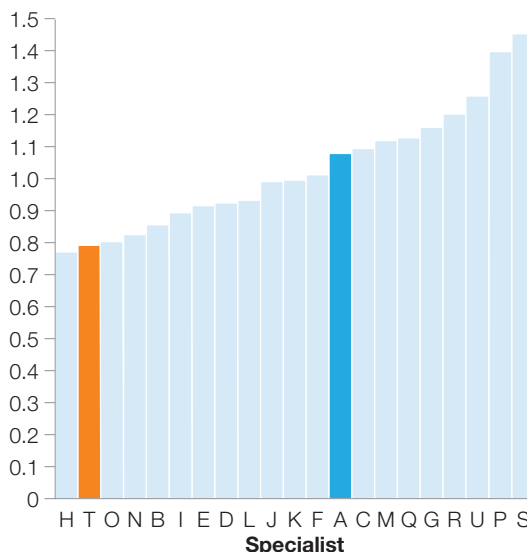
EXHIBIT 3 **Total risk-adjusted episode costs offer a different perspective on provider performance than procedure-only costs do**

Relative specialist cost performance for bypass surgery (relative spending normalized to mean)

Reported professional claim cost per patient[1]
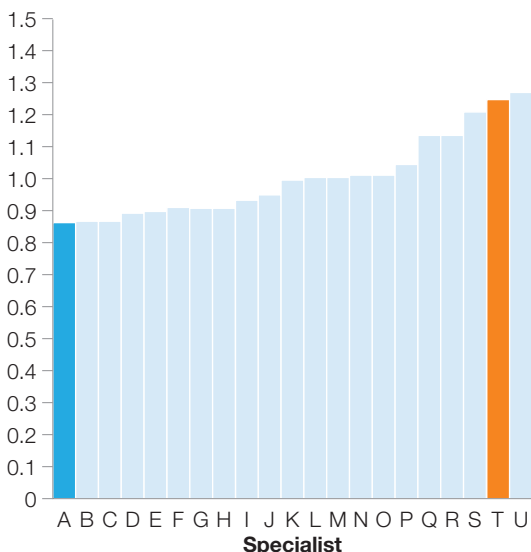
Total risk-adjusted episode cost per patient

[1] Defined as total cost associated with the surgeon during the procedure and associated inpatient stay.

Source: McKinsey analysis of data from one state's Medicaid fee-for-service program

[12] Using episode analytics, it is also possible to "normalize" inpatient facility costs to allow for a more accurate comparison based solely on specialist performance (unit cost and utilization).

lines.[13] Those in the top decile of performance received emails applauding them as "top performers"; the others were sent emails designated them as "not a top performer" and given information about their inappropriate antibiotic use. Within 18 months, the rate of inappropriate prescriptions fell from 19.9% to 3.7%.

Episode analytics can strengthen efforts such as this because a clinician's performance can be evaluated not just on a single behavior, but also on the end-to-end care pathway for a given condition or procedure. Exhibit 4 illustrates how episode analytics can be used to compare how often orthopedic surgeons order inpatient rehabilitation or SNF admission for patients with the same risk level.[14]
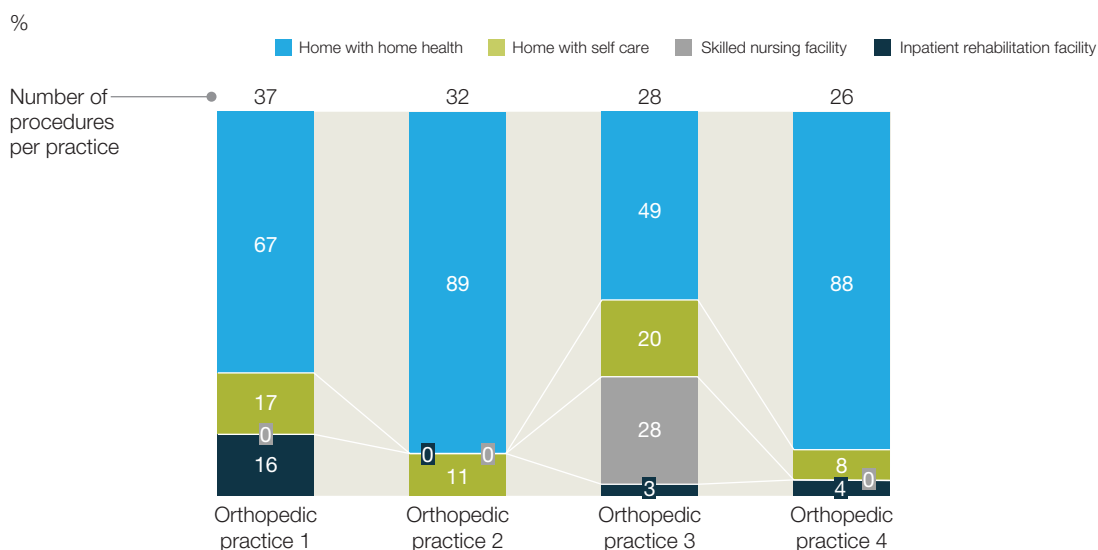
By making surgeons aware of such variations, health insurers could encourage more of them to discharge patients to lower-acuity, less expensive sites of care whenever doing so is clinically appropriate.

Referral management

Episode analytics data can help clinicians understand which other providers their patients are seeing, giving them a more complete view of the patients' care. Additionally, knowing how well other providers (e.g., specialists, hospitals, post-acute facilities) score on performance metrics can enable clinicians to make more informed referral decisions. Both situations can help increase communication and

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EXHIBIT 4   **Physicians' discharge patterns for similar patients often vary widely, even within a single region**

Location of post-discharge care following total joint replacement episodes for a single patient risk group[1]

%

Legend: ■ Home with home health ■ Home with self care ■ Skilled nursing facility ■ Inpatient rehabilitation facility

Number of procedures per practice: 37, 32, 28, 26

	Orthopedic practice 1	Orthopedic practice 2	Orthopedic practice 3	Orthopedic practice 4
Home with home health	67	89	49	88
Home with self care	17	0	20	8
Skilled nursing facility	0	0	28	4
Inpatient rehabilitation facility	16	11	3	0

[1] Comparability of patients' risk status was determined based on their initial admission MS-DRG (medical severity–diagnosis related group).

Source: McKinsey analysis of data from the Truven Health Analytics Inc., MarketScan Commercial database

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[13] Meeker D et al. Effect of behavioral interventions on inappropriate antibiotic prescribing among primary care practices. *JAMA*. 2016;315:562-570.

[14] Patients' risk levels were defined based on their initial admission MS-DRG (medical severity–diagnosis related group) code. Note that the data in Exhibit 4 came from a single metropolitan statistical area. Thus, neither risk nor geography account for the differences in provider behavior.
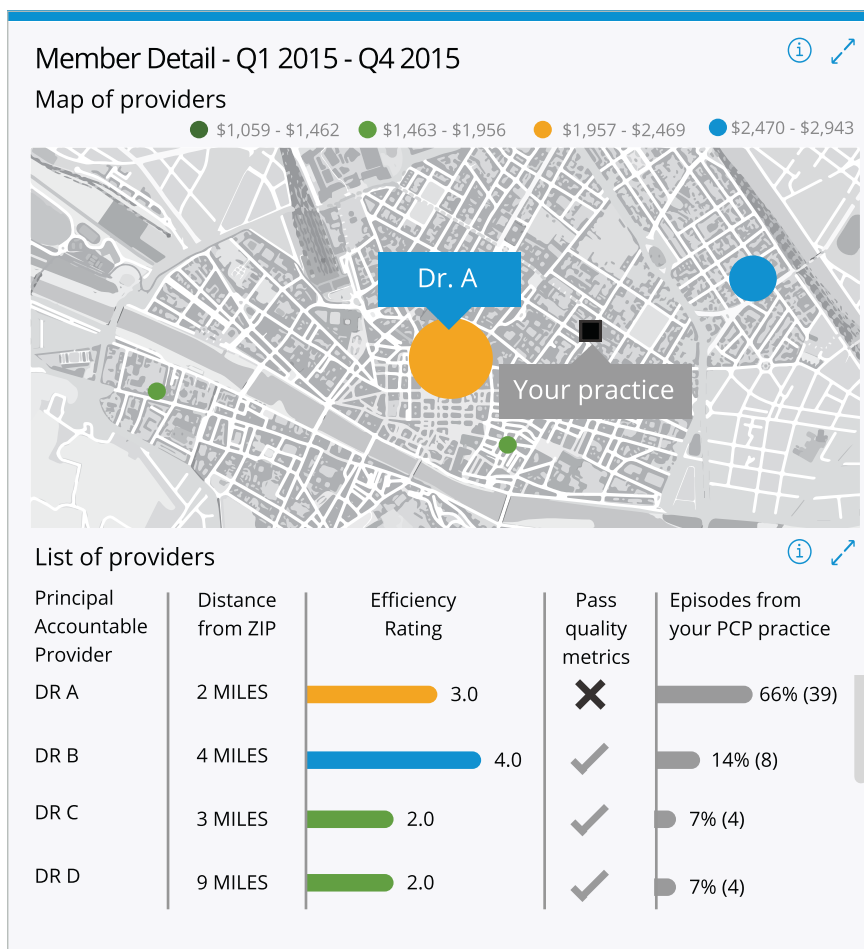
encourage team-based care, which in turn can enable further improvements in cost and quality.

Exhibit 5 gives an illustration of how one health insurer is using episode analytics to help a primary care practice better determine where to refer patients (in this example, for planned cardiac catheterizations). Episode analytics could permit the primary care practice to

compare local interventional cardiologists based on the quality and risk-adjusted cost data in its claims records. As Exhibit 5 shows, two-thirds of the practice's patients are being referred to the closest interventional cardiologist, but that clinician's episode costs are comparatively high. By referring more patients to the cardiologist located only a mile further away, the practice can ensure that its patients receive high-quality, higher-value care.

EXHIBIT 5 **Primary care practices can optimize referral efficiency with episode analytics**

ILLUSTRATIVE

Member Detail - Q1 2015 - Q4 2015

Map of providers

● $1,059 - $1,462　● $1,463 - $1,956　● $1,957 - $2,469　● $2,470 - $2,943

Dr. A

Your practice

List of providers

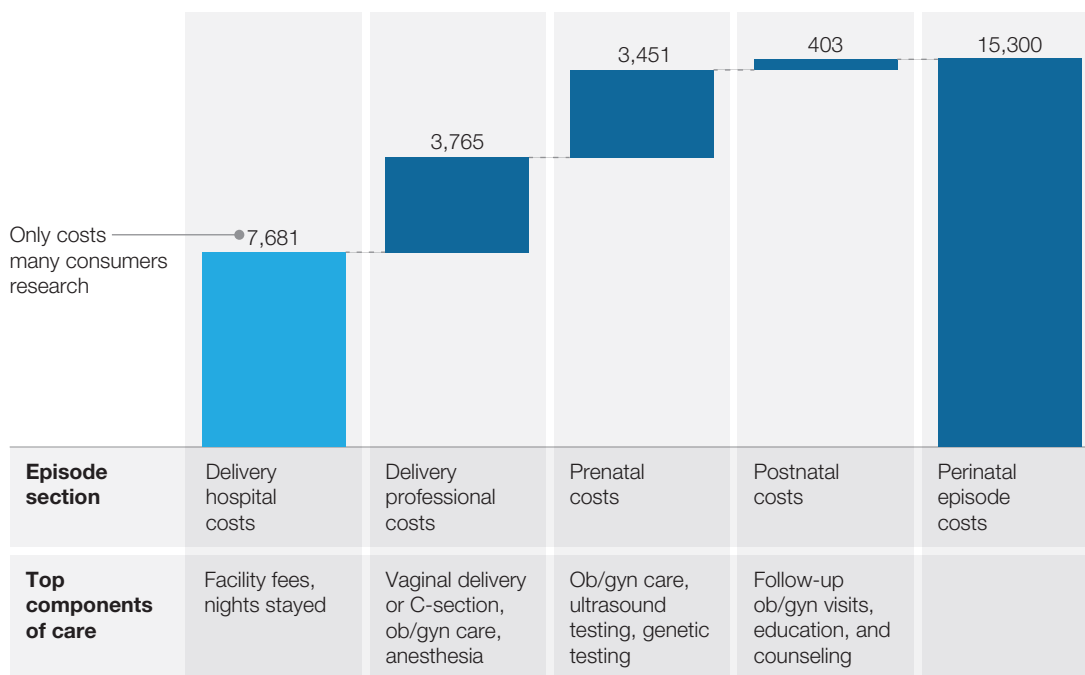| Principal Accountable Provider	Distance from ZIP	Efficiency Rating	Pass quality metrics	Episodes from your PCP practice
DR A	2 MILES	3.0	✗	66% (39)
DR B	4 MILES	4.0	✓	14% (8)
DR C	3 MILES	2.0	✓	7% (4)
DR D	9 MILES	2.0	✓	7% (4)

PCP, primary care provider.

Consumer shopping

Several converging trends (e.g., higher cost sharing and the increasing prevalence of narrow networks) have been encouraging the rise of healthcare consumerism. By sharing provider performance metrics with consumers, health insurers could encourage them to make more informed decisions. Episode analytics is well suited for this purpose because it offers visibility into costs throughout an entire episode of care and thus can help consumers understand that the direct cost of a procedure is often only a fraction of total costs.

Exhibit 6 breaks down the typical cost to an insurer of a normal perinatal episode (from the pregnancy's start to three months after birth). It shows that the cost of the inpatient stay (something many consumers investigate) is only about half of total costs. The other half reflects prenatal care (e.g., ultrasounds, genetic testing, obstetric check-ups), clinicians' fees during delivery (e.g., for anesthesia), and post-natal care (e.g., follow-up clinician visits). How much of the cost is passed on to the patient depends on a range of factors, including insurance status, deductible level, and

EXHIBIT 6 **Total episode costs often encompass far more than most consumers realize**

Total episode costs for pregnancy and childbirth, $

Episode section	Delivery hospital costs	Delivery professional costs	Prenatal costs	Postnatal costs	Perinatal episode costs
	7,681	3,765	3,451	403	15,300
Top components of care	Facility fees, nights stayed	Vaginal delivery or C-section, ob/gyn care, anesthesia	Ob/gyn care, ultrasound testing, genetic testing	Follow-up ob/gyn visits, education, and counseling	

Only costs many consumers research (7,681)

C-section, cesarean section; ob/gyn, obstetrics/gynecology.
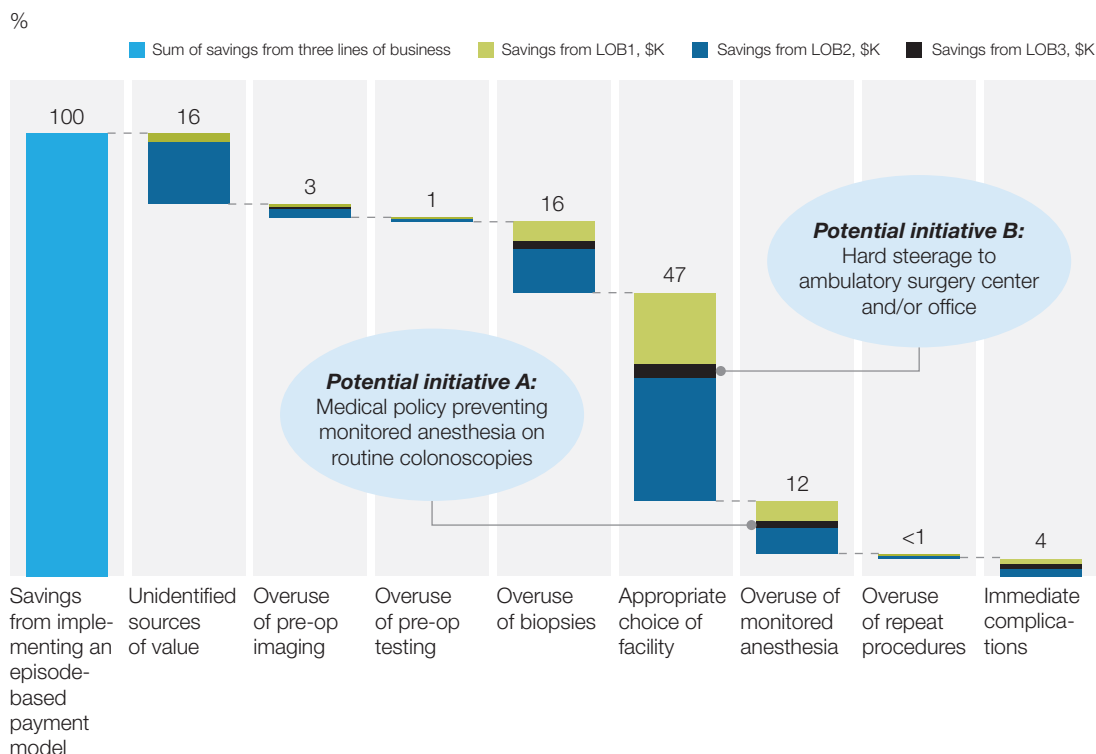Source: McKinsey analysis of data from the Truven Health Analytics Inc., MarketScan Commercial database

the provider's network status. A break-down such as the one in Exhibit 6 could help consumers better determine the costs they may face.

Some health insurers and employers have already started giving consumers visibility into costs using the episode construct. For example, one insurer has created an application that enables con-sumers to see market prices for more than 700 services and 500 episodes

of care and to receive estimates of their individual share of costs.[15] Another insurer has coupled information sharing with strategic changes to benefit design (e.g., increasing the cost-sharing level when consumers select high-cost providers) to achieve dramatic results. This approach, implemented for hip and knee replacement surgery, resulted in a 21% increase in the use of preferred hospitals and a 37% decrease in the amount charged by more expensive hospitals within two years.[16]

EXHIBIT 7 **Episode analytics can identify variations in provider practice and opportunities for medical cost savings**

Episode example: Potential savings identified in colonoscopy[1]

%

Legend:
- Sum of savings from three lines of business
- Savings from LOB1, $K
- Savings from LOB2, $K
- Savings from LOB3, $K

Bar values: 100, 16, 3, 1, 16, 47, 12, <1, 4

Potential initiative B: Hard steerage to ambulatory surgery center and/or office

Potential initiative A: Medical policy preventing monitored anesthesia on routine colonoscopies

Categories (x-axis): Savings from implementing an episode-based payment model | Unidentified sources of value | Overuse of pre-op imaging | Overuse of pre-op testing | Overuse of biopsies | Appropriate choice of facility | Overuse of monitored anesthesia | Overuse of repeat procedures | Immediate complications

LOB, line of business.
[1]Savings estimated by lowering utilization/spend for providers in the 75th–100th percentile down to the 75th percentile, and lowering utilization/spend for providers in the 50th–75th percentile down to the 50th percentile.

Source: McKinsey analysis of data from one commercial payer

[15]Health4Me mobile app now enables United-Healthcare plan parti-cipants to pay their medical bills with their smartphones. *Business Wire*. February 16, 2015.
[16]Terhune C. Hospitals cut some surgery prices after CalPERS caps reimburse-ments. *LA Times*. June 23,2013.

Utilization management

Utilization management (UM) is designed to ensure that all of a health insurer's processes come together so that services are paid for only when they are medically necessary and consistent with medical policy and plan design. Detailed data from episode analytics can help insurers design, implement, and evaluate their medical policies and UM programs, thereby making the programs more effective and efficient (and, in some cases, making it possible to streamline the programs to reduce the burden on providers):

Design. The data can allow insurers to view condition-specific utilization rates proactively to influence a policy's coverage details.

Implementation. UM can be highly resource intensive. The data's granularity allows insurers to target resources to critical areas, thereby reducing resource requirements.

Evaluation. The data can help insurers retroactively identify gaps in blanket medical policies by highlighting conditions or service lines that could benefit from changes (either to decrease medical costs or provide exemptions for necessary care).

Exhibit 7 illustrates how one health insurer is using episode analytics to better study how routine colonoscopies are being performed. As the graph shows, the insurer has an opportunity to better understand the overuse of monitored anesthesia and to assess variations in facility choice (e.g., hospital outpatient versus ambulatory sur-

gical center) that may unnecessarily increase utilization and spending. These analytics can help the insurer develop practical initiatives to improve care while controlling costs, such as tightening its medical policies to limit inappropriate monitored anesthesia use or implementing a prior authorization requirement for site of service to prevent over-performance of hospital outpatient colonoscopies.

The granularity offered by episode analytics gives a health insurer a more accurate assessment of such opportunities in at least two ways. First, it stratifies the insurer's members to include only those who would be affected by the policy changes (in this case, patients receiving routine colonoscopies in various settings) and exclude those with atypical clinical journeys (e.g., patients receiving emergency colonoscopies). Second, by identifying provider-level variations in site of care or monitored anesthesia use, it makes possible realistic, peer-driven targets that are potentially more actionable than absolute thresholds. (For example, efforts to reduce monitored anesthesia utilization to a level equivalent to about that used by a 50th-percentile provider have the potential to be more effective than efforts to reduce utilization to a single low number for all providers.)

Case management and care coordination

Case management programs allow health insurers to offer additional support to specific populations, thereby lowering medical costs through better outcomes, appropriate utilization, or both.[17] ACOs and some Advanced Primary Care practices[18] are

[17] Designing and Implementing Medicaid Disease and Care Management Programs. Agency for Healthcare Research and Quality (AHRQ). Content last reviewed by AHRQ October 2014.
[18] Advanced Primary Care practices have met criteria established by CMS based on the principles of patient-centered medical homes.

EXHIBIT 8   **Episode analytics sheds light not only on how many patients are at risk for an opioid overdose, but also on which clinicians are contributing most to the problem**
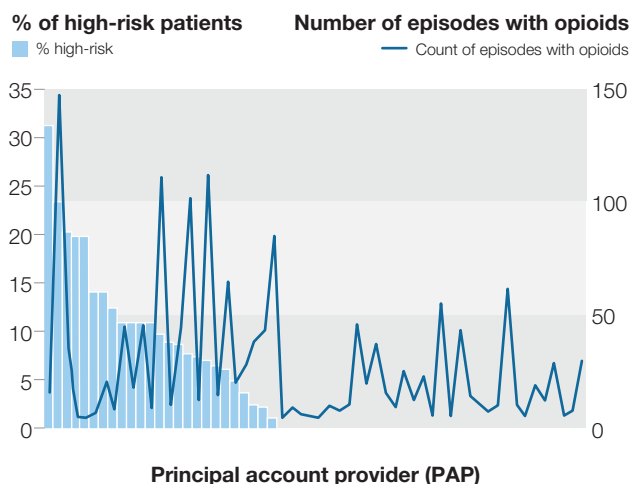
Among the spinal fusion patients in one state, opioid use varied widely, but…

…about 5% to 10% were taking high doses and had received prescriptions from multiple clinicians…
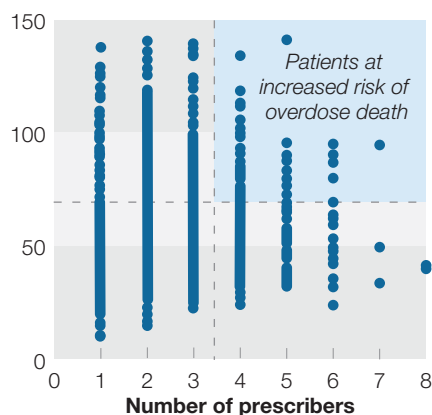
…and more than 70% of those high-risk patients were being cared for by only 10% of the state's spinal fusion PAPs

Average MED per day

Patients at increased risk of overdose death

Number of prescribers

% of high-risk patients
■ % high-risk

Number of episodes with opioids
— Count of episodes with opioids

Principal account provider (PAP)

- For PAPs, only 10% or less of their patients with opioid prescriptions were at high risk for overdose death
- But for nearly 10% of PAPs, more than 20% of their opioid patients were at high risk

MED, morphine equivalent dose.

Source: McKinsey analysis of data from one state's Medicaid fee-for-service program

now adopting similar responsibilities in a manner that is more deeply integrated with care delivery. In either context, episode analytics can enable more effective program design and clinical operations by creating more clinically relevant and patient-centric views of patient needs, provider utilization patterns, and outcomes.[19]

Exhibit 8 illustrates how episode analytics was used by a health insurer to identify patients misusing opioids. The risk of an overdose increases not only when patients take high opioid doses, but also when they obtain prescriptions from four or more clinicians.[20] The insurer used episode analytics to investigate this problem by studying patients who had undergone spinal fusion in one US state. Findings showed that 5% to 10% of the patients were at high risk of overdose because they were taking high drug doses and had filled opioid prescriptions from four or more clinicians within a single 60-day period. Furthermore, about 10% of the principal account providers (PAPs) performing

[19]Garrett B et al. Risk adjustment for retrospective episode-based payment. McKinsey on Healthcare blog post. February 2015.

[20]Gwira Baumblatt JA et al. High-risk use by patients prescribed opioids for pain and its role in overdose deaths. *JAMA Internal Medicine*. 2014;174:796-801.

spinal fusion in that state had taken care of more than 70% of the high-risk patients.

As this example shows, episode analytics can help focus case management resources more effectively for two reasons. First, it can target specific conditions or procedures and their associated patient journeys, which can produce a deeper understanding of on-the-ground realities and a better ability to intervene. Second, it can offer case management teams a system-wide view they may not otherwise see and give providers a longitudinal view of patient behavior.

•   •   •

While the use of episode analytics continues to accelerate in the context of payment innovation, it seems clear that growth solely along this vector leaves tremendous uncaptured value on the table. The six new use cases outlined in this paper, ranging from network design

to care management, showcase how the analytic construct can be applied in innovative ways. All of these use cases rely on the ability of episode analytics to make accurate and fair comparisons at both the patient and provider levels—a significant improvement over the approaches many insurers employ today. Our experience has convinced us that additional savings, increased quality, and a better experience could be realized if insurers extended their use of episode analytics for non-payment purposes. ○

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