



EVIDENCE-INFORMED CASE RATES: A NEW HEALTH CARE PAYMENT MODEL

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ABSTRACT: As a way to address the flaws of traditional payment methods, like fee-for-service and capitation, the authors of this report suggest a new payment model, based on evidence-informed case rates (ECRs). Under this system, providers are paid a single, risk-adjusted payment across inpatient and outpatient settings to care for a patient diagnosed with a specific condition. Working with experts in the health care field, the authors selected 10 conditions for ECR development, examining issues like diagnosis, services covered by the ECR, and criteria for successful completion of care. This new model, say the authors, can improve health care quality, lower administrative burden, enhance transparency, and support a patient-centered, consumer-driven environment. To further promote quality care, the ECR model calls for a portion of the payment to be withheld and re-distributed based on provider performance on measures of clinical process, outcomes of care, and patient experiences.

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EXECUTIVE SUMMARY

The flaws of the traditional fee-for-service and capitation systems are well known. The former—which involves separate payments for each service—has been closely associated with the rapid rise of health insurance premiums, while the latter—which provides a flat fee per patient—can put providers at risk by providing insufficient funds to cover the cost of services rendered. In the United States, both systems have failed to promote coordination among providers or high-quality outcomes for patients.

A new payment model, based on evidence-informed case rates (ECRs), attempts to address these failings. An ECR is a single, risk-adjusted, prospective (or retrospective) payment given to providers across inpatient and outpatient settings to care for a patient diagnosed with a specific condition. Payment amounts are based on the resources required to provide care as recommended in well-accepted clinical guidelines. The ECR model was developed by Prometheus Payment, a nonprofit corporation focused on developing a new health care payment model designed to improve health care quality, lower administrative burden, enhance transparency, and support a patient-centered, consumer-driven environment.¹ To further promote quality care, the Prometheus ECR model calls for a portion of the payment to be withheld and re-distributed based on provider performance on measures of clinical process, outcomes of care, and patient experience with care received.

To model ECRs in a way that would be credible, realistic, and accurately reflect the clinical delivery of care, Prometheus gathered experts in the field and convened five working groups, consisting of medical professionals, health care researchers, and data modeling experts. The working groups selected 10 conditions for ECR development, looking at criteria like prevalence, costs, treatment variation, coordination, and reimbursement, among others. Then, they developed the scope of each ECR, by examining issues like the standard workup required to diagnose the condition, the services covered by the ECR, and criteria for successful completion of care.

To develop an estimate of the base ECR payment, the groups walked a typical patient step-by-step through the relevant clinical practice guidelines, using the following four questions to match costs with guidelines:

1. What are the actual resources (e.g., equipment, facilities, supplies) used to provide the recommended care?
2. Who is most likely to use those resources?

3. Where might this care happen most often?
4. How long will it take (using surrogates of evaluation and management visits for time)?

Table ES-1 shows the visits required to treat stage III colorectal cancer, based on the National Comprehensive Cancer Network’s practice guidelines

Table ES-1. Visits Required to Treat Stage III Colorectal Cancer

Activity	Frequency*	Person
Colonoscopy	1	Gastroenterologist and primary care provider counseling on need for colonoscopy
Visit to review biopsy	1	Gastroenterologist
Appointment regarding surgery	1	Surgeon
Hospital stay and surgery	3 to 5 days	Surgeon and hospital staff
Review data for stage III disease	1	Medical oncologist
Visit social worker	1	Social worker
Visit chemo nurse for teaching	1	Chemotherapy nurse
Decide on drug therapy	1	Medical oncologist
Lab for pre-chemo CBC, CMP, liver, CEA	1	Lab
Meet with clinical trial staff regarding protocol	1	Trial staff
Chemotherapy and follow-up visit every two weeks	24	Medical oncologist, chemo nurse
Potential problems: nausea, diarrhea, fever, etc.	3	Medical oncologist, nurse
One month post therapy: review drug therapy and survivorship likelihood	1	Medical oncologist
Follow-up visit every 3 months	4	Medical oncologist
Disease and case management	Ongoing	Medical oncologist and/or primary care provider

* Frequency refers to visits unless bed days are specified for hospital stays.

Source: Authors’ analysis.

For each condition, the working groups also identified a set of common complications that will change the services required. Future data modeling efforts will determine how the identified complications change the total cost of care. As complications develop, both the scorecard and the price paid for services rendered will change accordingly.

An essential component of the ECR is the performance withhold. Provider performance will be tracked using two methods: 1) the Prometheus scorecard, which is

currently being designed, will include measures of care process, outcomes, and patient experience and 2) normal claims activity. Tracking claims can play an important a role in assessing provider performance—as much as the scorecard—because appropriate performance on a condition can potentially only be known by looking at what services were delivered (or not delivered) to the patient. For example, measuring the right care for back pain is effectively accomplished by using claims data to identify services that should (and, more important, should not) have been provided. Conversely, depression typically has very few encounters, which provide limited detail on whether the patient’s status has changed. In this case, a patient’s status using a standardized clinical assessment tool is necessary.

Next steps in developing and implementing ECRs include data modeling activities; determining which conditions merit development of new ECRs, based on availability of guidelines and potential impact on the payment system; and determining how best to keep ECRs updated as clinical guidelines change. In 2007, Prometheus will select up to four pilot sites and work with local stakeholders to prepare each site for implementation. Current candidates include Brockton, Mass.; Chicago; Memphis, Tenn.; Philadelphia; and San Francisco. Prometheus also expects to develop an additional 50 to 60 ECRs during the next three years to increase the scope of the pilots and cover an increasing portion of the total care delivered in any community.

EVIDENCE-INFORMED CASE RATES: A NEW HEALTH CARE PAYMENT MODEL

INTRODUCTION

The flaws of the traditional fee-for-service and capitation systems are well known. The former—which involves separate payments for each service—has been closely associated with the rapid rise of health insurance premiums, while the latter—which provides a flat fee per patient—can put providers at risk by providing insufficient funds to cover the cost of services rendered. In the United States, both systems have failed to promote coordination among providers or high-quality outcomes for patients.

A new payment model, based on evidence-informed case rates (ECRs), attempts to address these failings. An ECR is a single, risk-adjusted, prospective payment given to providers across inpatient and outpatient settings to care for a patient diagnosed with a specific condition. Payment amounts are based on the resources required to provide care as recommended in well-accepted clinical guidelines. The ECR model was developed by Prometheus Payment, a nonprofit corporation focused on developing a new health care payment model designed to improve health care quality, lower administrative burden, enhance transparency, and support a patient-centered, consumer-driven environment. To further promote quality care, the Prometheus model calls for a portion of the payment to be withheld and re-distributed based on provider performance on measures of clinical process, outcomes of care, and patient experience with care received.

The goal of ECRs is to limit both underuse and overuse, eliminate unwarranted variation, reduce risk selection problems that occur when providers receive the same payment to treat different types of patients, promote clinical integration between providers across disparate settings, and deliver recommended, high-quality care.

To model ECRs in a way that would be credible, realistic, and accurately reflect the clinical delivery of care, Prometheus gathered experts in the field and convened five working groups, consisting of medical professionals, health care researchers, and data modeling experts. The goal of each group was to deliver one or more fully constructed ECRs. Specifically, the groups were charged with:

- choosing the conditions for ECR development;
- selecting clinical practice guidelines for those conditions;
- determining the natural boundaries of the ECR;

- providing a rigorous estimate of the base of the ECR, including the total units of service and the type of provider responsible for delivering those services;
- establishing a reasonable set of performance measures that should be used to evaluate the clinical performance of providers delivering the services included in the ECR;
- participating in and supervising the data modeling of the ECR to determine the extent to which the results were valid; and
- creating estimates for the warranted variation of services that should be added to the base.

SELECTING CONDITIONS FOR ECR DEVELOPMENT

The working groups selected 10 conditions for ECR development (Table 1).² With an eye toward a future pilot program, discussion centered on the following selection criteria:

1. *Conditions have high prevalence or high cost per event.*
2. *There is wide variation in the treatment of the condition.* Team members identified conditions where empirical data suggest treatment does not always follow the best available clinical evidence.
3. *Treatment of the condition requires coordination among multiple providers.* Lack of coordination is a serious problem in the American health care system that lowers the quality of care patients receive.³ By choosing conditions that cross inpatient and outpatient settings, the working groups sought to identify situations where ECRs could promote coordination and reduce underuse, overuse, and misuse of services.
4. *Treatment of the condition requires services that are not currently reimbursed.* Critics of the current system suggest that when it comes to conditions requiring frequent follow-up, many health plans fail to adequately reimburse for necessary services such as case management and time spent providing patient care outside the office setting. In theory, ECRs should help solve these problems by providing a full accounting of the costs required to deliver all services in line with the best available evidence.
5. *Condition has clear boundaries.* For some conditions, choosing a beginning and end state can be a difficult and somewhat arbitrary choice. Such conditions may not be good models for a set of pilot ECRs. With certain exceptions, the working groups agreed that the first set of ECRs should focus on conditions for which beginning and end points could be easily documented by clinicians and would not become issues of contention.⁴

6. *Clinical practice guidelines exist for the condition.* The working groups built their ECRs based on clinical practice guidelines. If a condition does not have a well-accepted set of clinical practice guidelines, there may not be sufficient evidence or expert consensus to make a strong case for the more standardized levels of care that ECRs should promote.

Table 1. Conditions Selected by Working Groups

Working Group	Conditions	Guidelines Chosen
Cancer	<ul style="list-style-type: none"> • Colon cancer • Non-small-cell lung cancer 	National Comprehensive Cancer Network
Cardiac care	<ul style="list-style-type: none"> • Mitral valve regurgitation • Non-ischemic stage C congestive heart failure • ST segment elevated myocardial infarction 	American College of Cardiology/ American Heart Association
Chronic care	<ul style="list-style-type: none"> • Depression • Diabetes mellitus type 2 	Institute for Clinical Systems Improvement
Orthopedics	<ul style="list-style-type: none"> • Knee replacement • Hip replacement 	<i>No one set chosen</i>
Preventive care	<ul style="list-style-type: none"> • All preventive care 	Institute for Clinical Systems Improvement and U.S. Preventive Services Task Force Guidelines

Source: Authors' analysis.

For several of the conditions selected, research suggests there are significant opportunities to promote increased compliance with recommended care (Table 2). Other conditions are expensive to treat or costly if not treated properly. For example, depression treatment has a very high cost impact, in terms of medical management and productivity, on both employers and society overall, making the condition a good candidate for ECR development.

Table 2. Adherence to Quality Indicators in 12 U.S. Metropolitan Areas

Condition	Number of Indicators	Percentage of Recommended Care Received (95% C.I.)
Congestive heart failure	36	63.9 (55.4–72.4)
Depression	14	57.7 (55.2–60.2)
Orthopedic conditions	10	57.2 (50.8–63.7)
Colorectal cancer	12	53.9 (47.5–60.4)
Diabetes mellitus	13	45.4 (42.7–48.3)

Source: E. A. McGlynn et al., “The Quality of Health Care Delivered to Adults in the United States,” *New England Journal of Medicine*, June 26, 2003 348(26):2635–45.

DETERMINING THE NATURAL BOUNDARIES OF ECRS

To finalize the scope of each ECR (i.e., to determine when it begins, when it ends, and when it should no longer be in force) working groups focused on four key questions:

1. What is the clinical description of a typical patient covered by the core ECR?
2. What is the standard workup required to diagnose the condition and establish the appropriateness and scope of the services covered by the ECR?
3. What are the criteria that must be met for a typical patient to be eligible for coverage under the ECR?
4. What are the criteria for successful completion of care for a typical patient covered by the ECR?

Table 3 lists the responses to these questions for ST Segment Elevated Myocardial Infarction (STEMI).

Table 3. Natural Boundaries for
ST Segment Elevated Myocardial Infarction

Boundary	Description
Clinical description of a typical patient	<p>A 64-year-old male without a prior history of ischemic heart disease has the acute onset of sub-sternal chest pain that radiates into his left arm and jaw. He presents to the emergency department within one hour of the onset of pain. He has no prior history of any similar chest pain.</p> <p>Physical examination reveals blood pressure is 145/85, pulse is 105 and regular, and respiratory rate is 28. He is anxious and diaphoretic. Examination of his heart and lungs is unremarkable except for his tachycardia. An EKG reveals an acute anterior myocardial infarction with ST segment elevation in the precordial leads.</p>
Standard workup required to diagnose the condition	<ul style="list-style-type: none"> • History consistent with a diagnosis of an acute myocardial infarction • EKG documentation of ST segment elevation characteristic of evolving acute myocardial infarction
Criteria that must be met for a typical patient to be eligible	<ul style="list-style-type: none"> • History consistent with a diagnosis of an acute myocardial infarction • EKG documentation of ST segment elevation characteristic of evolving acute myocardial infarction • Confirmation of myocardial injury with elevated cardiac enzymes (e.g., CK-MB, troponin)
Criteria for successful completion of care for a typical patient	<ul style="list-style-type: none"> • Subsidence of acute symptoms • Recovery from acute interventions and their sequelae • Discharge from hospital • Completion of post-infarction rehabilitation • First year of follow-up is included in ECR • Lifetime follow-up for coronary artery disease is not included in this ECR • Coronary artery bypass surgery terminates this ECR

Notes: EKG = electrocardiogram, CK-MB = creatine kinase-MB.

Source: Authors' analysis.

The ECR boundary development raises two issues for further discussion: 1) the choice of a typical patient as the focus for the ECR and 2) the boundaries of conditions with unclear beginning and end points.

Using a Typical Patient as the Focus for the ECR

Because patient attributes can change treatment regimens, it is necessary to agree on a patient type before constructing an ECR. In practice, this typical patient may actually be in the vast minority of patients with a given condition. In the case of diabetes mellitus type 2, the working group estimated that only a small percentage of all diabetes patients would fall under the base ECR—most patients have some comorbidity. In this instance, comorbidities are a critical issue: a diabetic with macrovascular disease can increase the

average cost of care by 300 percent.⁵ Such factors must be incorporated into the case rate to prevent any problems with risk selection. To this end, working groups identified factors like comorbidities, clinical status, and demographics that must be empirically tested to determine their influence on costs (Table 4). Moving forward, the Prometheus team will conduct data modeling to determine the extent to which these indicators will change the scope (and reimbursement level) associated with a given ECR.

Table 4. Factors that May Require Increased Services Beyond the Core ECR for ST Segment Elevated Myocardial Infarction

Factors
Acute cardiac dysrhythmias requiring mechanical intervention (e.g., pacemaker)
Acute pump failure requiring mechanical intervention (e.g., intra-aortic balloon pump)
Age
Chronic cardiac dysrhythmias
Chronic heart failure
Diabetes
Dyslipidemia
Gender
Hypertension
Obesity
Pulmonary disease/respiratory failure

Source: Authors' analysis.

Determination of ECR Beginning and End Points

Physicians may be challenged in making a definitive clinical judgment about the beginning and end points of some conditions, as illustrated in the development of an ECR for heart failure, a chronic progressive illness. The Prometheus ECR is restricted to non-ischemic stage C heart failure, where the patient is no longer at risk for heart failure (Stage A) or has a structural disorder of the heart (Stage B), but has past or current symptoms of heart failure associated with structural heart disease. As a result of this restricted definition, it becomes an easier task for a physician to objectively document the ECR trigger. As a corollary, monitoring and treatment will always be required for a patient with non-ischemic stage C heart failure; consequently, the ECR must account for the appropriate periodic assessments for the rest of the patient's life.

In addition to providing clear beginning and end points, Prometheus must also differentiate between onset and maintenance ECRs. Colorectal cancer, for example, is a disease that is very resource-intensive once diagnosed and then requires different levels of follow-up depending on the patient's response to treatment. The disease is fatal in

approximately half of all patients, so many will require long-term nursing care. Without a differentiation in onset and maintenance ECRs, the payment system could theoretically be gamed by providers selecting when to care for patients in order to increase their profits.

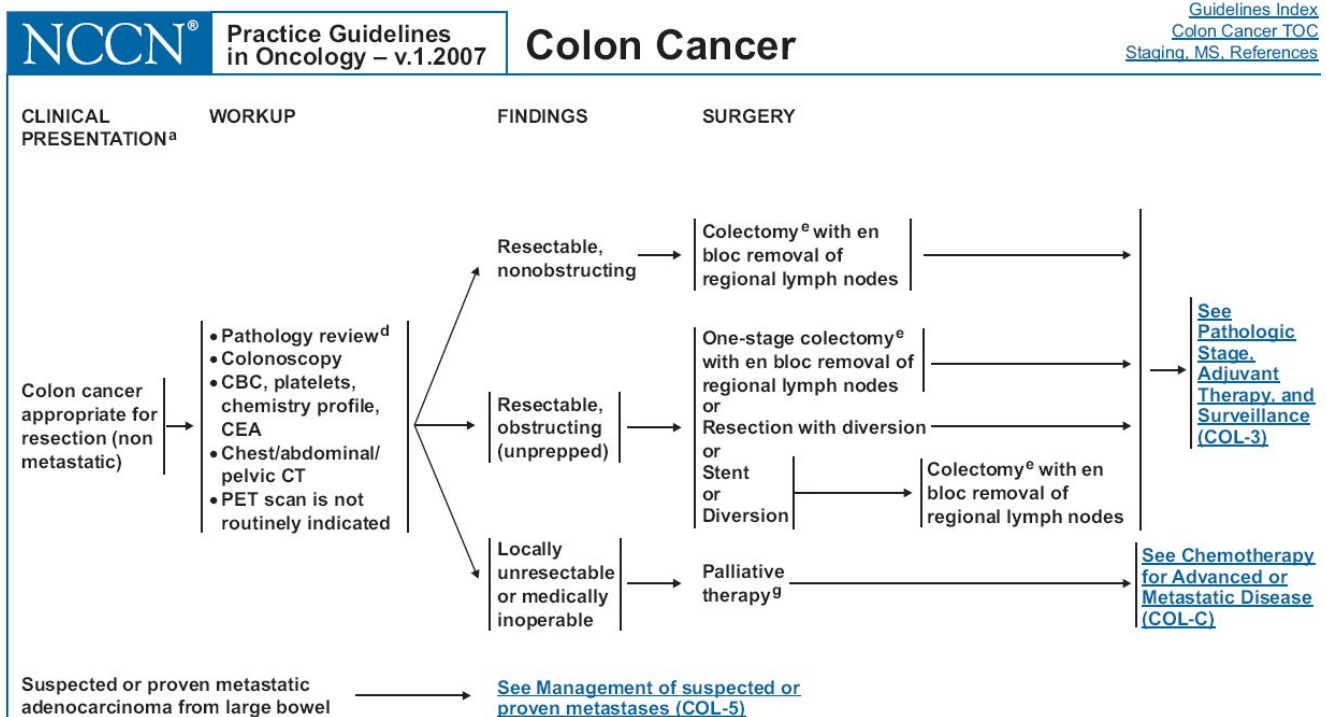
ESTIMATING THE ECR BASE

To develop an estimate of the base ECR payment, working groups walked a typical patient step-by-step through the relevant clinical practice guidelines, using the following four questions to match costs with guidelines:

1. What are the actual resources (e.g., equipment, facilities, supplies) used to provide the recommended care?
2. Who is most likely to use those resources?
3. Where might this care happen most often?
4. How long will it take (using surrogates of evaluation and management visits for time)?

Figure 1 and Tables 5 and 6 show the National Comprehensive Cancer Network’s (NCCN) practice guidelines for stage III colorectal cancer and services needed based on those practice guidelines.

Figure 1. NCCN Practice Guidelines for Stage III Colorectal Cancer



Source: National Comprehensive Cancer Network (http://nccn.org/professionals/physician_gls/PDF/colon.pdf), p. 6.

Table 5. Standard Components of Stage III Colorectal Cancer

Component	Detail	Common Complications
Workup	CBC/chemistries, CEA, CT of abdomen and pelvis, chest CT	Elderly/comorbid may need cardiac workup or clearance; occasionally patients with poor renal, cardiac, or pulmonary function need more testing
Surgical resection	Three-to-five-day stay; some patients get colostomy with teaching, most do not; occasional prolonged stay with ileus; occasional postoperative leaks, infections, and deep vein thrombolosis	Ileus, postoperative leaks, pneumonia, deep vein thrombolosis, obstruction, perforation
Chemotherapy	Most will receive FOLFOX, but some Xeloda or 5FU/leucovorin, unless they are on a clinical trial. Adding Avastin in this setting is not standard care. Chemotherapy requires visits, pump charges, drug charges, CBC/chemistries at every visit, doctor or nurse practitioner charges at every other visit	Dose delays increase numbers of visits; many patients do not get all 12 doses because of neuropathy; oxaliplatin allergies can occur in around 5 percent; 5 percent to 10 percent of patients are hospitalized for three to 10 days with diarrhea (mostly elderly)
Surveillance	Visit every three to six months; CEA every three to six months; CT scans of colon, abdomen, and pelvis every year for three consecutive years for higher-risk patients.	Observation patients may have extra tests provoked by false positive surveillance tests

Notes: CBC = complete blood count, CEA = carcinoembryonic antigen, CT = computerized tomography, FOLFOX = fluorouracil (5FU) and oxaliplatin

Source: Authors' analysis.

Table 6. Visits Required to Treat Stage III Colorectal Cancer

Activity	Frequency*	Person
Colonoscopy	1	Gastroenterologist and primary care provider counseling on need for colonoscopy
Visit to review biopsy	1	Gastroenterologist
Appointment regarding surgery	1	Surgeon
Hospital stay and surgery	3 to 5 days	Surgeon and hospital staff
Review data for stage III disease	1	Medical oncologist
Visit social worker	1	Social worker
Visit chemo nurse for teaching	1	Chemotherapy nurse
Decide on drug therapy	1	Medical oncologist
Lab for pre-chemo CBC, CMP, liver, CEA	1	Lab
Meet with clinical trial staff regarding protocol	1	Trial staff
Chemotherapy and follow-up visit every two weeks	24	Medical oncologist, chemo nurse
Potential problems: nausea, diarrhea, fever, etc.	3	Medical oncologist, nurse
One month post therapy: review drug therapy and survivorship likelihood	1	Medical oncologist
Follow-up visit every 3 months	4	Medical oncologist
Disease and case management	Ongoing	Medical oncologist and/or primary care provider

* Frequency refers to visits unless bed days are specified for hospital stays.

Source: Authors' analysis.

Adjusting ECRs for Complications and Ex Ante Factors

For many conditions, a significant number of treatment decisions depend on the progression of the condition and the patient's reaction to treatment. These decision points must be clearly delineated and factored into the case rates. For each condition, the working group identified a set of common complications that will change the services required. (See Table 5 for common complications associated with stage III colorectal cancer.) Future data modeling efforts will determine how the identified complications change the total cost of care. Where necessary, ECRs will be modified by adding a branch to the case rate decision tree. As complications develop, both the scorecard and the price paid for services rendered will change accordingly.

The goal of the data modeling exercise is to adjust payments for complications outside the provider's control that will increase required services beyond the core ECR. Such a step will help prevent risk selection problems. In theory, ECRs do not fully adjust for changes in patient status during treatment that are the result of care provided. A central tenet of ECRs is to separate technical risk from probability risk and to hold physicians

accountable for the former but not the latter.⁶ As a result, providers will carry some financial risk for patient outcomes that are the result of poor quality care. Separating outcomes inside and outside a provider's control and determining how much reimbursement is necessary to mitigate unnecessary downside risk are issues that must be monitored and revisited as Prometheus moves into its pilot phase.

Limitations of Clinical Guidelines

Work to date suggests clinical guidelines are necessary, but not always sufficient, to create a base ECR. Guidelines can use language that defers to a doctor's discretion, such as, "Use treatment X, when appropriate." This can make it difficult to determine the resources necessary to provide recommended care. Where the best available evidence or expert consensus does not provide sufficient information, empirical data must be used to fill in knowledge gaps. In these cases, data modeling will help to determine where ECRs can provide sufficient flexibility to physicians without having significant impact on the final case rate. For example, clinical guidelines are often not specific in detailing the amount of case management and follow-up required to treat a given condition. However, if the final ECR rate is not sensitive to wide variation in follow-up time, this becomes much less of an issue. Alternatively, examining cost data with high compliance rates may show a more consistent approach to case management as done by best-practice providers.

ESTABLISHING MEASURES TO EVALUATE CLINICAL PERFORMANCE

An essential component of the ECR is the performance withhold. Provider performance will be tracked using two methods: 1) the Prometheus scorecard, which is currently being designed, will include measures of care process, outcomes, and patient experience and 2) normal claims activity. Tracking claims can play an important a role in assessing provider performance—as much as the scorecard—because appropriate performance on a condition can potentially only be known by looking at what services were delivered (or not delivered) to the patient. For example, measuring the right care for back pain is effectively accomplished by using claims data to identify services that should (and, more important, should not) have been provided. Conversely, depression typically has very few encounters, which provide limited detail on whether the patient's status has changed. In this case, using a standardized clinical assessment tool is necessary to determine a patient's status.

To ensure the Prometheus scorecards are regarded positively by physicians, team members will provide the following guidance about measures.

What Results Should Be Measured?

Poor measures can drive poor outcomes. Physicians involved in the working groups identified eye exams for diabetics as a classic example of a measure that places emphasis on

treating a symptom of poor care rather than managing a disease properly. Where expert bodies have not already provided guidance, choosing performance measures that drive desired behavior can be challenging.⁷ Many working group members felt the scorecard should not shy away from using outcome measures. In the worst cases, process measures can handcuff doctors and create inefficiencies. As stated in the introduction to the American College of Cardiology/American Heart Association clinical guidelines: “These guidelines attempt to meet the need of most patients in most circumstances.”⁸ Doctors who are aware of the evidence but are charged with the care of a patient with an uncommon condition should not be punished for not following guidelines. One way to handle such issues is to focus on outcomes and avoid process measures where clinical guidelines call for flexibility and a physician’s best judgment.

How Should Results Be Measured?

In the past, measures such as eye exams were used because data were readily available through claims databases. Today, electronic medical records have made it easier for third parties to focus on the right performance measures, including clinical data such as hemoglobin A1c levels for diabetics. As a result, Prometheus should plan on collecting both claims data and clinical data to fill its scorecard.

How Should Measures Be Scored and Used for Incentive Purposes?

Once Prometheus has the right measures and measurement systems, the question of scoring results will arise. Team members debated three general options for scoring performance: 1) as discrete variables, each with a specific threshold; 2) as joint variables with an all-or-nothing target; or 3) as score relative to others’ performance.

Many of the physicians in the group felt that the latter two options could be discouraging to a large percentage of physicians and may not promote significant improvement. Instead, members favored having a number of measures on the scorecard, with Prometheus heavily weighting those measures determined by experts to be most closely associated with good care and outcomes. Working groups did emphasize that if Prometheus pursued this path, scorecard goals must be reasonable and account for patient choice. Setting targets at the ideal (e.g., lipids at 70 for 100% of myocardial infarction patients) is unreasonable and may cause physicians to neglect making substantive efforts to reach targets in the scorecard. The scorecard must also deal with the reality that patients can choose their own care paths. If someone declines care, this should immediately close the case rate and remove the patient’s data from the scorecard. Finally, to promote the concept of physician control and responsibility, physicians should have the option to be evaluated at the individual level or at the practice level.

NEXT STEPS

Data Modeling

Data modeling activities will determine the final value of the ECRs used in a future pilot. The Prometheus data modeling team expects to find that the variation in episode costs will be significant. As a result, the team will seek to address this problem by: adjusting case rates for severity, using the risk factors identified by working groups; eliminating cost data with low compliance rates, or, conversely, only using data with 100 percent compliance rates; and removing outliers (i.e., dropping top and bottom 5% of providers from the analysis). Data for the modeling will come from both clinical and claims databases.

Development of Additional ECRs

To aid in ECR creation, working groups designed an ECR development template as an important first step (Appendix A). Members suggested that future development efforts should focus on a “building block” approach to ECR creation. This would apply specifically to ECRs with clear patient management hand-offs. Each building block could be looked at as a smaller, self-contained episode. For example, a surgical episode is a building block of the overall stage III colon cancer ECR. Development of a series of technical episodes that can become modules to plug into case rates when warranted will reduce overall ECR development time.

There are other outstanding questions for the pilot phase of the project. First, how many ECRs are necessary to make Prometheus a compelling payment alternative? The Institute for Clinical Systems Improvement currently has clinical guidelines for 53 different conditions. However, if data modeling indicates a need for more specific ECRs to eliminate the problem of average risk, then the total number of ECRs could multiply into the hundreds, or even thousands, very quickly. If this were to happen, Prometheus could choose to focus on the conditions where a new payment system can have the greatest impact and let current payment models cover the remaining conditions.

Prometheus needs a clear method to prioritize the development of future ECRs. The Prometheus team suggests placing conditions into the following framework, in the following order:

1. high prevalence and high cost per event,
2. high prevalence and moderate cost per event,
3. moderate prevalence and high cost per event, and
4. moderate prevalence and moderate cost per event.

Appendix B provides a list of surgical conditions that may be well suited to future ECR development.

Finally, the Prometheus team must consider how to keep ECRs updated as clinical guidelines change. To date, Prometheus has relied on volunteer time from physicians dedicated to payment reform. This commitment will not continue indefinitely. Working group members suggested that Prometheus investigate other business models that rely on networked volunteers to contribute to the overall effort (e.g., the Linux community). Working group members also noted that future ECR development should involve interdisciplinary teams (e.g., hospital representatives, pharmacists) and not just physicians.

Pilot Projects

In 2007, Prometheus will select up to four pilot sites and work with local stakeholders to prepare each site for implementation. Current candidates include Brockton, Mass.; Chicago; Memphis, Tenn.; Philadelphia; and San Francisco. Prometheus also expects to develop an additional 50 to 60 ECRs during the next three years to increase the scope of the pilots and cover an increasing portion of the total care delivered in any community.

CONCLUSION

Work to date has shown it is possible to create a working set of ECRs. Moving forward, Prometheus must determine if the product can successfully achieve its ends: a limitation on physician-induced demand, a reduction in risk selection problems, the promotion of clinical integration, and the delivery of recommended, high-quality care. The pilot projects present the opportunity to measure progress against these goals and set the stage for a fuller implementation of the Prometheus payment system.

NOTES

¹ Prometheus Payment was named for the Titan, in Greek mythology, who defied Zeus by bringing fire to mankind. The term “Promethean” refers to events or people of great creativity, intellect, and boldness.

² Because one of the working groups focused on preventive care, the working groups agreed to use the term “condition” in lieu of “disease state.”

³ Institute of Medicine, *Crossing the Quality Chasm: A New Health System for the Twenty-first Century* (Washington, D.C.: National Academies Press, 2001).

⁴ The cardiac care group chose heart failure as one of its ECRs, despite uncertainty around when the case rate should begin and end. Lessons learned here can be applied to other disease states with complex beginning and end points.

⁵ T. P. Gilmer, P. J. O’Connor, W. A. Rush et al., “Predictors of Health Care Costs in Adults with Diabetes,” *Diabetes Care*, Jan. 2005 28(1):59–64; S. R. Gandra, L. W. Lawrence, B. M. Parasuraman et al., “Total and Component Health Care Costs in a Non-Medicare HMO Population of Patients with and without Type 2 Diabetes and with and without Macrovascular Disease,” *Journal of Managed Care Pharmacy*, Sept. 2006 12(7):546–54.

⁶ Technical risk is the “care production” risk that is controllable by the provider and a result of the provider’s technical skills. Probability risk is the classic form of insurance risk that is caused by the likelihood of a negative event occurring to a patient as a result of that patient’s genes, health status, and any external event not controllable by the provider (e.g., contracting a virus or breaking a leg).

⁷ For some conditions, a solid set of performance measures already exists. For example, the American College of Cardiology/American Heart Association issued a set of clinical performance measures for adults with ST-elevation myocardial infarction in 2006.

⁸ See <http://www.acc.org/qualityandscience/clinical/guidelines/stemi/Guideline1/Preamble.htm#1top>.

APPENDIX A. ECR WORKSHEET AND ECR WORKING GROUP MEMBERS

1. Condition and/or procedure to be covered by the ECR.
2. Expected impact in cost-efficiency and quality of paying for care with an ECR. That is, if the case rate works to positively modify behavior, what would change relative to status quo? What really matters in making a change in this clinical area?
3. What are the current barriers in the current payment system that may prevent the “right thing” from being done?
4. Clinical description of a typical patient covered by the core ECR.
5. Standard workup required to diagnose and characterize the condition and establish the appropriateness and scope of the procedure covered by the ECR.
6. Criteria that must be met for a typical patient to be eligible for coverage by the core evidence-informed case rate.
7. Criteria for successful completion of care for a typical patient covered by the core ECR.
8. Listing of clear and specific hand-offs between clinicians during care of the patient. Include only those hand-offs during which the provider responsible for the management of the patient changes (e.g., oncologist handing off the patient to the surgeon or hospital for a colon resection).
9. Type and intensity of services required by clinical practice guidelines to care for a typical patient covered by the core ECR. To the extent applicable, note where hand-offs occur, as follows:

Standard component of care	Definitions of the component	Detail of the component	Modifiers due to patient characteristic	Common complications	Duration of the component
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10. Listing of typical caregivers and frequency of care type. Make sure to include an allowance for the management of the case by a physician, if appropriate, and for nurse-led disease and care management activities, as follows:

Activity	Frequency	Person/organization
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11. Ex ante factors (e.g., comorbidities, clinical status, disease progression) that increase required services beyond those covered by the core ECR.

12. Complications associated with the covered condition and/or procedure or with its diagnosis and/or treatment that increase required services beyond those covered by the core ECR.

ECR Working Group Members

Cancer: Linda Bosserman, M.D., Dawn Holcombe, M.B.A., Sara Perkel, M.B.A., Peter Eisenberg, M.D., Lee Schwartzberg, M.D., Chris Desch, M.D.

Cardiac care: Mort Arnsdorff, M.D., Joe Messer, M.D., Michael Pine, M.D., Bonnie Weiner, M.D., Janet Wright, M.D.

Chronic and preventive care: Peter Basch, M.D., Patrick O'Connor, M.D., Leif Solberg, M.D.

Orthopedics: Michael London, M.D., Robert Haralson, M.D.

APPENDIX B. SURGICAL PROCEDURES FOR ECR DEVELOPMENT

Prospective global payment for episodes of clinical care is suited for many surgical situations. Many surgical episodes have a definable beginning of care and a definable point where follow-up is complete and additional costs and management are not necessary. The following procedures are particularly well suited for consideration of ECR development within the Prometheus payment strategy. These procedures have been chosen because they constitute high-volume procedures or are modest-volume procedures that carry very high costs. All have the potential for dramatic improvement in expenditures without compromising quality of care.

Procedures	Total Number of Cases (2004)	Length of Stay	Billed Charges
Gastrointestinal			
Partial gastrectomy	10,222	13.3 days	\$72,000
Total gastrectomy	3,875	15.6 days	\$97,000
Open gastric bypass	23,221	3.2 days	\$33,500
Lap gastric bypass	13,868	2.7 days	\$32,000
Lap cholecystectomy	323,399	4 days	\$24,600
Open appendectomy	161,533	3.3 days	\$18,700
Lap appendectomy	135,473	2.4 days	\$19,000
Colon resection	320,437	10 days	\$50,000
Major pancreatectomy	11,174	14 days	\$82,000
Hepatic resection	3,025	9.5 days	\$69,000
Cardiothoracic			
Esophagectomy	2,747	17 days	\$107,000
Open heart procedures	357,324	10 days	\$95,000
Open lung resection	38,224	9 days	\$54,000
<i>Head and neck</i>			
Total laryngectomy	1,304	12.3 days	\$57,750
Radical laryngectomy	1,757	11.9 days	\$59,000
Radical neck dissection	9,481	3.6 days	\$25,000
Obstetrics-Gynecology			
Abdominal hysterectomy	389,109	3.1 days	\$16,500
Vaginal hysterectomy	184,896	2 days	\$14,750
C-section	1,246,978	3.7 days	\$13,300

Procedures	Total Number of Cases (2004)	Length of Stay	Billed Charges
Orthopedic			
Total knee arthroplasty	431,485	4 days	\$33,700
Total hip arthroplasty	328,283	5 days	\$37,000
<i>Peripheral vascular</i>			
Major vascular procedures	113,670	8.3 days	\$54,000
Carotid endarterectomy	121,470	2.7 days	\$22,000
Urology			
Nephrectomy	44,871	5.6 days	\$34,000
Radical prostatectomy	55,945	3 days	\$22,000
Total cystectomy	7,117	10.9 days	\$60,000

Source: Healthcare Cost and Utilization Project Data—2004–2006, AHRQ.

APPENDIX C. GLOSSARY

Ex ante clinical factors: Patient-specific factors known up front as a result of an initial examination and diagnosis and that can have an impact on resource consumption. For example, a morbidly obese patient requiring a hip replacement will require a longer time in physical therapy than an average patient.

Risk/severity-adjustments: Patients with ex ante factors that are related to increased resource consumption will trigger an adjustment in the ECR to reflect the higher level of severity and/or the greater risk for warranted increases in resource consumption. These adjustments are arrived at by analyzing large databases of claims and medical records to determine the strength of associations between certain ex ante factors and resource consumption.

Care delivery process: Process through which a patient receives care for a condition by all providers who interact directly or indirectly with that patient.

Physician-induced demand/Unwarranted variation: Resource consumption varies from patient to patient and that variation can be split into two components: warranted and unwarranted. Warranted variation is caused by ex ante factors—clinical factors that are brought into the care delivery process by the patient. Unwarranted variation is introduced by errors of overuse, underuse, misuse, and other technical competence defects committed by one or more care providers during the care delivery process, which can lead to unneeded “physician-induced” services.

Clinical integration: Result of providers involved in the care delivery process working as a team although no formal legal contract necessarily binds them together to do so.

RELATED PUBLICATIONS

Publications listed below can be found on The Commonwealth Fund's Web site at www.cmwf.org.

[*Hospital Performance Improvement: Trends in Quality and Efficiency*](#) (April 2007). Eugene A. Kroch, Michael Duan, Sharon Silow-Carroll, and Jack A. Meyer.

[*Hospital Quality Improvement: Strategies and Lessons from U.S. Hospitals*](#) (April 2007). Sharon Silow-Carroll, Tanya Alteras, and Jack A. Meyer.

[*Paying for Care Episodes and Care Coordination*](#) (March 15, 2007). Karen Davis. *New England Journal of Medicine*, vol. 356, no. 11. Commentary.

[*Fundamental Reform of Payment for Adult Primary Care: Comprehensive Payment for Comprehensive Care*](#) (March 2007). Allan H. Goroll, Robert A. Berenson, Stephen C. Schoenbaum et al. *Journal of General Internal Medicine*, vol. 22, no. 3 (*In the Literature* summary).

[*Slowing the Growth of U.S. Health Care Expenditures: What Are the Options?*](#) (January 2007). Karen Davis, Cathy Schoen, Stuart Guterman, Tony Shih, Stephen C. Schoenbaum, and Ilana Weinbaum.

[*Quality Matters: Pay-for-Performance in Medicare*](#) (September 2006). Newsletter.

[*Achieving a High Performance Health System: High Reliability Organizations Within a Broader Agenda*](#) (August 2006). Anne K. Gauthier, Karen Davis, and Stephen C. Schoenbaum. *Health Services Research*, vol. 41, no. 4, part 2 (*In the Literature* summary).