

Episodes of Care: Is Emergency Medicine Ready?

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Optimizing resource use, eliminating waste, aligning provider incentives, reducing overall costs, and coordinating the delivery of quality care while improving outcomes have been major themes of health care reform initiatives. Recent legislation contains several provisions designed to move away from the current fee-for-service payment mechanism toward a model that reimburses providers for caring for a population of patients over time while shifting more financial risk to providers. In this article, we review current approaches to episode of care development and reimbursement. We describe the challenges of incorporating emergency medicine into the episode of care approach and the uncertain influence this delivery model will have on emergency medicine care, including quality outcomes. We discuss the limitations of the episode of care payment model for emergency services and advocate retention of the current fee-for-service payment model, as well as identify research gaps that, if addressed, could be used to inform future policy decisions of emergency medicine health policy leaders. We then describe a meaningful role for emergency medicine in an episode of care setting. [Ann Emerg Med. 2011;xx:xxx.]

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BACKGROUND

Reducing total costs, optimizing resource use, eliminating waste, and improving health outcomes by aligning provider incentives have been major themes in health care reform initiatives.¹ This is in part a reaction to reports that total US health care expenditures were expected to exceed 20% of the gross domestic product by 2019 if no change in national health care spending occurred²; drivers of escalating costs included potentially avoidable complications, which are estimated to add \$0.40 to every dollar spent on care for chronic conditions and \$0.15 to \$0.20 per dollar spent on acute hospitalizations and procedures³; wide geographic discrepancies in cost, use, and quality outcomes exist⁴⁻⁶; and the current fee-for-service system contributes to quality and safety gaps by encouraging a fragmented health care delivery system that rewards overuse and fails to provide incentives for coordination of care.⁷⁻¹⁰

The Patient Protection and Affordable Care Act,¹ signed into law in March 2010, includes methods to develop and test novel models of health care delivery and payment reform, with proposed payment policies based on “value-based purchasing” paradigms, rather than payment based on the volume of services provided.¹¹⁻¹³ Policymakers have cited the care delivered at integrated health care delivery systems such as Intermountain Healthcare, Kaiser Permanente, Mayo Clinic, Geisinger Health System, and the Cleveland Clinic as models of higher-value systems.^{10,14,15} Based on these systems, one new health care delivery model legislatively mandated is the development of

accountable care organizations. These networks of providers (primary care, specialty, and ancillary) and facilities (eg, hospitals, ambulatory surgery centers) are to be financially accountable for managing a defined population of patients. The objective is to align patient, provider, and societal incentives to improve cost efficiencies and decrease avoidable expenditures (ie, potentially avoidable complications).^{1,13} In addition to reorganizing the health insurance system, the Patient Protection and Affordable Care Act legislation also contains provisions designed to move away from the current fee-for-service payment mechanism to global payment system models that shift financial risk to the provider compared with fee-for-services systems.^{9,16-18}

One form of global payment is reimbursement for episodes of care, which describe a patient's complete interaction with the health care system for an illness or procedure during a defined period (eg, total knee replacement). Episode of care payment methodologies are intended to cover the cost of all services associated with a care “episode” (including evaluation and management, surgery, ancillary, laboratory, and pharmacy) according to a fixed set of anticipated health care resources needed to treat the patient by providing a lump sum “bundled” or “global” payment to all providers who are involved in the delivery of services to the patient. Each episode has a set of associated quality metrics or clinical guidelines with financial incentives (or penalties) based on provider performance.^{19,20} Whereas accountable care organizations represent

comprehensive restructuring of the health care delivery system (ie, they are intended to be health care delivery organizations that provide comprehensive care to a population for a defined period and accept risk for the total cost of care of that population), episodes of care are intended to be payment reform models that can be used within the current care delivery system.

The primary motivation for development of new payment models (including episodes of care) and health care delivery systems relates to the emphasis of improving the value of medical care. In that context, discussions related to the value of emergency services in an episode of care have for the most part been notably absent. In this article, we briefly review the current state of episode of care development, discuss the value of emergency care in current episodes, consider the potential influence of episode of care payment methodologies on emergency service care delivery, identify the benefits and challenges of episode payments, and propose the framework for a research agenda to better inform policymakers about the role of emergency medicine in the new episode of care environment.

CURRENT STATE OF EPISODE OF CARE DEVELOPMENT

The Patient Protection and Affordable Care Act legislation mandates the establishment of an episode of care demonstration project (an episode timeframe is defined as 3 days before a hospitalization until 30 days postdischarge) for 1 or more of 8 stated conditions to be determined by the Secretary of Health and Human Services and directs the Secretary to develop episode groupers and episode quality measures by 2012 (section 3003).¹ In addition, it directs establishment of bundled payments for episodes by 2013 (section 3023), a budget-neutral physician payment value-based payment modifier using the episode groupers beginning in 2015 (section 3007), hospital value-based purchasing programs (section 3001), penalties for hospital-acquired conditions and readmissions (sections 2702 and 3025), and extension of the gain-sharing demonstration project (section 3027).

The episode grouper methodology began in the private sector nearly 15 years ago with Ingenix ETG and Thomson-Reuters Medstat MEG, which were initially intended for commercial payers to aid in development of a “unit of analysis to measure health care and provide incentives for high performance” through episode and payment bundling methodologies.²¹ In 2009, the Centers for Medicare and Medicaid Services (CMS) used this software to create a limited number of episodes of care mandated by passage of the Medicare Improvements for Patients and Providers Act (2008) as the first of 2 phases of the Physician Resource Use Measurement and Reporting program.

Since passage of Patient Protection and Affordable Care Act, more players have entered the field, each focusing on different health conditions and using a variety of methods, but most with aggressive project completion timelines. CMS has been the most active facilitator of episode development, coordinating, sponsoring, or funding numerous episode development projects.

In the summer of 2010, CMS completed a competitive bidding process, awarding 5 contracts for groupers development to Thomson-Reuters (who will adapt its existing product), The Lewin Group with Ingenix, Brandeis University, 3M Information Systems, and Agency for Healthcare Research and Quality. All are expected to devise groupers that will be evaluated by an independent third party (Acumen) and reviewed by CMS in the fall of 2011. CMS will then select 1 contractor (product) by January 1, 2012.²²

PROMETHEUS, a nonprofit entity, is another party creating episode groupers. The PROMETHEUS Payment model was designed by a multidisciplinary panel, using “evidence-informed case rates” derived from clinical guidelines and risk-adjusted, to assign bundled payment for inpatient and outpatient care, with an explicit 10% profit margin built in.^{12,17,20,23,24} It embraces global budgets rather than global payments and segregates provider payments from hospital payments, allowing a portion of the payment to be withheld and redistributed according to provider performance on clinical process measures, patient outcomes, and patient satisfaction for several procedure and disease conditions (Table). Expansion to spine care, medical home modeling, and other conditions is planned. These groupers are being tested with commercial and Medicaid plan members in 4 pilot states.^{9,19,23-27}

The American Board of Medical Specialties has also created 22 acute and chronic episode-based cost-of-care episodes (Table) that are or will be the basis of quality measure development by the group.^{28,29} In partnership with the Brookings Institute, Agency for Healthcare Research and Quality, CMS, National Committee for Quality Assurance, and National Quality Forum, this group intends to pilot the measures within commercial and public data sets and then submit them to the National Quality Forum for endorsement.²⁸ To date, none of the episode of care projects (other than acute myocardial infarction) have considered emergency care delivered during an episode.

THE CHALLENGES OF INCORPORATING EMERGENCY MEDICINE INTO AN EPISODE OF CARE APPROACH

Conceptually, episode grouping is composed of 3 modules: clinical logic, episode construction logic, and a risk-adjustment method. Clinical logic refers to the use of evidence-based guidelines to direct care for a certain patient population (eg, hypertension). Episode logic defines the rationale and parameters of what care is included in the episode (eg, specific *International Classification of Diseases, Ninth Revision* and procedure codes, outpatient versus inpatient versus both, acute exacerbation of disease versus chronic disease management). Acknowledging that there are limitations to defining a patient solely according to 1 disease process (eg, diabetes), and recognizing the potential effect of comorbid conditions on the health of the patient, risk adjustment methods consider which factors enhance the likelihood of a patient’s requiring additional resources and necessarily generating higher costs (eg, obese diabetic patient with retinopathy). This logic is then used to

Table. Episodes of care being developed by PROMETHEUS and the American Board of Medical Specialties.

PROMETHEUS	American Board of Medical Specialties
Procedure episode groupers	Acute myocardial infarction for 30 days after onset; and postacute period (days 31–365 days postevent)
Hip/knee replacement	Diabetes during a 1-y period
Coronary artery bypass graft surgery	Chronic management of CHF during a 1-y period; and posthospitalization management of CHF during a 4-mo period
Cardiac catheterization	CAD chronic management during a 1-y period; and CAD management postrevascularization during a 1-y period
Bariatric surgery	Acute/subacute lumbar radiculopathy with or without lower back pain; and simple nonspecific lower back pain (acute and subacute)
Colon resection	Community-acquired pneumonia hospitalization; and ambulatory pneumonia episode
Hernia repair	Asthma during 1-y period
Disease condition episode groupers	Breast cancer 60-day period preceding breast biopsy; and treatment in newly diagnosed cases of breast cancer during a 15-mo period
Diabetes	Stable COPD during a 1-y period; and unstable COPD during a 1-y period
CAD	Colon cancer 21-day period around colonoscopy; and treatment of localized colon cancer
Hypertension	GERD 12-mo period for treatment; and GERD 12-mo period of hiatal hernia treatment
CHF	Acute/acute-recurrent sinusitis; and chronic sinusitis
COPD	
Asthma	
Depression	
Acute myocardial infarction	

CAD, Coronary artery disease; CHF, congestive heart failure; COPD, chronic obstructive pulmonary disorder; GERD, gastroesophageal reflux disease.

quantify the economic expenditures for a given operative procedure or disease condition (ie, diagnosis) during a defined period.

This framework does not characterize the practice of emergency medicine for a number of reasons. First, all current episode grouping models, including those based on elective surgical care, are defined by a diagnosis, most of which are “ambulatory sensitive conditions” (ie, chronic conditions).^{30–32} In the emergency department (ED), we treat according to presenting symptoms of a suspected or identified diagnosis, but at times no definitive diagnosis is made in the ED. At this time, essentially no research-based evidence or policy exists from which an episode of care system might be derived for chief complaints.

Second, although the direct costs of emergency care represent a tiny proportion of overall US national health care expenditures (less than 2% in 2008),^{33–35} there is an increasing perception that ED visits are expensive, wasteful, unnecessary, and a “failure of the system.”^{36,37} This oversimplification and misunderstanding about the role of emergency care^{38,39} has influenced episode of care development projects. Unfortunately, emergency care provided to a patient as part of an episode (eg, a severe congestive heart failure exacerbation) is frequently characterized as a potentially avoidable complication, which supposes that this care provided is an inappropriate cost to the health care system and therefore assigns essentially no value to emergency care. Although prevention of the disease exacerbation is the ideal health objective, timely treatment of acute exacerbation of chronic disease conditions (eg, hyperglycemia in a diabetic patient) is important and valuable for the patient and health care system to improve overall health outcomes. Further, if a patient presents to the ED requesting care, the Emergency Medical Treatment and Active Labor Act mandates that the patient be evaluated and stabilized. Third, risk adjustment (disease severity and patient comorbidity) is complex in the ED

setting. For example, although the severity of a diagnosis may be amenable to characterization, how is the severity of a chief complaint to be judged? Finally, episode methodology is founded on the assumption that predicted costs can be accurately attributed to each episode care provider. Although a handful of emergency physicians have been involved in current episode development projects, none to date have included attribution to emergency physicians, accurately citing that their costs are too small relative to the episode timeframe (eg, 1 year for chronic care). However, the value of preventing an episode (eg, ruling out ST-segment elevation myocardial infarction) has not been considered or quantified.

INFLUENCE OF EPISODES ON THE SPECIALTY OF EMERGENCY MEDICINE

Because episode development is still in its relative infancy, the full implications for emergency medicine patients and practice are still speculative. However, it is likely that increased pressure will be placed on emergency physicians to reduce resource use, which increases the likelihood of missed diagnosis—and exposes emergency physicians to increased individual liability risk. Emergency physicians will also be encouraged to provide better care transitions, in particular from ED to outpatient providers. And as inpatient gatekeepers, emergency physicians will be increasingly challenged by hospital administrators when patients require hospital admission or readmission. The current emergency care system was built on the fee-for-service model. Changes in facility and provider reimbursement may result in ED and trauma center closures, which would have deleterious effects on patient care and access. The effect on emergency medicine group practice is unknown but will likely result in relative revenue reductions for the specialty, which may in turn result in expansion of large group practice or hospital employee models.

EPISODES AS A PAYMENT MODEL

Theoretically, the greatest benefit of the episode of care model is that it aligns incentives of providers and health care facilities with those of the patient and payer—all focused on the value proposition of maximizing quality of patient care and minimizing cost. Episode of care could also improve transparency, giving patients and payers the ability to compare physician-hospital teams, prices, and patient cost-sharing obligations for a consistently defined package of treatment services. However, although much has been written about the *theoretical* benefit of episode of care payment methodologies, to date few outcomes data have been published. A handful of studies in small cohorts have reported improved cost efficiencies through decreased potentially avoidable complications⁴⁰⁻⁴² and improved care coordination²⁶ using episodes of care, with one study claiming improved physician reimbursement for elective joint replacement.⁴² However, one recent report suggests that better-quality care may not always cost less.⁴³

There are many challenges inherent in implementing an episode of care–based payment model in the current US health care system. First, more than 1 provider and facility are usually involved in the care of a patient during an episode. The median number of physicians involved in a Medicare beneficiary's episode of care is 7.⁴⁴ Likewise, patient care is provided in many settings. In one study, 57% of hip fracture and 28% of acute myocardial infarction patients received care in 4 or more facility settings.¹⁷ Therefore, equitable allocation of payment for services to both multiple providers and facilities for 1 episode of care is challenging. It is not surprising that recent studies have noted concerns of inappropriate attribution by grouper software programs used by several commercial insurers to profile physician resource use.^{17,45-48} Second, many patients have multiple comorbid conditions. One analysis found that beneficiaries averaged 8 or more episodes of care during a year, some for interrelated conditions (eg, patients with acute myocardial infarction also had hypertension [63%], congestive heart failure [54%], or diabetes mellitus [35%] episodes).¹⁷ Just as many guideline recommendations do not apply to patients with multiple comorbidities,⁴⁹ so also does this complicate development of meaningful, discrete, and widely applicable episodes that can appropriately risk-adjust patients and accurately define evidence-based case rates, further challenging appropriate payment allocation. Finally, despite current realities, episode of care methodologies presume that patients have continuous access to care. In 2009, the number of uninsured Americans increased to 50 million, and the uninsured are far more likely than those with insurance to report problems accessing medical care in the current environment.⁵⁰ In addition, a critical shortage of primary care physicians is expected,⁵¹ which will further complicate care coordination and access. It is unclear how episodes of care will address the health care needs of uninsured patients.

RECOMMENDATIONS FOR THE SPECIALTY OF EMERGENCY MEDICINE

PROMETHEUS estimates that 30% to 40% of episode costs are attributed to potentially avoidable complications.^{8,41} Although some ED visits are avoidable,^{52,53} current episode of care models ignore the value of operating a high-quality emergency care system (eg, regional trauma system) and the contribution of emergency physicians to desirable patient outcomes, as described in episodes, when the health care delivery system is underresourced (eg, inaccessible primary care) or when the system fails (safety net function). The value of emergency care includes rapid diagnosis and intervention in acute illness or acute decompensation of chronic illness and managing resources to a safe patient disposition.³² However, we do not believe that development of ED-centered (ie, chief complaint–based) episodes are likely to be a successful strategy to define the value of emergency services in the health care system. Most typical undifferentiated ED chief complaints present with diagnostic uncertainty (eg, abdominal pain), whereas diagnostic evaluation, therapeutic intervention, and patient disposition vary according to patient comorbidities and preferences, physician preferences, and local facility resources (eg, primary care and specialist network access, imaging availability). This is confounded by the fact that EDs are obliged to deploy “appropriate” resources, irrespective of a patient's risk profile, because of the federal Emergency Medical Treatment and Active Labor Act mandate. Thus, undifferentiated, symptom-based evaluations necessitate a greater degree of variability in resource use, making derivation of reliable and useful emergency care episodes challenging. Further, although emergency medicine has developed some evidence-based clinical guidelines, the majority of emergency practice occurs in areas without definitive evidence.

Whether or not episodes of care that are specific to ED chief complaints are ultimately developed, a pressing question remains: How should reimbursement for ED visits be managed for patients who are part of a broader care episode (eg, a total hip replacement patient presents to the ED 3 days after hospital discharge)? Unlike primary care physicians managing a patient with a complex disease, emergency care providers cannot influence patients' care-seeking behavior. There is no effective process of diverting patients to alternative locations for care once an emergency care episode has been initiated by patients or their “agents.” Thus, we agree with Goldsmith¹⁰ that acute unscheduled episodic care, such as emergency care, cannot be accurately valued within an episode grouper for the reasons previously noted, and as such, emergency services should continue to be reimbursed by a fee-for-service model. The addition of performance incentives for elements such as care coordination (including out-of-hospital transportation and interfacility transports for time-critical diagnosis and specialized care) and adherence to clinical pathways that improve quality

outcomes may provide additional rationale for value within ED visits once initiated.

The primary disadvantage of pursuing a fee-for-service carve-out from the episode grouper payment system is that the lever of aligning payment incentives to reduce use and treatment costs is lost. If payments are bundled, there is a compelling motivation to avoid unnecessary or repeat imaging or testing and to find a way to work with other physician specialists in a more cost-effective manner (eg, cardiology for a next-morning stress test). In addition, if EDs were allowed to opt out of episode of care payments and retain fee-for-service reimbursement, non-ED providers receiving episode payments may preferentially send patients to the ED for high-cost imaging studies and tests to avoid attribution and defer use scrutiny that could ultimately decrease that providers' payment. No doubt, pursuing a "carve-out" may be politically challenging and unpopular as physician practice payment models undergo significant evolution. At this time, there are minimal to no validated data from which to make economic policy recommendations for emergency medicine. Therefore, we recommend pursuit of a national research agenda with an aggressive timeline to inform payment policy reform decisions for emergency care. Emergency medicine research that quantifies the economic value of emergency care within an "episode" would be helpful for developing future models of payment and would assist in informing a sustainable, patient-centered health care policy. Modeling of ED-based episodes (ie, 40- to 50-year-old man with chest pain), including cost analysis and predictive modeling related to outcomes (eg, missed AMI, missed aortic dissection), would also be beneficial. Finally, the unintended consequences of episode of care (traditional or ED care based) should also be quantitatively and qualitatively described.

Potential ED care episodes are unlikely to address all ED visits adequately. However, we believe that any effective episode of care methodology must (1) accurately define an episode (duration, acuity, diagnosis-based); (2) provide accurate facility and provider attribution and payment methodologies; (3) correctly classify patients according to comorbid conditions (ie, risk adjust or stream patients in multiple episodes); (4) ensure that the system can provide continuous access to care; (5) be nimble enough to allow continuous quality improvement as clinical care guidelines change; (6) consider local resources (ie, access to stroke specialist), address uninsured patients, prevent "cherry-picking" of patients and inappropriate care rationing; and (7) codify patient responsibility/accountability for care during an episode. Current federal antitrust and self-referral/kickback laws must also be revised if episode of care payment programs are to be successful.⁵⁴

CONCLUSIONS

Payment reform methodologies, including bundled payment systems, seek to align the incentives of providers and payers in the hope of linking reimbursement to improved patient outcomes at a discounted cost. The Patient Protection and Affordable Care Act legislation mandates implementation of

episode of care–based programs within the next few years. It is unclear which episode development method will become the standard, and several unanswered questions remain about program payment structure. Emergency medicine participation in current episode development projects is critical to ensure that the value of emergency care is appropriately considered and that resources are allocated accordingly. An emergency medicine research agenda that quantifies the economic value of emergency care within an "episode" would be helpful for developing future models of payment and would assist in informing a sustainable, patient-centered health care policy.

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REFERENCES

1. Patient Protection and Affordable Care Act [PL 111-148] and Healthcare and Education Reconciliation Act of 2010 [PL 111-152], March 23, 2010. US Government Printing Office Web site. Available at: <http://www.gpo.gov/fdsys/pkg/PLAW-111publ148/pdf/PLAW-111publ148.pdf>. Accessed May 10, 2011.
2. Office of the Actuary, Centers for Medicare & Medicaid Services. Estimated financial effects of the Patient Protection and Affordable Care Act, as amended. April 22, 2010. Centers for Medicare & Medicaid Service Web site. Available at: https://www.cms.gov/ActuarialStudies/Downloads/PPACA_2010-04-22.pdf. Accessed January 1, 2011.
3. Waste in US healthcare spending: potentially avoidable complications, hip replacements. Robert Wood Johnson Foundation Web site. Available at: <http://www.rwjf.org/qualityequality/product.jsp?id=47128>. Accessed January 2, 2011.
4. The Dartmouth Atlas of Healthcare. Dartmouth Atlas of Health Care Web site. Available at: <http://www.dartmouthatlas.org/>. Accessed May 10, 2011.
5. Sirovich B, Gallagher PM, Wennberg DE, et al. Discretionary decision making by primary care physicians and the cost of US healthcare. *Health Aff (Millwood)*. 2008;27:813-823.
6. Schoen C, Davis K, How SK, et al. US health system performance: a national scorecard. *Health Aff (Millwood)*. 2006; 25:w457-w475.
7. Eddy DM. Balancing cost and quality in fee-for-service versus managed care. *Health Aff (Millwood)*. 1997;16:162-173.
8. Goldfield NI, Fuller RL, Averill RF. Paying for quality and coordination: aligning provider payments with global goals. *Am J Med Qual*. 2009;24:480-488.

9. Davis K. Paying for care episodes and care coordination. *N Engl J Med*. 2007;356:1166-1168.
10. Goldsmith J. Accountable care organizations: the case for flexible partnerships between health plans and providers. *Health Aff (Millwood)*. 2011;30:32-40.
11. Fisher ES, Shortell SM. Accountable care organizations: accountable for what, to whom, and how. *JAMA*. 2010;304:1715-1716.
12. de Brantes F, Rosenthal MB, Painter M. Building a bridge from fragmentation to accountability—the Prometheus payment model. *N Engl J Med*. 2009;361:1033-1036.
13. McClellan M, McKethan AN, Lewis JL, et al. A national strategy to put accountable care into practice. *Health Aff (Millwood)*. 2010;29:982-990.
14. Leonhardt D. Making healthcare better. *New York Times Magazine*. November 3, 2009. New York Times Web site. Available at: <http://www.nytimes.com/2009/11/08/magazine/08Healthcare-t.html?pagewanted=1&r=1>. Accessed May 10, 2011.
15. Weeks WB, Gottlieb DJ, Nyweide DJ, et al. Higher health care quality and bigger savings found at large multispecialty medical groups. *Health Aff (Millwood)*. 2010;29:991-997.
16. Relman AS. Doctors as the key to healthcare reform. *N Engl J Med*. 2009;361:1225-1227.
17. de Brantes F, D'Andrea G, Rosenthal MB. Should healthcare come with a warranty? *Health Aff (Millwood)*. 2009;28:w678-687.
18. Institute of Medicine. *Rewarding Provider Performance: Aligning Incentives in Medicare*. Washington, DC: National Academies Press; 2006.
19. Hussey PS, Sorbero ME, Mehrotra A, et al. Episode-based performance measurement and payment: making it a reality. *Health Aff (Millwood)*. 2009;28:1406-1417.
20. de Brantes F, Rastogi A. Evidence-informed case rates: paying for safer, more reliable care. Commonwealth Fund Web site. Available at: http://www.commonwealthfund.org/~media/Files/Publications/Issue%20Brief/2008/Jun/Evidence%20Informed%20Case%20Rates%20%20Paying%20for%20Safer%20%20More%20Reliable%20Care/de_Brantes_issue_brief_SBA_final%20pdf.pdf. Accessed May 10, 2011.
21. Dang DK, Pont JM, Portnoy MA. Episode treatment groups: an illness classification and episode building system—part II. *Med Interface*. 1996;9:122-128.
22. Episode of care grouper project. American Medical Association Web site. Available at: <http://www.ama-assn.org/ama1/pub/upload/mm/370/cms-coi-policy.pdf>. Accessed May 10, 2011.
23. Health Care Incentives Improvement Institute Web site. Available at: <http://bridgestoexcellence.org/>. Accessed May 10, 2011.
24. Gosfield AG. A new payment model for quality: why care now? *Am J Med Qual*. 2007;22:145-147.
25. Damberg C, Sorbero M, Hussey P, et al. Exploring episode-based approaches for Medicare performance measurement, accountability and payment. February 2009, WR-633-ASPE. Office of the Assistant Secretary for Planning and Evaluation, US Department of Health and Human Services Web site. Available at: <http://aspe.hhs.gov/health/reports/09/mcperform/index.shtml>. Accessed May 10, 2011.
26. PROMETHEUS payment: on the frontlines of health care payment reform. Robert Wood Johnson Foundation Web site. Available at: <http://www.rwjf.org/files/research/66748.pdf>. Accessed May 10, 2011.
27. de Brantes F, Camillus J. Evidence-informed case rates: a new healthcare payment model. April 17, 2007. Commonwealth Fund Web site. Available at: http://www.commonwealthfund.org/publications/publications_show.htm?doc_id=478278. Accessed May 10, 2011.
28. Foundation for Developing Better Care. American Board of Medical Specialties Web site. Available at: http://www.abms.org/about_abms/abms_research/current.aspx. Accessed May 10, 2011.
29. Quality Alliance Steering Committee quarterly meeting, December 15, 2010. Health Quality Alliance Web site. Available at: <http://www.healthqualityalliance.org/userfiles/QASC%20Presentations%2012%2015%2010.pdf>. Accessed May 10, 2011.
30. Prevention quality indicators overview. US Department of Health and Human Services Agency for Healthcare Research and Quality Web site. Available at: http://www.qualityindicators.ahrq.gov/Modules/pqi_overview.aspx. Accessed May 10, 2011.
31. Appendix B. Ambulatory care sensitive conditions. US Department of Health and Human Services Agency for Healthcare Research and Quality Web site. Available at: <http://www.ahrq.gov/data/safetynet/billappb.htm>. Accessed December 16, 2010.
32. Carr BG, Conway PH, Meisel ZF, et al. Defining the emergency care sensitive condition: a health policy research agenda in emergency medicine. *Ann Emerg Med*. 2010;56:49-51.
33. Martin A, Lassman D, Whittle L, et al. Recession contributes to slowest annual rate of increase in health spending in five decades. *Health Aff (Millwood)*. 2011;30:11-22.
34. National Hospital Ambulatory Medical Care Survey: 2008 emergency department summary tables. Centers for Disease Control and Prevention Web site. Available at: <http://www.cdc.gov/nchs/fastats/evisits.htm>. Accessed May 10, 2011.
35. Expenses and characteristics of physician visits in different ambulatory care settings, 2008. Statistical brief #318, March 2011. US Department of Health and Human Services Agency for Healthcare Research and Quality Web site. Available at: http://www.meps.ahrq.gov/mepsweb/data_files/publications/st318/stat318.pdf. Accessed May 10, 2011.
36. The price of excess: identifying waste in healthcare spending, page 9. Pricewaterhouse Cooper Web site. Available at: <http://www.pwc.com/us/en/healthcare/publications/the-price-of-excess.jhtml>. Accessed May 10, 2011.
37. Redstone P, Vancura JL, Barry D, et al. Nonurgent use of the emergency department. *J Ambul Care Manage*. 2008;31:370-376.
38. LaCalle E, Rabin E. Frequent users of emergency departments: the myths, the data, and the policy implications. *Ann Emerg Med*. 2010;56:42-48.
39. Newton MF, Keims CC, Cunningham R, et al. Uninsured adults presenting to US emergency departments: assumptions vs data. *JAMA*. 2008;300:1914-1924.
40. Berry SA, Doll MC, McKinley KE, et al. ProvenCare: quality improvement model for designing highly reliable care in cardiac surgery. *Qual Saf Healthcare*. 2009;18:360-368.
41. de Brantes F, Rastogi A, Painter M. Reducing potentially avoidable complications in patients with chronic diseases: the Prometheus Payment approach. *Health Serv Res*. 2010;45(6 pt 2):1854-1871.
42. Johnson LL, Becker RL. An alternative health-care reimbursement system—application of arthroscopy and financial warranty: results of a 2-year pilot study. *Arthroscopy*. 1994;10:462-470; discussion 471-472.
43. Silber JH, Kaestner R, Even-Shoshan O, et al. Aggressive treatment style and surgical outcomes. *Health Serv Res*. 2010;45(6 pt 2):1872-1892.
44. Pham HH, Schrag D, O'Malley AS, et al. Care patterns in Medicare and their implications for pay for performance. *N Engl J Med*. 2007;356:1130-1139.

45. Thomas F, Caplan C, Levy JM, et al. Clinician feedback on using episode groupers with Medicare claims data. *Health Care Financ Rev.* 2010;31:51-61.
46. MaCurdy T, Kerwin J, Gibbs J, et al. *Evaluating the Functionality of the Symmetry ETG and Medstat MEG Software in Forming Episodes of Care Using Medicare Data.* Burlingame, CA: Acumen; 2008. Centers for Medicare & Medicaid Services Web site. Available at: <http://www.cms.hhs.gov/Reports/downloads/MaCurdy.pdf>. Accessed May 10, 2011.
47. Rosen AK, Mayer-Oakes A. Episodes of care: theoretical frameworks versus current operational realities. *Jt Comm J Qual Improv.* 1999;25:111-128.
48. Adams JL, Mehrotra A, Thomas JW, et al. Physician cost profiling—reliability and risk of misclassification. *N Engl J Med.* 2010;362:1014-1021.
49. Boyd CM, Darer J, Boulton C, et al. Clinical practice guidelines and quality of care for older patients with multiple comorbid diseases: implications for pay for performance. *JAMA.* 2005; 294:716-724.
50. Five facts about the uninsured; Kaiser Commission on Medicaid and the Uninsured. Kaiser Family Foundation Web site. Available at: <http://www.kff.org/uninsured/upload/7806-03.pdf>. Accessed May 10, 2011.
51. The impending collapse of primary care medicine and its implications for the state of the nation's healthcare: a report from the American College of Physicians; 2006 Jan 30. American College of Physicians Web site. Available at: http://www.acponline.org/advocacy/events/state_of_healthcare/statehc06_1.pdf. Accessed May 10, 2011.
52. Grossman LK, Rich LN, Johnson C. Decreasing nonurgent emergency department utilization by Medicaid children. *Pediatrics.* 1998;102(1 pt 1):20-24.
53. Billings J, Parikh N, Mijanovich T. Emergency department use in New York City: a substitute for primary care? Issue Brief (Commonwealth Fund). 2000;433:1-5.
54. Paths to healthcare payment reform: transitioning to episode-based payment; 2010. Center for Healthcare Quality and Payment Reform Web site. Available at: www.chqpr.org/downloads/TransitioningtoEpisodes.pdf. Accessed May 10, 2011.