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AOA Symposium

Economic Credentialing and Physician Performance Measures: They Know Who You Are*

By David A. Wong, MD, MSc, FRCS(C), and Laura L. Forese, MD, MPH

The impact of massive health reform looms large in the United States[1]. During the health-care debate, orthopaedic surgeons found politicians, health policy analysts, and health economists talking in a somewhat unfamiliar lexicon. Suddenly, data derived from the areas of economic credentialing and physician performance measures are being incorporated into major national health-care policy[2] and are influencing policies and procedures down to the individual hospital level[3]. These determinations have the potential to radically change the practice of orthopaedic surgery for the foreseeable future. Such momentous times in medicine compel us to gain an understanding of the driving issues in health-care reform and the reliability and true utility of data derived from economic credentialing and physician performance measures. These concepts are key to the understanding of how health-care reform is positioned in the overall context of the present economic and political climate in the United States.

The Centers for Medicare and Medicaid Services (CMS), Office of the Actuary, reported that the percentage of gross domestic product spent by the United States on health care essentially doubled over the thirty years from 1975 to 2005 (from 8.1% to 16%)[4]. It is estimated that by 2015, that percentage will continue to increase to 19.2%[4]. Even before the present proposals for health-care reform became public, the Honorable David Walker, Comptroller of the United States and Director of the General Accounting Office, had written that, in terms of medical economics, the "current fiscal policy is unsustainable."[5] Walker estimated that, at the present rate of growth, the combined expenditure for the Medicare and Social Security programs would comprise 101% of predicted federal tax revenues by the year 2070. Substantial analysis and policy change would be required to sustain these programs. Walker summarized that "saving our future requires tough choices today."[4]

In this context, politicians, health policy analysts, third-party payers, physicians, and hospitals have been viewing the economic aspects of medicine with an ever keener eye. As the gatekeepers for the majority of health-care interventions, physicians—particularly specialty physicians (including orthopaedic surgeons)—are certain targets in efforts to analyze and control health-care expenditures[6].

In an analysis of the United States National Medical Expenditure Survey data between 1987 and 2000, Thorpe et al.[7] identified fifteen health conditions that accounted for >50% of the increase in health-care costs. They include three conditions directly related to orthopaedics (trauma, arthritis, and back problems).

In the subanalysis of increased health-care expenditures, a number of

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cost drivers that also have specific relevance to orthopaedic surgery have been identified. The supply of specialist physicians and technologic innovation were identified as the two major health-care cost drivers by Bodenheimer in a four-part analysis of rising health-care costs published in 2005[8-11]. He believed that issues such as the aging population were relatively minor.

Interestingly, in the twenty-seven pages that make up Bodenheimer's papers, only twelve lines in a half-column page were devoted to the economic influence of defensive medicine[10]. There was recognition that this problem accounted for 5% to 9% of total health-care expenditures; however, there was no suggestion of tort reform as a strategy to control health-care costs.

Bodenheimer opined that specialists ordered expensive tests and performed costly so-called high-tech procedures. Furthermore, use of these high-cost interventions did not necessarily correlate to an improvement in the quality of health-care delivery[12]. Economic credentialing is one of the strategies used to address the specialist's frequency and mode of use of high-cost investigations and procedures[13]. Economic credentialing is also one of the more controversial strategies. Physicians are concerned about the potential for abuse of the data gathered in this stratagem[13-15].

One of the strategies suggested in Part 4 of Bodenheimer's article, "Can Costs Be Controlled While Preserving Quality?"[11] was the establishment of disease management programs. The National Quality Forum in the United States has begun a pilot project looking into this principle under the title "Establishing Priorities, Goals and a Measurement Framework for Assessing Value Across Episodes of Care."[16] The two clinical areas selected for this review were acute myocardial infarction and low back pain. The Robert Wood Johnson Foundation[17] has also funded two Episodes of Care Workgroups on congestive heart failure and low back pain.

A key element to all of these strategies is the necessity to measure, analyze, and target specific economic elements within health care. The mechanism to allow these procedures within the physician module of health care is the development of physician performance measures[18]. One of the possible strategies for the implementation of these performance measures of most concern to the practicing physician is the application of economic credentialing by third parties such as insurance companies and hospitals[13-15].

This paper explores physician performance measures and economic credentialing in general and provides perspectives from physicians, insurance companies, and hospitals. More specific details on cost-evaluation strategies are provided, with attention to economic credentialing and with use of episodes of care as a framework for assessment. The material presented in this paper was the subject of a symposium presented at the 2009 Annual Meeting of the American Orthopaedic Association (AOA) on June 11, 2009, in Bonita Springs, Florida.

Definitions

The consideration of economic issues is a generally unfamiliar subject matter for orthopaedic surgeons, and agreement on common terminology and definitions is helpful in evaluating these topics. The North American Spine Society has published a brief document outlining definitions used in physician performance measures and their related implementation of Pay for Performance (P4P)[19]. Part of this document is reproduced in Figure 1. Key definitions for the present discussion are as follows:

Physician-clinical performance measure[18,19]: The mechanism for assessing the degree to which a provider competently and safely delivers clinical services that are appropriate for the patient in the optimal time period.

Economic credentialing[13,15]: The use of economic criteria unrelated to quality of care or professional competence in determining a physician's qualifications for initial or continuing hospital medical staff membership or privileges. An additional layer to the definition is the use of economic data by insurance companies to determine membership in tiered provider programs[20,21] and, in less common situations, to eliminate physicians from provider panels[22,23].

Episode of care[24]: The total cost of hospital services, physician services, and other services required for treating an acute condition or the total cost for all of the care required during a given year for a patient with a chronic condition—with appropriate adjustment for complexity.

Comparative effectiveness research[25]: A rigorous evaluation of the impact of the different options that are available for treating a given medical condition for a particular set of patients. The analysis may focus only on the relative medical benefits and risks of each option, or it may also weigh both the costs and the benefits of those options.

Tiered provider network[20]: The division of physicians by insurance companies into preferred or limited panels compared with a broader single panel. Health plans generally select physicians for the preferred panels on the basis of cost-effectiveness and, in some cases, clinical quality indicators. Insurers provide patients with financial incentives (e.g., lower copayments) for choosing more cost-effective physicians.

Physician Performance Measures and Episodes of Care Framework

Performance measures have been used commonly to evaluate care at the level of the individual physician and mainly for quality assurance purposes[26]. However, in terms of medical economics, the impact of measures at the physician level has relatively minor effect. Rather, more global parameters have been considered for the evaluation of health-care spending as the individual physician controls a relatively small percentage of the health-care dollar.

One strategy for application of a more global approach to medical economics is to consider the cost across an entire episode of care[24]. The potential is much greater for influencing how the total health-care dollar is spent when one considers aggregate costs for clinical

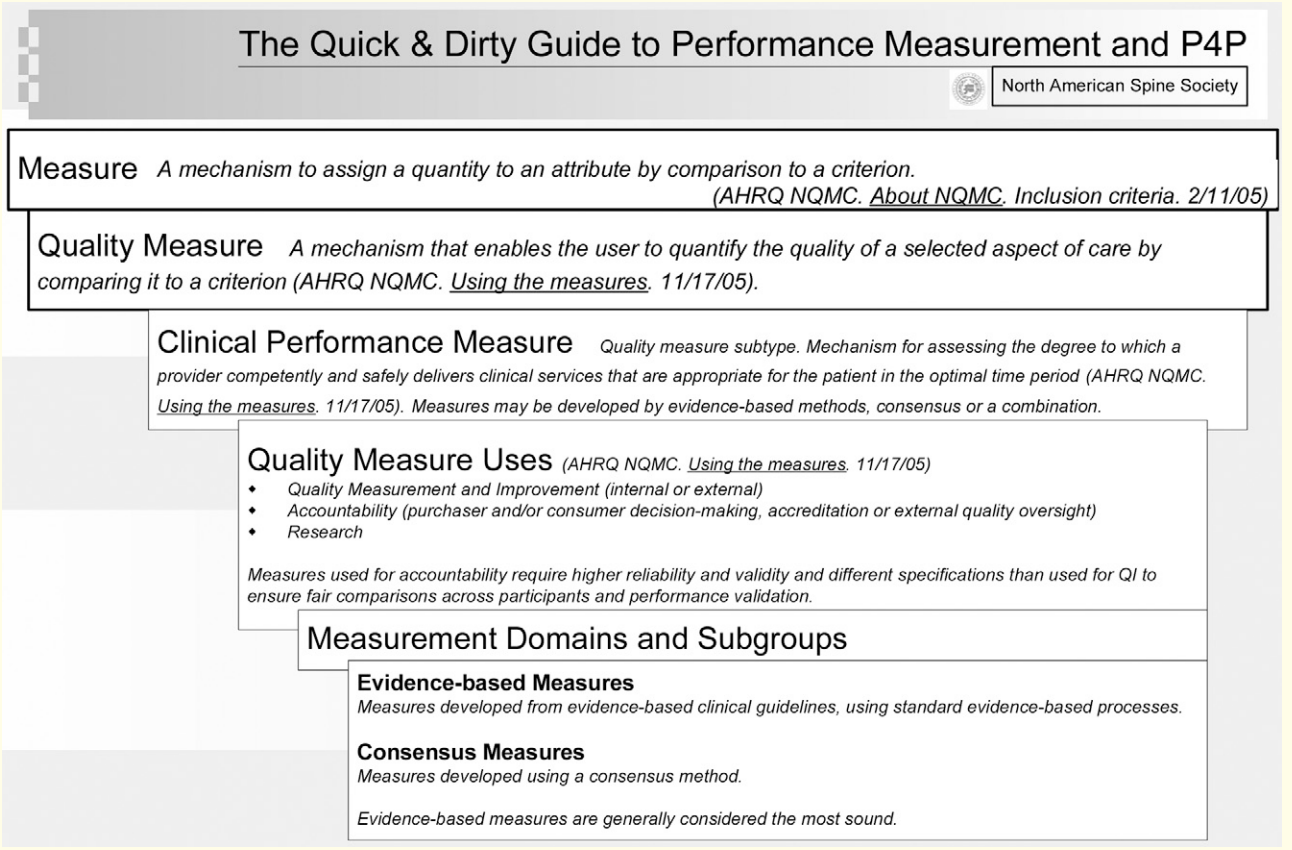

Fig. 1

Several key definitions for understanding economic credentialing and physician performance measures. P4P = Pay for Performance, AHRQ NQMC = Agency for Healthcare Research and Quality, National Quality Measures Clearinghouse. (Reprinted, with permission, from: The Quick and Dirty Guide to Performance Measurement and P4P. LaGrange, IL: North American Spine Society; 2005. http://www.spine.org/Documents/P4PPositionstatement_FINAL.pdf.)

evaluation (office and hospital), investigation (imaging and laboratory), and treatment (medical, surgical, drugs, and ancillaries, such as physiotherapy). There are considerable challenges to this methodology. Foremost are the questions of how to assign patients with a specific diagnosis, adjust for severity of illness, and then choose a process to assign cost to individual physicians for analysis. Lesser challenges include deciding on reasonable time frames for acute episodes, adjusting for patients who change physicians or geographic locations, and accounting for regional differences in reimbursement.

Low back pain has been the pilot area involving orthopaedic surgery considered by both the National Quality Forum[16] and the Robert Wood Johnson Foundation[17]. Some of the specific issues under consideration by the work groups regarding physician performance measures include:

- How should responsibility for various measures be assigned to individual physicians in the episodes of care provider group?
- Are different performance measures appropriate for back pain compared with sciatica?
- What published guidelines or evidence in the literature can be used to establish physician performance measures? Examples include:
  - Timing of imaging studies
  - Use of analgesics, anti-inflammatories, oral steroids, and muscle relaxants
  - Use of physiotherapy
  - Appropriateness of electromyography and nerve conduction studies
  - Indications, timing, and "best" technique for discography
  - Indications and timing of injection procedures (epidural steroids and facet blocks)
  - Indications for and timing of surgery
  - Surgical procedures acceptable for this diagnosis

Physician performance measurements are most easily derived from evidence-based clinical guidelines[27,28] as the evidence base has already been established. This requires a shift in focus from clinical investigation and/or treat-

ment (in the guidelines) to an evaluation of processes or outcomes that is the focus of physician performance measures.

The Insurance Company Perspective

Third-party payers already collect considerable data that can be used for economic credentialing of physicians. This information is compiled from the insurance company's demographic and administrative database. There are limitations to this type of analysis. Nevertheless, useful quality assurance trending issues can be identified. These data have been used by third-party payers for several interventions that include an element of economic credentialing. Strategies employed by third-party payers to address economic issues among its contracted physicians include tiered provider networks and restricted physician panels.

The most transparent use of economic credentialing is in the removal of so-called high-cost doctors from the insurance company's physician provider panels. This strategy has met with considerable resistance from physicians and has led to negative publicity for the insurance industry[22,23]. Presently, the employment of this strategy is uncommon.

Use of economic credentialing data to establish tiered provider networks is more widespread. In 2002 to 2003, the Center for Studying Health System Change sampled twelve nationally representative communities (Boston, Massachusetts; Cleveland, Ohio; Greenville, South Carolina; Indianapolis, Indiana; Lansing, Michigan; Little Rock, Arkansas; Miami, Florida; northern New Jersey; Orange County, California; Phoenix, Arizona; Seattle, Washington; and Syracuse, New York)[21]. Tiered networks had been launched in six of the twelve communities and were being pilot tested in another two. Of the fifty-seven health plans in these centers, ten (18%) had launched a tiered network, two (4%) were in pilot testing, five (9%) had attempted but abandoned a network, and nine (16%) were considering a tiered network. Other considerations such as quality data may be a factor in the insurance company's decision concerning in which tier to stratify a surgeon[29].

Economic and quality data have been used by private payers as well as CMS to encourage the establishment of high-volume "centers of excellence."[30,31] Concerns have been raised that publication of data (such as death rates from coronary bypass surgery) causes hospital administrators to discourage surgeons from bringing high-risk patients to their institutions for fear of making their numbers look bad[32]. Now that hospitals will not be paid for certain preventable complications termed "never events" (including postoperative wound infections and deep vein thrombosis)[33], these pressures may grow.

If the third-party payer is a government-run health-care system such as Canada, then strategies such as global prosthetic budgets have been employed[34]. A limited budget for prosthetics encourages the use of low-cost prostheses as it translates to the ability to treat a larger number of patients.

The Hospital Perspective

Hospital leaders must place quality and safety above other considerations for patients, but they also have an obligation to address financial concerns. Given the ongoing challenges to hospital finances, physicians must recognize that hospitals will increasingly be looking for opportunities to address cost savings. Given limited resources, hospitals will attempt to identify individuals who deliver the highest quality in the most efficient fashion. Also, physicians who partner with hospital leadership will have an opportunity to influence how certain financial and operational decisions are reached.

Hospitals have strong incentives to track data by individual physician or surgeon. Because health-care organizations are required by regulatory agencies to identify whether individuals are qualified to be given or to maintain privileges, they must use performance metrics that are specific to the practitioner. While regulations may not specify which parameters are tracked, all regulatory agencies, including the Joint Commission (formerly the Joint Commission on the Accreditation of Healthcare Organizations), will expect to see some surgeon-specific data. Traditionally, these statistics have included volume and complication data such as those regarding morbidity and mortality. Some institutions are able to use more complex statistics, such as return to operating room, time per procedure, and cost per case. With increasingly advanced information technology resources, hospitals are putting more time and effort into metrics that identify opportunities for efficiency and cost saving while continuing to maintain quality of care.

There are already measures in place for many payers to limit or eliminate reimbursement for certain "never events." These may include such things as wrong-site surgery, hospital-acquired infection, or other complications[33]. Because payers establish these reimbursement terms, hospitals will inevitably track the events and will likely hold physicians accountable. Physicians must understand which events apply as they may be substantially different on the basis of locale and contract terms.

Length of stay is one of the most common metrics to track and has some of the most detailed benchmarking available. Physicians should determine how the hospital tracks and reports length of stay and should work to eliminate variability. While it may not be fair or reasonable to compare physicians on the basis of any one individual patient, physicians can expect to be evaluated on the basis of the length of stay of multiple patients. From a quality perspective, it is increasingly clear that the risks of keeping patients in hospitals longer than necessary are substantial and include medication error and hospital-acquired infections[33]. At the same time, hospitals are also increasingly tracking readmission within thirty days. Physicians should pay careful attention to appropriately

documenting all comorbidities. Expected lengths of stay for undifferentiated cases compared with those with substantial comorbid conditions can differ dramatically; this has implications for the treatment of the patient and may also allow the hospital to be reimbursed at more appropriate levels.

Operating rooms are among the costliest of hospital resources in terms of staffing and technology. Hospital leaders, understandably, feel pressure to use them to maximum efficiency. Surgeons can expect hospitals to track such measures as time per case, use of personnel, and use of disposable equipment among other variables. Surgeons should be aware that not just items used for the patient, but also those that are prepared just in case they are needed, will be tabulated.

When looking at the cost per patient, it is natural for hospitals to turn first to the areas of greatest expense to identify cost-savings opportunities. For many years, hospitals have used formularies to control high drug costs. Implants, as some of the highest priced items, have also come under scrutiny, with hospitals typically using either a formulary approach or a ceiling on amounts that they will pay. Given a discrete and costly item like an implant, hospital administrators may be tempted to limit the choices to the one that is least expensive. Also, physicians may attempt to take the position that the device they prefer is superior in some way; however, unless they can really back up those claims with data, they should anticipate a standoff.

Having a single vendor may not be the most advantageous strategy for the hospital because it could eliminate the notion of competition among vendors. A vendor who has a monopoly at a hospital may have no need to meet price objectives or render great service. A more effective model for cost saving within hospitals is for surgeons to work with the administrative leadership to define specific characteristics of devices that are critical. They should be aware that in many cases, there are limited data that would suggest the superiority of one particular product over another. There is typically substantial room for hospitals to negotiate with vendors if physicians partner with the hospital leadership and do not attempt to make separate deals with vendors. Of course, physicians who do have financial arrangements with vendors have a conflict of interest (i.e., royalties, stock ownership, consulting, speakers bureau, fellowship funding, or research funding) and should disclose these matters to hospitals and should recuse themselves from decision making involving the vendor.

Hospitals are increasingly able to differentiate surgeon performance by standards that include economic data. Physicians have the greatest influence on how economic data are used when participating in the hospital quality assurance and credentialing processes. Identifying meaningful quality and efficiency parameters is best done with physician input.

Results of the AOA Symposium Audience Survey: Penetration of Economic Credentialing and Physician Performance Measures

The exact penetration of economic credentialing and physician performance measures into orthopaedic practice is clearly unknown at this point. The audience response survey conducted as part of the AOA symposium on the topic provides some interesting (but not scientific) insights (Fig. 2).

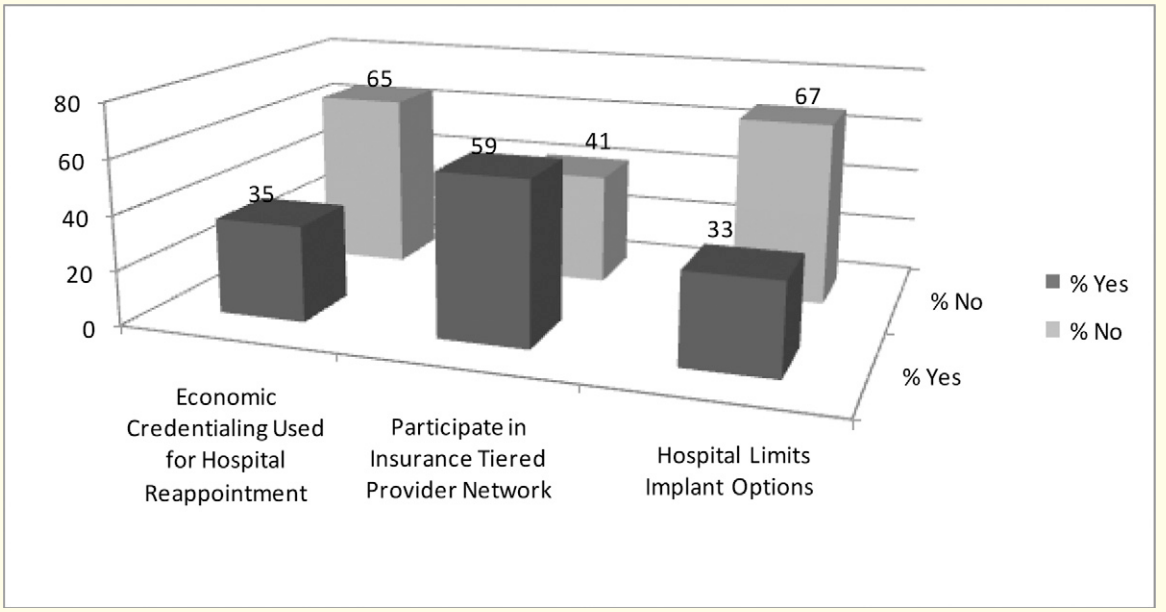

Fig. 2

Penetration of economic credentialing and physician performance measures: results of the AOA Symposium audience survey.

To briefly summarize relevant data from the audience survey, 35% of the AOA attendees had noted that economic credentialing data were used in their last hospital credentialing process experience. Fifty-nine percent of the respondents were already involved in an insurance company tiered provider program. Implant options were limited in the hospitals where 33% of the attendees practiced. In terms of an overall impression of physician performance and/or adherence to reasonable surgical indications, 59% of the orthopaedists responding to the survey thought the rate of orthopaedic surgical procedures in their community was about right, 35% considered the rate too high, and 7% believed it was too low.

Discussion

Data from economic credentialing and physician performance measures will become increasingly important as the health-care industry tries to find a better balance between cost and quality. Evaluating episodes of care[16,17] and bringing equilibrium to geographic practice variation are examples of issues incorporating this genre of data[35,36].

A large portion of erratic costs appears to correlate with geographic practice variation[35-38]. In clinical situations where good evidence exists, there is general agreement between physicians in high-cost as well as low-cost geographic areas on indications for higher-cost interventions such as imaging and surgery. The variation in cost between geographic areas seems to reside in the options for investigation and treatment that exist at the next lower level of evidence-based medicine. In situations with less compelling evidence, the high-cost geographic areas seem to experience more frequent interventions and use more high-tech, expensive procedures. This area is a clear target for the implementation of strategies to reduce the growth of health-care costs[37,38]. It is also an obvious forum for the involvement of the major orthopaedic associations in educational and quality endeavors.

On a more regional and local level, orthopaedic surgeons can expect economic credentialing and data from physician performance measures to impact orthopaedic practice through insurance companies and hospital policies.

Overview

Ever more detailed analysis of the economic aspects of health care will increasingly involve orthopaedics and orthopaedic surgeons. As specialty physicians, orthopaedic surgeons need to be actively involved in these efforts on the national as well as the hospital level. Surgeons have the clinical and surgical expertise to bring appropriate clinical perspective to the discussion. As David Walker, former Comptroller of the United States, summarized, "Saving our future requires tough choices today."[4]

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David A. Wong, MD, MSc, FRCS(C)
Denver Spine, 7800 East Orchard Road, Suite 100, Greenwood Village, CO 80111.
E-mail address: ddaw@denverspine.com

Laura L. Forese, MD, MPH
New York Presbyterian Hospital/Weill Cornell Medical Center, 525 East 68th Street P114, New York, NY 10065.
E-mail address: foresel@nyp.org

References

1. Committee on Energy and Commerce, House of Representatives, United States Congress. H.R. 3200, America's Affordable Health Choices Act of 2009, district by district impact. 2009 Jul 24. http://energycommerce.house.gov/index.php?option=com_content&view=article&id=1717:hr-3200-americas-affordable-health-choices-act-of-2009-markup-district-by-district&catid=156:reports&Itemid=55. Accessed 2009 Aug 1.

2. H.R. 3200, America's Affordable Health Choices Act of 2009. Division B—Medicare and Medicaid improvements, Title I—Improving health care value, Subtitle B—Provisions related to Part B, Part 1—Physicians' services, Sections 1123–1125. 2009 Jul 14. http://docs.house.gov/edlabor/AAHCA-BillText-071409.pdf. Accessed 2009 Aug 1.

3. Sutton JH. Economic credentialing: a growing concern. 2002 Dec. http://www.facs.org/fellows_info/bulletin/sutton1202.pdf. Accessed 2009 Aug 1.

4. United States Government Accountability Office. Saving our future requires tough choices today. Document GAO-08-241CG. Washington, DC: U.S. Government Accountability Office; 2007.

5. United States Government Accountability Office. Fiscal and health care challenges. Document GAO-08-158CG. Washington, DC: U.S. Government Accountability Office; 2007.

6. Fisher ES, Bynum JP, Skinner JS. Slowing the growth of health care costs—lessons from regional variation. N Engl J Med. 2009;360:849-52.

7. Thorpe KE, Florence CS, Joski P. Which medical conditions account for the rise in health care spending? Health Aff (Millwood). 2004;Suppl Web Exclusives:W4-20-30.

8. Bodenheimer T. High and rising health care costs. Part 1: seeking an explanation. Ann Intern Med. 2005;142:847-54.

9. Bodenheimer T. High and rising health care costs. Part 2: technologic innovation. Ann Intern Med. 2005;142:932-7.

10. Bodenheimer T. High and rising health care costs. Part 3: the role of health care providers. Ann Intern Med. 2005;142(12 Pt 1):996-1002.

11. Bodenheimer T, Fernandez A. High and rising health care costs. Part 4: can costs be controlled while preserving quality? Ann Intern Med. 2005;143:26-31.

12. Jencks SF, Huff ED, Cuerdon T. Change in the quality of care delivered to Medicare beneficiaries, 1998-1999 to 2000-2001. JAMA. 2003;289:305-12. Erratum in: JAMA. 2002;289:2649.

13. American Medical Association. Economic credentialing—issues and answers. AMA Policy H-230.975. http://www.ama-assn.org/ama/pub/physician-resources/legal-topics/medical-staff-topics/economic-credentialing.shtml/. Accessed 2009 May 3.

14. Jones JW. Legal implications of economic credentialing. 2006 Apr 13. http://www.physiciansnews.com/2006/04/13/legal-implications-of-economic-credentialing/. Accessed 2009 May 4.

15. Olderman N. Legal aspects of economic credentialing—managing medical care costs. Physician Executive. 1991 Nov-Dec. http://findarticles.com/p/articles/mi_m0843/is_n6_v17/ai_11647238/. Accessed 2009 May 4.

16. National Quality Forum. Establishing priorities, goals and a measurement framework for assessing value across episodes of care [summary]. 2009 May. http://input.qualityforum.org/pdf/IsNQFprojects_Ongoing_Current_May.doc. Accessed 2009 May 3.

17. Robert Wood Johnson Foundation. Regional Quality Strategy. Request for proposals. http://www.q-corp.org/q-corp/images/public/pdfs/RWJF%20Regional%20Quality%20Strategy%20Program%20Announcement.pdf/. Accessed 2009 May 3.

18. National Quality Measures Clearinghouse, Agency for Healthcare Research and Quality. Using measures. Modified 2010 Feb 8. http://www.qualitymeasures.ahrq.gov/resources/measure_use.aspx. Accessed 2009 May 3.

19. North American Spine Society. The quick and dirty guide to performance measurement and P4P. 2005. http://www.spine.org/Documents/pay_performance_primer.pdf. Accessed 2009 May 4.

20. Terry K. What ''tiered networks'' will mean to you. 2004 Sep 17. http://www.modernmedicine.com/modernmedicine/article/articleDetail.jsp?id=123434. Accessed 2009 Aug 1.

21. Mays GP, Claxton G, Strunk BC; Center for Studying Health System Change. Tiered-provider networks: patients face cost-choice trade-offs. Issue brief no. 71. 2003 Nov. http://www.hschange.com/CONTENT/627/?words=tiered. Accessed 2009 Aug 1.

22. Marano R. Insurer MD credentialing rationed. 1997 Sep. http://www.physiciansnews.com/cover/997wp.html. Accessed 2009 Aug 8.

23. Anwar R, Capko J. Why physicians get deselected. 1997 Sep. http://www.physiciansnews.com/business/997anwar.html. Accessed 2009 Aug 8.

24. Davis K. Paying for care episodes and care coordination. N Engl J Med. 2007;356:1166-8.

25. Congressional Budget Office, Congress of the United States. Research on the comparative effectiveness of medical treatments: issues and options for an expanded federal role. Publication no. 2975. 2007 Dec. http://www.cbo.gov/ftpdocs/88xx/doc8891/12-18-ComparativeEffectiveness.pdf. Accessed 2009 Aug 1.

26. Scinto JD, Sherwin TE, Fowler J. Use of administrative data in measuring quality of care. 2000 Aug. http://www.health.ri.gov/chic/performance/quality/quality7.pdf. Accessed 2009 Aug 1.

27. The Physician Consortium for Performance Improvement, American Medical Association. Guidance for requesting Physician Consortium for Performance Improvement (PCPI) review and approval of measures developed independently by PCPI voting members. 2007 Oct 5. http://www.ama-assn.org/ama1/pub/upload/mm/370/meas_dev_ind_pcpi.pdf. Accessed 2009 Aug 8.

28. Walter LC, Davidowitz NP, Heineken PA, Covinsky KE. Pitfalls of converting practice guidelines into quality measures: lessons learned from a VA performance measure. JAMA. 2004;291:2466-70.

29. UnitedHealth Premium physician designation program. http://www.uhc.com/physicians/care_programs/unitedhealth_premium_designation.htm. Accessed 2009 Aug 1.

30. Birkmeyer JD. High-risk surgery—follow the crowd. JAMA. 2000;283:1191-3.

31. Hamilton JJ, Fisher SE. Centers of Excellence: an evolving concept—and controversy. 2006 Feb. http://www2.aaos.org/aaos/archives/bulletin/feb06/fline8.asp. Accessed 2009 Aug 8.

32. Lyall S. Heart-bypass survival rates up in New York, study says. 1992 Dec 9. http://www.nytimes.com/1992/12/09/nyregion/heart-bypass-survival-rates-up-in-new-york-study-says.html. Accessed 2009 Aug 1.

33. Center for Medicare and Medicaid Services. Eliminating serious, preventable, and costly medical errors—never events. 2006 May 18; modified 2007 May 14. http://www.cms.hhs.gov/apps/media/press/release.asp?Counter=1863. Accessed 2009 Aug 1.

34. Richer P, United States Department of Commerce. Canada: healthcare financing and delivery in Ontario and Quebec. Document no. 135057. 2005 Dec 2. http://www.nema.org/gov/trade/briefs/canhealthfin.pdf. Accessed 2009 Aug 1.

35. Coady SF. Influencing physician practice variation: the future of evidence-based medicine portends use of information that is cumulative and evolutionary, not static—Evidence-Based Medicine. 2002 Feb. http://findarticles.com/p/articles/mi_m0DUD/is_2_23/ai_82879516/. Accessed 2009 Aug 8.

36. James BC, Hammond MEH. The challenge of variation in medical practice. 2000. http://arpa.allenpress.com/arpaonline/?request=get-document&doi=10.1043%2F0003-9985(2000)124%3C1001:TCOVIM%3E2.0.CO%3B2. Accessed 2009 Aug 8.

37. Fisher ES, Bynum JP, Skinner JS. Slowing the growth of health care costs—lessons from regional variation. 2009 Feb 26. http://content.nejm.org/cgi/content/full/360/9/849. Accessed 2009 Aug 8.

38. Fisher ES. Session 3: the paradox of plenty. Testimony to the President's Council on Bioethics. 2008 Mar 6. http://www.bioethics.gov/transcripts/march08/session3.html. Accessed 2009 Aug 8.