
Quality in Medicare: From Measurement to Payment and Provider to Patient

Karen Milgate, M.P.P. and Glenn Hackbarth, J.D.

Establishing the Medicare Program in 1965 led to greater access to care for millions of Americans. Yet, until the mid-1980s Medicare spent minimal efforts measuring or improving quality. Since that time, the Health Care Financing Administration (HCFA), later called CMS, has led many efforts to measure, publicly report, and work with providers to improve care. In 2005, policymakers seek to build incentives for improved quality into the payment system. This policy is critical for encouraging improvement and rewarding investment. Future efforts need to look beyond individual provider settings to encouraging improvement for patients receiving care in multiple settings, and at home.

INTRODUCTION

The Medicare Program has made it possible for older and disabled Americans to obtain medical care while providing significant protection against the financial burden of illness. Important breakthroughs in medicine might not have happened without sufficient and dependable funding from a payer as large as the Federal Government. This dependable funding created a market for new and improved technology, such as less invasive heart procedures and more accurate imaging.

Yet, until the mid-1980s, Medicare spent minimal effort measuring or working to improve quality. Medicare was originally

designed to mirror private sector insurance practices; among them was a policy of not interfering with the practice of medicine. Title 18 of the Social Security Act begins with the following admonition for the Federal Government to stay out of the practice of medicine (Section 1801. [42 U.S.C. 1395]).

“Nothing in this title shall be construed to authorize any Federal officer or employee to exercise any supervision or control over the practice of medicine or the manner in which medical services are provided...”

The prevailing view, then, was that properly licensed, autonomous physicians could be relied on to assure quality, providing that the Federal Government or private insurers did not meddle.

However, times have changed. We now know that high quality cannot be assumed. There are wide variations in how physicians practice, and some well-established medical practices have not been proven to be effective. Meanwhile, many effective treatments are underutilized and even appropriate care may be improperly administered, posing significant safety issues. In short, quality cannot be taken for granted; it must be zealously pursued.

COST CONTROL AND QUALITY ASSURANCE

Medicare was established without a mechanism for overseeing quality, but escalating costs soon aroused concern regarding the appropriateness of admissions for certain services. Congress authorized the creation of experimental medical

The authors are with the Medicare Payment Advisory Commission (MedPAC). The statements expressed in this article are those of the authors and do not necessarily reflect the views or policies of the Medicare Payment Advisory Commission or the Centers for Medicare & Medicaid Services (CMS).

care review organizations (EMCROs) in 1971 to try to reduce unnecessary utilization. The program was built on the assumption that groups of locally based physician peers could review inpatient and ambulatory medical records to identify individual cases in which the care provided was unnecessary. This model led to the establishment in 1972 of the professional standards review organizations (PSROs). Using the same mechanism as the EMCROs, the PSROs reviewed records for whether services were medically necessary, met professionally recognized standards and were provided in the most effective and economic manner (Bhatia et al., 2000). Congress then made further refinements to the program when it passed the Peer Review Improvement Act of 1982, which established the utilization and quality control peer review organization (PRO). So that the program was less focused on local practice patterns, this legislation consolidated the number of entities that could perform this type of work and provided a tighter Federal structure.

In 1983, Congress passed legislation establishing a prospective payment system (PPS) for hospitals. Changing the payment from the costs of care to a prospective amount determined by diagnostic-related groupings (DRGs) created incentives for hospitals to use fewer resources and days to deliver care. At the time, there was some concern that hospitals might react by trying to admit more patients while shortening the average length of stay. To evaluate hospital behavior in response to the PPS, HCFA placed a strong emphasis in the first 3-year PRO contract cycle (1984–1986) specifically on inappropriate admissions and early discharges. The statute also gave the PROs the ability to deny claims when health services are not medically necessary and reasonable. The PROs determined the appropriateness of specific

cases based on individual case review. As a result of this emphasis, relationships between local PROs and providers were often antagonistic.

In addition to the program to monitor providers, HCFA created standards for facilities to meet, entitled conditions of participation (COPs), when they entered into contracts with the program. In 1966, HCFA created the first set of such standards for hospitals, adding other standards as provider settings came into the program. These requirements were primarily structural in nature and intended as minimum standards for assuring quality for beneficiaries (Institute of Medicine, 1990). The requirements were general in nature. For example, they require hospitals to have adequate nurse and physician staffing and quality assurance and discharge planning processes. HCFA did not establish any such standards for physician offices, relying instead on State licensure to ensure quality.

In 1986, after receiving a request from the *New York Times* for data collected by the PROs, William Roper (HCFA Administrator), decided to publish Medicare hospital mortality statistics. HCFA staff did the analysis, with very significant assistance from leading health services researchers. HCFA emphasized that mortality rates alone should not be used to make judgments about the quality of care in individual hospitals, yet the message was clear: Hospitals should not be assumed to perform equally well. Despite strong opposition from the hospital industry, the hospital mortality statistics were published annually until the mid-1990s. By that time, however, another barrier had been crossed. Data about quality were not just for health care providers and researchers; the public must also be included in the discussion.

FROM QUALITY ASSURANCE TO QUALITY IMPROVEMENT

Another important shift occurred in the late 1980s and early 1990s, as a rapidly growing body of research highlighted potential quality problems (Institute of Medicine, 1990; Chassin et al., 1986). Improvement was not a matter of identifying isolated poor performers, in effect punishing or eliminating the low end of the performance distribution. Instead, the goal should be to improve the performance of all providers. Continuous improvement of this sort required thinking about systems of care; poor performance is not attributable to individuals so much as to how organizations function. Although largely developed by Americans, this approach to quality improvement first took root among Japanese industrial firms. American health care purchasers and providers very slowly began to build these concepts—often labeled “total quality improvement” or “continuous quality improvement”—into health care (Berwick, Godfrey, and Roessner, 1991).

This new philosophy departed sharply from the prevailing HCFA strategy, which used retrospective review to identify and potentially punish individual providers who did not meet minimal standards of quality. Even the goal was profoundly different. According to the principles of continuous improvement, there is no minimum acceptable level; processes can always be improved.

Recognizing the wisdom of this approach, HCFA began to shift its thinking. Jencks and Wilensky (1992) laid out a new vision for how Medicare would interact with providers and quality. They described the important shift from retrospective review for the purposes of identifying a few poor-performing providers to attempting to improve the quality of care of all providers prospectively.

Reflecting this shift in thinking, HCFA established the Health Care Quality Improvement Initiative (HCQII) in the PRO program. The goal of this program was for PROs to work with providers to improve care for certain conditions using accepted guidelines. HCFA used a four-State project entitled the Cooperative Cardiovascular Project (CCP) to test the concept. Through this project, HCFA determined that, armed with well-accepted, clinically proven measures, PROs were able to work with hospitals and physicians to improve care (Marciniak, Ellerbeck, and Radford, 1998). Because this project was limited to cardiac care in four States, HCFA needed to learn more about how the strategy would work for other conditions and other measures. In the next contract cycle, HCFA gave the PROs flexibility to choose measures from a wide variety of conditions and work with providers to improve on the care measures. Through this process HCFA then identified specific core tasks in the following contract cycles.

The PRO program continued to evolve, developing and testing new measures, and expanding to work in settings other than hospitals. To acknowledge the change in emphasis, CMS in 2002 led efforts to officially change the name of the program to the quality improvement organization (QIO).

Care has improved on the conditions that have been emphasized in the QIO contracts (Jencks, Huff, and Cuerdon, 2003). It is unclear whether all of the improvement is due to the activities of the QIOs, both because the conclusions of evaluative studies differ and because it is hard to isolate the effects of the program. On the cardiac measures in the CCP, care improved more on the cardiac measures in States where QIOs worked with hospitals than in other States (Marciniak, Ellerbeck, and Radford, 1998). Another just-released

study documents the success hospitals working with QIOs have had on surgical infection prevention (Dellinger et al., 2005). Another study, however, found that in four States improvement did not differ significantly between hospitals working and not working with PROs (Snyder and Anderson, 2005). Isolating the effects of the program on hospital behavior is hard because all hospitals are well-acquainted with QIOs and their clinical quality goals; moreover, their measures often overlap with those of other organizations, such as the Joint Commission on Accreditation of Healthcare Organizations (JCAHO).

In addition to shifting the focus of the PRO program, CMS also began to shift the minimum requirements for participating in the program, the COPs, to an improvement focus. Changes were proposed and issued in final form for hospitals, home health agencies (HHAs), and managed care plans that included requirements for providers to have processes in place for improving quality. The managed care program even required plans to demonstrate quality was improved and to maintain that level of improvement over time.

To document improved quality, one must be able to measure it. Although CMS had worked to develop measures for hospitals through the PRO program, it began to expand measure development to other settings. The agency developed, or adopted from others, measures for HHAs, dialysis facilities, nursing homes (including a few post-acute measures), and managed care plans. So, in addition to requirements for providers to have processes in place, the agency identified measures of quality on which providers could improve and be held publicly accountable. CMS created Web sites and posted quality scores on dialysis facilities, managed care plans, nursing homes, and HHAs.

As a result of a provision in the Medicare Prescription Drug, Improvement, and Modernization Act of 2003 (MMA), hospitals began publicly reporting on 10 quality indicators in the fall 2004. The provision required hospitals to report on quality as a condition of receiving the full update. Currently, CMS does not require physicians to collect or report any data on quality.

NEW STRATEGY: PAY-FOR-PERFORMANCE

At the same time as measurement, feedback, and public reporting were moving forward in Medicare, the Institute of Medicine (IOM) (2000) issued a report, creating an even greater sense of urgency. This report brought together findings from previous research on the occurrence of fatal medical errors in hospitals. The authors used these data to calculate the risks patients face in receiving care in hospitals—between 44,000 and 98,000 patients die every year in hospitals as a result of medical errors. IOM illustrated the depth of a problem that to this point had primarily been the subject for research. While the numbers cited in the report can be debated, the fact that significant error is an everyday occurrence in health care struck a chord. Patients, physicians, nurses, and administrators knew of their own experiences and a long-simmering problem became the subject of public discussion, hearings, articles, and various congressional and private sector proposals. While the report focused on hospitals, it also described how these types of quality problems also exist across providers.

A subsequent IOM (2001) report, outlined the significant chasm between optimal care and care currently delivered, further fueling the need for action. Since the two IOM reports, a variety of organizations

have developed and released for public use, measures of quality. Many of these efforts began before those reports, but their work became even more critical and visible after the release of the reports.

Impatient for change and weary of ever-escalating costs, private payers—both insurers and self-funded employers—began experimenting with financial incentives to further spur improvement. Private sector purchasers began pressing Medicare—the Nation’s largest single purchaser—to become more aggressive improving efficiency and quality.

MedPAC was one of the first Federal policymaking bodies to voice an opinion on financial incentives for quality¹. Believing that as long as payment was neutral or even negative toward quality the pace of improvement would be too slow, MedPAC (2003) recommended that Medicare build incentives for quality into its payment systems. Over the next 2 years, they analyzed the measures and capacity to collect information in various settings in which Medicare beneficiaries receive care and determined that a pay-for-performance program could be applied to hospitals, physicians, HHAs, dialysis facilities and physicians who treat dialysis patients, and Medicare Advantage plans.

Because of its previous work, described in this article, CMS already had information on the quality of care in some settings. For example, HHAs, dialysis facilities, Medicare Advantage plans, and hospitals already provide information to CMS on quality measures that could be used for pay-for-performance. However, additional information may be necessary for a broader assessment of quality, particularly for hospitals. Almost all hospitals provide information on a set of 10 measures. Other measures could include information on an

¹MedPAC is a 17-member body established to advise Congress and CMS on Medicare payment and related quality and access policies.

additional 12 process measures currently reported through the voluntary initiative, or measures of safe practices, a few outcomes, and self-reported patient experience of care.

For physicians, the only information Medicare currently collects is claims. Physician claims (particularly if linked with prescription and lab value data) could provide significant information about the quality of care. However, MedPAC also wants to ensure that physicians have systems in place to manage patients appropriately and to begin to incorporate clinical information technology into their practices. Therefore, MedPAC recommends linking payment to quality-enhancing activities associated with IT use, such as the use of patient registries to track and send reminders to patients or systems for ensuring that patients discharged from the hospital receive recommended followup care.

MedPAC suggests that a pay-for-performance incentive be built into the program in a budget-neutral manner. One or 2 percent would be taken out of provider or plan payment and redistributed based on quality. Providers who reached or exceeded certain thresholds would receive part of the performance pool while the remainder would go to providers who improved by a large amount, whatever their absolute score. This system would reward already high performers and create an incentive for others to improve.

CMS has also developed a variety of demonstrations on pay-for-performance. The following four examples illustrate strategies to tie performance on quality measures directly to levels of payment. Two of them could be built into the current fee-for-service (FFS) payment system and two are new organizational designs.

- The Premier Hospital Demonstration—CMS initiated this demonstration to test a specific approach to financial

incentives for improving hospital quality. CMS assesses hospitals' performance in five clinical areas: (1) acute myocardial infarction, (2) coronary artery bypass graft, (3) pneumonia, (4) heart failure, and (5) hip and knee replacements. It will pay out bonuses based on each separate clinical score. For example, hospitals in the top decile for heart failure will receive a 2-percent bonus for its heart failure patients. Initial results from the demonstration are positive—care has improved for patients with all of the conditions even before any incentives have been paid out (Remus, 2005).

- **Medicare Care Management—**Mandated by the MMA, this demonstration seeks to test pay-for-performance for physicians, specifically those in small or medium size practices in four sites. The legislation defined a variety of quality measures (including use of information technology for managing patient care). CMS will financially reward physicians who reach certain targeted thresholds on the measures.
- **Physician Group Practice—**CMS is using this demonstration to test a pay-for-performance model outside of the current payment system. Seeking models to improve efficiencies for the continuum of patient care, CMS is focusing this demonstration on group practices. If the annual combined Part A and B expenses for assigned patients are less than the expected level, the Medicare Program will share a portion of the savings with the practice. Performance on the quality measures helps determine the portion of savings retained by the physician group.
- **Chronic Care Improvement Program (CCIP) (now termed the “Medicare Health Support” Program)—**The MMA established this program as a pilot, instead of a demonstration, to make it possible to expand it to the entire Nation

if it is successful. Rewards in this program do not go directly to providers, but instead to an external CCIP contractor. The contractor works directly with patients and physicians to improve care for assigned beneficiaries with certain chronic conditions, such as chronic heart failure or diabetes, or those that have multiple conditions. CMS describes this program as a pay-for-performance demonstration because the contractors do not receive payment for their services unless they achieve certain thresholds of savings and quality.

The first two demonstrations build incentives into the current FFS payment system and are similar to the MedPAC recommendations. However, neither anticipates paying for the rewards by setting aside a portion of provider payment and redistributing the dollars based on quality. The other two rely on different organizational structures, with the CCIP also including a new payment mechanism. The group practice demonstration allows for the payment mechanism to remain the same—each physician or provider is paid for individual services rendered—but the ability to reap rewards for their efforts depends on the group practice's ability to better manage care to create savings and quality improvements. Both of the latter two demonstrations could also be useful in showing how the program could better coordinate beneficiary care across settings.

IMPLEMENTATION OF PAY-FOR-PERFORMANCE

CMS has significant work underway to develop strategies to reward quality care, but Congress still needs to pass legislation to authorize pay-for-performance as a routine feature of Medicare payment policy. Such legislation would require CMS to identify measures, collect, audit and

analyze data, and define a process to ensure that the measures are as accurate and up-to-date as possible. CMS will also need to develop a formula for scoring providers and distributing funds. Among the challenges in implementing pay-for-performance are:

- **Minimizing Burden When Choosing Measures**—A wide variety of measures exist for both physicians and hospitals, but the difficult question is how to obtain the data. In general, more burdensome methods of data collection, such as medical record abstraction, provide the most accurate data. CMS will need to achieve a balance between the accuracy of quality assessments and the burden of data collection. Some quality information could be obtained through claims, with limited burden on the provider.
- **Enhancing Existing Data Sources**—Improvements to claims could greatly enhance their utility. For hospitals, MedPAC recommended that hospital discharge information should include information on which secondary diagnoses were present on admission. This information would improve the accuracy of claims-based mortality and adverse event indicators. For physicians, the Commission recommended that CMS link prescription data and laboratory values (to be reported by laboratories) with physician claims to enrich the quality information available.

Another strategy could be to encourage both settings to accelerate adoption of information technology to make it easier to report the necessary information. However, it will be important to ensure that such technology includes the functions necessary to collect and report information on clinical measures.

- **Developing New Data Sources**—Some of this information will be new and CMS will need to develop mechanisms for collecting and analyzing a significant new

level of information. Through the voluntary hospital initiative and its expanding work with physician offices, CMS is beginning to create these systems, but the magnitude of this task must be recognized and funded.

- **Evolution of the Measure Sets**—New medical treatments and better ways of measuring the quality of care must be included in the measure sets. To ensure comparability, MedPAC recommended that a separate entity facilitate the involvement of all stakeholders. This entity would work with CMS to ensure that development of measures is well-coordinated with efforts in the private sector.
- **Distribution of Funds**—CMS or Congress will need to determine how much weight to give to absolute performance as opposed to improvement in performance. Within a measure set, measures could be weighted equally or given different weights based on the importance or accuracy of the data. Further, CMS or Congress could set a high threshold below which they would not pay out rewards (fewer providers would get relatively higher rewards) or distribute the dollars more broadly (more providers would get relatively lower rewards). Rewards could be based on certain conditions separately, as in the Premier demonstration, or CMS could create a composite index based on scores on all measures.
- **Managing Unintended Consequences**—Some have suggested that providers may avoid taking more difficult patients if their payments are tied to their performance on quality. This is of particular concern when outcomes measures, which need risk adjustment, are used. Although strategies for managing this problem exist—such as using process or structural measures that are not

affected by patient characteristics—CMS will need to monitor changes in provider behavior.

It will also be important to make sure that the program is not measuring the ability to report information rather than the actual quality of care. In the first years of the program it will take time for providers to become familiar with the data collection methods. CMS, or its contractors, will need to provide clear guidance and straightforward mechanisms on how to define and report on measures and assistance on an ongoing basis.

Building Rewards for Quality-Based Payments

Quality-based payments in a FFS system may improve the quality of care provided by individual providers. They do not, however, directly address the need for incentives to improve the efficiency of care, nor do they address the need to ensure better coordination among providers and over time.

Improving the Efficiency of Care

Reducing costs regardless of the effect on quality of care does not necessarily improve the value of the care beneficiaries receive. On the other hand, improving quality regardless of the resources used to do so does not necessarily improve value either. Information on both is needed. Measures of provider efficiency (identifying providers who deliver low cost, high quality care) are important, as are broader measures that look at how certain care (diabetics receiving all the appropriate care and diagnostic tests that prevent hospitalizations) affects total expenditures.

As the costs of the Medicare Program continue to climb, knowing the value obtained for the additional dollars will become critical. Policymakers, beneficiaries, and taxpayers could soon be faced with difficult choices to ensure the viability of the Medicare Program—decrease benefits, limit eligibility, increase cost sharing, increase taxes, or cut provider payments. If cutting provider payments emerges as part of the strategy, as seems likely, it will be critical to have information on both resource use and quality. Such information will make it possible for policymakers to make more rational choices about the level of payment necessary to ensure high-quality care for beneficiaries.

How could this information be used? It could be used to identify efficient providers and establish benchmark prices. For example, if 70 percent of hospitals achieve high-quality outcomes for their patients at a cost to the program less than the average for all hospitals, perhaps the program would set payments at the efficient hospital levels, rather than the national average. The data could also be used to guide investment decisions. For example, Medicare could decide to increase payment for ambulatory care for diabetics if that added care helps to reduce expensive hospital admissions.

It might also be used to help identify unnecessary utilization of services. Studies have documented tremendous variation in the amount of services used in different geographic regions (Fisher, Wennberg, and Stukel, 2003; Welch, Miller, and Welch, 1993; Brook et al., 1984). Determining precisely what level of resource expenditure is necessary to obtain high-quality care for every beneficiary and condition is probably not feasible. However, reducing the variation in quality and resource use is feasible and a necessary goal for the future of the program.

Improving Care Across Settings

Linking payment to quality for individual providers does not necessarily enhance coordination across settings or ensure that care is properly managed once patients must take care of themselves. Many quality lapses occur in the transition between settings. For example, when a hospital discharges a patient to home care without the necessary clinical information they could receive the wrong medication or care plan. Care must also be managed over time, not just at a point in time. Improvements in treatment have allowed a larger number of beneficiaries to live longer with chronic conditions. Conditions, such as diabetes, coronary artery disease, and hypertension all need to be managed not only by providers, but also by beneficiaries and their families.

Better management of chronic conditions is important, not only because of how prevalent these conditions are, but also because they are a significant proportion of Medicare expenditures. A recent U.S. Congressional Budget Office (2005) analysis found that more than 75 percent of high-cost beneficiaries were diagnosed with one or more of seven major chronic conditions in 2001. More than 40 percent of these beneficiaries had coronary artery disease, and about 30 percent had each of three other conditions diabetes, congestive heart failure, and chronic obstructive pulmonary disease. Various studies have documented significant gaps in care for beneficiaries with these conditions (McGlynn et al., 2003; Asch et al., 2000).

Strategies to ensure that the health system provides necessary support for patients in their homes and over time are necessary now and in the future. Medicare's quality efforts need to shift to acknowledge these needs.

The program could use a variety of strategies, either by building them into the current system, or through broader system changes. The program could:

- Include measures of appropriate hand-offs in a pay-for-performance program to ensure that the right information travels with the patient and gets to the new providers.
- Assign responsibility for the patient to a group of providers who are the patient's usual care system, or to an external entity such as those defined in the CCIP. That entity could then be held responsible for the care management function, including any measurable patient outcomes. This assignment could be done more or less formally depending on the program. For example, formally affiliated group practices could be given the choice to be paid on a basis similar to the group practice demonstration and be accountable for cost savings and quality improvements. Or, the program could require providers to identify a virtual network of providers with whom they work (perhaps a hospital and its affiliated physicians), and the larger entity could be responsible for the quality of that patient's care.
- Define the care management function for different conditions and patients and develop a new code physicians could use to bill the program for managing the patient over time.
- Find ways to further support the movement of patient information from provider to provider and from provider to patient. Increasing numbers of providers are finding ways to share at least some portion of patient health information with other providers electronically. The continuity of care record is one initiative that moves in this direction. Clinicians are working with a standard-setting body to define the key elements that practitioners should

pass on with their patients when they go to another setting of care. A standardized core set of information that moves with the patient could make it much easier for transitions to occur smoothly.

Another way to encourage a smooth transition of patients across settings and time is to enable patients to have their own information and carry it with them either electronically or have access to it on the Internet. Increasing numbers of providers and insurers are finding ways to allow patients to access their own medical records. Such improved flow of information could be achieved even without fundamental changes in the Medicare Program design or payment.

CMS Quality Improvements Efforts

Enhancing coordination across settings and supporting patient self-management as described previously illustrates how CMS quality improvement efforts could better focus on the patient. CMS has numerous demonstrations underway that operate across care settings to test these and other strategies for care coordination for individuals. Two other initiatives also provide examples of CMS efforts to shift towards patient-focused quality improvement efforts.

First, it has supported and used measures of quality designed to capture the patient's perception of their care experience. Initially, CMS helped develop the Consumer Assessment of Health Plan (CAHPS®) survey along with the Agency for Healthcare Research and Quality and has subsequently supported its development for hospital, and ambulatory care.

Second, it has made quality information on individual providers available to patients and their families through its Medicare compare Web sites. Quality scores for individual settings are posted on the CMS

Web site for Medicare Advantage plans, hospitals, nursing homes, HHAs, and dialysis facilities.

Maintaining and Improving Quality

By establishing the Medicare Program, Congress provided broader access to health care for older and disabled beneficiaries. It also provided a stable funding base for the revolution in health care treatments that took place between 1965 and 2005. In 2005, 40 years later, the high number and seriousness of quality problems in health care delivery require the Nation's single largest purchaser to lead efforts to improve care. Without incentives in the payment system for care to improve, necessary provider change will be much slower. While efforts to build incentives in the current payment system focus on individual provider care, efforts in the future must expand this program across settings. The program must focus directly on the patient, and start developing ways to measure care over time and settings. Such an approach may also become an important tool for managing the ever increasing costs of the Medicare Program.

ACKNOWLEDGMENTS

The authors would like to acknowledge the contributions of Mark Miller, Sarah Thomas, Sharon Bee Cheng and Mimi Cantwell.

REFERENCES

- Asch, S.M., Sloss, E.M., Hogan, C., et al.: Measuring Under Use of Necessary Care Among Elderly Medicare Beneficiaries Using Inpatient and Outpatient Claims. *Journal of the American Medical Association* 284(18):2325-2333, November 2000.
- Berwick, D.M., Godfrey, A.B., and Roessner, J.: *Curing Health Care: New Strategies for Quality Improvement*. Jossey-Bass and Company. San Francisco, CA. 1991.

- Bhatia, A.J., Blackstock, S., Nelson, R., et al.: Evolution of Quality Review Programs for Medicare: Quality Assurance to Quality Improvement. *Health Care Financing Review* 22(1):69-74, Fall 2000.
- Brook, R.H., Lohr, K., Chassin, M., et al.: Geographic Variations in the Use of Services: Do They Have Any Clinical Significance? *Health Affairs* 3(2):64-74, Summer 1984.
- Chassin, M.R., Brook, R.H., Park, R.E., et al.: Variations in the Use of Medical and Surgical Services by the Medicare Population. *New England Journal of Medicine* 314(5):285-290, January 1986.
- Dellinger, E.P., Hausmann, S.M., Bratzler, D.W., et al.: Hospitals Collaborate to Decrease Surgical Site Infections. *The American Journal of Surgery* 190(1):9-15, July 2005.
- Fisher, E.S., Wennberg, D.E., Stukel, T.A., et al.: The Implications of Regional Variations in Medicare Spending. Part 2: Health Outcomes and Satisfaction with Care. *Annals of Internal Medicine* 138(4):288-299, February 2003.
- Institute of Medicine: *Medicare: A Strategy for Quality Assurance, Volume 1*. National Academy Press. Washington, DC. 1990.
- Institute of Medicine: *To Err is Human*. National Academy Press. Washington, DC. 2000.
- Institute of Medicine: *Crossing the Quality Chasm*. National Academy Press. Washington, DC. March 2001.
- Jencks, S.F. and Wilensky, G.R.: The Health Care Quality Improvement Initiative: A New Approach to Quality Assurance in Medicare. *Journal of the American Medical Association* 268(7):900-903, August 1992.
- Jencks, S.F., Huff, E.D., and Cuerdon, T.: Change in the Quality of Care Delivered to Medicare Beneficiaries, 1998-1999 to 2000-2001. *Journal of the American Medical Association* 289(3):305-312, January 2003.
- Marciniak, T.A., Ellerbeck, E.F., and Radford, M.J.: Improving the Quality of Care for Medicare Patients with Acute Myocardial Infarction: Results from the Cooperative Cardiovascular Project. *Journal of the American Medical Association* 279(4):525-536, January 1998.
- McGlynn, E.A., Asch, J., Adams, J., et al.: The Quality of Health Care Delivered to Adults in the United States. *New England Journal of Medicine* 348(26):2635-2645, June 2003.
- Medicare Payment Advisory Commission: *Report to the Congress: Variation and Innovation in Medicare*. Washington DC. June 2003.
- Remus, D.: *Implementing a Hospital-Based Pay-for-Performance Model: Challenges and Opportunities*. Presentation at the National Quality Forum Meeting. May 9, 2005.
- Snyder, C. and Anderson, G.: Do Quality Improvement Organizations Improve the Quality of Hospital Care for Medicare Beneficiaries? *Journal of the American Medical Association* 293(23):2900-2907, June 2005.
- U.S. Congressional Budget Office: *High-Cost Medicare Beneficiaries. A Congressional Budget Paper*. Washington, DC. May 2005.
- Welch, W.P., Miller, M.E., Welch, H.G., et al.: Geographic Variation in Expenditures for Physicians' Services in the United States. *New England Journal of Medicine* 328(9):621-627, March 1993.

Reprint Requests: Karen Milgate, M.P.P., Medicare Payment Advisory Commission, 601 New Jersey Avenue, NW, Suite 900, Washington, DC 20001. E-mail: kmilgate@medpac.gov