

Alternative Volume Performance Standards for Medicare Physicians' Services

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VOLUME PERFORMANCE STANDARDS (VPSS) ARE ONE component of the legislation that reformed the way Medicare pays for physicians' services. The legislation introduced the Medicare fee schedule (MFS), which is based on the resource-based relative value scale (RBRVS) (Hsiao et al. 1992). The MFS replaces the payment rates for physician services and procedures—based on customary, prevailing, and reasonable charges—with relative values based on physician work plus overhead and malpractice expenses. Payment for a procedure or service is determined by multiplying the relative value units (RVUs) for physician work, practice costs, and malpractice by separate geographic practice cost indexes, then multiplying the sum by a national conversion factor. Although the new system gives Medicare greater control over the unit prices paid for services, the total cost of physician services in Medicare could increase if physicians respond to changes in fees by expanding the volume of services (Holahan et al. 1979; Rice and McCall 1982; Gabel and Rice 1985; Reinhardt 1985). Therefore, in an effort to contain overall health care spending, Congress also enacted the Medicare VPS policy, which establishes a Medicare target for physician services and imposes a penalty in the form of lower fee updates if expenditures exceed the target.

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Many other countries that use a fee schedule for physician services have adopted overall budget constraints or targets as a mechanism to control quantity and total expenditures; their experience suggests success in slowing the growth in the volume of services provided. Volume growth decelerated in West Germany after regional expenditure targets were introduced in 1978 (Kirkmann-Liff 1990). Nevertheless, the targets were consistently exceeded, leading to the adoption of budget caps in 1986. Quebec has had income ceilings for individual general practitioners and global expenditure caps for services of both general practitioners and specialists since 1977. British Columbia introduced a prospective threshold for expenditures in 1985. In both provinces, growth in per capita utilization slowed after adoption of the ceilings (Barer, Evans, and LaBelle 1988; Lomas et al. 1989). Furthermore, per capita utilization increased sharply in both provinces during a temporary lapse in the ceilings (Barer, Evans, and LaBelle 1988). This evidence of a slowdown in aggregate volume growth suggests that the controls work as intended, although the possibility that other factors contributed to the slowdown cannot be ruled out. Other evidence raises questions about the effectiveness of global budgets in controlling costs, however. Gerdtham et al. (1992) found that global budgeting did not lower the per capita spending of 19 countries in the Organization for Economic Cooperation and Development.

The question of how a slowdown is achieved also remains unanswered. Does the cutback occur in the procedures least likely to benefit the patient or in access to needed health care services? Some analysts take favorable comparisons between health outcomes in the United States and countries that have adopted controls as evidence that there are no deleterious effects on the quality of care delivered (Kirkmann-Liff 1990; Pfaff 1990). Nonetheless, more study is needed of the effectiveness of alternative performance standard policies in achieving the policy goals.

The goals of the Medicare VPS and of any global budget policy are:

- to constrain the increase in total expenditures
- to assure equitable access to quality health care
- to encourage changes in practice patterns without unnecessary intrusion into clinical decision making, imposing undue financial risk, or distorting training and location decisions

Establishing a VPS policy requires making choices along three dimensions: the risk pool, the scope and nature of the standard, and the appli-

cation of the standard. Table 1 presents an inventory of the choices along each of these dimensions. We will draw on existing literature to analyze the strengths and weaknesses of these choices in light of the broad policy objectives just described. We will also consider the administrative and political implementation issues related to the choices. Because this country has had no direct experience with VPSs, our analysis is qualitative—drawing on existing literature—rather than quantitative.

Our analysis is framed in terms of Medicare VPS policy. However, global expenditure policy is also under discussion as part of U.S. national health care reform, and several states have passed legislation to adopt statewide global health budgets or targets. Most of our analysis

TABLE 1
Dimensions of Alternative VPS Policies

Risk pool
Geographic (nation, region, state, county)
Delivery organization (HMO/PPO/IPA/hospital medical staff)
Other professional membership (specialty society)
Scope and nature of the standard
Scope of services in the standard
Services provided by group members
All physician services (including referrals) provided to group member patients
All Part B services provided to group patients
All Medicare-covered services provided to group patients
Nature of the standard
Expenditure level versus rate of growth
Global standard versus standards by type of service
Adjustments for differences between risk groups in patient population
Method of establishing the standard
By government
By formula
Through negotiation
Through competitive bidding
Application of standard
Adjust future prices
Total payment (capitation payment)
Maximum payment

Abbreviations: HMO, health maintenance organization; PPO, preferred provider organization; IPA, independent practice association.

raises issues that should be considered in designing a global budget policy applicable to population groups other than Medicare beneficiaries and their providers.

Effects of Risk Pool Choices

Mechanisms for Cost Control

There are three ways to change physician behavior and control the volume of services delivered: through financial incentives, through utilization management and control, and through education about appropriate patterns of care. The probable impact of risk group choice on the significance of each of these factors is summarized in table 2.

Geographic Units. The current Medicare VPS policy sets a standard for the nation. Under a national VPS, the incentives for any individual physician to modify his or her behavior are weak because the risk group is so large. Anticipating this problem, Congress mandated studies to investigate setting separate standards by geographic area as well as by specialty, by type of service, and for voluntarily formed groups of physicians. Analysts of health care systems abroad also point to the importance of regionalizing in order to provide physicians with a reasonable incentive to collaborate in controlling volume (Jönsson 1989; Kirkmann-Liff 1990; Rice and Bernstein 1990). However, because collective incentives alone are unlikely to alter individual behavior in large groups (Newhouse 1973; Hadley 1984), even subnational geographic risk pools—such as states, metropolitan areas, or even counties—are likely to offer only weak financial incentives to alter practice styles.

Many recommend separate VPSs for states to encourage physicians to work closely with carrier and Medicare Peer Review Organizations (PROs)—both primarily state-level organizations—to establish effective utilization review for services and procedures provided under Medicare Part B. The effectiveness of utilization review in containing total health care spending has not been clearly demonstrated, however (Gray and Field 1989). Mandatory review for certain medical procedures provided to Medicare patients did little to reduce the rate at which medically unnecessary claims were submitted (Nyman et al. 1990). More aggressive review programs—such as preadmission certification, management of high-cost cases, and discharge planning—have a mixed record (Scheffler,

TABLE 2
Effects of Risk Pool Choices

	Risk pool option	
	Geographic area	Other membership
Mechanisms for cost control	<p>Weak individual financial incentive</p> <p>Foundations exist for physician utilization review, but outlier UR unlikely to change average behavior</p> <p>Diffuse peer pressure</p>	<p>Strength of individual incentive varies with size of group and risk/reward structure of organization</p> <p>Utilization management with stronger economic sanctions</p> <p>Degree of peer pressure depends on size of group and organization structure</p>
Potential adverse consequences	<p>Variation across areas in Medicare policy</p> <p>Physician location decisions</p>	<p>Weak individual financial incentive</p> <p>Good organization for establishing standard, but lacks data and enforcement</p> <p>Information dissemination is primary activity, but lacks data for comparative profiles</p>
Implementation issues	<p>Variability in the data for setting standards</p> <p>Measuring performance</p>	<p>Introduces specialty differentials/incentives to specialize</p> <p>Distorts RBRVS/service mix</p> <p>Growth for some specialties depends on others' behavior</p> <p>Measuring performance</p>

Abbreviations: RBRVS, resource-based relative value scale; UR, utilization review.

Sullivan, and Ko 1991), and utilization review programs that lower use do not appear to alter the subsequent rate of growth in volume of services (Gray and Field 1989). This is particularly true for review programs, like Medicare's, that focus on detecting and eliminating "outliers" and abuse, because removing outliers is unlikely to alter average behavior (Enthoven 1989). Moreover, physicians increasingly object to the intrusion of these programs into clinical decision making.

Many hope that VPSs will encourage the physician community to support the development of new tools—such as practice guidelines, physician profiles, and education programs—that will give physicians information to improve decision making and will curtail growth by reducing inappropriate care (Physician Payment Review Commission 1989). Education programs designed to alter physician performance work best when they provide specific information about how the individual physician's practice patterns differ from those of peers or from accepted practice and when they provide continued feedback and enforcement (Rubin and Hackbarth 1984). Data collected by state-level Medicare carriers provide a ready foundation for profiling a physician's practice and providing information to the physician about how he or she differs from others in the risk group. In fact, the Omnibus Budget Reconciliation Act of 1989 (OBRA89) requires that carriers expand and build upon their existing postpayment review to profile physicians' billing patterns and provide comparative data to physicians whose patterns differ from their peers. In some cases, physicians are quick to change practices when informed that their practices diverge from the norm (Wennberg 1984). In other cases, peer pressure and advice may help to turn such information into behavioral change; at a state level, however, such peer influence may be too diffuse.

Delivery Organizations. Whether an organized group of physicians—a multispecialty group, a preferred provider organization (PPO), an individual practice association (IPA)—can translate a collective financial incentive into incentives for the individual physician depends on the structure of the risk-and-reward system the organization develops and the size of the physician group. Without individual financial incentives to control cost, early IPAs were unsuccessful in containing cost (Luft 1981). However, many IPAs in the 1980s placed small groups of physicians at some financial risk if costs exceeded budget; Welch (1987) provides evidence that such IPAs were more successful in containing costs than IPAs in which all IPA members shared in the risk. Organized

physician groups can also impose penalties or rewards that vary with individual performance; such arrangements have been shown to alter performance (Hillman, Pauly, and Kerstein 1989).

Utilization management and education directed at altering performance may also be stronger in organized physician groups than in geographic area-based risk pools. The former group may be in a position to impose stronger economic sanctions— notably, denial of group membership.

Other Professional Membership. Professional societies play a primary role in continuing education for physicians. They are increasingly active in developing guidelines on appropriate service utilization and on the safety and efficacy of procedures (Schwartz 1984). Because many specialty societies have state organizations, establishing separate VPSs for society members in a geographic area, such as specialty societies within a state or a county medical society, might encourage greater cooperation among members with the Medicare carriers and PROs to meet the targets. The societies, however, currently lack either the data to develop profiles or the formal sanction for an effective utilization review program.

Potential Adverse Consequences for Patients and Providers

Geographic Units. For the physician community in a state to be effective in developing strategies to contain growth and meet the set target, it must have some liberty to adopt policies that will achieve the objective. However, absent standardized policies and restrictions placed on carriers and PROs by Medicare, variations among regions and states in policies affecting Medicare beneficiaries and providers may arise (Burney et al. 1984; Hammons, Brook, and Newhouse 1986). Such variation in the implementation of a federal program will undoubtedly raise issues of equity among beneficiaries.

Geographic VPSs establish borders across which standards may vary. These differences may encourage physicians to relocate across borders to areas with less stringent targets. If geographic VPSs are used to update fees, over time differences in fees across areas will deviate from differences in geographic practice costs, and this too may alter location decisions.

Delivery Organizations. Using VPSs for multiple delivery organizations or group practices in an area to guide updates in prices for each group practice could lead to variation between group practices within a

market area in conversion factors, and hence in prices for care. One objective of payment reform was to simplify Medicare physician payment. Numerous group conversion factors would produce a payment system that was administratively complex, difficult for beneficiaries and physicians to understand, and possibly leading to greater volatility in beneficiary out-of-pocket liabilities. Moreover, holding down updates for group practices that fail to control volume growth may encourage Medicare beneficiaries to switch to less efficient performers because, with lower fees, the beneficiaries' cost sharing is also reduced.

Incentives to select healthier patients may exacerbate any access effects of VPS for less healthy patients and referrals; the group practice would have an incentive to treat the healthiest patients in order to improve the chances of meeting the group performance standard (evidence of favorable selection experience by HMOs serving Medicare patients is summarized in Hellinger [1987]). To the extent that the group is able to identify less healthy patients in advance of treatment, it would have an incentive to refer them elsewhere for care. But the residual market would also be reluctant to take on the unhealthy patients. Accepting the patient would compromise the ability of the residual market to stay within the target, if its target is based on the average patient. Thus, access for the neediest patients could be threatened.

Other Professional Membership. Separate VPSs for specialty societies might reintroduce a number of distortions in the payment system that the reform legislation was intended to correct. First, if payment updates differed among specialty groups, specialty differentials in payment would result for a given procedure. If differences persist over time, they could affect specialization choices. Second, different payment updates would result in relative payments for procedures performed by different specialties that could differ substantially from the relative values established by RBRVS. Third, primary care providers might increase their referrals of costly cases to specialists, although whether this increase would affect Medicare outlays and the quality of care delivered is uncertain.

The services provided by some specialty groups are largely determined by the referral and prescribing practices of other specialties. For example, most of the services of radiologists are the consequence of referrals from other physicians. Thus, both optimum financial incentives and equity would suggest that other physicians share in the growth of the volume of radiologists' services. Establishing separate VPSs would break this link.

Implementation Issues

Data variability may present problems in setting standards and measuring performance. Even state-level data show large year-to-year variability in expenditures. The magnitude of these variations is likely to be greater for geographic units below the state level. This seems to preclude using a few historical years of data for setting state-level targets, and suggests that the full difference between a target and actual measured performance for a year should not be incorporated in determining fee updates (Physician Payment Review Commission 1990).

Defining a population base on which to set standards and measure performance poses difficulties in establishing separate VPSs for delivery organizations (Physician Payment Review Commission 1990). For example, some believe that hospital medical staffs present an ideal risk group because they have an established utilization program and other internal incentives to control cost (Welch 1989). However, this option does not seem feasible because there is no defined population base on which to set expenditure targets.

Similarly, if beneficiaries are to retain point-of-service free choice in selecting their provider, there is no easy way to determine beneficiary membership in a group practice. For example, beneficiaries could be asked to report their usual source of care or where they would be most likely to go if they needed care as one way of determining membership. However, intentions and actual behavior are likely to diverge (Hosek, Marquis, and Wells 1990). Although targets and performance could be restricted to the services actually provided to patients, excluding services provided outside of the group practice in measuring performance presents the group with poor financial incentives, as we discuss in the next section. Health plans, such as HMOs, that require explicit beneficiary enrollment in the group practice and do not pay benefits for out-of-plan use are not subject to this problem.

Administrative problems also arise if physicians are allowed to belong to more than one group practice. Incentives for cost control within a single group practice might be diluted by multiple group membership. Physicians might refer complex cases to the group practice with higher targets. Establishing the population base for a single group practice and tracking group performance are further complicated when physicians belong to multiple group practices.

Scope and Nature of the Standard

The second major dimension in defining a VPS involves the scope of services for which physicians should be placed at risk, the nature of the standard itself, and the method of establishing the standard.

Scope of Services in the Standard

The most basic issue is whether physician groups should be placed at risk for only those services they provide, or for all services offered to their patients, including those provided by physicians outside the group. Another important issue is which services to include in the standard. Under current policy, the standard applies to physicians' services and other services typically provided in physicians' offices, such as laboratory testing, although the standard could be expanded. Issues related to these choices are summarized in table 3.

Incentives for Cost Control. The weakest incentives for cost control will occur if physicians are placed at risk for only the services provided within the VPS risk group. Under this arrangement, the risk group will have some incentive to monitor physician utilization, but it may not impose strong economic pressures on its peers if high-use patients can easily be referred outside the group. Ease of referral will be related to the size of the physician group and the number of competing groups. For example, for geographic risk groups, referral across boundaries will be limited if the geographic area is large, such as a metropolitan area or a state. Under a highly competitive model, referral of high-use patients is also likely to be difficult.

Placing physicians at risk for all physician services provided to their patients could have a major effect on the incentives faced by physicians within the risk group. The strength of these incentives increases as the scope of included services becomes more comprehensive. For example, limiting the scope of services to physician services would provide some incentive to overutilize nonphysician services.

Expanding the scope of services in the standard to include all Part B services would eliminate the incentive to overutilize nonphysician services. Because the scope of services is more comprehensive—including, for example, hospital outpatient services and services furnished by ambulatory surgical centers as well as physician care—the incentives to monitor and to influence physician utilization are even stronger.

TABLE 3
Effects of the Scope of Services Included in the Standard

		Options for defining included services		
	All Part B services provided to patients of group members only	All physician services provided to patients of group members	All Part B services provided to patients of group members	All Medicare covered services provided to patients of group members
Incentives for cost control	Depends on ability to shift sickest patients to other groups (e.g., to other delivery organizations, across boundaries)	Individual incentives depend on group size and organizational structure	Greater flexibility in controlling cost by modifying volume of nonphysician services	Greater flexibility in controlling cost by modifying volume of nonphysician services Strong incentive for provision of care in ambulatory setting Incentive to accept capitation
Potential adverse consequences	Incentive to refer sickest patients to nonmember providers Incentive for physicians to switch groups and/or affiliate with multiple groups	Distort RBRVS and service mix owing to incentives to use tests and other non-physician services Incentive for physicians to switch groups and/or affiliate with multiple groups	Incentive for physicians to switch groups and/or affiliate with multiple groups	Incentive for physicians to switch groups and/or affiliate with multiple groups
Implementation issues	Lack of group-specific data for establishing standards Additional administrative burden of tracking group-specific performance	Lack of group-specific data for establishing standards Additional administrative burden of tracking group-specific performance Payment procedures for out-of-group use	Lack of group-specific data for establishing standards Additional administrative burden of tracking group-specific performance Payment procedures for out-of-group use	Lack of group-specific data for establishing standards Additional administrative burden of tracking group-specific performance Lack of timely Part A and Part B linked data Payment procedures for out-of-group use

The most comprehensive scope of services for defining the standard would include all Medicare Part B and Part A services, providing by far the strongest incentives for the physician group to monitor member practice patterns and to manage patient care in every setting. Including Part A services in the target offers an incentive to shift inpatient care to the less costly ambulatory setting. It might also establish a strong incentive for groups to accept capitated payments instead of fee-for-service. Capitated payments would tend to be profitable (at least in short-term cash flow), although more risky than fee-for-service payments. Because groups under this option have a strong incentive to manage each beneficiary's entire episode of care, they also have an incentive to accept payment in advance (i.e., capitated payment) rather than at the point of service.

Including all Medicare services in the VPS would also introduce standards for total expenditures under the Medicare prospective payment system (PPS). To date, expenditure limits under PPS have been applied only to per case payments, not total payments. This option would introduce a single standard for total Medicare expenditures, thus creating a less fragmented system of payment.

Potential Adverse Consequences for Patients and Physicians. If performance measures were based only on the services delivered by the group practice to their patients, and not on all services received by their patients, the risk group would have an incentive to refer complex cases to another group of physicians when they identified health problems that could not be detected in advance. This incentive may impair access for those most in need. To address this problem, Congress might need to enact antidumping or antidiscrimination statutes to protect beneficiaries. The broader the scope of services included in the standard, the greater both the financial risk to providers and the risk of cutbacks in needed and appropriate care.

Physician membership in multiple risk groups and switching among groups might dilute incentives for cost control. Physicians would have an incentive to leave risk groups with low targets and to shift patients among groups according to their health risk, rather than to find ways to contain costs. The ability to do so, however, will diminish as the scope of services included in the group target increases to include all services provided to patients of the group. In such cases, the greater incentives to monitor physician behavior and utilization may make it more difficult for physicians to change risk groups. At the very least, they might have

to provide information about their practice profile before joining a new group. In general, the options that place groups at risk for all services provided to the patient would seem to create a more stable environment for group formation and membership.

Whether each option is perceived as posing an undue financial risk to physicians will depend on other decisions about the organization of the delivery system. For example, placing physicians at risk for all services provided to their patients may impose an unfair risk unless patients are required to enroll with a group and are not free to obtain covered care outside the group. Including Medicare Part A services in the standard also may be perceived as requiring undue risk-taking for physicians because they would now be liable for hospital cost overruns. This risk is much less if the standard is expanded to all of Part B, including hospital outpatient departments, because inpatient expenditures account for such a large share of total Medicare expenditures. A standard that includes all of Part B plus Part A would be less risky to physicians if they joined with hospitals to form organized delivery systems that provide all required services to a defined population.

Implementation Issues. Including out-of-group use in the group performance measure poses administrative burdens. All physician services delivered to a patient need to be attributed to one group, even if these services are performed by a physician belonging to a different group, including groups reporting to a different carrier. This problem could be overcome if beneficiaries were required to enroll in a single group and to agree to receive all care from that group. Out-of-group use would not be covered under Medicare in this case.

A VPS that included all Medicare services would require a data system that linked Part A and Part B records for beneficiaries in a timely manner, such as the National History File that is currently being developed. Because this file is new, however, accurate data from previous periods are not necessarily available.

Nature of the Standard

Establishing the standard requires making choices about whether to establish a target rate of growth or a target level of service, whether to set one standard for all services or to set standards that vary by type of service, and how to adjust a target for differences between risk groups in

the patient population served. Issues in making these choices are summarized in table 4.

Expenditure Level versus Rate of Growth. A target rate of growth can be established based on estimates of inflation and population growth and an assessment of the appropriate growth in the volume of services per person to account for changes in technology and other factors. Or, a target can establish the *level* of total resources (expenditures) that are to be devoted to medical care.

TABLE 4
Effects of Choices about Nature of Standard

	Nature of the standard		
	Expenditure level vs. rate of growth	Global standard vs. by type of service	Risk adjusters
Incentives for cost control	Level can focus areas of overservice	By type can focus on problems of excess use and respond to physician behavioral change Global makes physicians responsible for services they prescribe but do not perform	AAPCC adjusters may distort incentives in small groups Some additional adjusters may weaken incentives for all groups
Potential adverse consequences	Rate can perpetuate and exacerbate inequities	By type, payment difference does not reflect difference in resource cost By type may distort referral patterns	Depends on risk group; AAPCC adjusters may lead to selection and access problems
Implementation issues	Level makes explicit redistribution Data reliability	Increased complexity in setting multiple standards Establishing appropriate growth of different services	Good adjusters not available in current databases

Abbreviation: AAPCC, adjusted average per capita cost.

Although these choices are essentially equivalent for a national target, in the case of subnational risk groups the type of standard does alter the policy aims that can be addressed with the target (Physician Payment Review Commission 1988). To direct cost containment incentives to areas that exhibit high-cost patterns of care, while rewarding areas that are more cost efficient, requires explicit consideration of the target level of expenditure in each area. In addition, establishing target levels of expenditure for each subnational risk group can provide incentives to increase care in areas of underservice. Growth targets, however, would perpetuate the relative difference in use between under- and overserved areas and exacerbate the absolute differences. The wide interarea differences that have been observed in Medicare outlays per beneficiary are unlikely to represent differences in need (McClure and Shaller 1984). Given these differences in base rates, it would be difficult to hold separate areas to a common growth rate when equal access is a policy goal of reform.

Although expenditure-level targets offer some additional flexibility in meeting policy objectives, they pose political and administrative difficulties: First, as we noted earlier, explicit allocation of federal expenditures under Medicare to subnational areas is likely to be a politically difficult process. Explicit *redistribution* of monies may well make the process even more contentious.

Second, data variability presents problems in setting target levels. Even at the state level, there are large year-to-year variations in expenditures. At the smaller unit of a county, these large variations remain even when averaging the data over several years (Physician Payment Review Commission 1988). This variability makes it difficult to use historical data to set the level. Historical data are not strictly needed to establish area targets. For example, a national target level could be allocated to subnational areas based on the size and composition of the area's Medicare population. However, targets that are set too low relative to current practice patterns could impede access to care for Medicare beneficiaries in the area. Thus, some blending of the adjusted national target and the area historical data might be needed for some time, thus requiring the area data.

Global Standard versus Different Standards by Type of Service. A global standard would be a target increase or expenditure level that covers all services. Alternatively, separate targets can be set for different types of service. OBRA89 requires separate standards for surgical and nonsurgical services. In West Germany, separate expenditure caps are es-

tablished for physician consultations, laboratory tests, and other services. Separate standards might be set as a function of place of service to encourage the provision of care in less costly settings; inpatient versus outpatient targets would be one example.

Setting separate standards for different types of service allows policy makers to focus cost controls on services that have exhibited rapid volume increases and provides another policy mechanism for stimulating desired provider behavior and responding quickly to undesired changes (Kirkmann-Liff 1990). Furthermore, separate standards may encourage physicians to organize through their existing specialty societies. For example, separate standards may provide the societies with greater incentives to establish practice guidelines and disseminate information about appropriate practice.

However, physicians prescribe many services that they do not perform, but for which they refer patients to other physicians. The example of radiology services was mentioned earlier. A global standard makes physicians responsible for increases in all the services they perform and prescribe.

Another disadvantage of setting separate standards for different types of service is that it may lead to payment differences among types of service that do not reflect differences in the resource costs of providing them because the conversion factors will diverge over time. Having separate standards might also provide unanticipated incentives that would distort the mix of services and referral patterns. For example, if the standard for laboratory tests was higher than the standard for evaluation and management services, general practitioners might refer patients for more tests when making a diagnosis rather than take an extended history and physical.

Setting different standards for different types of service would increase the administrative complexity of the system, especially if risk groups are subnational. It also would require decisions about what mix of different type of services is appropriate or how the rate of growth should differ among classes of service—information we do not have.

Risk Adjusters. One way to set a target for a subnational risk group is to allocate a target level of national expenditure to the group based on the size and risk composition of the patient population it serves. The issue then is what variables or adjusters to use to define differences in the risk composition of the group.

The formula Medicare now uses to adjust for differential risk of treatment when setting payment for capitated health plans, the adjusted av-

erage per capita cost (AAPCC), includes age, sex, welfare status, and institutional status. There is wide agreement that these variables do not adequately adjust for case-mix differences because they poorly predict expenditures for individual beneficiaries (Newhouse 1986). As a result, capitated plans have an incentive to enroll only healthy Medicare beneficiaries. Such incentives could be a problem in using the AAPCC risk adjusters to set separate standards for different delivery organization risk groups in a geographic area. If delivery organizations are able to select healthy patients, then the unhealthy patients must obtain care from the residual risk pool. But with inadequate adjusters, the target for the residual pool will be too low and persons most in need of medical care may encounter difficulties in gaining access to or receiving quality care.

Because targets for geographic areas cover the entire population of the area, selection is less of a problem, and the AAPCC risk adjusters, combined with geographic price factors, may be adequate for setting geographic targets, especially for large territories like states. In fact, for setting geographic targets, the current demographic adjusters may be superior to the alternatives. Most of the possible alternatives under current data systems include prior utilization in the adjustment formula (Anderson et al. 1990), which offers groups a motive to deliver more care to patients in order to affect their risk adjustment in the subsequent periods.

Rather than using utilization as a proxy for health status, others have examined ways of directly incorporating health status as an adjuster, including measurement of functional status (Lubitz, Beebe, and Riley 1985; Thomas and Lichtenstein 1986) or the existence of certain chronic conditions. These measures are not part of the current data collection of the Medicare program, however.

Establishing the Standard

There are several ways that the standard can be established: by the federal government; by formula; through negotiation; and through competitive bidding. OBRA89 specifies that Medicare VPSs will be established each year by Congress, and spells out a default formula to apply if Congress does not approve a certain target. The Secretary of Health and Human Services and the Physician Payment Review Commission (PPRC) are called upon to make recommendations to the Congress about the VPS. The recommended growth standard is to take into consideration changes in prices; the composition of the Medicare population; technology; and

medical needs due to changes in the prevalence of certain conditions. In addition, recommendations are to take into account access to appropriate care and inappropriate use of services (Physician Payment Review Commission 1990).

Prices and population size and mix can be readily measured. Technological growth, the amount of technological improvement to fund, and changing medical needs of the population are difficult to measure directly and therefore are often based on "informed judgment." Thus, a strict formula-only approach to setting standards is unlikely to work in the long run. Furthermore, OBRA89 did not intend for VPSs to be set by formula; the formula provides the Secretary of Health and Human Services with a standard to implement should the Congress fail to act in any given year.

The role of interested parties outside of government in setting the standard under the OBRA89 legislation will be informal—offering advice and comment on the recommendations of the Secretary and the PPRC. Some, however, believe that physicians need to have a formal role in the process if they are to cooperate in meeting the reform objectives, and they recommend formal negotiations involving physician groups, as is practiced in some other countries (Glaser 1989, 1993). For example, in Germany, the expenditure cap is determined through negotiations between a national association of payers and physicians (Kirkmann-Liff 1990; Physician Payment Review Commission 1991). The negotiations are guided, but not bound, by recommendations from a government advisory body that includes representatives from insurers, physicians, hospitals, employers, and unions. Failure to reach negotiated agreements can result in compulsory arbitration. In Canada, targets and ceilings are established through negotiations between the provincial governments and physician associations. In some provinces, the parties agree to binding arbitration for disputes; in others, there is no mechanism to resolve disputes (Lomas et al. 1989). In British Columbia, which does not have an agreement for binding arbitration, failure to reach an agreement recently ended in the lifting of the ceiling.

Critics of establishing formal negotiations to set targets or fee schedules in the United States note problems of involving interested parties other than physicians, such as consumers and private payers, in a formal process. They also point to Medicare's limited negotiating role because it is Congress that sets budgets and because political power is decentralized in the United States (Ginsburg and Lee 1989; Hsiao 1989; Rodwin

1989). They observe that there is little evidence that formal negotiations in other countries reduce conflict between the medical profession and the state, and that informal working relations between payers and physicians have led to innovative and cooperative efforts to contain costs in this country, such as the establishment of PPOs.

Competitive bidding might also be used to establish volume standards if the standard was a maximum under which the group bears the full risk for volume per patient above the maximum and bears some or all of the reward from delivering care under the maximum. One winning bidder in an area could be selected. This would operate like the geographic capitation described by Burney et al. (1984) and by the Congressional Budget Office (1986). A disadvantage of selecting a single bid is that it might discourage competition in subsequent bidding rounds.

If more than one bidder is selected to participate, the winning (low) bidders might be treated as preferred providers and the losing bidders could then form a residual market that is reimbursed at a lower rate. This would preserve beneficiary freedom of choice and provide flexibility in the event that not enough participants with acceptable bids come forward. Beneficiaries could be offered incentives to enroll with the PPO. To safeguard against collusion in the bidding process, the preferred providers might be limited to the number and mix of providers necessary to ensure access. Limits on balance billing by physicians outside the preferred provider pool might be necessary to preserve beneficiary choice while protecting against burdensome beneficiary out-of-pocket liability.

In practice, competitive bidding has not conclusively been a more effective cost-containment device than traditional ways of setting prices or capitation rates (McCombs and Christianson 1987). Furthermore, the bidding process adds to the cost and complexity of administering the program.

Applications of the Standard

Implementing the standard involves making choices about whether to use it to adjust future price updates (i.e., through updates to the conversion factor), to determine total per capita payments, or to establish payment ceilings. The important effects of each application are summarized in table 5.

TABLE 5
Effects of How the Standard Is Applied

Options for applying the standard	
To adjust future prices	To establish total payment ceilings
<p>Incentives for cost control</p> <p>Weakest incentive because of time lag between overutilization and economic sanction</p> <p>Single update for all services dilutes incentive to reduce increased utilization of specific services</p>	<p>Depends on distribution of payment to group members</p> <p>Depends on how group shares in savings from delivering a volume less than ceiling</p> <p>Depends on how payments are distributed to group members</p>
<p>Potential adverse consequences</p> <p>Low updates may lead to reduced assignment rates, and thus greater beneficiary liability</p> <p>Medicare expenditures will still be somewhat unpredictable</p> <p>Medicare expenditures will still be somewhat unpredictable</p>	<p>Lower assignment rate among physicians</p> <p>Increase in beneficiary liability</p> <p>Poor access and low quality</p> <p>Lack of adequate care for beneficiaries at the end of fiscal year if ceiling is exceeded</p> <p>Lower assignment rates among physicians</p> <p>Potential distortion in service mix if ceilings are set for individual physicians</p> <p>Large potential beneficiary liability after ceilings are exceeded unless balance billing is restricted or prohibited</p>
<p>Implementation issues</p> <p>Need to distinguish between "real" changes in service mix and "upcoding"</p>	<p>Lack of data about utilization by patients under capitated payment, unless providers are required to submit utilization data</p> <p>Need to monitor program expenditures and/or payments to individual physicians to determine when ceiling has been exceeded</p> <p>Likely to create an annual year-end crisis after ceilings are exceeded</p>

Adjusting Future Prices

The current Medicare VPSs are used to adjust future prices. This approach provides the weakest economic incentive to control overutilization because of the rather lengthy time lag before economic sanctions are applied and because all services are affected uniformly. Whether costs are brought under control while simultaneously preserving access to quality care depends on physicians' response to the budgets and price changes. We have argued that global budgets are unlikely to provide short-term financial incentives to physicians to alter practice styles. If they do not respond to targets, however, lower payment rates will result. If physicians respond to lower fees by reducing volume, cost containment objectives might be realized. In this way, VPSs would work by sending physicians price signals to reduce quantity. However, we earlier cited evidence that physicians respond to reductions in fees by increasing the volume of services, further thwarting cost containment goals.

There are other ways that physicians might respond to a real reduction in fees, however. Some physicians may respond by charging higher prices to Medicare patients and attempting to recover the difference between Medicare's fee and their charge through balance billing—charging patients for prices in excess of the fee schedule. Congress enacted limits on balance billing as part of OBRA89 to reduce this effect. Demand responses to price increases also constrain the ability of physicians to increase prices, although supplementary coverage dampens the demand response to higher prices. For some patients, however, higher prices would reduce access. Another potential adverse effect is that physicians may reduce their assignment rates in response to lower payments in the future, thus increasing the financial liability of beneficiaries, despite limits on balance billing.

Furthermore, the Medicare VPS applies only to services delivered to Medicare patients, which account for about one-third of the total U.S. physician bill (Waldo et al. 1989). Some physicians may respond to limitations on Medicare fee increases resulting from failure to meet targets by focusing their practice on younger patients covered by private payers rather than taking new Medicare patients. Others may try to shift costs by raising prices to patients covered by private payers. Again, although there are demand-side constraints on such responses, they are limited by extensive insurance coverage. Finally, some may respond to constraints on Medicare fees by treating fewer charity patients or Medicaid patients, whose reimbursement rates are lower than those of Medicare patients.

If physicians do respond to VPS targets by reducing the volume of services, meeting the goal of assuring equitable access to quality care depends on whether physicians respond by reducing inappropriate care or by cutting back on all services. Adjusting all prices by a uniform factor provides no direct incentive to discard unnecessary services or to encourage the use of highly beneficial services. To focus cost containment on overused services, adjusted targets (and price updates) for different service groups can be established. However, if separate standards are developed according to type of service, these multiple updates may quickly lead to divergent fee schedules. The trade-off is between specificity in targeting overutilized services and uniformity in the fee schedule. Rather than using the price system to improve the quality of care, many recommend support for the development of practice guidelines and the expanded use of profiling (Physician Payment Review Commission 1992).

An important administrative task will be distinguishing between "real" changes in service mix and "upcoding." Evidence from PPS (Carter, Newhouse, and Relles 1990) suggests that a significant amount of the annual increase in expenditures for hospital care is related to coding patients into higher payment categories, or upcoding. Both the Health Care Financing Administration (HCFA) and the Prospective Payment Assessment Commission (ProPAC) develop annual estimates of changes in hospital case mix due to real changes in the underlying mix of patients. These estimates are included in proposals for the annual update for PPS payments. Changes due to upcoding are excluded because hospitals have already received higher payments for these cases. Under any VPS policy, there will clearly be a need to separate upcoding from real changes in service mix. The technology and practice pattern component of the standard should account for volume changes related to appropriate advances in medical practice and technology. Otherwise, physicians will be penalized in the future for increasing their use of these new services.

Determining Total per Capita Payments

Under this option, the standard would be calculated as a per capita amount and would include an estimate of an appropriate increase in per capita expenditures. This option provides strong group incentives to control costs and makes future Medicare outlays completely predictable. Evidence shows that HMOs, which receive per capita payments, do deliver

less costly care than fee-for-service (Luft 1981; Manning et al. 1984). However, there is little evidence that HMOs alter the *rate of growth* in utilization.

Incentives for the individual group member depend on how the group distributes the total payment to members. If physicians are paid in proportion to services they provide, there is little incentive to control volume, and the amount of the per capita payment would affect fees received for each billable service. If fees are low as a result, this may affect physicians' decisions to accept assignment and so would affect beneficiary liability. There may also be adverse consequences for access and quality if capitation results in low fees because volume is not constrained. Furthermore, it may be difficult for Medicare to monitor access and quality if current capitation arrangements continue whereby groups are not required to submit utilization data.

Establishing Payment Ceilings

A payment ceiling establishes an absolute limit on total payments. The incentive to control utilization, therefore, depends on how the group is paid. At one extreme, if physicians are paid on a fee-for-service basis with no reward for reducing volume, there is little incentive to control utilization. In fact, individual physicians have an incentive to increase their volume of services unless individual performance is monitored or payments are prorated, as in Germany. At the other extreme, if physicians are paid a risk-adjusted per capita amount, the incentive to control utilization is strong.

Payment ceilings could have several adverse effects on beneficiaries. If the budget is exceeded before the end of the year, for example, beneficiaries might be denied access to essential services. Physicians might lower their assignment rates, exposing beneficiaries to greater out-of-pocket expenses, unless balance billing was further restricted or prohibited. Furthermore, beneficiaries could face an annual, year-end crisis atmosphere that could erode confidence in Medicare.

Physician practice patterns could be dramatically affected by individual or organizational payment ceilings. Because individual payment ceilings would, in effect, place physicians on salary, it is difficult to consider them a feasible option. Organizational or group payment ceilings would provide incentives for physicians to determine methods for allocating a fixed amount of money.

Finally, this option would require accurate, timely monitoring of program expenditures to determine whether ceilings were exceeded, and if so, by how much. Of course, under a system of prorated payments such as Germany's, payments could be established low enough to guarantee that the ceilings were not exceeded. These lower payments could reduce physicians' supply of services to Medicare patients, however.

Conclusions

Using the framework we have developed, we conclude that VPSs are likely to be most effective in controlling expenditures and changing physician behavior if they are defined using states as the risk pool; all Medicare Part B services, possibly expanded to include Part A services; and per capita utilization targets.

Choice of Risk Pool

There is little empirical evidence to suggest that VPSs will provide financial incentives to individual physicians to alter practices. Therefore, we conclude that VPSs will be most effective in controlling cost if established for groups with an identifiable leadership and a nonfinancial mechanism for monitoring and influencing the behavior of individual members. States have been proposed as an appropriate unit (Rice and Bernstein 1990; Physician Payment Review Commission 1990) because of the effectiveness of geographically based VPSs in other countries, the potential for greater use of carrier data by state medical societies, the importance of standards of appropriateness reflecting community needs if they are to influence provider practice, and the need to be able to respond to local concerns. Setting state standards also can potentially improve the equity of per capita expenditures for Part B services across states.

Group-specific VPSs (i.e., "carve-out" groups) present enormous administrative challenges as well as self-selection problems. Access objectives of the policy may be compromised with group-specific VPSs because physicians have an incentive to withhold necessary services or to refer their patients to physicians outside their group unless the physicians are at risk for all services received by their patients. However, organized groups of providers, such as HMOs, that accept a capitation payment to provide all covered services to a defined population face strong incentives to control utilization and can translate these into indi-

vidual incentives through the risk and reward system used to pay physicians. The evidence is that at least staff model HMOs do provide less costly care (Luft 1981; Manning et al. 1984). Therefore, Congress should continue to explore methods for encouraging beneficiaries to enroll voluntarily in managed care organizations. Research should also continue on incentives to encourage physicians to accept capitated payments under Medicare as an alternative to VPSs.

Scope and Nature of the Standard

Current policy includes physician services and other services commonly performed in a physician's office in the standard. Expanding the scope of services to include all Part B services would place physicians at risk for controlling expenditures in other settings, such as hospital outpatient departments and ambulatory surgery centers. This risk could be reduced if physicians joined with hospitals or other providers to form organized delivery systems.

An alternative is to include all Medicare Part A and Part B services. This method would apply a single VPS to Part A as well as Part B services and would thus provide an incentive to control *total* rather than *per unit* increases in Part A expenditures. Because this alternative requires improved data systems, it could not be immediately carried out. After some experience with the success of the new physician policy, Congress may wish to consider the advisability and desirability of expanding the VPS to include Part A services, especially if national health reform leads to the development of more organized systems of care.

Because physician membership in a state-level VPS is not voluntary, it may be politically difficult to hold physicians accountable for services provided to their residents in other states. Therefore, VPSs based on geographic units should include all Part B services provided within those boundaries. One important issue for further research, however, is the extent of boundary crossing.

OBRA89 established separate VPSs for surgical and medical services. Because these separate VPSs will be used to adjust future prices (i.e., through separate updates to the conversion factor), this policy will distort the original RBRVS over time and thus seems contrary to the original goals of physician payment reform. Furthermore, because certain specialties provide primarily surgical or medical services, this policy reintroduces an aggregate form of specialty differentials into the payment system. Separate VPSs by type of service could provide targeted incen-

tives without distorting the original RBRVS if they were used to establish expenditure ceilings instead of to adjust future prices. However, because separate standards rely on political rather than clinical judgment about the appropriate mix of services, we recommend a global standard.

Application of the Standard

The third, and perhaps most important, dimension concerning VPSs is how to apply them. Under current law, VPSs will be used to adjust future prices. Successful models in other countries have adopted expenditure ceilings, which necessarily control program costs. The effect on physicians' practice patterns, however, is not known. Obviously, expenditure ceilings present a major political battle that Congress may not be willing to tackle unless the current method of using VPSs to adjust future prices proves unsuccessful in controlling Medicare program costs. In this climate, we believe that some experience with the current application should be gained before recommending changes.

Physician Response to the Fee Schedule and VPSs

In closing, there remains a great deal of uncertainty about how physicians will respond to the new MFS and to VPSs. Furthermore, the success or failure of the current method of defining and applying VPSs is unlikely to be known for several more years. The interim period, therefore, provides a unique opportunity to conduct empirical research to determine how physicians actually respond to the economic incentives of the new payment system. The findings from research on the early impact of the fee schedule and VPSs should prove invaluable in developing future refinements.

References

- Anderson, G.F., E.P. Steinberg, N.R. Powe, et al. 1990. Setting Payment Rates for Capitated Systems: A Comparison of Various Alternatives. *Inquiry* 27:225-33.
- Barer, M.L., R.G. Evans, and R.J. LaBelle. 1988. Fee Controls as Cost Control: Tales from the Frozen North. *Milbank Quarterly* 66:1-64.
- Burney, I., P. Hickman, J. Paradise, and G. Schieber. 1984. Medicare

- Physician Payment, Participation, and Reform. *Health Affairs* 3(4):5-24.
- Carter, G.M., J.P. Newhouse, and D.A. Relles. 1990. *How Much Change in the Case Mix Index is DRG Creep?* (R-3826-HCFA). Santa Monica, Calif.: RAND.
- Congressional Budget Office. 1986. *Physician Reimbursement under Medicare: Options for Change*. Washington.
- Egdahl, R.H., and C.H. Taft. 1986. Financial Incentives to Physicians. *New England Journal of Medicine* 315:59-61.
- Enthoven, A.C. 1989. What Can Europeans Learn from Americans? *Health Care Financing Review* (suppl.):49-77.
- Gabel, J.R., and T.H. Rice. 1985. Reducing Public Expenditures for Physician Services: The Price of Paying Less. *Journal of Health Politics, Policy and Law* 9:595-609.
- Gerdtham, U.G., J. Sjøgaard, F. Andersson, and B. Jönsson. 1992. An Econometric Analysis of Health Care Expenditures: A Cross-Section Study of OECD Countries. *Journal of Health Economics* 11:63-84.
- Ginsburg, P.B., and P.R. Lee. 1989. Defending U.S. Physician Payment Reform. *Health Affairs* 8(4):67-71.
- Glaser, W.A. 1989. The Politics of Paying American Physicians. *Health Affairs* 8(3):129-46.
- . 1993. How Expenditure Caps and Expenditure Targets Really Work. *Milbank Quarterly* 71:97-127.
- Gray, B.H., and M.J. Field. 1989. *Controlling Costs and Changing Patient Care? The Role of Utilization Management*. Washington: Institute of Medicine, National Academy Press.
- Hadley, J. 1984. Critique of Peter Fox's Physician Reimbursement under Medicare: An Overview and a Proposal for Area-Wide Physician Incentives. In *Proceedings of the Conference on the Future of Medicare*, Subcommittee on Health of the Committee on Ways and Means, U.S. House of Representatives, 98th Congress, 2d Session, 120-8. Washington.
- Hammons, G.T., R.H. Brook, and J.P. Newhouse. 1986. *Selected Alternatives for Paying Physicians under the Medicare Program: Effects on Quality of Care* (R-3394-OTA). Santa Monica, Calif.: RAND.
- Hellinger, F.J. 1987. Selection Bias in Health Maintenance Organizations: Analysis of Recent Evidence. *Health Care Financing Review* 9(2):55-63.
- Hillman, A.L., M.V. Pauly, and J.J. Kerstein. 1989. How Do Financial Incentives Affect Physicians' Clinical Decisions and the Financial Performance of Health Maintenance Organizations? *New England Journal of Medicine* 321:86-92.
- Holahan, J., J. Hadley, W. Scanlon, et al. 1979. Paying for Physician

- Services under Medicare and Medicaid. *Milbank Memorial Fund Quarterly/Health and Society* 57:183-211.
- Hosek, S.D., M.S. Marquis, and K.B. Wells. 1990. *Health Care Utilization in Employer Plans with Preferred Provider Organization Options* (R-3800-HHS/NIMH). Santa Monica, Calif.: RAND.
- Hsiao, W.C. 1989. Objective Research and Physician Payment: A Response from Harvard. *Health Affairs* 8(4):72-5.
- Hsiao, W.C., P. Braun, D.L. Dunn, et al. 1992. An Overview of the Development and Refinement of the Resource-Based Relative Value Scale. *Medical Care* 30(11,suppl.):NS1-NS12.
- Jönsson, B. 1989. What Can Americans Learn from Europeans? *Health Care Financing Review* (suppl.):79-93.
- Kirkmann-Liff, B.L. 1990. Physician Payment and Cost-Containment Strategies in West Germany: Suggestions for Medicare Reform. *Journal of Health Politics, Policy and Law* 15:69-99.
- Lomas, J., C. Fooks, T.H. Rice, and R.J. LaBelle. 1989. Paying Physicians in Canada. *Health Affairs* 8(1):80-102.
- Lubitz, J., J. Beebe, and G. Riley. 1985. Improving the Medicare HMO Payment Formula. In *Advances in Health Economics and Health Services Research* (vol. 6), eds. R.M. Scheffler and L.F. Rossiter. Greenwich, Conn.: Jai Press.
- Luft, H.S. 1981. *Health Maintenance Organizations: Dimensions of Performance*. New York: Wiley.
- Manning, W.S., A. Leibowitz, G. Goldberg, et al. 1984. A Controlled Trial of the Effect of a Prepaid Group Practice on Use of Services. *New England Journal of Medicine* 310:1505-10.
- McClure, W., and D. Shaller. 1984. Variations in Medicare Expenditures. *Health Affairs* 3(2):120-9.
- McCombs, J.S., and J.B. Christianson. 1987. Applying Competitive Bidding to Health Care. *Journal of Health Politics, Policy and Law* 12:703-22.
- Newhouse, J.P. 1973. The Economics of Group Practice. *Journal of Human Resources* 8:37-56.
- . 1986. *Capitation and Medicare* (R-3455-HCFA). Santa Monica, Calif.: RAND.
- Nyman, J.A., R. Feldman, J. Shapiro, et al. 1990. Changing Physician Behavior: Does Medical Review of Part B Medicare Claims Make a Difference? *Inquiry* 27:127-37.
- Pfaff, M. 1990. Differences in Health Care Spending Across Countries: Statistical Evidence. *Journal of Health Politics, Policy and Law* 15:1-68.
- Physician Payment Review Commission. 1988. *Annual Report to Congress*. Washington.

- . 1989. *Annual Report to Congress*. Washington.
- . 1990. *Annual Report to Congress*. Washington.
- . 1991. *Annual Report to Congress*. Washington.
- . 1992. *Annual Report to Congress*. Washington.
- Reinhardt, U.E. 1985. The Theory of Physician-Induced Demand: Reflections After a Decade. *Journal of Health Economics* 4:187-93.
- Rice, T.H., and J. Bernstein. 1990. Volume Performance Standards: Can They Control Growth in Medicare Services? *Milbank Quarterly* 68(3):295-319.
- Rice, T.H., and N. McCall. 1982. Changes in Medicare Reimbursement in Colorado: Impact on Physicians' Economic Behavior. *Health Care Financing Review* 4:67-85.
- Rodwin, V.G. 1989. Physician Payment Reform: Lessons from Abroad. *Health Affairs* 8(4):76-83.
- Rubin, R., and G. Hackbarth. 1984. Review: The Federal Government. *Health Affairs* 3(2):38-45.
- Scheffler, R.M., S.D. Sullivan, and T.H. Ko. 1991. The Impact of Blue Cross and Blue Shield Plan Utilization Management Programs, 1980-1988. *Inquiry* 28:263-75.
- Schwartz, J.S. 1984. The Role of Professional Medical Societies in Reducing Variations. *Health Affairs* 3(2):90-101.
- Thomas, J.W., and R. Lichtenstein. 1986. Functional Health Measure for Adjusting Health Maintenance Organization Capitation Rates. *Health Care Review* 7(3):85-95.
- Waldo, D.R., S.T. Sonnefeld, D.R. McKusick, and R.H. Arnett. 1989. Health Expenditures by Age Group, 1977 and 1987. *Health Care Financing Review* 10(4):111-20.
- Welch, W.P. 1987. The New Structure of Individual Practice Associations. *Journal of Health Politics, Policy and Law* 12:723-39.
- . 1989. Prospective Payment to Medical Staffs: A Proposal. *Health Affairs* 8(1):34-49.
- Wennberg, J.E. 1984. Dealing with Medical Practice Variations: A Proposal for Action. *Health Affairs* 3(2):6-32.

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