

Special Report

Volume and intensity of Medicare physicians' services: An overview

by Terrence L. Kay

From 1978 to 1987, Medicare spending for physicians' services increased at annual compound rates of 16 percent, far exceeding increases expected based on inflation and increases in beneficiaries. As a result, Medicare spending for Part B physicians' services has attracted considerable attention. This article contains an overview of expenditure trends for Part B physicians' services, a summary of recent research findings on issues related to volume and intensity of physicians' services, and a discussion of options for controlling volume and intensity. The possible impact of the recently enacted relative-value-based fee schedule on volume and intensity of services is discussed briefly.

Introduction

During the past several years, Congress, the Administration, beneficiary representatives, and others have directed considerable attention to Federal spending for physicians' services covered by the Medicare Part B program. Medicare expenditures for physicians' services during fiscal year 1990 are expected to exceed \$25 billion. Expenditures for physicians' services are the second largest component (after hospital expenditures) of Medicare spending and the third largest Federal domestic program. Actuaries at the Health Care Financing Administration (HCFA) estimate that, over the 10-year period 1978-87, Medicare expenditures for physicians' services increased at an annual compound rate of 16 percent.

Much of this increased spending is thought to result from factors related to increased volume and intensity of physicians' services, because the rate of increase far exceeds the combined effect of the general inflation rate and increases in the number of beneficiaries. For example, HCFA actuaries estimate that about 15 percent of the increase in spending for physicians' services during 1978-87 was caused by an increase in the number of beneficiaries (about 2 percent a year). About 40 percent was caused by increases in payments per service, which are largely the result of adjustments for inflation. About 45 percent of the growth resulted from residual factors, including growth in the number of services per enrollee (growth resulting from new services and technology) and shifts from less expensive to more expensive services (greater intensity).

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Background

Forces behind volume-intensity growth

Volume-intensity (VI) includes all factors contributing to increases in expenditures for physicians' services other than increases in payments for individual services and in the covered population. A number of related factors that drive VI growth can be identified. They include payment incentives, technology, physician willingness to provide services, and factors related to beneficiary demand for services. Following are summaries of the issues related to these factors.

Payment incentives

The VI of physicians' services is partly affected by the way that physicians are paid for their services (Pauty, 1970; Manning et al., 1988; Hemenway et al., 1990). Medicare pays for most services through traditional fee-for-service arrangements, in which a separate payment is made for each service rendered by the physician. Clearly, this arrangement provides few incentives for efficiency and may actually encourage the overprovision of services. Further, physicians currently have considerable discretion as to how they define and report services. They might assign more remunerative codes to services for which they formerly assigned less remunerative codes (upcoding), or they might bill separately for services for which they formerly billed under a single code (unbundling). In addition, the current payment system contains no incentives to encourage physicians to reduce charges for procedures to reflect technological improvements, increased experience, and other factors that might lower production costs.

Technology

Technological advances have contributed to VI growth because new services and treatment methods have emerged. Although many technical advances in health care benefit patients, they also may increase costs in several ways:

- The development of new technologies is often accompanied by the need for additional services. For example, transplants require immunosuppressive drugs, and end stage renal disease treatment requires supplies.
- A new service designed to replace an established service may be more expensive than the older one.
- As new technology diffuses, it may be used additively rather than as a substitute for the older technology (e.g., magnetic resonance imaging along with X-rays and other diagnostic imaging). This may occur because of insufficient scientific information to limit use of overlapping technologies, fear of malpractice, attempts to gain a marketing advantage, or practitioner reluctance to modify established practice methods.

- Technologies that benefit a specific condition are often applied to other conditions for which benefit is less certain because of physician hopefulness or patient expectations and requests.

Physician willingness to provide services

Because the supply of physicians has increased dramatically over the past two decades or so, physicians may have become more willing to provide services, thus contributing to VI growth. From 1960 to 1985, the number of physicians per 100,000 population rose from 151 to 237, a 57-percent increase (American Medical Association, 1986). The trend toward increasing specialization also has important implications for Medicare expenditures. Specialized physicians seem to perform more complex and expensive procedures than general practitioners, and they perform more complex services for similar patients (Cromwell and Mitchell, 1986). Another factor that might contribute to increased expenditures is defensive medicine, a possible reason for the rising cesarean section rate, the increasing rate of computerized tomography scans, and the growing use of exercise tolerance tests and cardiac monitoring.

Beneficiary demand for services

Services have become available for conditions not treatable until recently (e.g., joint replacements), increasing patient demand for services. Also, as found by Manning et al. (1988), lower out-of-pocket payments increase the total volume of services and the level of expenditures for physicians' services for medical care consumers under 65 years of age. Without some truly "out-of-pocket" cost sharing, beneficiaries may simply seek all care that promises even minimal benefit, or they may uncritically accept physician recommendations, regardless of how costly the service might be.

A number of factors have decreased the immediate, real out-of-pocket cost of physicians' services, possibly increasing beneficiary demand or willingness to accept additional services. Inflation has reduced the real cost of the annual deductible to Medicare Part B beneficiaries. If the original \$50 deductible established in 1966 had been increased to keep pace with general inflation, it would now be more than \$180 instead of the current \$75.

The widespread purchase of medigap policies tends to decrease the cost to the beneficiary of an additional service. According to 1980 data from the National Medical Care Utilization and Expenditure Survey (Garfinkel and Corder, 1985), approximately 70 percent of beneficiaries are covered under some type of medigap policy. Although the coverage of medigap policies varies, the deductible and coinsurance are often covered. Because an additional 10 percent of beneficiaries are covered by Medicaid, only about 20 percent of beneficiaries are thought to be subject to all of the out-of-pocket costs associated with Medicare's statutory deductibles and coinsurance.

Another factor contributing to decreases in out-of-pocket cost per service is the increase in the assignment rate caused by implementation of the participating physician program and other efforts to

Table 1
Percent of Medicare Part B and physicians' allowed charges for which physicians accepted assignment: Fiscal years 1977-88

Fiscal year	All Part B services	Physicians' services ¹
1977	46.4	—
1978	47.7	—
1979	48.9	—
1980	49.8	—
1981	51.2	—
1982	52.1	—
1983	53.7	—
1984	57.0	—
1985	66.9	65.5
1986	68.9	66.4
1987	73.0	70.8
1988	78.4	77.0

¹Prior to reasonable charge reductions.

SOURCE: Health Care Financing Administration, Bureau of Program Operations: Quarterly reports on Medicare participating physician claims workload.

encourage physicians to accept assignment. Assignment rates have increased from slightly less than 50 percent of allowed charges in 1980 to about 80 percent in 1988 (Table 1). (Allowed charges include Part B expenditures, beneficiary deductibles, and coinsurance.) Patients who are covered by medigap and receive services from a participating physician can receive covered services at no out-of-pocket cost, as can most patients covered by Medicaid.

Recent research

Because several factors affecting VI have occurred almost simultaneously, it is difficult to separate them and measure their relative influence. Ideally, a full explanation of the factors responsible for Part B growth would be developed from a full clinical and economic model of physician and patient behavior. Problems in developing a full model are compounded by inadequate data, data-measurement problems, multiple simultaneous changes in the Medicare program, and technological advances. The U.S. Department of Health and Human Services (DHHS) made an extensive effort to gain more information on this subject and to respond to the congressional mandate to study VI issues. National trends in total allowed charges for physicians' services were examined by HCFA staff using national Part B data files. In addition, DHHS commissioned the following extramural research studies to provide data on geographic variation in expenditure growth and to perform a wide variety of VI-related analyses:

- The Center for Health Economics Research (1988) studied Part B claims for four States (Alabama, Connecticut, Washington, and Wisconsin) for the 4-year period 1983-86. Total physician expenditures in these States represent about 6 percent of the national total.
- Mandex, Inc. (1988) analyzed Part B claims for 1983 and 1985 for five States (Indiana, North Dakota, South Carolina, South Dakota, and Washington), representing about 5 percent of national spending.

- The Urban Institute studied a 5-percent national sample of claims for 1983 and 1985 (Holahan, 1989).
- The University of Minnesota/University of Pennsylvania Policy Research Center (Pauly et al., 1988) performed theoretical and conceptual analyses of several VI-related issues, including an analysis of possible impacts of a resource-based relative value scale (RBRVS).

Some of the highlights from these analyses follow. Additional details are available from the project final reports (Center for Health Economics Research, 1988; Mandex, Inc., 1988; Holahan, 1989; Pauly et al., 1988).

National trends

National trends in total allowed charges for physicians' services during the period 1982-87 are shown by type and place of service in Table 2. During this period, total allowed charges for physicians' services grew from \$15.1 billion to \$26.6 billion, an increase of \$11.5 billion (76 percent). By type of service, the increases in total allowed charges from 1982 to 1987 were as follows:

- Surgical-related services, including surgery, assistant at surgery, and anesthesia, increased by 85 percent and accounted for 42 percent of the overall increase in expenditures for physicians' services.
- Medical care, primarily physicians' visits, increased by 52 percent and accounted for an additional 27 percent of the increase.
- Clinical laboratory services increased by 84 percent, accounting for 11 percent of overall growth.
- Consultations increased by 127 percent and accounted for 6 percent of overall growth.
- Diagnostic radiology services increased by 114 percent and accounted for 12 percent of total growth. Therapeutic radiology services increased by 109 percent and accounted for 2 percent of overall growth.

Place of service

Inpatient settings

Allowed charges for physicians' services in inpatient settings increased by \$2.5 billion, or 27 percent, from 1982 to 1987 (Table 2). The largest increase during this period (11 percent) occurred from 1986 to 1987.

The increase in expenditures for physicians' services in inpatient settings is especially striking because it occurred while the number of Medicare hospital admissions and days decreased. Medicare allowed charges for physicians' services per admission increased from 1982 to 1987 (Table 3). Notably, allowed charges per inpatient admission increased by 10.6 percent from 1986 to 1987.

From 1982 to 1987, allowed charges for inpatient consultations nearly doubled. In addition, spending for physicians' services for inpatient diagnostic radiology services increased by more than 60 percent. These increases are even larger when considered on a per-admission basis.

Because Medicare allowed charges for physicians' services increased by larger amounts in noninpatient

settings, the share of spending for inpatient services dropped considerably. In 1982, before implementation of the prospective payment system (PPS), admission reviews by peer review organizations, and other factors influencing hospital use, 62 percent of allowed charges for physicians' services were for inpatient services. By 1987, this proportion had dropped to 45 percent.

Physicians' offices

Allowed charges for physicians' services in office settings increased 102 percent from 1982 to 1987, accounting for 39 percent of total growth. During this period, the share of Medicare spending for physicians' services furnished in office settings increased from 29 percent to 32 percent.

Type of service

Surgical services

About one-half of the increase in surgical spending over the 5-year period 1982-87 was for hospital outpatient department services. Expenditures for surgical services furnished on an inpatient basis accounted for about one-quarter of the growth in surgical spending during this period, primarily because of an increase from 1986 to 1987: Although spending was generally stable from 1983 to 1986, it rose by almost 11 percent from 1986 to 1987. The remainder of the increase in spending for surgical services primarily was for services rendered in office settings (20 percent), with all other places of service accounting for 5 percent of the increase.

Medical services

About two-thirds of the increase in spending for medical services from 1982 to 1987 was for office settings. From 1983 to 1986, expenditures for medical services in inpatient settings actually declined, probably because of decreases in hospital admissions and lengths of stay. However, medical services spending rose 15 percent from 1986 to 1987. Furthermore, as seen in national data from the Part B Medicare Annual Data file for 1985-87 (Tables 4 and 5), the use of more expensive codes increased for both office and hospital visits.

Consultations

Expenditures for consultations grew rapidly for all treatment settings (Table 2). About 59 percent of the growth in expenditures for consultations was for inpatient hospital settings, 32 percent for office settings, 6 percent for outpatient hospital settings, and 3 percent for other settings.

Table 2
Amount and percent distribution of Medicare allowed charges for physicians' services, by type and place of service:
Calendar years 1982-87

Type and place of service	1982		1983		1984		1985		1986		1987	
	Amount in millions	Percent distribution	Amount in millions	Percent distribution	Amount in millions	Percent distribution	Amount in millions	Percent distribution	Amount in millions	Percent distribution	Amount in millions	Percent distribution
Total	\$15,139.3	100.0	\$17,605.9	100.0	\$19,221.4	100.0	\$20,994.4	100.0	\$22,947.7	100.0	\$26,604.4	100.0
Medical care	5,969.0	39.4	6,675.8	37.9	6,999.1	36.4	7,460.3	35.5	7,872.2	34.3	9,075.1	34.1
Office	2,403.7	15.9	2,738.7	15.6	3,053.0	15.9	3,456.3	16.5	3,727.5	16.2	4,376.4	16.4
Inpatient	3,044.3	20.1	3,368.4	19.1	3,269.7	17.0	3,206.8	15.3	3,247.1	14.1	3,575.9	13.4
Outpatient hospital	222.9	1.5	238.4	1.4	297.4	1.5	359.3	1.7	493.5	2.2	556.9	2.1
Other	298.1	2.0	330.3	1.9	379.0	2.0	437.9	2.1	404.1	1.8	565.9	2.1
Surgery	4,781.3	31.6	5,709.5	32.4	6,472.5	33.7	7,156.2	34.1	7,986.0	34.8	9,165.3	34.5
Office	601.2	4.0	738.3	4.2	878.2	4.6	1,088.2	5.2	1,241.0	5.4	1,441.6	5.4
Inpatient	3,919.2	25.9	4,546.6	25.8	4,801.1	25.0	4,463.4	21.3	4,551.5	19.8	5,046.9	19.0
Outpatient hospital	228.2	1.5	382.1	2.2	735.7	3.8	1,526.7	7.3	2,096.4	9.1	2,550.7	9.6
Other	32.7	0.2	42.5	0.2	57.5	0.3	77.9	0.4	97.1	0.4	126.1	0.5
Consultation	502.1	3.3	595.6	3.4	659.4	3.4	699.4	3.3	818.1	3.6	1,141.9	4.3
Office	85.1	0.6	104.1	0.6	121.9	0.6	148.1	0.7	175.5	0.8	292.0	1.1
Inpatient	398.0	2.6	468.1	2.7	509.4	2.7	519.4	2.5	603.1	2.6	778.2	2.9
Outpatient hospital	10.0	0.1	12.0	0.1	14.9	0.1	18.2	0.1	22.0	0.1	46.3	0.2
Other	9.0	0.1	11.4	0.1	13.2	0.1	13.7	0.1	17.5	0.1	25.4	0.1
Diagnostic X-ray	1,238.0	8.2	1,515.4	8.6	1,700.9	8.8	1,918.6	9.1	2,213.4	9.6	2,644.4	9.9
Office	471.3	3.1	554.9	3.2	635.0	3.3	775.0	3.7	851.2	3.7	1,056.5	4.0
Inpatient	573.2	3.8	704.9	4.0	742.5	3.9	742.3	3.5	826.0	3.6	920.4	3.5
Outpatient hospital	156.9	1.0	210.2	1.2	267.4	1.4	335.3	1.6	469.8	2.0	588.4	2.2
Other	36.6	0.2	45.4	0.3	56.0	0.3	66.0	0.3	66.4	0.3	79.1	0.3
Clinical laboratory	1,519.1	10.0	1,797.9	10.2	1,952.5	10.2	2,184.4	10.4	2,439.0	10.6	2,794.7	10.5
Office	704.9	4.7	832.0	4.7	931.0	4.8	993.4	4.7	1,073.8	4.7	1,217.5	4.6
Inpatient	456.0	3.0	524.0	3.0	457.4	2.4	435.2	2.1	451.5	2.0	468.0	1.8
Outpatient hospital	53.7	0.4	68.7	0.4	94.0	0.5	122.1	0.6	164.3	0.7	188.9	0.7
Other	304.5	2.0	373.2	2.1	470.1	2.4	643.7	3.1	749.4	3.3	920.3	3.5
Radiation therapy	180.3	1.2	214.7	1.2	238.1	1.2	273.7	1.3	314.5	1.4	376.0	1.4
Office	60.0	0.4	73.8	0.4	87.8	0.5	110.5	0.5	134.1	0.6	163.2	0.6
Inpatient	53.8	0.4	49.4	0.3	41.9	0.2	37.1	0.2	41.1	0.2	42.4	0.2
Outpatient hospital	62.9	0.4	86.0	0.5	101.6	0.5	118.4	0.6	131.3	0.6	159.6	0.6
Other	3.6	0.0	5.5	0.0	6.8	0.0	7.7	0.0	8.0	0.0	10.8	0.0
Anesthesia	695.2	4.6	805.8	4.6	871.7	4.5	945.0	4.5	981.6	4.3	1,093.8	4.1
Office	2.5	0.0	3.3	0.0	4.3	0.0	9.1	0.0	6.9	0.0	5.7	0.0
Inpatient	681.5	4.5	783.7	4.5	819.3	4.3	808.6	3.9	777.2	3.4	860.2	3.2
Outpatient hospital	11.0	0.1	18.2	0.1	44.1	0.2	119.7	0.6	191.4	0.8	221.3	0.8
Other	0.2	0.0	0.6	0.0	3.9	0.0	7.7	0.0	6.1	0.0	6.6	0.0
Assistant at surgery	254.3	1.7	291.3	1.7	327.2	1.7	356.8	1.7	322.9	1.4	313.2	1.2
Office	3.1	0.0	3.8	0.0	4.1	0.0	7.6	0.0	4.9	0.0	3.9	0.0
Inpatient	247.7	1.6	278.2	1.6	294.1	1.5	284.2	1.4	285.6	1.2	283.0	1.1
Outpatient hospital	3.4	0.0	8.9	0.1	27.8	0.1	62.0	0.3	30.2	0.1	22.3	0.1
Other	0.1	0.0	0.3	0.0	1.3	0.0	3.1	0.0	2.2	0.0	4.0	0.0

SOURCES: Health Care Financing Administration, Bureau of Data Management and Strategy: 1982-84 data from bill summary records; 1985-87 data from the Part B Medicare Annual Data Procedure file.

Table 3
Medicare allowed charges for physicians' services for inpatient admissions: Calendar years 1982-87

Year	Amount in millions	Number of admissions in thousands	Allowed charge per admission	
			Amount	Percent change from previous year
1982	\$9,374	11,278	\$831	—
1983	10,723	11,812	908	9.2
1984	10,935	11,508	950	4.7
1985	10,497	10,904	963	1.3
1986	10,783	10,795	999	3.8
1987	11,975	10,841	1,105	10.6

SOURCES: Part B Medicare Annual Data file; data on admissions from American Hospital Association panel survey.

Diagnostic radiology

During the period 1982-87, expenditures for diagnostic radiology grew by almost 114 percent (Table 2). About 42 percent of this growth was for services rendered in physicians' offices, 31 percent for outpatient hospital services, 25 percent for inpatient hospital services, and 3 percent for other settings.

Extramural research

Center for Health Economics Research

The Center for Health Economics Research (1988) reported that expenditures per beneficiary in Alabama,

Connecticut, Washington, and Wisconsin combined increased 29.5 percent from 1983 to 1986. As shown in Table 6, the increase varied from 13.6 percent in Wisconsin to 46.4 percent in Washington. Washington's rapid spending growth brought its per-beneficiary expenditures, initially lower than spending in the other three States, up to their level.

Increased spending on surgical procedures in these four States was by far the most important source of Medicare expenditure growth, accounting for 35.8 percent of spending and 41.3 percent of the increase in physician payments (Table 7). Specialized tests such as electrocardiograms accounted for only 5 percent of spending but for 11 percent of spending growth. As shown in Table 8, payments to physicians for services performed in outpatient departments and ambulatory surgical centers increased by more than 260 percent during the period (from \$11.84 per beneficiary in January-June 1983 to \$47.46 per beneficiary in July-December 1986). In contrast, there was virtually no growth (1 percent) in expenditures per beneficiary for inpatient settings.

Examining trends in surgery further, the Center for Health Economics Research (CHER) showed that much of this increased growth was accounted for by a small number of diagnostic surgeries (e.g., colonoscopies) and therapeutic surgeries (e.g., cataract lens implants) that increased rapidly (Table 9). These descriptive observations suggest that the development and dissemination of technological advances may be a prime contributor to Part B growth.

CHER also examined data for office and hospital visits to determine whether there has been a shift in the mix of codes. The two simplest followup visit codes (minimal

Table 4
Percent distribution of office visits to physicians by Medicare enrollees and average Medicare allowed charge per visit for new and established patients, by type of visit: Calendar years 1985-87

Type of patient and type of office visit	1985		1986		1987	
	Percent distribution of visits	Average charge	Percent distribution of visits	Average charge	Percent distribution of visits	Average charge
Total	100.0	\$1.47	100.0	\$23.09	100.0	\$25.26
New patient	7.5	34.91	7.3	37.37	7.2	41.54
Established patient	92.5	21.11	92.7	21.96	92.8	24.00
New patient	100.0	34.91	100.0	37.37	100.0	41.54
Brief service	10.1	20.41	9.3	21.52	7.7	23.51
Limited service	23.6	24.68	19.9	26.79	18.8	29.40
Intermediate service	25.2	31.30	27.3	32.23	27.6	35.04
Extended service	7.7	32.31	8.5	34.26	9.7	38.70
Comprehensive service	33.4	49.80	35.0	52.32	36.4	57.44
Established patient	100.0	21.11	100.0	21.96	100.0	24.00
Minimal service	2.2	12.74	1.7	11.75	1.8	11.71
Brief service	14.4	15.48	13.3	15.75	11.8	16.99
Limited service	38.4	18.74	37.7	19.11	37.3	20.56
Intermediate service	34.4	22.55	36.1	23.54	37.5	25.71
Extended service	6.7	29.30	7.5	30.58	8.0	33.59
Comprehensive service	3.9	42.75	3.7	44.82	3.7	48.87

NOTES: Visits with Health Care Financing Administration Common Procedure Coding System codes 90000-90080 are included. Services with carrier local codes are excluded. Data for 6 Part B carriers were omitted from the computations for this table.

SOURCE: Health Care Financing Administration, Bureau of Data Management and Strategy: Part B Medicare Annual Data Procedure file.

Table 5

**Percent distribution of inpatient hospital visits by Medicare enrollees and average Medicare allowed charge per visit for initial-care and subsequent-care visits, by type of visit:
Calendar years 1985-87**

Type of care and type of inpatient hospital visit	1985		1986		1987	
	Percent distribution of visits	Average charge	Percent distribution of visits	Average charge	Percent distribution of visits	Average charge
Total	100.0	\$28.54	100.0	\$29.98	100.0	\$33.37
Initial care	10.0	62.25	10.5	65.00	9.9	71.23
Subsequent care	90.0	24.81	89.5	25.88	90.1	29.25
Initial care	100.0	62.25	100.0	65.00	100.0	71.23
Brief	10.2	42.52	8.0	43.28	6.7	46.12
Intermediate	23.7	54.33	23.7	55.59	23.0	60.25
Comprehensive	66.1	68.13	68.3	70.80	70.3	77.20
Subsequent care	100.0	24.81	100.0	25.88	100.0	29.25
Brief	16.2	17.97	13.4	18.73	11.0	20.50
Limited	32.9	23.01	33.6	23.55	32.4	25.93
Intermediate	37.2	26.24	38.0	26.86	40.1	30.22
Extended	8.4	34.27	8.9	35.45	9.7	39.69
Comprehensive	2.5	34.60	3.0	37.04	3.1	41.87
Discharge day management	2.6	29.95	3.2	31.66	3.6	35.92

NOTES: Visits with Health Care Financing Administration Common Procedure Coding System codes 90200-90292 are included. Services with carrier local codes are excluded. Data for 6 Part B carriers were omitted from the computations for this table.

SOURCE: Health Care Financing Administration, Bureau of Data Management and Strategy: Part B Medicare Annual Data Procedure file.

and brief) declined as a percent of total visits, whereas the more complex visit codes all increased in frequency. CHER researchers caution that it is not possible to determine with certainty the cause of upcoding. Although physicians could be upcoding an unchanged mix of services to generate additional income, the shift in the mix of codes used may reflect a higher level of services provided.

To attempt to control for simultaneous changes in a wide variety of variables of interest, CHER researchers attempted to apply a regression analysis to the trends in Part B services over the period 1983-86. The independent variables included in the econometric equations included number of physicians, per capita income for the total population, Medicare inpatient days per capita, health

maintenance organization penetration, degree of urbanization, and an indirect measure of the effect of the fee freeze of the mid-1980s. They interpreted the coefficients in their regressions as suggesting that growth in the number of physicians was a strong contributor to physician volume increases. CHER researchers claim that the decrease in real dollar payments during the fee freeze contributed modestly, at most, to volume increases, whereas a reduction in inpatient days contributed to volume growth in a complex, delayed way, presumably through a lagged substitution of physician care for hospital-based care. They suggest that inpatient days are short-run complements and long-term substitutes for Part B expenditures. This interpretation implies that reductions in inpatient days produced Part B savings over

Table 6

**Total Medicare expenditures for physicians' services per beneficiary, by State:
Selected States, calendar years 1983-86**

Time period	Total	Alabama	Connecticut	Washington	Wisconsin
	Amount				
January-June 1983	\$220.96	\$220.40	\$229.53	\$205.65	\$227.61
July-December 1983	228.67	222.69	249.21	209.86	234.60
January-June 1984	246.98	239.10	262.60	244.51	244.95
July-December 1984	236.52	224.42	259.36	223.69	241.27
January-June 1985	262.91	249.68	283.12	278.43	247.93
July-December 1985	268.92	253.90	289.46	283.62	255.74
January-June 1986	286.72	293.41	296.72	304.06	260.95
July-December 1986	295.65	307.18	319.31	304.40	263.93
	Percent change				
1983-84	7.5	4.6	9.0	12.7	5.2
1984-85	10.0	8.6	9.7	20.0	3.6
1985-86	9.5	19.3	7.6	8.3	4.2
1983-86	29.5	35.5	28.7	46.4	13.6

SOURCE: Center for Health Economics Research: Medicare Part B claims for Alabama, Connecticut, Washington, and Wisconsin.

Table 7**Sources of increase in Medicare per-beneficiary expenditures for physicians' services, by type of service: Selected States, calendar years 1983-86**

Type of service	Percent of increase	Percent of total expenditures
Total	100.0	100.0
Medical care	17.9	31.6
Consultation	3.0	3.1
Surgery	41.3	35.8
Anesthesia	4.6	4.7
Assistant at surgery	1.5	2.6
Radiology	15.3	12.6
Laboratory	-0.1	3.0
Specialized tests	10.6	5.3
Other	5.9	1.3

SOURCE: Center for Health Economics Research: Medicare Part B claims for Alabama, Connecticut, Washington, and Wisconsin.

the short run but caused physician expenditures to increase over the long run.

Mandex, Inc.

Mandex, Inc. (1988) conducted analyses to identify and explain factors causing physician expenditure growth. Expenditure data for 1983 and 1985 were examined by type and place of service. Beneficiary growth in the five States studied (Indiana, North Dakota, South Carolina, South Dakota, and Washington) was only 4.4 percent. However, total outlays grew by approximately 18.7 percent (\$138 million) over the period (Table 10). Growth ranged from a low of 10.4 percent in North Dakota to a high of 27.4 percent in South Carolina.

A little more than one-half (53 percent) of the growth in expenditures from 1983 to 1985 resulted from increases for ambulatory surgery, primarily in outpatient

hospital settings (\$53 million of the total \$138 million expenditure increase). Allowed charges for inpatient surgery during the period 1983-85 declined by \$3 million. More complex surgeries resulted in a doubling of the average allowed charge for outpatient surgery.

Growth in outpatient surgery, with the possible exception of cataract surgery, did not appear to substitute for, but rather supplemented, inpatient hospital surgery. For example, even if it were assumed that all the observed decline in inpatient surgeries resulted from a shift to outpatient departments, only 8.3 percent of the increase in outpatient surgeries could be explained by this shift. The growth in relatively expensive outpatient surgery procedures and a decrease in the volume of relatively low-priced laboratory tests because of changes in the billing system under PPS led to a more intense mix of services in 1985 than in 1983.

Changes in office-visit and procedure coding and increases in ancillary services were found to have positive explanatory effects but to account for only approximately 4 percent of the total increase in Part B physicians' services.

In an analysis of factors contributing to expenditure growth, Mandex reported that 21 percent of the expenditure increase for physicians' services in the five States during the time period 1983-85 resulted from fee increases, 24 percent from Part B enrollment increases, 20 percent from increases in the number of beneficiaries who used services and for whom a claim was submitted to the carrier (i.e., claimants), 4 percent from the use of more intensive procedure codes (i.e., upcoding), and 31 percent from additional services and all other factors.

Urban Institute

The Urban Institute (Holahan, 1989) examined expenditure growth during the period 1983-85 by geographic division using a 5-percent national sample of

Table 8**Total Medicare expenditures for physicians' services per beneficiary, by place of service: Selected States, Calendar years 1983-86**

Time period	Total	Office	Inpatient	Outpatient	Skilled	Home	Other
				department or ambulatory surgical center	nursing facility or nursing home		
Amount							
January-June 1983	\$220.96	\$63.16	\$140.67	\$11.84	\$2.87	\$1.70	\$0.73
July-December 1983	228.67	67.10	142.70	12.94	3.16	1.74	1.04
January-June 1984	246.98	72.54	150.91	16.68	3.49	1.88	1.49
July-December 1984	236.52	72.08	136.42	21.74	3.25	1.89	1.15
January-June 1985	262.91	82.59	141.89	31.39	3.75	2.16	1.13
July-December 1985	268.92	86.94	137.58	37.57	3.72	1.94	1.16
January-June 1986	286.72	94.22	143.35	42.28	3.90	1.73	1.25
July-December 1986	295.65	99.48	142.31	47.46	4.26	1.24	0.90
Percent change							
1983-84	7.5	11.0	1.4	55.0	11.8	9.6	49.2
1984-85	10.0	17.2	-2.7	79.5	10.8	8.8	-13.3
1985-86	9.5	14.3	2.2	30.1	9.2	-27.6	-6.1
1983-86	29.5	48.7	0.8	262.1	35.3	-13.7	21.5

SOURCE: Center for Health Economics Research: Medicare Part B claims for Alabama, Connecticut, Washington, and Wisconsin.

Table 9
Sources of increase in Medicare per-beneficiary expenditures for physicians' surgical services, by surgical procedure: Selected States, Calendar years 1983-86

Surgical procedure	Change in	
	Percent of total increase	Amount
Total	100.0	\$54.88
Lens procedures	25.3	13.89
Colonoscopy	9.5	5.20
Coronary artery bypass graft	4.7	2.57
Cardiac catheterization	4.0	2.18
Upper gastrointestinal endoscopy	3.0	1.67
Knee replacement	1.7	0.96
Hip replacement	1.0	0.56
Sigmoidoscopy	0.9	0.50
Transurethral resection of prostate	0.8	0.43
Hip fracture	0.7	0.37
Hernia repair	0.3	0.19
Bronchoscopy	0.0	0.00
Carotid thromboendarterectomy	-0.1	-0.08
Cholecystectomy	-0.1	-0.04
Proctosigmoidoscopy	-0.4	-0.20
Partial colectomy	-0.6	-0.32
Pacemaker insertion	-0.7	-0.39
Other	50.0	27.39

SOURCE: Center for Health Economics Research: Medicare Part B claims for Alabama, Connecticut, Washington, and Wisconsin.

Table 10
Medicare allowed charges for physicians' services, by State: Selected States, calendar years 1983 and 1985

State	1983	1985	Percent change
	Amount in millions		
Total	\$741.1	\$879.6	18.7
South Carolina	102.5	130.6	27.4
South Dakota	38.3	46.2	20.6
Indiana	287.4	338.5	17.8
Washington	261.0	307.1	17.7
North Dakota	51.8	57.2	10.4

SOURCE: (Mandex, Inc., 1988).

beneficiary claims from two different data sources, the 1983 Bill Summary Record file and the 1985 Part B Medicare Annual Data file, both from HCFA. In general, the New England, Middle Atlantic, and Mountain Divisions had the fastest growth rates in Medicare expenditures (19.1 percent, 18.8 percent, and 21 percent, respectively), whereas the East North Central Division (11.5 percent) and Pacific Division (10.2 percent) had the slowest growth rates. These results, along with results from the two studies discussed earlier, show that expenditure growth has varied across geographic areas and types of service and that these differences need to be considered when developing options to control expenditure growth.

The Urban Institute also performed econometric analyses to examine factors responsible for recent changes in Medicare outlays (Holahan, 1989). The units of analysis were type and place of physicians' service,

aggregated by metropolitan statistical area (MSA). Areas outside of an MSA in each State were combined into a single non-MSA area.

Based on the regression coefficients of these aggregate data, the Urban Institute researchers concluded that the most important factors related to expenditure growth during this period were the increased incomes of the elderly and increased assignment rates, both of which increased service volume by about 3 percent during the study period. (Incomes of the elderly increased by about 13 percent, and assignment rates increased from 51 percent to 67 percent during this period.) The researchers also believe that the introduction of new technologies plays an important role in increasing expenditures but could not measure this factor directly. Billing changes, such as the termination of combined billing by hospitals for radiology, pathology, and other services, also contributed to physicians' services growth. In contrast to CHER, the Urban Institute concluded that other factors studied, such as the implementation of PPS, the fee freeze, and increased physician supply, appeared to have small or negligible effects on expenditure growth.

Discussion

Descriptive data from these studies provide important clues as to the types and places of service that grew most and the factors that drove expenditure growth for individual procedures. Despite differences in methodology and data sources, results from these three studies, along with results from an earlier study on trends in physician spending (Fisher, 1988), show that there has been dramatic growth in ambulatory surgery, especially cataract surgery and procedures such as colonoscopies. This suggests that technological developments (e.g., flexible scopes and the extracapsular technique for cataract surgery) constitute an important factor affecting growth. Some upcoding of visits, which appears to vary in amount across States, was also detected.

Many of the surgical services with high rates of increase appear to involve three related changes in technology and clinical practice:

- Some services (e.g., cataract and hernia procedures) might have become more accessible because they are now regularly performed in outpatient settings or because they now involve shorter recovery times or more complete restoration of function.
- Procedures with wide application (e.g., joint replacements) might have diffused to a larger number of providers and centers.
- Some procedures increasingly have been used for diagnostic and other medical reasons (e.g., colonoscopy).

It also appears that the medical indications for many high-growth services are not well defined. The clinical threshold at which procedures such as cataract surgery or joint replacements are indicated is unclear, and the indications for diagnostic procedures such as colonoscopy are debatable.

The descriptive findings also suggest that outpatient surgery does not appear to substitute for inpatient

surgery. No strong evidence was found that outlay growth resulted primarily from a PPS-induced shift to services outside the hospital.

It is not possible to precisely attribute expenditure growth over the past few years to specific causes. The physicians' services market is dynamic. Many changes have occurred recently in payment methodologies by private payers, technology, medical practice, and physician supply. Reductions have occurred in out-of-pocket costs per service, with increased assignment and wide medigap coverage. Medicare program changes, such as the fee freeze, implementation of the participating provider and peer review organization programs, and changes in billing for laboratory services, have also occurred. These factors are highly correlated with one another and cannot be easily measured or disentangled. Analysis has been further limited by a lack of long-term, detailed, national, time-series data and by data-measurement problems. In addition, we do not know the value of additional services to the beneficiary.

The dynamic nature of the physicians' services market makes it difficult to study and establish past trends or, more importantly, to agree on implications for current and future spending. For example, CHER studied data for 1983-86, and the Urban Institute and Mandex analyses were based on aggregate data for only 2 calendar years, 1983 and 1985. The story that would emerge from study of more recent time periods might be much different. The more recent data in Table 2 suggest that current trends may differ from those that existed during the period 1983-85. Outpatient surgery grew much more rapidly from 1983 to 1985 (300 percent) than from 1985 to 1987 (67 percent). Also, inpatient surgery spending declined from 1983 to 1985 (2-percent decrease) but then had a fairly large increase (almost 11 percent from 1986 to 1987).

No firm conclusions about causes of VI growth can be reached. As discussed earlier, it is likely that multiple factors, including payment incentives, technology, physician willingness to provide services, and factors related to beneficiary demand for services, have all contributed to VI growth.

Experience with volume-intensity control

The Medicare program and the carriers conduct medical review, either before or after payment, to assure that payment is made only for items and services that are reasonable and necessary. HCFA mandates about 13 prepayment screens that must be utilized by all carriers. During fiscal year 1989, carriers spent about \$56 million to conduct prepayment review on about 57 million claims. According to data from the quarterly carrier medical review reports sent to HCFA by the carriers, prepayment review provides approximately \$10 in program cost savings for each administrative dollar spent in support of the activity.

Post-payment review is conducted by the carriers at the individual-provider level (about 20,000 providers

reviewed in fiscal year 1988) for intensified review through a variety of techniques, such as reviewing practice patterns for high-volume procedures.

During fiscal year 1988, HCFA spent about \$14 million on post-payment review. Using estimates of actual savings only, carrier quarterly reports indicate that post-payment review saves 1 to 2 program dollars for each administrative dollar expended. Post-payment review may provide significant but unmeasured additional savings through avoided costs, such as through an educational effect in the physician community that helps reduce inappropriate billings.

Many State Medicaid programs have adopted managed-care initiatives, as authorized by the Omnibus Budget Reconciliation Act (OBRA) of 1981 (Bell et al., 1987). Managed care is perceived by these States as an alternative to the control of utilization and expenditures through limitations on eligibility or payment.

A review of private-payer VI initiatives was conducted with DHHS support by researchers at the University of Minnesota and the University of Pennsylvania (Pauly et al., 1988). Results from a survey of commercial health insurance carriers that are members of the Health Insurance Association of America, representing 132 different health insurance plans, indicate that these private carriers continue to pay for services primarily using traditional fee-for-service methods. Of the 120 plans responding to the survey, 111 indicated that they pay using usual and customary charges.

In addition, the Canadian experience with regard to volume and expenditure control is of interest. Health care expenditures per capita are lower in Canada than in the United States (Barer, Evans, and Labelle, 1988). Nevertheless, the Canadian experience in controlling expenditures must be discussed in the context of its health care system. Since 1971, every Canadian province has paid for physicians' services under a comprehensive and universal health insurance program. Each province has only one payer, and fee levels for physicians' services are negotiated between provincial government health representatives and professional associations. Although each province has a unique payment system, the medical associations generally determine the relative fee levels for each service and negotiate annual percentage increases in payments with the provincial governments. In effect, the approach is to control total expenditures through adjusting fee levels rather than attempting to directly manage or control volume.

Options: Controlling volume-intensity impact

Earlier, it was suggested that multiple factors have contributed to VI growth, suggesting that no one payment option can successfully control it. Options for devising a VI control strategy, discussed next, might include the following possibilities:

- Aggregating payments.
 - Capitation.
 - Geographic capitation.
 - Physician capitation.
 - Preferred provider organizations (PPOs) and other managed-care arrangements.
 - Bundling of physician and facility payments.
 - Other bundling options.
 - Improved coding and definition of services.
- Incentives targeted toward beneficiaries.
 - Beneficiary cost sharing.
 - Second surgical opinions.
- Influencing physician decisionmaking.
 - Clinical guidelines and effectiveness research.
 - Utilization review and coverage policy.
 - Conflict-of-interest rules.
 - Adjusting payments for services.
 - Growth targets.

In evaluating these options, we consider their ability to control the effect of VI growth on outlays, their administrative costs and feasibility, and their likely effect on the appropriateness of medical care, on beneficiary liability and access to care, and on physician and beneficiary behavior.

Aggregating payments

Under a capitated approach, Medicare makes a single payment in advance for all covered services for each beneficiary (Luft, 1978; Manning et al., 1984). In contrast to fee-for-service payment systems, capitated systems are thought to provide incentives for providers to simultaneously control both price and VI and create a mechanism to control Medicare outlays. Capitated systems have a number of related advantages. A reduced level of Federal regulation can be achieved, for example, because the capitated providers can be assigned responsibility for payment details.

The number of Medicare beneficiaries enrolled in capitated systems has doubled in the last 5 years. Nevertheless, only 3 percent of Medicare beneficiaries are enrolled in capitated systems and, even with continued strong growth, other strategies are necessary for the short and medium term.

A geographic capitation system would put an organization, such as an insurer, at risk for physicians' services provided to all Medicare beneficiaries living in a geographic area, such as a State or carrier service area. In effect, the Federal Government would buy the Medicare benefit package on behalf of all Medicare beneficiaries in an area at a fixed price from a single underwriting entity (Burney et al., 1984). Competition could be encouraged by permitting beneficiaries to enroll in other capitated plans in the same area. Under this approach, Medicare might be able to take advantage of the benefits of dealing with capitated entities without all beneficiaries enrolling in health maintenance organizations or other capitated plans.

Another alternative to making capitated payments for all Medicare services would be to make a capitated payment to physician groups that would cover some or all

Part B services. As with total capitation, physician capitation shifts the risk of increasing VI from the Government to the physicians, thereby changing incentives.

Services covered could include all physicians' services or a package of selected services, such as primary care along with outpatient laboratory and X-rays. The individual primary-care physician or group practice could receive a capitated payment for the primary care of each enrolled beneficiary. An advantage of physician capitation is that the total amount of risk to physicians is less than when all services are capitated because the relatively more expensive hospital costs are excluded from the capitated payment.

A PPO is a network of providers who agree to provide health care services under certain constraints (such as lower fees or increased utilization review) in exchange for expected advantages, such as prompt payment and an increased volume of patients. The savings from PPOs are generally achieved through efforts such as utilization review, hospital precertification, concurrent review of inpatient days, discounted fees, and directing patients to preferred providers. PPOs, prepaid plans, and other insurance programs often employ case-management techniques as a method of controlling expenditures for especially expensive patients through directly managing use of services, offering special benefits, and directing patients to particular sources of care.

HCFA is developing a PPO demonstration involving five sites to test the feasibility of offering Medicare beneficiaries the option of receiving managed health care services on a fee-for-service basis.

At present, Medicare makes a separate payment for each physicians' service and also makes a payment to facilities, such as hospitals and ambulatory surgical centers, in which services are provided. VI of some physicians' services might be controlled by making a single payment for all associated physician charges. This payment could be combined with the payment to the facility or could be made separately to a physician group or the medical staff. In general, bundling payments adds incentives for providers to reduce the use of marginal procedures and reduces the opportunity for discretionary billing of services. There are many possibilities for developing prospective, per-case payments for physicians' services, such as including selected services performed in inpatient facilities (e.g., physician diagnosis-related groups) or in outpatient hospitals and ambulatory surgical centers. Medicare has begun implementation of a demonstration, the Medicare Participating Heart Bypass Center Demonstration, in which a single payment is made for all services associated with coronary artery bypass surgery.

Other, less extensive bundling approaches might help Medicare to control costs of some services by redefining the payment unit from a narrow procedure to a more comprehensive packaging of services. An example is development of office visit packages (Mitchell et al., 1987), in which the visit charge includes all associated ancillary services (e.g., laboratory tests, X-rays, and electrocardiograms). In another possible bundling approach, the office visit charge is included in the charge

for some minor surgical and diagnostic procedures, such as skin lesion removals (Bogen, Boutwell, and Mitchell, 1989). In these instances, separate bills for visits would not be allowed unless it were clear that other significant services were provided during the visit.

More precise coding rules could reduce both upcoding and unbundling for some services. Upcoding is of special concern for office visits, hospital visits, and consultations (Office of the Inspector General, 1989). Possible solutions could be to collapse the number of codes used for payment purposes or to incorporate time spent by the physician in providing the service.

Incentives targeted toward beneficiaries

Currently, Medicare beneficiaries are responsible for the first \$75 of covered services before Medicare begins to pay for service. (This deductible amount was set at \$50 in 1966 and was raised to \$60 in 1973 and \$75 in 1982). After the deductible is met, the beneficiary is responsible for 20 percent of the allowed charge per service and, for unassigned claims, any amount by which the actual charge, as limited by the maximum allowable actual charge, exceeds the allowed charge. The goal of cost sharing is to give beneficiaries an interest in selecting less costly providers and in questioning the necessity of services by making them more sensitive to cost.

Surgery accounted for about 41 percent of the total increase in Medicare physician spending over a recent period (1982-87). In an attempt to reduce unnecessary risk to patients and control surgical spending, Medicare and many private payers and Medicaid programs use second surgical opinion programs to ensure that the proposed surgery is medically necessary. Medicare encourages second surgical opinions by paying for them and by maintaining hotlines through which beneficiaries can obtain names of physicians qualified to provide second or even third opinions. In addition, as required by the Consolidated Omnibus Budget Reconciliation Act of 1985 (Public Law 99-272), PROs subject at least 10 surgical procedures to preadmission and/or preprocedure review and may require a second opinion when appropriate.

Influencing physician decisionmaking

Research on clinical guidelines and effectiveness is being undertaken to provide physicians and others with information to assist in determining the type of care that should be rendered to a particular patient. Effectiveness research may have implications regarding what services will be covered by Medicare, even though the primary goal is to influence decisionmaking by providing better data. The argument for this strategy is the shortage of consensus and hard data about when procedures should be done. Neither guidelines based on consensus nor effectiveness research will necessarily reduce VI of services; effectiveness research could lead to increased use of some services.

Utilization review depends on organizations such as Medicare carriers, PROs, insurers, and medical societies

to change physician behavior through education, withholding payment, or other sanctions. Utilization review may operate three ways:

- Prospectively, through methods such as preadmission screening and second surgical opinions.
- Concurrently, through monitoring care during treatment.
- Retrospectively, through reviews of claims and medical records, either before or after payment is made.

Utilization review of the appropriateness of individual services may control some VI growth (Eisenberg, 1988). It might be possible to increase utilization review activities for physicians who have large increases in Medicare volume and intensity or in geographic areas where the number of procedures per beneficiary is large. Coverage policy is the method by which Medicare defines the services for which it will pay and the circumstances in which it will pay. It is closely related to utilization review, although the administrative structures are different.

A potential conflict of interest arises any time physicians' decisions regarding the provision or ordering of a service may increase their profit. In a fee-for-service system, some such conflicts are inevitable, but certain situations create even more powerful conflicts. For example, conflict-of-interest concerns are raised by the possibility that physicians might overprescribe drugs that they dispense directly to patients or when they refer patients to imaging facilities or laboratories that they own. Subsequent growth in VI of those services raises inevitable suspicions in the minds of the public and Federal officials. There is little direct evidence about actual inducements resulting from such arrangements and, consequently, about the savings that forbidding such referrals might achieve. In areas where physicians own the only facilities, conflict-of-interest rules might even create barriers to care.

Some economists believe that inequitable payment rates might create economic incentives for physicians to inappropriately perform some services (Hsiao et al., 1988). This suggests that it might be possible to moderate volume growth of some services through selected payment adjustments based, for example, on inherent reasonableness or on recent research on relative values for physicians' services. However, modifying relative payment amounts is unlikely to result in a significant slowing of volume growth. Basic fee-for-service incentives to increase volume would remain in place. Furthermore, physicians might respond to decreased payments by attempting to recoup lost income in unpredictable ways (e.g., by increasing volume of the service with the reduced payment or by inappropriately performing other, more profitable services).

Growth targets can be set by determining in advance an acceptable level of aggregate Medicare expenditures for a given geographic area and time period. A widely discussed model (Physician Payment Review Commission, 1989), similar to the "default" Medicare Volume Performance Standards mandated by OBRA of 1989, would vary the annual physician fee update based on a comparison of actual and targeted program outlays

in a preceding period. Growth targets can be set at the national level or at some other geographic level. Medicare could set a growth target for the year for a group of services—all physicians' services, all Part B services, or even all Part A and Part B services. This method would not control VI directly, but it could shield Medicare trust funds from the impact of VI growth, because costs to Medicare would be controlled directly through the payment per service.

Although growth targets involve policy issues, they do not reflect a major change from recent policy experience, whereby the Medicare annual payment update has been reduced to partially offset large expenditure increases. A growth target has one potential advantage compared with this de facto policy. Growth targets are intended to create a collective incentive to encourage the medical community to work cooperatively with the Medicare program to identify and correct problems related to unnecessary care. A more direct linkage between the collective incentives of the growth target and the practice patterns of individual physicians might be established by an "opt-out" option for qualified physician groups. OBRA of 1989 requires the Secretary of DHHS to develop criteria for establishing opt-out groups by April 1991. Under this policy, a physician group (such as a PPO or hospital medical staff) could opt out of the general growth target. Such a group would then receive a fee update based on its cost performance in relation to the target rate. This would provide incentives for physician groups to be organized to provide care in a cost-effective manner.

A variety of design questions should be addressed in developing a growth target policy, such as the range of services to be included in the target; whether the target should apply at a national, statewide, or substate basis; what factors should be used to establish and update the target; the nature of the fee adjustment that would result if the target were exceeded; whether current-year payments should be withheld or fee levels adjusted in the year after the end of the target period; and whether there should be an opt out for qualified physician groups and, if so, what the terms of the policy should be.

Resource-based relative value scales

For years, economists have inconclusively debated whether growth in VI is driven predominantly by physicians inducing patients to accept services or by patient demand. These and similar issues have been discussed at recent Physician Payment Review Commission meetings. The debate has usually focused on issues such as whether physicians seek to attain a target income and whether physicians can induce demand for their services. This debate has important implications for implementing an RBRVS-based fee schedule.

It is clear from preliminary analyses (e.g., Sullivan, 1989a) that the RBRVS-based payment system, when implemented in a budget-neutral fashion, will substantially alter payments for a significant number of services, generally increasing payments for visits and decreasing payments for many surgical procedures. These

payment changes could be substantially greater than any previous payment change implemented by the Medicare program. Thus, there is no precedent from which to predict confidently how physicians can or will respond to payments based on an RBRVS.

We reviewed studies of physicians' responses to payment changes to determine possible implications of an RBRVS payment system. In two prior empirical studies (Holahan and Scanlon, 1979; Rice, 1983), researchers examined physician responses to absolute payment changes in the Medicare program and reported significant volume changes in response to payment restraints or reductions.

Researchers at the Urban Institute (Holahan and Scanlon, 1979) studied physician reactions to wage and price controls that lasted from 1971 to 1974. Even though prices for individual services were limited to a 2.5-percent annual increase during this period, expenditures increased from 10 to 13 percent per year because of substantial increases in the VI of services provided.

Rice (1983) examined physician responses to an administrative change by the carrier for Colorado by which all physicians in the State within a specialty were combined into a single statewide locality for purposes of computing prevailing charges. (Previously, the carrier recognized 10 different geographic areas in the State for payment purposes.) The effect of this administrative change was to increase payments for rural physicians and slightly decrease those for urban physicians. Physicians receiving lower payments provided more intensive office and hospital visit services and increased the volume of surgery and laboratory services.

In a review of Canadian efforts to control expenditures, Barer, Evans, and Labelle (1988) and Lomas et al. (1989) demonstrated a strong relationship between fee levels and service volume. Although growth in expenditures for physicians' services has been much lower in Canada than in the United States, Canadian utilization growth is even higher than U.S. growth, somewhat offsetting lower growth in payments per service.

Other investigators reported that they believe the evidence for demand inducement is more complex. Feldman and Sloan (1988), for example, suggest that physician response is more likely to involve changes in mix or quality of service than inducement for additional services. Pauly (1988) reported that, in theory, physician response to payment changes is partly dependent on physician motivation for practicing medicine, such as whether a physician attempts to maximize profits or to act as a patient advocate regardless of economic consequences.

Based on research findings concerning limited payment changes and based on Medicare program experience, it seems clear that physicians can induce services or alter billing patterns to at least partially offset income losses from limitations on payments for individual services. It is not clear, however, how physicians can or will respond to payments based on an RBRVS. After examining the evidence on physician responses to payment changes, Pauly (1988) concluded that the effects of an RBRVS on volume of services are unpredictable and that physicians'

response is likely to depend on their ability to induce demand for their services. Ability to induce demand includes not only ability to recoup losses by inducing volume but also many other factors, such as ability to substitute other services, the amount of physician discretion as to billing for services, the degree of physician dependence on income from Medicare, ability to recapture Medicare losses from non-Medicare patients, and whether other payers also adopt payment schedules based on an RBRVS.

An example may clarify this point. Ophthalmologists and thoracic surgeons are likely to receive sharply lower payments under an RBRVS. Both types of specialist receive 42-43 percent of their income from Medicare beneficiaries, compared with 21-22 percent for the average general or family practitioner (Paxton, 1987). Thus, it is likely that both ophthalmologists and thoracic surgeons would find it difficult and costly to stop treating Medicare beneficiaries. Their ability to increase their volume of services, however, may differ. Ophthalmologists provide a substantial amount of routine primary eye care. Therefore, it might be feasible for them to identify new candidates for cataract surgery and lens implantation, which is the procedure from which they receive most income, and to offer the procedure to their patients. In contrast, thoracic surgeons provide little primary care and are heavily dependent on referrals from nonsurgeons, especially cardiologists. Thus, it might be far more difficult for thoracic surgeons to induce demand for their services.

As an alternative to inducing demand for services to Medicare patients, some physicians might attempt to recoup losses by not accepting assignment. However, the recent physician payment reform legislation, OBRA of 1989, further restricts balance-billing opportunities, starting in 1991. Another alternative might be to provide fewer services to Medicare patients if payments for those services dropped. However, even decreased payments under an RBRVS would provide substantial take-home income to affected specialists, so they would be likely to decrease their services to Medicare patients only if they could treat some other group who paid more. The ability of specialists to do this is likely to depend on payment levels from other insurers. If other payers were to adopt the fee schedules that Medicare developed from an RBRVS, physicians might not be able to decrease services to Medicare patients.

Finally, it is important to realize that this focuses on the induction of demand in response to decreased payments. The other side of the coin is that physicians might be more willing to provide those services for which payments increased. For example, a number of advocates of the RBRVS have argued that it would increase the incentives to provide "cognitive" services, such as primary care. There is, however, almost no direct evidence on whether increased payments result in increased or decreased volume of services. Another hypothesis that has been suggested (Lee, 1989) is that physicians receiving increased payments might reduce the rate of growth of their volume of services.

Because we do not know whether the specialists most affected will be able to induce demand for their services,

we cannot predict the responses of other insurers, and the contemplated changes are different from those for which we have historical evidence, projections of physician response to an RBRVS are uncertain. The uncertainty of physician response to the implementation of payments based on relative value scales provided support for the coupling of the RBRVS-based fee schedule with the Medicare Volume Performance Standards in OBRA of 1989 to more directly control the impact of VI growth on Medicare outlays.

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