
Practice Expenses in the MFS: The Service-Class Approach

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The practice expense component of the Medicare fee schedule (MFS), which is currently based on historical charges and rewards physician procedures at the expense of cognitive services, is due to be changed by January 1, 1998. The Physician Payment Review Commission (PPRC) and others have proposed microcosting direct costs and allocating all indirect costs on a common basis, such as physician time or work plus direct costs. Without altering the treatment of direct costs, the service-class approach disaggregates indirect costs into six practice function costs. The practice function costs are then allocated to classes of services using cost-accounting and statistical methods. This approach would make the practice expense component more resource-based than other proposed alternatives.

INTRODUCTION

The Medicare Physician Payment Reform Program (MPPRP) of 1989 established the MFS, based on Harvard University's resource-based relative value scale (RBRVS), as the new basis of fee-for-service (FFS) payment for physician services under Medicare. The MFS maintains the coding of services according to the *Current Procedural Terminology, Fourth Edition (CPT-4)*, but intends to make payment for those services resource-based. In other words, it intends to compensate physicians for their services in proportion

to the resources that they expend in providing them. This is supposed to provide physicians with a "level playing field," giving them neutral economic incentives in their treatment decisions (Hsiao et al., 1988). In its current form, the MFS falls well short of that goal: Almost one-half of payments made are still based on historical Medicare charges.

The MFS is made up of three components. The largest, which accounts for about 54 percent of the fee, on average, is intended to compensate physicians for their work in providing a service (as defined by CPT-4). It is based on the RBRVS (Hsiao et al., 1992). A second component, accounting for only 5 percent of the fee, on average, compensates physicians for their malpractice insurance premium expenses. The third and final component, accounting for about 41 percent of the fee, on average, compensates physicians for other practice expenses. The malpractice and practice expense components are largely based on historical (i.e., pre-MFS) Medicare charges for services. They do not necessarily reflect expenses incurred in providing services (Physician Payment Review Commission, 1992). When the MPPRP was passed in 1989, neither the methods nor the data yet existed to produce resource-based malpractice and practice expense components. Recent legislation, however, requires that HCFA revise the practice expense component by January 1, 1998. The specific methodology that will be used to accomplish this has not yet been determined as of this writing.

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The stakes are considerable: The evidence to date indicates that making the practice expense component resource-based could produce changes of 15 percent or more in Medicare fees for two-thirds of services, as well as changes of 10 percent or more in several specialties' Medicare incomes (Physician Payment Review Commission, 1992). In addition, many non-Medicare payers, especially State Medicaid programs and Blue Cross/Blue Shield plans, are replacing their usual, customary, and reasonable charge systems with fee schedules patterned after the MFS (Physician Payment Review Commission, 1993). Whatever revision Medicare adopts is likely to affect non-Medicare payers as well. Depending on what legislation (if any) emerges from Congress, the revision could have a more substantial impact still: Most proposals for an all-payer fee schedule are based on the MFS. Even capitation-based payment systems (payment made on a per capita rather than per service basis) are expected to incorporate explicit assumptions regarding resource-based values of services provided per enrollee.

Various proposals for redefining the practice expense component have been made, most notably by the Physician Payment Review Commission (1992). The service-class approach, which we propose here, significantly extends the methodological foundations that PPRC has laid. As background, we explain the construction of the current practice expense component in the MFS.

CURRENT CHARGE-BASED PRACTICE EXPENSE COMPONENT

The MPPRP specifies that the practice expense relative value units (RVUs) for a service be computed by applying a service-specific practice cost percentage to the

estimated 1991 national average Medicare-allowed charge for each service.

The practice cost percentage is computed by following several steps. First, the average percentages of physicians' gross revenues that go toward practice expenses are determined from national survey data for each specialty. The MFS uses American Medical Association (AMA) survey data, which indicate, for example, that 31.8 percent of general surgeons' gross incomes go toward practice costs, and 7.4 percent toward professional liability insurance. Second, using Medicare Part B data, the numbers of each type of service performed in 1989 are determined, and the proportions that each specialty accounts for are calculated. Such calculations could indicate, for example, that general surgeons perform 83 percent of service A, while obstetrician-gynecologists perform 17 percent. Third, using 0.83 and 0.17 as weights, a practice cost percentage is computed for each service. The practice cost share for general surgeons being 31.4 percent and that for obstetrician-gynecologists 38.0 percent, the practice expense percentage for service A (PEP_A) is:

$$PEP_A = (0.31 \times 0.83) + (0.38 \times 0.17)$$

$$PEP_A = 0.32.$$

The practice expense percentage for a service is then multiplied by the 1991 national average Medicare-allowed charge for the service to determine the practice share in dollars. If the national average Medicare-allowed charge for service A is \$500, the practice expense share for that service is $0.32 \times \$500 = \160 . The relative dollar amounts obtained determine the practice expense RVUs for each service.

Separate geographic adjustment factors are applied to each component to adjust for regional differences in input prices. Then the RVUs for practice and malpractice

are added to the RVUs for work, and the total RVUs for the service are converted to dollars through multiplication by the conversion factor.

Two adjustments to this formula should be noted. First, the MFS includes a site-of-service differential that reduces the practice expense portion of the fees for 545 (mostly office-based) services by one-half when they are performed in outpatient or hospital settings. This is intended to avoid duplicate payment for facility costs that are already covered under Medicare Part A payments to institutions. Second, as of 1994, payments for services usually performed in the hospital or other non-office settings for which the practice expense component is relatively high have been reduced (Physician Payment Review Commission, 1994). This adjustment, which affects relatively few Medicare services, does little to alter the charge-based nature of the practice expense component.

UNDESIRABILITY OF CURRENT PRACTICE EXPENSE COMPONENT

The historical charge-based practice expense component makes much higher payments for tests and procedures, per unit of (physician) time, than it does for evaluation and management (EM) services. Table 1 shows the average 1994 MFS practice expense RVUs per unit time for the most economically important Medicare services, grouped by type and site of service. Together these services account for about 75 percent of Medicare payments to physicians. Table 1 shows that practice expense RVUs per unit time (and hence practice expense payments per unit time) are almost four times greater for invasive services usually performed outside the office than they are for office visits. RVUs per unit time for other services (primarily imaging services and tests) fall in between.

Table 1
1994 Medicare Fee Schedule Practice Expense RVUs per Unit of Physician Time, by Type and Site of Service

Type and Site of Service	Mean ¹	n ²
Evaluation and Management	1.00	52
	(0.07)	
Office	0.82	23
	(0.06)	
Non-Office	1.14	29
	(0.10)	
Surgical Global Services³	2.71	49
	(0.17)	
Office	1.86	16
	(0.26)	
Non-Office	3.12	33
	(0.18)	
Other Services⁴	1.88	36
	(0.16)	
Office	2.35	5
	(0.42)	
Non-Office	1.81	31
	(0.17)	

¹To facilitate comparisons, units are standardized to give one RVU per unit time for evaluation and management services

²Number of services for which the mean is calculated. The 137 services represented in Table 1 are the Medicare services with the highest dollar volume, accounting for about 75 percent of Medicare physician expenditures.

³Surgical global services combine pre- and postoperative visits with the surgical procedure itself.

⁴Primarily imaging services and tests.

NOTES: Numbers in parentheses are standard errors of the mean. RVUs are relative value units.

SOURCES: 1994 Medicare Fee Schedule; Harvard School of Public Health: RBRVS study time estimates for selected services.

It would be surprising if the disparities evident in Table 1 reflected actual differences in resource use. Physicians do not normally incur expenses for performing procedures at the hospital at four times the rate that they do for seeing patients in their offices. On the contrary, they tend to incur expenses at a lower rate when providing services at the hospital than at the office, since the hospital assumes the costs of non-physician personnel, space, utilities, equipment, and supplies.

Such distortions in payment have at least two undesirable consequences. First, they result in practice expense payments to EM-oriented physicians that are disproportionately small compared with those to their procedurally oriented colleagues.

Consider the case of general surgeons and internists. Average annual practice expenses, exclusive of malpractice insurance premiums, for general surgeons in 1992 were \$128,200 versus \$156,200 for general internists (American Medical Association, 1993). Yet, because general surgeons spend much of their patient care time in surgery or in pre- and postoperative visits (all of which are included in global surgery packages) while internists spend much of their patient care time seeing patients in their offices, general surgeons' MFS practice expense payments are larger than those of internists for the same patient care time.

This point would ideally be made by using average physician service profiles and comparing practice expense payment RVUs with actual practice expenses by specialty. We did not have the data necessary to do this. The differences in MFS practice expense RVUs per unit time across types of service and settings, shown in Table 1, are, however, considerable. It appears likely that inequities such as are evident in the case of internal medicine and general surgery (evident because surveyed practice expenses are lower for general surgery than for internal medicine) would be common.

The second undesirable consequence is that physicians practicing on an FFS basis still face strong financial incentives in their day-to-day treatment decisions to deliver a more procedurally oriented—and more costly—brand of medicine than necessary. For both these reasons, there is now widespread agreement that the practice expense component needs to become resource-based rather than charge-based.

PPRC/CHPS APPROACH

The alternative to the current formulation of the practice expense component that has received the most attention and funding until now is the PPRC's resource-based

method. The PPRC method (1990) seeks to satisfy two objectives: (1) to be resource-based (i.e., payments for services reflect the costs incurred in providing them); and (2) to be incentive-neutral (i.e., payments give physicians neutral economic incentives in choosing the services to provide to their patients). It is similar to the Center for Health Policy Studies (CHPS) method described later.

The PPRC method distinguishes between direct and indirect costs. Direct costs, such as X-ray film or an X-ray machine, can be physically traced to a particular CPT-defined service or group of services. Indirect costs, such as office rent, cannot be so traced. In its published work, PPRC has classified clinical labor, medical supplies, medical equipment, and the variable component of billing costs (i.e., labor, not computer equipment) as direct costs. It has estimated that about one-third of physicians' costs are direct and two-thirds indirect (Physician Payment Review Commission, 1992).¹

Having divided the pool of practice expense dollars into direct and indirect cost subpools on the basis of this one-third/two-thirds split, PPRC then proposes an approach to distributing the two subpools among services. This involves determining, for each service, relative values for direct and indirect costs. Relative values for direct costs are determined by carefully tallying direct costs for individual

¹If direct costs are defined instead as variable costs, determined using econometric cost function estimation, then direct costs can account for as much as 70 or 80 percent of practice expenses (Pope and Burge, 1993a). But this does not correspond to the usual accounting definition, which requires that costs be physically (not just statistically) traceable to specific CPT codes. Microcosting involves tracing costs to CPT codes physically. If direct costs are determined using microcosting rather than statistical methods, the share of practice expenses that direct costs account for can then be increased only by physically tracing more and more costs to services—e.g., the costs of obtaining insurance authorizations, of medical recordkeeping, etc. In practice, this may not be feasible.

services (microcosting). Relative values for indirect costs are determined by the choice of an allocation basis, such as physician work plus direct costs, or physician time (Physician Payment Review Commission, 1992). The PPRC method expands the number of services for which payments are reduced when they are provided outside the physician's office.

The method developed by CHPS under funding from HCFA also involves microcosting direct costs. Unlike the PPRC method, however, it subdivides indirect costs into two groups. Departmental indirect costs (such as X-ray equipment used for a broad class of services) are allocated to all the relevant codes according to an activity measure such as patient contact time. Overhead is allocated to all CPT codes that the practice provides, again according to an activity measure such as patient contact time (Miller and Kelly, 1994).

PPRC has obtained preliminary measures of direct costs for most services, based on observations at one large multi-specialty clinic. Using these data, it has simulated the effects of replacing the MPPRP method with its own (Physician Payment Review Commission, 1992). As Table 2 shows, the PPRC practice expense RVUs would considerably narrow the gap between practice expense payments per unit time for EM and surgical services.

The PPRC and CHPS methods have in common two broad features: microcosting of expenses that can be directly traced to specific CPT codes, and allocation of indirect costs (PPRC) or overhead (CHPS) to all services on a single, arbitrary basis, such as physician work plus direct costs, physician time, or patient contact time.

Table 2
1994 MFS Versus PPRC Practice Expense RVUs per Unit of Physician Time, by Type and Site of Service

Type and Site of Service	1994 MFS	PPRC
Evaluation and Management		
Office	0.82	1.22
Non-Office	1.14	0.83
Surgical Global Services		
Office	1.86	1.69
Non-Office	3.12	1.29

NOTES: This table does not include "other services" as defined in Table 1 because PPRC relative values are available for only a few of them. PPRC is Physician Payment Review Commission.

SOURCES: 1994 Medicare Fee Schedule; (Physician Payment Review Commission, 1992); Harvard School of Public Health: RBRVS study time estimates for selected services.

DISAGGREGATION OF INDIRECT COSTS

Allocating indirect costs on a single, arbitrary basis, such as physician time or work plus direct costs, implicitly assumes that physician time or work plus direct costs—regardless of the nature of the practice—is the main determinant of a practice's indirect costs. It appears rather likely, however, that minutes of a physician's time or RVUs of a physician's effort are associated with different levels of indirect costs depending on the nature of the physician's practice. Characteristics of physician practices, such as the extent to which services are office-based, have an important influence on indirect expenses that physician time or work do not capture.

Consider, for example, the effect of allocating indirect costs on the basis of time. This has the result of giving all physicians who spend 45 hours a week in direct patient care exactly the same amount to cover their indirect expenses. Yet their indirect expenses are likely to vary according, for example, to the extent to which the practices are office-based. Using physician work rather than time as a basis leads to making higher indirect payments to physicians who provide a greater proportion of

procedures. Since procedures are often performed in non-office settings, the inequity between indirect expense payments to procedurally oriented and EM-oriented physicians tends to be even greater than when time is used as a basis (Latimer and Becker, 1992). This is all the more true as the procedures that involve the most work units per unit time are, in general, the ones most likely to be performed in non-office settings.

PPRC (1992) has suggested combining direct costs with physician work to form the basis for allocation, on the assumption that some indirect costs tend to be greater where direct costs are greater. Indeed, medical staff and equipment often require space and administrative resources that would be classified as indirect. But not all direct costs have the same impact on indirect costs. A small, specialized piece of medical equipment may have a high direct cost per service unit, yet have minimal impact on indirect costs. Any allocation method that ignores the influence of practice or service characteristics upon the level of indirect costs will not allocate indirect expenses in a way that reasonably reflects resource use.

SERVICE-CLASS APPROACH

The service-class approach is an alternative approach to indirect cost allocation that is more resource-based than allocation on a single basis, such as physician time or work plus direct costs. It relies on the observation that indirect costs are incurred to perform several distinct functions: obtaining insurance authorizations; medical recordkeeping; bookkeeping; management and coordination; occupancy; etc. The relative importance of each function in a practice reflects, to a large extent, the services that the practice provides. A practice that provides mostly office visits

will have different indirect cost requirements than a general surgery practice.

The service-class approach involves: dividing indirect expenses into practice function costs; grouping CPT codes into classes of services for the allocation of practice function costs; and allocating practice function costs to service classes using cost-accounting and statistical methods. Service classes are groups of CPT codes that are expected to be related in a similar way to a particular practice function cost. For example, elective procedures could form one class for insurance authorization costs, and other services another class. Direct costs are assigned to CPT codes using microcosting methods such as those described by PPRC (1992). By allocating indirect costs to services in this more careful way, the total payment for indirect costs to an internist will reflect the indirect resource requirements of internists, whereas the total indirect cost payment for general surgeons will reflect general surgeons' indirect resource requirements.

Practice Functions

During the summer of 1993, we met with over 40 physicians and practice managers representing a wide range of medical and surgical practices. Our purpose was to discover what types of services and other characteristics of practices do in fact drive practice expenses. In spite of considerable variation in practice arrangements, we found that a clear logic underlies the way in which practice expenses are incurred.

We found that practice expenses arise from the performance of some combination of the following nine practice functions:

- Providing direct patient care incident to visits (e.g., escorting patients to waiting rooms, taking histories).

- Providing direct patient care for services other than visits (e.g., tests and procedures).
- Billing.
- Obtaining authorizations from insurers for procedures or visit referrals.
- Maintaining medical records.
- Collection.
- Bookkeeping.
- Management and coordination.
- Occupancy (rent, utilities, furniture and non-medical equipment, and maintenance).

The first three functions correspond to the direct practice expenses that PPRC has traced to CPT-defined services. The remaining six functions account for costs that the PPRC method, in its current formulation, treats as indirect. Table 3 shows how different kinds of non-personnel practice expenses can be assigned to the different practice functions. Figure 1 is a survey form which shows how non-physician staff time can be distributed among the practice functions.

Based on our conversations, we expect that the level of expense in each function will vary with both the services that the practice provides and other characteristics of the practice not reflected in the services provided. For example, we found surgical practices in which nearly two full-time equivalent positions per surgeon were needed to obtain insurance authorizations. The insurance authorization practice function is expected to be a significant expense only in practices with a large proportion of elective procedures and managed-care payers.

To take another example, the medical recordkeeping function is likely to require more staff time in internal medicine practices, where records must be reopened as test results come in, than in ophthalmology practices, where the ophthalmologist can observe and record test results (often in automated form) during the visit. Table 4 lists the service and other characteristics of practices that we hypothesize, based on our conversations with physicians, are associated with the level of resources used to perform the specific practice functions.

Table 3
Assignment of Non-Personnel Practice Expense Line Items to Practice Functions

Line Item	Practice Function
Information and Data Processing	Management and coordination
Non-Personnel Laboratory, Radiology, Physical Therapy, and Optical Expenses	Direct patient care for services other than visits ¹
Medical and Surgical Supplies	Direct patient care incident to visits ¹
Building and Occupancy	Occupancy
Non-Medical Equipment	Occupancy
Medical Equipment	Direct patient care incident to services other than visits ¹
Office Supplies and Services	Management and coordination
Telephone Expenses	Management and coordination
Outside Professional Fees:	
Medical	Direct patient care incident to services other than visits ¹
Legal	Management and coordination
Accounting	Bookkeeping
Other Non-Physician Consultants	Management and coordination
Promotions and Marketing	Management and coordination
Interest Expense:	
Building and Non-Medical Equipment	Occupancy
Medical Equipment	Direct patient care incident to services other than visits ¹
Other	Management and coordination

¹ Direct costs assigned to direct practice cost functions such as this one would not be allocated to services using the service-class approach. They would be captured instead using microcosting methods.

SOURCE: (Latimer, Kane, and Moseley, 1993).

Figure 1
Allocation of Non-Physician Staff Hours to Practice Functions

Think about the work non-physician staff (at all practice locations) do in a typical work week. How many hours do the staff listed below work? What activities do they usually do? Please include any unpaid hours such as unpaid overtime or work by family members.

	Total # Hours/Week	Percent of Time Spent Doing:								Total	
		Practice Management and Coordination	Bookkeeping	Maintaining Medical Records	Patient Services Related to a Visit or Phone Call	Other (Ancillary) Patient Services (e.g., Lab, Optical)	Authorizations	Billing	Collections		
Administrative Staff:											
a. Executive Staff	Hours ->	%	%	%	%	%	%	%	%	%	= 100%
b. Business Office Staff	Hours ->	%	%	%	%	%	%	%	%	%	= 100%
c. Data Processing Staff	Hours ->	%	%	%	%	%	%	%	%	%	= 100%
d. Other Administrative Staff	Hours ->	%	%	%	%	%	%	%	%	%	= 100%
Non-Physician Medical Staff:											
e. Registered Nurses	Hours ->	%	%	%	%	%	%	%	%	%	= 100%
f. Certified Nurse Anesthetologists	Hours ->	%	%	%	%	%	%	%	%	%	= 100%
g. Licensed Practical Nurses	Hours ->	%	%	%	%	%	%	%	%	%	= 100%
h. Physical Therapists or Aides	Hours ->	%	%	%	%	%	%	%	%	%	= 100%
i. Nursing Aides or Techs	Hours ->	%	%	%	%	%	%	%	%	%	= 100%
j. Physician Extenders	Hours ->	%	%	%	%	%	%	%	%	%	= 100%
Clerical Staff:											
k. Receptionists	Hours ->	%	%	%	%	%	%	%	%	%	= 100%
l. Medical Secretaries/Transcribers	Hours ->	%	%	%	%	%	%	%	%	%	= 100%
m. Medical Records Clerks	Hours ->	%	%	%	%	%	%	%	%	%	= 100%
Technicians:											
n. Lab Technicians	Hours ->	%	%	%	%	%	%	%	%	%	= 100%
o. Radiology Technicians	Hours ->	%	%	%	%	%	%	%	%	%	= 100%
p. Optical Personnel	Hours ->	%	%	%	%	%	%	%	%	%	= 100%
Other Support Staff:											
q. (Specify):	Hours ->	%	%	%	%	%	%	%	%	%	= 100%

Total Hours

SOURCE: Latimer, E.A., and Kane, N.M., Harvard School of Public Health, Brown, J., RAND, 1993.

Table 4
Hypothesized Factors Driving Physician Practice Expenses, by Practice Function

Practice Function	Hypothesized Factors Driving Practice Expenses
Direct Patient Care Incident to Office Visits	Services provided (e.g., proportion of office EM services) Proportion of new patients Practice age or maturity
Direct Patient Care for Services Other Than Visits	Services provided (e.g., proportion of office non-EM services)
Obtaining Prior Insurance Authorizations	Services provided (proportion of elective tests and procedures commonly targeted by utilization review programs) Payer mix
Maintaining Medical Records	Services provided (e.g., proportion of consults versus visits) Degree of automation Proportion of new patients Number of patients
Billing	Services provided (services usually billed with others versus services usually billed alone) Payer mix
Collection	Services provided (services usually billed with others versus services usually billed alone; proportion of services subject to utilization review) Payer mix
Bookkeeping	Size of practice (Number of full-time equivalent medical doctors) Services provided (e.g., office versus non-office services)
Management and Coordination	Services provided (e.g., office versus non-office services) Size of practice Maturity of practice Whether faculty practice
Occupancy	Services provided (e.g., office versus non-office services) Number of sites Number of square feet Number of medical doctors Location Practice age or maturity

NOTE: EM is evaluation and management.

SOURCE: (Latimer, Kane, and Moseley, 1993).

Although we found that practice characteristics not reflected in the services provided, such as the number of physicians and the mix of payers, influence practice expenses, we do not propose to take them into account in an actual payment system. The reasons for this are practical, and are discussed later. The service-class approach therefore relies only upon the link between the services provided and practice function costs.

Allocation of Practice Function Costs

As previously indicated, three of the practice functions—provision of direct

patient care incident to visit, provision of medical services other than visits, and billing—together correspond closely to direct costs as defined by PPRC. These practice function costs would be assigned to CPT codes using micro-costing methods.

The remaining practice functions represent costs for which direct assignment to CPT codes using microcosting is either too costly or not feasible. To allocate these practice function costs to CPT-defined services, we would develop classes of services reflective of the characteristics driving

the level of each practice function cost. To take a simple example, services might be grouped into two classes for the allocation of authorization costs: class A, containing services for which no third party authorization is required (e.g., primary care or emergency services), and class B, containing those services for which third party authorization may be required (e.g., elective surgery).

Option One: Flat per Service Amount

For the latter group, one option would be to allocate authorization costs to each service in class B on a flat per service basis. In algebraic terms:

$$AC_B = \frac{TAC}{n_B}$$

where AC_B represents authorization costs allocated to services in class B, TAC total authorization costs (in the sample of practices), and n_B the number of times a service in class B was provided (in the sample of practices). Authorization costs assigned to services in class A are zero.

Option Two: Amount Proportional to Service Work

We may find, alternatively, that class B services requiring more physician work tend to be associated with higher levels of authorization costs. In this case, authorization costs might be allocated among class B services in proportion to their physician work amounts. In algebraic terms:

$$AC_{B_i} = \frac{TAC}{\sum_B RVU_j} \times RVU_i$$

where AC_{B_i} represents authorization costs allocated to service i in class B, TAC is still the sum of authorization costs across all practices in the sample, the denominator of

the fraction is the sum of work RVUs over all class B services provided in the sample of practices, and RVU_i represents the work RVUs of service i .

Additional options could also be examined. It may be preferable to subdivide the services in class B into two or more classes. For example, orthopedic procedures might be more difficult to obtain insurance authorization for than cardiac procedures—even holding fixed the amount of physician work. It would then make sense to group orthopedic procedures into one class and cardiac procedures into another. Statistical analysis would help determine which plausible classification of services best predicts practice function costs. If two or more service classes with non-zero authorization costs were defined, the allocation of insurance authorization costs to those classes could be accomplished using multiple regression analysis. This is described in greater detail later.

Table 4 suggests how services might be classified for each of the other practice functions representing indirect costs. A complication arises in the case of management and coordination as well as occupancy costs. These two types of costs are somewhat different from the others, in that they are incurred as a result of having to engage in the other practice functions. They are, as it were, more indirect than the others. It therefore seems reasonable to use a two-step allocation for these functions, similar to the “step-down” cost-accounting method used in the Medicare Cost Report to allocate overhead costs to revenue-producing departments.

This would require distributing management and coordination and occupancy costs among the seven remaining practice function costs. It is necessary to distribute some of them to direct practice functions

also, since direct practice functions also are likely to generate management and coordination and occupancy costs. The allocation would be done in proportion to a measure such as non-physician staff time incurred by each of the seven remaining practice functions. Alternative measures, such as non-physician staff plus physician time or total labor costs, could also be considered. Statistical analysis would determine which measure(s) best explains the variation in management and coordination and occupancy costs. Different measures could be used for management and coordination than for occupancy costs. Once management and coordination and occupancy costs were assigned to practice functions, the full practice function costs would be allocated to classes of services.

Indirect practice function costs would be allocated to classes of services. The management and coordination and occupancy costs assigned to direct practice functions could also be allocated to classes of services. For example, the management and coordination costs assigned to direct patient care incident to visits could then be themselves allocated to office visits, classified according to their duration. Alternatively, the costs assigned to direct practice functions could be allocated to services in proportion to the non-physician staff time, or labor cost, associated with each. In such a case, service classes would only be defined for the indirect practice function costs. Empirical analysis would determine which approach yields the greatest predictive power.

Implementing the service-class approach requires data on a sample of physician practices including: relevant practice characteristics, such as the number of physicians in the practice, and the number of sites; practice expenses, reported in such a way that they can be assigned to the practice

functions previously listed; and the volume of services provided by the practice, by CPT code. No data set currently exists that contains all this information. Practice expenses are not reported in a way that allows assignment of costs by practice function; nor are the CPT codes by practice generally available. Our meetings with physicians and practice managers suggest that the majority of physician practices can provide the information needed without undue burden (Latimer, Kane, and Moseley, 1993).

Most practices already keep track of their expenses in a manner consistent with the categorization in Table 3. During our meetings, physicians or their office managers were able, with minimal effort, to report personnel time by practice function using the form shown in Figure 1. The most difficult information for a number of physicians to provide was volume of services billed by CPT code. Many physicians subscribe to billing services that do not regularly provide billing summaries over a period of time. Many others, however, maintain or have access to their CPT codes at the office.

The most cost-effective way to obtain such data would be to conduct a mail survey, comparable to HCFA's Physician Practice Cost and Income Survey, or the AMA's annual survey of physicians' practices. Detailed onsite examinations of individual practices, which could be appropriate for microcosting, would be prohibitively expensive, given the thousands of practices from which data would need to be obtained. The number of practices from which data would need to be obtained is large because of the enormous variation in expense configurations that exists among physician practices, reflecting differences in specialty mix, size, payer mix, and other factors.

Statistical Methods

The analysis of survey data involves several steps. First, total practice expenses for each practice are divided into nine practice function costs, as previously indicated. Second, management and coordination and occupancy costs are divided among the seven remaining practice function costs, as described in the previous section. Third, as described, those costs assigned to direct practice functions are allocated to either classes of services or directly to services using a measure such as non-physician staff time.

Fourth, regression equations are estimated, one for each of the four remaining indirect practice cost functions. In their simplest form, the regression equations would be specified in the following way:

$$AU = \alpha_1 SC_1^{AU} + \alpha_2 SC_2^{AU} + \dots + \beta_N SC_N^{AU} + u,$$

$$MR = \beta_1 SC_1^{MR} + \beta_2 SC_2^{MR} + \dots + \beta_L SC_L^{MR} + v,$$

$$CO = \gamma_1 SC_1^{CO} + \gamma_2 SC_2^{CO} + \dots + \gamma_M SC_M^{CO} + w,$$

$$BK = \delta_1 SC_1^{BK} + \delta_2 SC_2^{BK} + \dots + \delta_N SC_N^{BK} + x,$$

where *AU*, *MR*, *CO*, and *BK* represent authorization, medical recordkeeping, collection, and bookkeeping costs, respectively (each including some portion of management and coordination as well as occupancy costs).

SCs represent counts of services belonging to each service class, with a potentially different number of classes, and indeed a different classification scheme, for each equation. α 's, β 's, γ 's, and δ 's represent parameters to be estimated. *u*, *v*, *w*, and *x* are random error terms. Note that the equation includes no intercept, in order to estimate average rather than marginal costs. Each estimated coefficient then indicates the average contribution to a particular practice function cost of CPT codes in a class of codes. Table 5 shows hypothetical regression coefficients.

The estimated coefficients are then summed by function to yield total indirect cost estimates for a specific CPT code. Table 6 shows hypothetical cost estimates, by practice function, for two services, CPT 33512 (3-vessel coronary artery bypass graft [CABG]) and CPT 99213 (15-minute office visit with established patient), and how they would be combined to produce the total indirect cost component for each service. The visit receives no authorization costs. The CABG receives more for every practice function, reflecting the fact that more management and coordination and occupancy costs must be allocated to it. Those costs are not likely to differ by orders of magnitude, per physician, across

Table 5
Hypothetical Regression Coefficients Using the Service-Class Approach¹

Service Classes	Indirect Practice Function Equations			
	Authorizations	Medical Records	Collection	Bookkeeping
			Dollars	
Number of Office Visits	—	—	5.62	11.81
Number of Office Visits: New	—	1.21	—	—
Number of Office Visits: Established	—	0.83	—	—
Number of Hospital Visits	—	2.40	—	3.48
Number of Surgical Procedures	177.66	32.35	13.45	31.83
Number of Imaging Services	11.98	2.81	7.62	2.43
Number of Tests	—	3.98	3.23	6.27

¹For clarity of exposition, the number of service classes has been kept small. In reality, we expect the total number of service classes, across all practice functions, to lie somewhere between 20 and 30.

SOURCE: Latimer, E.A., and Kane, N.M., Harvard School of Public Health, 1994.

Table 6
Hypothetical Indirect Costs Assigned to
CPT 33512 and CPT 99213

Practice Function	CPT 33512	CPT 99213
	Dollars	
Total Indirect Costs	221.62	12.60
Authorizations	182.24	0.00
Medical Records	11.83	3.83
Collection	9.04	4.04
Bookkeeping	18.51	4.73

NOTES: CPT is current procedural terminology. CPT 33512 is 3-vessel coronary artery bypass graft. CPT 99213 is 15-minute office visit with established patient. The four practice function costs each include a share of management and coordination and occupancy costs. Not shown are additional shares of these costs assigned to direct practice functions. These would be allocated to services using one of the methods described in the text.

SOURCE: Latimer, E.A., and Kane, N.M., Harvard School of Public Health, 1994.

practices, whereas the amount of time required to provide the two services differs by a factor of approximately 26 (according to RBRVS study data, the CABG requires nine hours of physician time, including pre- and postoperative visits, versus 21 minutes for the physician visit, including pre- and post-service activities). Practices that provide relatively few longer services are therefore likely to load more of those relatively fixed costs onto each service than practices that provide many short services.

The essence of the allocation strategy proposed here is to divide indirect costs into practice function costs and allocate these costs to service classes in a manner that allows the services that the practice provides to predict the level of indirect expenses with reasonable accuracy. Exploration of the data may reveal plausible statistical models with better predictive power than the one described here.

DISCUSSION

There is much to be gained by making the practice expense component resource-based. Not only would the fee schedule become more equitable, but by paying relatively more for EM services and less for procedures, it would encourage a less

procedurally oriented, and less costly, medicine than the FFS sector now delivers.

Several methods have been proposed for attaining this goal. Some have eschewed large new data collection efforts in favor of relatively simple formulae applied to existing data (Becker, Dunn, and Hsiao, 1988; Pope and Burge, 1993b). Such methods can achieve much of the redistributive gain of a resource-based payment system at low cost and allow earlier implementation than methods that require the collection of new data. Because they are derived from less detailed practice expense data bases, however, they are less resource-based than the methods discussed in this article. If politically and administratively feasible, such methods might be used to begin a transition toward a resource-based fee schedule before the more data-intensive methods can be implemented. Given the more than \$15 billion in practice expense payments the Medicare program disburses annually, however, a substantial data collection effort that would provide a broadly acceptable methodology for redefining the practice expense component seems justified.

The service-class approach allocates indirect costs to services in a more complex manner than do other approaches. We have already argued that allocation of indirect costs on a common basis, such as physician time or work plus direct costs, is inconsistent with the principle of resource-based allocation and also, by the same token, inequitable. Nonetheless, are the extra data collection and analysis that the service-class method would require worthwhile? Given that a substantial effort will be devoted to the development of a resource-based practice expense component, the answer would appear to be yes. A reasonable balance must be struck between the resources used to allocate direct costs and those used to allocate

indirect costs. Basic economic reasoning indicates that the marginal dollar spent on allocating direct costs should contribute as much to the overall precision of the practice expense component as the marginal dollar spent on allocating indirect costs.

Recognizing the importance of the method for allocating indirect costs and the arbitrariness of allocation on a common basis such as physician time, PPRC (1992) has called for researchers to find ways of classifying a greater share of indirect costs as direct. In one sense, this is what the service-class approach does. It breaks down indirect costs into components that can be statistically allocated to specific groups of CPT codes (albeit not physically traced to individual CPT codes). The service-class approach can be viewed as building on the methodological foundation PPRC has laid.

Although we expect that a number of non-service-related practice characteristics, such as number of sites, payer mix, and group size, may influence practice expenses, it may be that such characteristics cannot be feasibly incorporated into a payment system. Their use would present several administrative difficulties: the need for physicians to report, and for HCFA to collect, information on those characteristics; the need for HCFA to take the distribution of those characteristics among physician practices into account in setting the conversion factor; and the need for HCFA to ensure the accuracy of the information on practice characteristics that physicians report. That is why the service-class method, as we have described it, does not make use of such practice characteristics.

As part of a comprehensive data collection effort, it would nonetheless be helpful to collect data on such characteristics, for at least two reasons: (1) such data would allow more precise estimation of

coefficients with a given sample size; and (2) HCFA may conceivably choose to adjust its payment formula if it turns out that practice expenses are quite sensitive to one or more verifiable practice characteristics not reflected in the services provided.

Implementation of the payment system would raise additional issues: How would the practice expense component be updated? Should fees be adjusted in order to achieve specific policy goals? For example, would HCFA want to consider a special payment add-on for new primary practices in medically underserved areas, or add-ons for office-based teaching? These issues will emerge regardless of the practice expense methodology used, and are beyond the scope of this article.

In conclusion, considerable efforts are likely to be expended on the development of a resource-based practice expense component for the MFS. Given that indirect costs account for more than one-half of all practice expenses, such efforts should encompass careful consideration of how best to allocate indirect costs. The service-class approach marks, we believe, a significant step in that direction.

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