

Special Article

Resource-based Relative Value Units: A Primer for Academic Family Physicians

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The Resource-based Relative Value Scale (RBRVS) is the prevailing model used to reimburse physician services today. Based on empirical research, relative value units (RVUs) quantify the relative work, practice expense, and malpractice costs for specific physician services to appropriately establish payment. The fee schedule, implemented by the Health Care Financing Administration in 1992, dramatically affected physician reimbursement, with the goal of correcting disparities across disciplines. In the first 6 years, Medicare payments to family physicians increased by 36%, while payments to specialists decreased by as much as 18%. Recent changes include new practice expense estimates and adjustment of payment based on facility type. The impact of RVUs is even more widespread as many private payers use the fee schedule to set payment rates and as RVUs become the yardstick for physician productivity measures. Despite the initial successes, the ability of RVUs to capture the work done by primary care providers is still limited. Primary care services today are not as easily quantified as surgical procedures, and coding limitations hinder documentation of services. Rapid changes in health care make comparisons to work done 2 decades ago difficult. Understanding the strengths and limitations of RVUs as they apply to family physicians is fundamental to safeguarding the role of primary care.

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The Resource-based Relative Value Scale (RBRVS) is the prevailing model used today to describe, quantify, and reimburse physician services. Since the Health Care Financing Administration (HCFA) introduced the RBRVS-based fee schedule in 1992, this system, with its new terminology and implicit value judgments, has spread rapidly. Medicare, Medicaid, and many private insurance companies use the RBRVS to determine payment for physician services, and many practices and institutions use relative value units (RVUs) to track physician productivity and evaluate job performance. The RVU system, with its widespread application, influences physicians' daily practice, reimbursement, and policy decisions that shape health care in our society.

Many academic family physicians, however, know little about RVUs, their development, underlying assumptions, and current uses. Residency training programs often provide inadequate education about RVUs and other billing issues.¹ This article reviews the development of the RVU system and how it is being used

today. A close look at the history of RVUs and the effect it has had during its first 8 years provides insight and provokes questions about the new system. Academic family physicians must speak the language of RVUs to communicate with budget planners and policy makers, critique its widespread application, and, most importantly, help shape the evolution of the new system.

The Development of the RBRVS

The RBRVS assigns numerical values to health care services—office visits, hospital care, procedures, etc—to quantify the relative work and cost of these services. These units allow comparison of apples to oranges (ie, surgery to primary care visits) and can determine the allowable payment for any service in any specialty. In the 1980s, rapidly increasing Medicare spending, inequitable reimbursement for procedural services over cognitive clinical services, and the influence of income on the career choices of medical graduates fueled the interest in the development of such a scale.² In 1986, the Physician Payment Review Commission mandated the creation of a new resource-based physician fee schedule, with a goal of establishing a system that improved reimbursement for primary care services, was less procedure oriented, and controlled health care costs.

A 1988 study by William C. Hsiao from the Harvard School of Public Health became the foundation for this new fee schedule. Funded partially by the Health Care Financing Administration (HCFA), now referred to as the Centers for Medicare and Medicaid Services (CMS), Hsiao's research examined the resources and costs required to provide physician services to create a relative value scale for physician work that would set reimbursement standards more fairly than the previously used system of usual and customary fees.³

Hsiao's research examined several components of the work and resources involved in providing care. These components were physician work, practice costs, and opportunity costs of training. The Hsiao study focused on determining the relative value of the service-specific work component to establish quantitative measures for the actual work that physicians do.⁴ A series of surveys established reliable ways of describing and quantifying work—looking at the time spent before, during, and after a service, as well as the intensity of the work itself.^{5,6} Data were obtained by surveying 3,200 physicians about the relative work (including time, intensity, etc) of a variety of common services. Committees with representatives from 18 different specialties reviewed the survey results to assess whether the relative rankings seemed reasonable. A common scale was created using reference standards for each specialty and cross-linking the specialty-specific scales, and a final physician committee reviewed this cross-linking analysis.⁷ Ultimately, a complete RBRVS was extrapolated for all types of physician services from the smaller subset of services originally studied. The final product was a common scale that described and quantified the work and resource costs needed to provide physician services across all fields of medicine.⁸

The Medicare RVU-based Fee Schedule

In 1992, the HCFA adopted a modified version of the relative value scale created by Hsiao and applied it to Medicare billing. A total RVU amount, based on the sum of three components, is assigned to each service identified by *Current Procedural Terminology* (CPT) codes. The HCFA's system has a physician work component, a practice expense component, and a malpractice cost component. The

cost of a physician's training is calculated into the overall practice expense. Each service, whether an established patient office visit or bypass surgery, has a billing code with specific RVU amounts. On average, the work component accounts for 55% of the total RVU, about 41% of practice expense, and about 4% of malpractice costs. The RVUs for the more than 7,500 physician services are published annually by the HCFA in the Federal Registrar and are available on-line at www.hcfa.gov/stats/carrpuf.htm. Examples of the 2001 RVUs for common services are listed in Table 1.

A complex formula calculates the allowable payment for each service. The total RVU for a service is multiplied by a conversion factor and several adjustment factors to set a dollar amount for payment. Originally, three separate conversion factors were used to convert RVUs to dollars—one each for primary care, specialty care, and surgical services. In 1998, this three-tiered system was eliminated in favor of a universal conversion factor that is reviewed annually. The 2001 conversion factor is \$38.26 per RVU. Other factors are incorporated into the conversion calculation—a geographic adjustment factor to reflect cost differences across the country and a budget-balancing adjustment factor to maintain a balanced budget for Medicare spending. The HCFA modifies the fee schedule annually, with adjustments to the specific RVU assignments, the RVU framework, and the formula used to determine an allowable payment.⁹

Table 1

Comparison of 2001 RVUs for Common Physician Services

Service	CPT Code	Physician Work	Practice Expense*	Malpractice Costs	Total RVU
Office visit, detailed, established patient	99213	.67	.62	.03	1.32
Office visit, complex, established patient	99215	1.77	1.22	.07	3.06
Office visit, detailed, new patient	99203	1.34	.97	.08	2.39
Colposcopy and biopsy	57454	1.27	1.61	.13	3.01
Cardiovascular stress test	93015	.75	2.12	.11	2.98
Excision of benign skin lesion	11401	1.32	2.01	.09	3.42
Drain /inject joint/bursa	20600	.66	1.14	.06	1.86
Initial hospital care	99223	2.99	1.11	.10	4.20
Follow-up hospital care	99231	.64	.28	.02	.94
Inpatient consultation	99254	2.64	1.13	.11	3.88
Obstetrical care for routine prenatal care and delivery	59400	23.06	15.03	4.14	42.23
Hospital newborn discharge	99435	1.50	.85	.05	2.40
Cardiac catheter—left-sided only	93510	4.33	38.54	2.13	45.0

CPT—*Current Procedural Terminology*
RVU—relative value unit

* Practice expense components for outpatient services are transitional non-facility practice expense values.

The Impact on Reimbursement

In the first few years of the new fee schedule, distribution of payments to physicians of different specialties changed dramatically (Table 2). The average Medicare payments to family physicians increased by 35% from 1991 to 1997, while payments decreased by 18% for ophthalmologists and by 9% for cardiothoracic surgeons.¹⁰ Despite these favorable shifts for primary care and cognitive services, many physicians and policy makers questioned whether the monetary conversion factor provided fair compensation for physicians' work. Even Hsiao argued that the original monetary conversion factor yielded an unreasonably low income for physicians.¹²

The RVU-based fee schedule affects payment from other sources, including Medicaid and private insurance. Many private insurance companies have adopted fee schedules that set payment as a percentage of the Medicare allowable fee. At one academic center in North Carolina, nearly two thirds of private insurance contracts are based on a percentage of the Medicare fee schedule. Across the country, contract rates range from 150% or higher to less than 100% of Medicare rates, depending on market competition. Smaller practices with less economic bargaining power, business expertise, and staff may not negotiate rates well, and their payments from private insurance companies may not have fair conversion rates. However, if negotiated fairly, the use of RVU-based systems can serve as a protection for the smaller practice. Through these varied mechanisms, RVUs greatly influence physician reimbursement and financial security.

The Practice Expense Component Controversy

Current debate focuses on the practice expense component. Unlike the work component that was based on

rigorous data, the practice expense component was not resource based. Hsiao's original study analyzed historical data from the 1983 Physician Practice Cost and Income Survey to compare cost differences across specialties.^{11,12} By 1992, this historical data was out of date and continued to favor procedure-related services over noninvasive, cognitive care.¹³ Since 1996, the HCFA, joined by the American Medical Association (AMA) and other physician groups, has worked to establish practice expense estimates based on current resource cost data from practice today. The HCFA is also transitioning to a system that reflects differences in practice expense, based on whether services are provided in a hospital setting or a non-facility-based office.¹⁴ This change will show an increase in payment to office-based physicians who pay more of the costs of practice expense than their hospital-based counterparts. By 2002, with full implementation of these changes, the predicted overall effect on reimbursement across different specialties will vary widely (Table 3).

Even small changes to the fee schedule and the equation that determines allowable payment dramatically affect physician reimbursement and have prompted much political debate, strong responses from physician professional groups, and even legal action. For example, in 1998, medical and surgical specialty societies, including ophthalmologists, orthopedists, cardiologists, gastroenterologists, and neurosurgeons, filed an unsuccessful lawsuit against the federal government, claiming that the proposed practice expense modifications were unfair. This battle over reimbursement has reignited animosity between specialist and generalist physician groups and sparked controversy between the AMA and the American Academy of Family Physicians (AAFP). The AAFP continues to be an important voice for the interests of family physicians and their patients.

Table 2

Impact of the RVU Fee Schedule on Medicare Reimbursement of Physicians, by Specialty From 1991–1997¹⁰

Specialty	Total Impact on Medicare Payment
Cardiothoracic surgery	- 9.3%
Cardiology	- 15%
Urology	+ 12.2%
Family practice	+ 36.0%
Orthopedic surgery	- 1.7%
Ophthalmology	- 18.4%
Dermatology	+ 9.0%
General surgery	+ .1%
Gastroenterology	- 14.4%
Internal medicine	+ 16.5%

RVU—relative value unit

Table 3

Impact of Completed Practice Expense Transition on Medicare Payment, by Specialty²⁰

Specialty	Total Impact on Medicare Payment
Cardiac surgery	- 12%
Cardiology	- 9%
Emergency medicine	- 10%
Family practice	+ 7%
General surgery	- 7%
Gastroenterology	- 15%
Hematology/oncology	+ 6%
Internal medicine	+ 2%
Dermatology	+ 20%
Obstetrics/gynecology	+ 4%
Orthopedics	- 1%
Radiology	- 10%

Physician Productivity Measures

Physician productivity, a growing focus at both academic and private institutions, is another application of the RBRVS. Productivity measures are used to monitor individual performance, create incentive plans, compare departmental contributions within institutions, and monitor resources needed for patient care. In September 1999, the AAFP Congress of Delegates set a goal of creating physician productivity standards that embrace and value the work done by family physicians.¹⁵ Within many academic institutions, productivity measures are being developed and used to compare physician productivity between individuals and across specialties. Family physicians and other primary care providers should assess the ability of an RVU-based productivity scale to document and value the work they do.

RVUs are an obvious choice for productivity measures because they are consistent and reliable between individual doctors and across specialties and reflect the time and intensity of the work physicians do. Some institutions use charges or receipts as markers of productivity, but charges are limited by the influence of local market forces, and receipts are strongly influenced by pay mix. Other systems use patient visits to track productivity, but RVUs can reflect both time and intensity of services more accurately. Across specialties, RVUs are the only standardized measure that can compare a wide range of services. For family practice, a field with a broad scope that includes outpatient, inpatient, and obstetrical care, RVUs can quantify the complexity of all types of visits and procedures done and provide a more-accurate assessment of clinical productivity than patient numbers alone.

Some systems report productivity as “RVUs per hour worked” or “RVUs per clinic session.”¹⁶ Another approach is to report RVUs per full-time equivalent (FTE). This is useful for academic physicians whose time may be divided among different clinical and nonclinical responsibilities. RVUs can be measured for outpatient care, hospital work, surgical procedures, and obstetrical care. Physicians can compare themselves to average or benchmark productivity levels as published by organizations like the Medical Group Management Association and the University Health Consortium, which report physician productivity in both private and academic settings. Individuals and institutions can use these productivity measures in many ways—tracking individual performance or comparing physicians within a department, across departments, or with national standards.

The Limitations of RVUs in Primary Care

Though the resource-based fee schedule improved primary care reimbursement relative to that of procedural disciplines, the RBRVS does have important limitations. Some of these limitations may have a greater

effect on primary care and diminish the original successes of the fee schedule in improving primary care reimbursement.

First, medical care has changed rapidly since Hsiao’s original study. The original assessment of physician work does not address the growing amount of behind-the-scenes work that all physicians do today. Hsiao’s 1988 study specifically identified that physician work included time spent before and after the actual patient encounter, but more than a decade later, physician-direct services to patients are even more streamlined, and pre- and post-encounter work has likely increased. Efforts to improve cost-effectiveness moved work out of hospitals and offices and into the home. The HCFA’s effort to reevaluate RVU assignments will need to reflect these changes, since they involve physician work across all specialties.

A second limitation is related to, but different from, the shift to ambulatory settings. That limitation is that RVUs do not account for the increasing need for coordination of care, “downtime” when on call without billable services, or time spent supervising allied health professionals like physician assistants and nurse practitioners. The need for coordination is increasing, with rapid transitions out of the hospital, growing complexity of health care systems, and increasing comorbidity in an aging society.¹⁷ RVUs do not capture this need well. Medicare rules allow crediting of time for coordination of care spent in the presence of the patient but do not allow billing for time spent talking to other physicians, home health nurses, or staff at nursing homes. For these types of services, though there are some CPT codes designated, there are no RVUs assigned, making it impossible for physicians to document and bill for this type of work. Though novel procedures are updated with new CPT codes and RVU values, expanding primary care roles, such as coordination of care, telephone calls, and even e-mail communication with patients, are not accounted for in the current RVU system.

A third limitation is the direct reliance on CPT coding to identify the work that is done. Increasing regulations and threats of fraud have added more confusion to the already complex system of physician billing and documentation.¹⁸ Many feel that the current standards for physician documentation do not reflect the reality of clinical work, and the original RVU study was done at a time when the HCFA did not have such strict documentation requirements for services. Evaluation and management (E+M) codes are limited in comparison to the more-detailed CPT coding system for procedures. While there are 15 different CPT codes for knee arthroscopy/surgery, the single CPT code designated for an established patient visit (99213) can range in complexity from treatment of an uncomplicated urinary tract infection to follow-up for a patient with hypertension and diabetes. Further, unlike procedural

codes, E+M codes cannot be combined. For example, if a primary care physician addresses two health concerns during one visit without increasing the level of complexity enough to move to the next level of office visit, only one CPT code is billed. If two procedures are performed, on the other hand, two CPT codes are billed. Thus, physicians who provide cognitive services are limited in their ability to document and combine and bill for the types of services they provide because of the small number of available E+M codes and the strict documentation guidelines that exist today.

Finally, RVUs cannot reflect the complexity of different patient populations nor do they value the increasing expertise of a provider. Services are assigned a value based on the billing code alone, so a provider with 20 years' experience has the same value as one with much less experience performing the same service. RVUs also do not measure the quality of the care received. They do not reflect outcomes or patient satisfaction; they merely reflect what work was done. These attributes may ultimately prevent RVUs from accurately reflecting the work done in primary care and its overall value to society.

Future Issues for Academic Family Medicine

Academic family physicians can play key roles in increasing our understanding of the RVU system and its effect on primary care. First, physicians in training must learn about the RVU system so they can successfully manage a practice and ensure their own financial security. Second, researchers should examine the effect of the RVU fee schedule on practice patterns and patient outcomes. How has the implementation of RVUs changed the scope and quality of practice? Third, validation of the application of RVUs to primary care is essential to secure the future of primary care in our health care system. Can RVUs be modified to capture the core functions of primary care—comprehensiveness, continuity, and accessibility?¹⁹ Does the level of compensation ensure an adequate primary care workforce to provide for our nation's health care needs? Finally, fundamental decisions about the allocation of financial resources are being made at many levels, including the academic medical center, the state, and the nation. Do RVUs establish a fair playing field for primary care to compete for those resources? Is the work done by family physicians adequately valued in these larger systems? As our knowledge and understanding of this framework grows, academic family physicians can continue to be a voice in the arena of policy development to ensure fair compensation for primary care.

In summary, the development of the resource-based relative value scale has been a major step forward in the management of health care services and physician reimbursement, but it is just the first step. From the perspective of primary care, RVUs are better than what

they replace, but they are not perfect. As family physicians, it is imperative that we study and critique this system to ensure our survival in both academic medical centers and private practice, to educate our students and residents about the realities of practice, and, most importantly, to promote policy change that will safeguard primary care.

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The Resource-Based Relative Value Scale (RBRVS) used by Medicare and many other third-party payers is a common source of RVUs. Each CPT code is assigned a work RVU as well as RVUs for practice expenses and malpractice expenses. The work RVUs are intended to reflect the time required to perform the service; the technical skill, mental and physical effort and judgment involved; and the psychological stress associated with the physician's concern about the iatrogenic risk to the patient. A panel of 2,000 elderly patients probably represents a much different challenge than a panel of 2,000 young adults. Consequently, risk adjustment is important if panel size is used to measure productivity. Despite its limitations, panel size as a measure of