

RAND Modeling Offers Support for Transparent and Consistent CMS Physician Fee Schedules

Since 1992, the Centers for Medicare & Medicaid Services (CMS) has used the resource-based relative value scale (RBRVS) to pay physicians and other health care practitioners for their professional services. Under RBRVS, payment for a specific service is broken into three components—physician work, practice expense, and malpractice expense—with each component being assigned a value (in “relative value units” [RVUs]). To determine the fee schedule amount for a service, the RVUs assigned to a service are multiplied by a dollar conversion factor; under this approach, longer, higher-risk, more complicated procedures have a higher payment than shorter, low-risk, simpler procedures. In 2014, an estimated \$87 billion in allowed charges is expected to be paid under the physician fee schedule for services provided to fee-for-service Medicare beneficiaries.

The physician work component reflects the value given to the provider’s personal effort in furnishing a service. Concerns with the existing process for valuing work—currently based on physician responses to specialty society surveys—prompted a new requirement under the Affordable Care Act that CMS establish a process to validate the work values assigned to procedures and services.¹ Among the concerns that drove this change was the possibility of both overvaluation of services, which can create incentives to provide unnecessary interventions, and undervaluation of services, which can diminish availability and access. CMS asked RAND to develop a validation model using easily available external data sources to increase the process’s accuracy and transparency and to mitigate any perceived vested interest that would affect physician survey responses. In this project, RAND researchers examined the feasibility of developing such a model, as well as the methodological issues and limitations involved in such an undertaking.

¹ Under the current valuation process, CMS reviews the recommendations made by the American Medical Association/Specialty Society Relative Value Scale Update Committee (RUC) and others before establishing RVUs for new or revised codes and misvalued codes. The RUC’s recommendation for valuing a service takes into account surveys conducted by the relevant specialty societies performing the service. We use the term “CMS estimates” to describe the values that CMS adopts for the fee schedule, but note that they are most often based on the RUC’s recommendations.

Key findings:

- Consistent with previous research, RAND’s estimates of intra-service time are typically shorter than the current Centers for Medicare & Medicaid Services (CMS) estimates.
- Model assumptions about how shorter intra-service times affect procedure intensity have implications for the total work estimates.
- RAND model estimates for total work were, on average, similar to CMS estimates if shorter intra-service time is assumed to increase procedure intensity and were, on average, up to 10 percent lower than current CMS estimates if shorter intra-service time is assumed to have no impact on procedure intensity.
- Differences in total work between RAND and CMS estimates were larger for some groups of procedures and when results were weighted according to the Medicare volume of procedures.

An Overview of RAND’s Modeling Activities

The value of physician work (in RVUs) for a procedure or service is made up of four components: (1) pre-service work (for example, positioning prior to surgery), (2) intra-service work (the performance of the service or procedure, also referred to as “skin-to-skin” time), (3) immediate post-service (for example, management of a patient in the post-operative period), and (4) post-operative evaluation and management (E&M) visits for a subset of procedures.² Each of these four components can be further broken down into a function of time multiplied by an intensity factor, where the intensity factor values the physician’s cognitive effort and judgment,

² In the final rule for the 2015 Medicare fee schedule, CMS indicated that it will begin phasing out the inclusion of post-operative E&M visits in the payment for a surgical procedure beginning in 2017. A separate payment will be made for visits provided after the day of surgery.

technical skill and physical effort, and stress associated with the work component.

The time required to perform a procedure (i.e., intra-service time) is, in particular, a critical piece of information for independently estimating physician work. Taking this into account, RAND researchers focused on approximately 3,000 procedures that are often performed in an operating room setting, for which publicly available sets of time data exist; no such datasets exist for nonsurgical services or for surgical procedures that are nearly always performed in an office setting. Among the services that were included were surgery procedures involving an incision, other types of invasive procedures that do not require an incision (e.g., colonoscopy), and medical procedures often performed in an operating room (e.g., interventional cardiology). To determine intra-service time for this broad set of procedures, researchers combined data from two readily available datasets: Medicare anesthesia claims and the New York Statewide Planning and Research Cooperative system for ambulatory surgery.

Using these data sources and other information, RAND researchers measured 16 characteristics of each surgical procedure (such as intra-service time, years of training among physicians who perform the procedure, and the mortality risk after the procedure), which were then used in a regression model to estimate RVUs for both the four individual work components and total work. Because developing a model to predict surgical procedure work is complicated and lacks a single optimal approach, RAND researchers created a number of different models to account for methodological choices.

Key Findings

RAND's estimates of intra-service time are typically shorter than the current CMS estimates, which is consistent with previous research that has found that CMS time estimates are longer on average than those observed in empirical datasets. Differences in time varied by where the procedure was performed, ranging from 6 percent shorter than CMS estimates for inpatient procedures to 20 percent shorter for procedures done outside the hospital with anesthesia.

On average, the RAND model estimates for total work (i.e., the combined RVUs for the four components of a procedure) were similar to CMS estimates. However, there were important differences noted for some groups of procedures. For example, in one model, total work values for respiratory procedures were 7.5 percent higher on average than CMS values. In this model, for shorter procedures (0–30 minutes), RAND's work value estimates were 14.6 percent higher than CMS estimates, while for longer procedures (30–120 minutes), the work value estimates were 2.7 percent lower.

Differences between some RAND model estimates and CMS estimates for total work across all procedures were

greater when results were weighted according to the Medicare volume of procedures. The difference between unweighted results (the average difference across all procedures) and weighted results (in which the difference for high-volume procedures has more influence) is important because the weighted estimates capture differences in what Medicare would pay. For example, one RAND model estimated average total work values for the procedures in the model as 95 percent and 92 percent (unweighted and weighted, respectively) of CMS values.

The fact that RAND's intra-service time estimates are shorter on average than CMS estimates raises an important question for valuing intra-service work (i.e., intra-service time multiplied by intensity per unit of time): How does shorter procedure time affect the intensity of performing the procedure? For example, when less time is required to perform a procedure, do effort and stress levels increase under the pressure of doing the procedure more quickly, or has the procedure become easier as well as faster to perform (in which case intra-service work would decrease)? Different RAND models are based on different assumptions regarding the effect of the lower intra-service times on intra-service intensity and work. The differences across these models can be quite large. Under a RAND model that assumes that shorter times translate into higher intensity values, the weighted average for total work is 99 percent of CMS estimates. Under a model that assumes that the shorter times do not affect the intensity of performing the service, the weighted average for total work is 86 percent of CMS estimates.

Strengths and Weaknesses of the RAND Models

Many of the strengths of the RAND models speak to the concerns that have been noted with the current CMS valuation system. Because they use objective time data provided in external databases, the RAND models likely provide more accurate estimates of time than current surveys. Estimating total work using other procedure and patient characteristics also supports transparent and consistent valuation. Furthermore, because the RAND models can be run in an automated manner, they can be run frequently and therefore incorporate efficiency gains and changes in care. Together, these strengths address concerns that the current process is subject to bias and does not systematically address efficiency gains.

Nevertheless, there are several limitations of the RAND models. The most important of these is that, with the exception of intra-service time, there is a lack of external data that can be used to validate the different work components. RAND modeling relied on CMS estimates for some elements. For example, RAND's prediction models for post-operative E&M visits were built using data in the current CMS estimates. If the CMS estimates are on average biased, then on average RAND model estimates are similarly biased.

With respect to intra-service time, although RAND's time estimates—based on data from tens of thousands of surgical operations—are *on average* consistent with other well-established estimates of time and are *on average* more accurate than current CMS values, RAND time estimates for *specific* procedures may contain errors. For example, RAND's time estimates are based on the performance of a single procedure, but for some ophthalmology procedures, the time estimates used in the valuation of a procedure assume that multiple procedures are done within a 90-day period. Such an example highlights the need for further refinement of RAND's time estimates.

Unique procedure- or specialty-specific clinical issues may not be captured in the characteristics used to estimate work. For example, RAND's calculations of major post-procedure complications include such common risks as heart attack or blood clot but do not include complications such as serious cosmetic defects or disabilities associated with specific procedures.

Applications of the RAND Models

There are two key applications of the RAND model estimates that CMS could use to validate surgical procedure values. First, CMS could flag procedure codes as potentially mis-valued if the CMS and RAND model estimates are notably different. In some cases, a comparison of CMS and RAND estimates will identify a clinical rationale for why a code is valued differently and indicate that the CMS estimate is

appropriate. In other cases, the RAND validation model results will highlight that the code was not valued accurately. Second, CMS could use the RAND values as an independent estimate of work values to consider when assessing recommendations made by the RUC (part of the current process for valuing codes). Because the value of each work component is estimated separately, the RAND model, for example, could be used to provide independent valuations needed to implement the recent policy change to phase out post-operative E&M visits from the payment for a surgical procedure and pay separately for those provided after the day of surgery.

While the RAND model estimates provide CMS valuable information, it would not be appropriate to use them in their current form as a replacement for the current valuation process. The models for surgical services could be refined by obtaining independent physician estimates of intra-service work values for select procedures. These could be used to calibrate the model results and reduce reliance on the CMS estimates. The models could also be improved by obtaining more procedure time data for office-based surgeries and using clinical input to refine the procedure characteristics used in the RAND models. In addition, the current models focus only on surgical procedures; however, these procedures are only part of the RBRVS. Significant effort will be necessary to identify external datasets with intra-service times for such services as E&M visits, interpretation of laboratory pathology specimens, and radiology, which are key parts of the RBRVS not included in the models.

This research brief describes work done in RAND Health documented in *Development of a Model for the Validation of Work Relative Value Units for the Medicare Physician Fee Schedule*, by Wynn BO, Burgette LF, Mulcahy AW, Okeke EN, Brantley I, Iyer N, Ruder T, and Mehrotra A, RR-662-CMS (available at www.rand.org/t/RR662), 2015. To view this brief online, visit www.rand.org/t/RB9815. The RAND Corporation is a research organization that develops solutions to public policy challenges to help make communities throughout the world safer and more secure, healthier and more prosperous. RAND is nonprofit, nonpartisan, and committed to the public interest. RAND's publications do not necessarily reflect the opinions of its research clients and sponsors. RAND® is a registered trademark. © RAND 2015

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