

Milliman RBRVS for hospitals

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What is RBRVS for hospitals?

The Milliman RBRVS for Hospitals™ Fee Schedule provides a simple solution for comparing hospital contractual allowed amounts, billed charge master levels, relative efficiency, and patient mix differences. The fee schedule is based on Relative Value Units (RVUs). The RVUs are the same for procedures that require the same relative resources.

Advantages of RBRVS for hospitals?

- RVUs have been developed for all hospital services (inpatient and outpatient), so they reflect the relative resources required to perform the care.
- The concept is similar to Medicare's RBRVS physician fee schedule, in that a conversion factor provides a valid comparison even for widely different provider types and patient populations.
- A single conversion factor can be used to benchmark a hospital contract. Lengthy summaries of hospital contracts with medical/ surgical per diems, maternity case rates, ICU per diems, outlier arrangements, and miscellaneous outpatient reimbursement structures are no longer necessary.
- Allows insurers and hospitals to benchmark and compare contractual reimbursement levels, efficiency, billed charge master levels, and benchmark patient mix differences.

Developing RBRVS for hospitals RVUs

All inpatient and outpatient procedures are assigned RVUs. Procedures requiring the same level of resources have the same RVUs. Both the inpatient and outpatient RVUs are developed using Medicare payment rates, which are then converted to RVUs using Medicare's RBRVS conversion factor. Therefore, inpatient and outpatient RVUs are directly comparable.

Inpatient RVU development and adjudication

Inpatient RVUs are developed at the most detailed level possible using data commonly available in administrative claims, resulting in a very refined patient severity adjustment.

- RVUs are assigned per day, rather than per case. The RBRVS for Hospitals RVUs are comprised of Diagnosis Related Group (DRG) specific First Day and Additional Day RVUs. The First Day RVUs are an estimate of the resources required for the first day of each admission. DRG-specific Additional Day RVUs are assigned for each additional day of acute care. The Additional Day RVUs are an estimate of the resources required for each subsequent day of acute care.
- The Additional Day RVUs are lower than the First Day RVUs, reflecting lower resource use on the additional days. Thus, the RVU fee schedule adjusts for differences in length of stay and patient mix among hospitals. As a result, hospital-specific average inpatient conversion factors developed using the RVUs provide a direct comparison of historic or projected fee levels for different hospitals, even if the fee schedule for each hospital is structured differently.

TABLE A: INPATIENT EXAMPLE #1—FY 2021 MEDICARE RELATIVE WEIGHTS TO MILLIMAN RBRVS FOR HOSPITALS RVUS (V2021.0)

MEDICARE (FY 2021)		MILLIMAN RBRVS (V2021.0) – MS DRG	
RELATIVE WEIGHT	0.7861	INITIAL DAY RVU	93.241
CONVERSION FACTOR (NATIONWIDE)	\$6,427.52	ADDITIONAL DAY RVU	34.374
CASE PAYMENT	\$5,052.67	MEDICARE ALOS	2.5000
		TOTAL RVUS FOR ALOS	144.802
		RBRVS CONVERSION FACTOR	\$34.8931
		AVERAGE CASE PAYMENT	\$5,052.59

- Using Medicare’s average length of stay, the Milliman RVUs and the Medicare RBRVS conversion factor will produce payments that are similar to Medicare’s case rates, as demonstrated in Table A.
- For more refined risk adjustment, Milliman developed RVUs for inpatient services based on APR-DRGs at each severity level within the APR-DRG system (1,330 DRGs/severity levels versus 767 MS DRGs). In Table B, we provide a comparison of the MS-DRG RVUs to the APR-DRG RVUs.

The RVUs for any inpatient admission are calculated as:

$$\text{First Day RVUs} + (\text{Additional Days} \times \text{Additional Day RVUs})$$

Note that “Additional Days” includes all days after Day 1.

Inpatient RVUs can be assigned to claims on either a per-case or a per-day basis. The formula above illustrates the calculation of RVUs using a per-day approach and incorporates the LOS in estimating the resources used to treat a patient. Alternatively, case RVUs represent the average resources used for the given service independent of LOS.

Case RVUs are created to be consistent with the characteristics of the population to be measured. For example, resource

consumption for a given APR-DRG may differ between commercial and Medicare populations, or potentially between populations in different geographic areas based on LOS management. Milliman develops population-specific case-based RVUs by setting average LOS assumptions using client and/or benchmark data combined with actuarial judgment.

With RVUs assigned on both a per-day and per-case basis, a RVU-weighted LOS relativity measure can be calculated as:

RVUs on a per-day basis

RVUs on a per-case basis

Using this method of comparison, a ratio of 1.0 indicates average LOS efficiency. Values lower than 1.0 indicate better-than-average LOS efficiency, as the hospital required fewer RVUs than average to deliver its mix of services.

Table C shows an example of the RVU-weighted LOS relativity for a sample discharge using APR-DRG 047 and Severity Level 1. By summing the RVUs and case RVUs for each discharge, we estimate the overall efficiency factor for each facility.

TABLE B: INPATIENT EXAMPLE #2 — COMPARISON OF MEDICARE AND APR-DRG RVUS (V2021.0)

DRG	SEVERITY	DESCRIPTION	FIRST DAY RVUS	ADDITIONAL DAY RVUS
MEDICARE-DRG				
069		TRANSIENT ISCHEMIA	93.241	34.374
APR-DRG				
047	1	TRANSIENT ISCHEMIA	92.189	33.060
047	2	TRANSIENT ISCHEMIA	94.922	33.998
047	3	TRANSIENT ISCHEMIA	100.183	35.931
047	4	TRANSIENT ISCHEMIA	115.974	41.735

* The four severity levels available using APR-DRGs allow for a more refined quantification of the resources required for specific patients.

* Medicare sets DRG relative weights at the case rate level, not accounting for LOS variations.

TABLE C: EXAMPLE OF IMPLIED LOS EFFICIENCY

APR-DRG 047, SEVERITY LEVEL 1 (TRANSIENT ISCHEMIA)

BASE RVUS	BASE LOS	ADDITIONAL DAY RVUS	AVERAGE LOS	CASE RVUS
92.189	1.000	33.060	1.908	122.220

EXAMPLE OF EFFICIENCY CALCULATION

	(1)	(2)	(3)	(4) = (2) / (3)
LENGTH OF STAY (LOS) SCENARIO	ACTUAL LOS	LOS-ADJ. RVUS	CASE RVUS	EFFICIENCY FACTOR
AVERAGE LOS PATIENT	1.908	122.220	122.220	1.000
SHORT LOS PATIENT	1.000	92.189	122.220	0.754
LONG LOS PATIENT	3.000	158.309	122.220	1.295

Outpatient RVU development and adjudication

The outpatient case mix and severity adjustment methodology assigns an RVU for each procedure performed by the hospital using HCPCS.

The Milliman RBRVS for Hospitals outpatient RVUs can be viewed as an extension of the Medicare RBRVS schedule. We use the RBRVS technical component RVUs as a basis for many procedures, such as X-rays and cardiovascular testing. We utilize many other data sources to create our outpatient RVUs, including Medicare fee schedules, proprietary data sources, and public data sources. Clinical and actuarial reviews are used to finalize the relative relationships.

Our 2021 hospital RVU schedule consists of 18,362 procedure codes. The breakdown of codes by source is as follows:

RVU SOURCE	CODE COUNT	ALL-PAYER ALLOWED %
MEDICARE FEE SCHEDULES	6,737	51%
MILLIMAN BALANCED TO MEDICARE FEES BY APC	4,847	39%
MILLIMAN	1,051	8%
NOT VALUED	5,727	2%
TOTAL	18,362	100%

There are many areas where publicly available fee schedules are not adequate for creating RVUs. We used other databases and internal sources to estimate the relative resources to perform each of these services. Because Medicare APCs do not define homogeneous patient services, Milliman outpatient RVUs are assigned at the HCPCS level rather than APC level. For example, Medicare APCs include procedures of which the true cost may be as low as half of the APC average or as high as twice the average. Therefore, the actual resources required for a procedure within an APC can vary significantly. While the RVUs for each procedure within an APC may vary significantly, for many APCs the weighted average RVUs are consistent with the Medicare APC payment. By assigning RVUs at the HCPCS level for outpatient services, we are able to more precisely reflect the resources required for each specific service.

Tables D-1 and D-2 illustrate the resource differences by HCPCS for two sample Medicare APCs. Table D-1 shows an APC where the RVUs are developed predominantly based on Medicare fee schedule values, while Table D-2 shows an APC where the RVUs are developed from other sources. For some other APCs, RVUs are developed through a combination of both sources.

The Milliman outpatient RVU assignment for many outpatient services is simply the HCPCS-specific RVUs multiplied by the service units. However, there are a number of exceptions, which are primarily determined by the APC Status and the HCPCS Lookup. The treatment of services with no RVUs is determined by the HCPCS Lookup. Some HCPCS are not valued (have zero RVUs) because they are typically not paid to a facility but instead to professional providers (HCPCS Lookup "O"). Bundled procedures are labeled as "B" and are always assigned zero RVUs. Other services with zero RVUs are excluded from conversion factor analysis – this includes services typically done in an inpatient setting (APC Status "C") and some low-volume procedures have not yet been valued by Milliman and should be excluded from analysis. These services have zero RVUs and no HCPCS Lookup.

Conditionally packaged codes have both an RVU value and an HCPCS Lookup beginning with "Q" or "QC," depending upon the bundling rules applicable to the HCPCS. Lookups beginning with a "Q" bundle at the service date level within a claim. Lookups beginning with a "QC" bundle at the claim level. Q-J always bundles at a claim level, so there is no "QC-J" HCPCS Lookup.

The HCPCS Lookup values are summarized below.

"QC" HCPCS Lookups are not shown, but mirror the "Q" entries.

O = Not Valued – Other provider type should bill.

B = Not Valued – Bundled procedure.

Q-T = Bundled if another code with an APC Status of T is included in the same claim, but this code cannot bundle into a comprehensive APC. Otherwise, RVUs are separately assigned.

Q-STVX = Bundled if another code with an APC Status of S, T, V, or X is included in the same claim, but this code cannot bundle into a comprehensive APC. Otherwise, RVUs are separately assigned.

Q-J = Bundled into a comprehensive APC when present on the same claim.

Q-TJ = Bundled if another code with an APC Status of T is included in the same claim, and this code can bundle into a comprehensive APC. Otherwise, RVUs are separately assigned.

Q-STVXJ = Bundled if another code with an APC Status of S, T, V, or X is included in the same claim, and this code can bundle into a comprehensive APC. Otherwise, RVUs are separately assigned.

Not all outpatient services that are conditionally packaged by Medicare are packaged under Milliman RBRVS for Hospitals. Specifically, clinical laboratory and radiology procedures each have their own separate RVU value. Likewise, the RVUs for the major procedures they support (e.g., surgeries) are developed excluding the resource use associated with ancillary clinical laboratory and radiology procedures.

Ultimately, this results in more consistency in RVU assignment across different sites of service: hospital, ambulatory surgical centers, and office/clinic.

The RVU schedule includes a maximum procedure count, which limits the number of times a procedure can be counted during a single encounter. This is used to prevent outlier unit

counts from distorting RVU values and the resulting reimbursement evaluations and other metrics. Our adjudication process limits units to the maximum procs for a HCPCS.

RBRVS for Hospitals includes a listing of revenue codes that represent bundled services. No RVUs should be calculated for line items with these revenue codes (unless there is a valid non-bundled CPT/HCPCS code), as the workload is implicitly covered in other lines within the encounter. CPT/HCPCS codes with N status indicators have no RVUs because they are bundled items. Multiple procedure discounting follows the CMS rules. The code with the greatest RVUs and with status T is paid at 100%. Other codes with a T status are paid at 50% and therefore assigned half of the standard RVUs.

TABLE D-1: COMPARISON OF 2021 APC VS RBRVS FOR APC 5621 - LEVEL 1 RADIATION THERAPY

CPT/HCPCS	STATUS INDICATOR	DESCRIPTION	APC	APC RATE	MILLIMAN	MEDICARE FREQUENCY
77401	S	RADIATION TREATMENT DELIVERY	5621	120.54	43.97	10,005
77402	S	RADIATION TREATMENT DELIVERY	5621	120.54	132.91	8,577
77789	S	APPLY SURF LDR RADIONUCLIDE	5621	120.54	72.58	79
77799	S	RADIUM/RADIOISOTOPE THERAPY	5621	120.54	120.43	84
				MINIMUM	43.97	
				MAXIMUM	132.91	
				WEIGHTED AVERAGE	\$85.13	

TABLE D-2: COMPARISON OF 2021 APC VS RBRVS FOR APC 5212 - LEVEL II ELECTROPHYSIOLOGIC PROCEDURES

CPT/HCPCS	STATUS INDICATOR	DESCRIPTION	APC	APC RATE	MILLIMAN	MEDICARE FREQUENCY
93600	J1	BUNDLE OF HIS RECORDING	5212	6,078.48	5,717.19	326
93602	J1	INTRA-ATRIAL RECORDING	5212	6,078.48	5,894.58	6
93610	J1	INTRA-ATRIAL PACING	5212	6,078.48	5,894.61	15
93612	J1	INTRAVENTRICULAR PACING	5212	6,078.48	5,894.64	42
93619	J1	ELECTROPHYSIOLOGY EVALUATION	5212	6,078.48	4,908.33	212
93620	J1	ELECTROPHYSIOLOGY EVALUATION	5212	6,078.48	7,052.40	3,284
93624	J1	ELECTROPHYSIOLOGIC STUDY	5212	6,078.48	5,932.33	11
93650	J1	ABLATE HEART DYSRHYTHM FOCUS	5212	6,078.48	5,148.14	4,129
				MINIMUM	4,908.33	
				MAXIMUM	7,052.40	
				WEIGHTED AVERAGE	\$5,591.12	
				WITH RVUS FOR LAB AND RADIOLOGY SERVICES*	\$6,078.48	

* Many lab and radiology services are bundled into Medicare OPPS payment but assigned separate RVUs under RBRVS for Hospitals to provide more granular RVU assignment. The impact of removing this bundling varies by APC.

Table E shows the adjudication of a sample claim.

TABLE E: SAMPLE OUTPATIENT CLAIM RVU ASSIGNMENT

CLAIM NUMBER	CLAIM LINE	REVENUE CODE	PROCEDURE CODE	STATUS INDICATOR	UNITS	RVUS	ADJUDICATED RVUS	COMMENTS
2004999	1	0250			5	-	-	BUNDLED REVENUE CODE AND NO HCPCS.
2004999	2	0258			1	-	-	BUNDLED REVENUE CODE AND NO HCPCS.
2004999	3	0270	A4649	N	3	-	-	BUNDLED CPT/HCPCS CODE. NO RVUS.
2004999	4	0300	88302	S	1	0.720	0.720	PAID IN FULL.
2004999	5	0360	15829	T	1	97.885	97.885	1ST "T" PROCEDURE. PAID IN FULL.
2004999	6	0360	11102	T	1	6.226	3.113	2ND "T" PROCEDURE. REDUCED TO 50%.
2004999	7	0370			4	-	-	BUNDLED REVENUE CODE AND NO HCPCS.
2004999	8	0636	J2180	N	1	-	-	BUNDLED CPT/HCPCS CODE. NO RVUS.
2004999	9	0636	J2270	N	1	-	-	BUNDLED CPT/HCPCS CODE. NO RVUS.
2004999	10	0762			1	-	-	BUNDLED REVENUE CODE AND NO HCPCS.
TOTAL							101.718	

Note that, as a result of the bundling rules implicit in RBRVS for Hospitals, payment amounts should be compared on a claim-by-claim basis and should not use individual service lines. Payment systems that separately pay bundled services will have higher values for those amounts but lower values for the main procedure(s) within each encounter.

Calculating conversion factors

Benchmarking contracts is as straightforward as adding up the allowed charges and RVUs for all procedures performed under that contract. Table F shows an example of calculating an average conversion factor for a data set including one inpatient claim and one outpatient claim.

TABLE F: CALCULATING A CONVERSION FACTOR

	ALLOWED CHARGES	LOS	RVUS
APR 047-1	\$8,000	3	158.309
82441	\$20		0.172
99284	\$500		8.928
A4642*	\$95		-
74150	\$425		2.630
TOTAL	\$9,040		170.039
CONVERSION FACTOR			
[ALLOWED CHARGES/RVUS]			\$53.16

* Bundled service. RVUs are implicitly included in RVUs for other CPT/HCPCS codes.

The procedural basis can be a CPT/HCPCS procedure code (i.e., outpatient hospital services) or a DRG (i.e., inpatient hospital stays). For DRGs, the RVUs vary with the LOS to further reflect the severity within a DRG.

A conversion factor may be calculated for any number and/or mix of services performed under the contract. If a procedure can be performed multiple times in one encounter (i.e., 15-minute physical therapy), then the procedure can either be listed multiple times or with multiple units of service on a single line. In either case, the units will be multiplied by the RVUs per unit of service to show RVUs consistent with the charges on the claim.

Case mix and severity-adjusted conversion factors provide a means to compare average per-unit costs among contracts, lines of business, health plans, service categories, hospitals, or health systems. Because the RBRVS for Hospitals RVUs adjust for the relative resources required to perform the services, the calculated conversion factors are comparable regardless of the underlying population, hospital type, or location. See Table G for an example of conversion factors for six contracts and their relative cost differences.

TABLE G: CONTRACT SUMMARY TABLE

	CONVERSION FACTOR	CONVERSION FACTOR RELATIVE TO TOTAL
CONTRACT #1	\$55.48	1.000
CONTRACT #2	\$46.29	0.834
CONTRACT #3	\$80.43	1.450
CONTRACT #4	\$60.64	1.093
CONTRACT #5	\$63.70	1.148
CONTRACT #6	\$48.46	0.874
TOTAL	\$55.47	1.000

Users interested in developing a better understanding of the components affecting the average conversion factor may drill down to review the results by type of service. Table H expands the six-contract conversion factor summary from Table G to include each major type of inpatient and outpatient service.

A summary like Table H can be useful in identifying where a contract is high or low and allows the user to develop an action plan to change the contract details in order to improve the desired results. For example, assume that Table H represents six contracts for a payer and the payer wants to renegotiate Contract #3 rates to be more in line with the other contracts. Rather than just ask for an overall rate decrease, the payer may want to focus on a particular area, such as outpatient radiology.

The payer may either propose that the contract move to use the RBRVS for Hospitals RVUs and a lower conversion factor, or they may simply negotiate a lower payment using the current payment methodology (e.g., percent of billed charges).

Alternatively, assume that Table H represents six contracts for a hospital and the hospital identifies that Contract #2 is a low outlier. The hospital can use the information in Table G to quantify the amount of increase needed. They may decide that they need a 25% increase in inpatient rates, but the outpatient rates are satisfactory.

Reimbursement analyses can usually be performed with less than perfect data, since we can assume that the calculated conversion factor for the partial data is representative of the complete outpatient data set.

TABLE H: CONVERSION FACTOR (CF) BY MAJOR TYPE OF SERVICE

CONTRACT	INPATIENT						OUTPATIENT						TOTAL
	MEDICAL	SURGICAL	MAT	NEWBORN	MH/SA	AVG	ER	SURG	RAD	LAB	OTHER	AVG	AVG
CONTRACT #1	\$65	\$52	\$58	\$59	\$61	\$58	\$53	\$32	\$68	\$89	\$57	\$50	\$55
CONTRACT #2	\$48	\$30	\$53	\$42	\$37	\$40	\$45	\$41	\$77	\$60	\$60	\$53	\$46
CONTRACT #3	\$85	\$92	\$79	\$84	\$80	\$86	\$49	\$77	\$95	\$94	\$80	\$77	\$80
CONTRACT #4	\$54	\$41	\$53	\$55	\$70	\$53	\$36	\$50	\$81	\$83	\$74	\$67	\$61
CONTRACT #5	\$58	\$44	\$57	\$58	\$75	\$57	\$42	\$49	\$87	\$88	\$79	\$69	\$64
CONTRACT #6	\$51	\$33	\$53	\$48	\$56	\$45	\$38	\$47	\$54	\$58	\$68	\$50	\$48
TOTAL	\$62	\$48	\$57	\$56	\$59	\$55	\$47	\$41	\$72	\$77	\$67	\$56	\$55

RBRVS for hospitals users and reviews

There are a large number of companies that have used or currently use the RBRVS for Hospitals. They include:

- More than 20 Blue Cross Blue Shield plans
- National and regional carriers
- Many other insurers
- Multiple state All Payer Databases and Community Coalitions
- State Medicaid organizations
- Accountable Care Organizations (ACOs)
- CalPERS (used to create a high-performance network)

The RVUs were first developed in 1994 and are updated and reviewed at least once a year, in accordance with Milliman's strict internal peer-review standards. In addition, the RVUs are receiving continuous outside review as they are used by a wide variety of clients.

At the request of a client, an independent actuarial consulting firm performed a review. This review encompassed not only the RVUs themselves but also the worksheets used to calculate relative provider costs, and ultimately, to determine relative facility rankings.

A complete audit of the RVUs and hospital rankings was performed by the California Bureau of State Audits. The audit was comprehensive, covering all aspects of the hospital ranking process. The audit included an on-site review of the RVU development and documentation by an independent actuary hired by the state.



Milliman is among the world's largest providers of actuarial and related products and services. The firm has consulting practices in life insurance and financial services, property & casualty insurance, healthcare, and employee benefits. Founded in 1947, Milliman is an independent firm with offices in major cities around the globe.

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