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## Potential Savings to Fee-for-Service Medicare from Radiology Benefit Management Programs

Commissioned by:  
**NIA, a subsidiary of Magellan Health Services**

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### ABOUT MILLIMAN

Milliman is among the world's largest independent actuarial and consulting firms. Founded in 1947 as Milliman & Robertson, the company currently has 54 offices in key locations worldwide. Milliman employs more than 2,500 people. The firm has consulting practices in healthcare, employee benefits, property & casualty insurance, life insurance and financial services. Milliman serves the full spectrum of business, financial, government, union, education and nonprofit organizations. For further information, visit [milliman.com](http://milliman.com).

## BACKGROUND

Radiology Benefits Management programs have been successfully utilized in the commercial insurance market for 15 years and are currently utilized with over 90 million commercial, Medicaid, and Medicare Advantage enrollees across all 50 states. Radiology Benefits Management processes have been incorporated into the practice patterns of virtually every primary care and specialist practice.

The process used by Radiology Benefits Management programs is to collect clinical information applicable to the requested test as a means to ensure the patient's specific clinical indications support the use of the requested imaging study consistent with evidence based medicine and clinical literature. During the process, the provider has the option of discussing any unique patient considerations with a physician of a like specialty. Affirming the appropriateness of imaging tests has two results: a reduction in costs for the patient and their health plan as well as a potential reduction in patient risk from unnecessary exposure to ionizing radiation.

Currently, Medicare specifically restricts the use of prior authorization programs for the Medicare fee-for-service population. However, these types of programs are being used by Medicare Advantage plans and many state Medicaid programs. Almost every commercial insurer also utilizes these kinds of programs. If these programs were applied to the Medicare fee-for-service population, with the same level of impact achieved within Medicare Advantage plans, there would be an opportunity to generate savings relative to the status quo.

## EXECUTIVE SUMMARY

Milliman, Inc. (Milliman) was engaged by NIA, a subsidiary of Magellan Health Services, Inc., to aggregate results from two separate Radiology Benefits Management vendors – one through NIA and one through a competitor – and evaluate whether there is a common level of impact observed across their Medicare Advantage customers. To the extent a consensus-level effect was observed, Milliman was requested to apply the impact to the Medicare fee-for-service experience to develop a 10 year savings estimate. This report is the result of Milliman's independent review.

NIA coordinated the submission of multi-year experience for their Medicare Advantage clients as well as the clients of a competing vendor. The results from the vendors were aggregated, so that the performance reported by the vendors was not explicitly shared with the competitors. Both programs are large, national programs that serve commercial, Medicaid, and Medicare Advantage clients. Together, the programs are estimated to cover approximately 60 million enrollees across all these markets.

Milliman used the experience for ten Medicare Advantage clients to develop an estimate of the impact typically achieved by Radiology Benefits Management vendors. The range of reasonable results was applied to the experience of the fee-for-service Medicare population to estimate the reduced allowed charges associated with advanced imaging services in the first year following the implementation of a Radiology Benefits Management program.

Milliman developed a 10 year projection of allowed charges associated with advanced imaging services assuming the status quo is maintained. The projection used estimates of enrollment growth, changes in reimbursement levels, and utilization rate changes. The projections recognized the significant changes in reimbursement implemented between 2009 and 2011, but assumed no additional dramatic changes to the Medicare fee-for-service program in the subsequent years. The ten year savings projection was developed under two alternative scenarios: (1) assuming the Radiology Benefits Management program would have a first year impact, but no further impact to the baseline trend assumptions and (2) assuming the Radiology Benefits Management program would have a first year impact as well as a 50% reduction in baseline utilization rate trend assumptions as a result of the program.

Milliman estimates the total allowed charges associated with advanced imaging services will be approximately \$111.6 billion from fiscal year 2011 through fiscal year 2020. If a Radiology Benefits Management program were implemented in fiscal year 2012, Milliman estimates the program would generate \$13 billion to \$24 billion in savings over the ten year period ending 2020. The savings would be shared between the beneficiary (through lower cost sharing) and the fee-for-service Medicare program. On average, patients are responsible for 22% of the allowed charges for these services. Therefore, the estimated savings to the Medicare program will be \$10 billion to \$19 billion over the ten year period ending 2020.

## METHODOLOGY OVERVIEW

There are four key components to the calculation of the savings estimate:

- (1) Current, baseline spending on advanced imaging procedures;
- (2) Baseline trends over the ten year period if the status quo were maintained;
- (3) First year impact from the implementation of a Radiology Benefits Management program; and
- (4) Impact on trend beyond the first year; *i.e.*, the extent to which the program will “bend the trend.”

The remainder of this document describes the development of these four components and provides estimates of the savings that may be associated with the implementation of a Radiology Benefits Management program for the fee-for-service Medicare program. These estimates were developed from a set of assumptions related to baseline expenditures and the scope of the Radiology Benefits Management program. If the program is implemented differently – such as with a later implementation date, or with populations or providers carved out from the program, or with other clinical guidelines that may produce a different impact from what has been achieved by the contributing vendors with their Medicare Advantage clients – the savings estimates developed will be impacted and would need to be revised to reflect the intended scope of the program.

## MEDICARE FEE-FOR-SERVICE BASELINE

Milliman used the calendar year 2009 Medicare 5% Sample to develop the baseline fee-for-service expenditures related to advanced imaging procedures. In fiscal year 2009, approximately 34.7 million Medicare beneficiaries were enrolled in Medicare Part A through the fee-for-service Medicare program and approximately 31.6 million Medicare beneficiaries were enrolled in Medicare Part B through the fee-for-service Medicare program<sup>1</sup>. Imaging services associated with computerized tomography (CT), magnetic resonance imaging / magnetic resonance angiography (MRI/MRA), and positron emission tomography (PET) were identified by procedure code. Services performed in a hospital inpatient setting or emergency room setting were excluded. Services provided in these settings are typically out of scope for Radiology Benefits Management programs.

The extrapolated allowed charges are summarized in Table 1. The allowed charges include all components of the advanced imaging services performed in the outpatient setting, including the professional and technical components billed by professionals, hospitals, and non-hospital providers under the fee-for-service Medicare benefit. As shown in Table 1, total allowed charges for advanced imaging procedures were approximately \$7.9 billion in calendar year 2009 for the entire Medicare fee-for-service population.

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<sup>1</sup> CBO's August 2010 Baseline: MEDICARE

Table 1

**RADIOLOGY BENEFITS MANAGEMENT PROGRAMS**  
**Baseline Fee-for-Service Medicare Experience**  
**Calendar Year 2009**  
**Allowed Charges in \$000,000**

Service Category	Extrapolated Allowed Charges		
	Hospital Outpatient Facility	Professional Services and Office Setting	Total Outpatient Advanced Imaging
Computerized Tomography (CT)	\$2,985.1	\$1,488.8	\$4,473.9
Magnetic Resonance Imaging / Angiography (MRI/MRA)	1,123.9	1,551.5	2,675.4
Positron Emission Tomography (PET)	303.6	428.5	732.1
All Advanced Imaging Categories	\$4,412.6	\$3,468.8	\$7,881.4

- Notes:
1. Source is Medicare 5% Sample dataset.
  2. Allowed charges have been extrapolated to the full fee-for-service Medicare population. Allowed charges include the patient's cost sharing responsibility.
  3. Services performed in the hospital inpatient setting, Skilled Nursing Facility, hospice, or emergency room setting were excluded.

Nuclear cardiology services are a fourth category of advanced imaging services, but have been excluded from the projections. The Medicare fee-for-service allowed charges in 2009 for nuclear cardiology services were \$1,503.2 million. It is becoming increasingly common for nuclear cardiology services to be included as part of a Radiology Benefits Management program. The experience submitted by the vendors for this analysis indicates that savings are likely to be consistent with the three other major categories of advanced imaging services; however, the range of savings achieved had a wider variation across the reported Medicare Advantage experience than was observed for the other three categories. Nuclear cardiology was excluded from the impact projections in order to focus on the categories with highly consistent impacts across plans and RBM vendors.

**BASELINE TRENDS OVER THE TEN YEAR PROJECTION PERIOD**

The CBO's Medicare Baseline report forecasts Medicare spending for 10 years, as does the National Health Expenditures projection. These sources provide trend projections for many service categories, but neither isolates the advanced imaging services. Milliman developed trend assumptions to estimate the projected baseline allowed charges through fiscal year 2020.

Table 2 summarizes the assumptions used to restate the calendar year 2009 experience (in Table 1) to a fiscal year 2011 experience period. Table 2 also summarizes the trend factors applied to the fiscal year 2011 estimates to develop the 2012 through 2020 projection period. The enrollment and unit price trend assumptions for those years are sourced directly from the CBO's forecast. The utilization rate trends underlying the CBO forecast are lower than the 3% illustrated in Table 2. The utilization rate trend was stated at 3% to recognize the historically higher trends experienced by the advanced imaging services compared to other categories of service. The Appendix provides additional detail about the trend components in Table 2.

Table 2

**RADIOLOGY BENEFITS MANAGEMENT PROGRAMS  
Baseline Trend Assumptions  
Applied to CY 2009 Experience Period**

	Advanced Imaging Services				Projected Baseline Allowed Charges <sup>5</sup> (in \$000,000)
	Enrollment Trend <sup>1</sup>	Unit Price Trend <sup>2</sup>	Utilization Rate Trend <sup>3</sup>	Composite Trend <sup>4</sup>	
CY 2009 to FY 2011	5.6%	-6.3%	0.0%	-1.0%	\$7,801.4
FY 2012	5.1%	0.3%	3.0%	8.6%	\$8,470.6
FY 2013	5.3%	0.5%	3.0%	9.0%	\$9,233.1
FY 2014	5.3%	1.1%	3.0%	9.7%	\$10,124.3
FY 2015	5.7%	1.9%	3.0%	10.9%	\$11,231.8
FY 2016	4.6%	2.3%	3.0%	10.2%	\$12,379.3
FY 2017	3.8%	2.8%	3.0%	9.9%	\$13,605.8
FY 2018	3.1%	2.5%	3.0%	8.8%	\$14,809.6
FY 2019	2.7%	2.4%	3.0%	8.3%	\$16,041.7
FY 2020	2.7%	2.2%	3.0%	8.1%	\$17,342.4

- Notes:
1. CBO's August 2010 Baseline: Medicare – Growth in Part A Enrollment Fee-for-Service. Change from CY 2009 to FY 2011 cumulates the effect across the multi-year time period.
  2. FY 2012 through FY 2020 from CBO's August 2010 Baseline: Medicare – Physician Medicare Economic Index. Change from CY 2009 to FY 2011 developed from actual changes in reimbursement implemented during the time period. Detail is provided in the Appendix.
  3. FY 2012 through FY 2020 established at 3%.
  4. Calculated from the following:  
Composite Trend Factor = (1+Enrollment Trend) x (1+Unit Price Trend) x (1+Utilization Rate Trend) – 1
  5. Allowed charges include the patient's cost sharing responsibility.

**RADIOLOGY BENEFIT MANagements IMPACT – FIRST YEAR**

Two Radiology Benefits Management vendors submitted multi-year experience for ten Medicare Advantage clients. The experience was submitted in a summarized format, reported by the service categories in Table 1. The Radiology Benefits Management vendors did not provide information that would allow Milliman to assess the morbidity of the groups, although some information about the age and gender mix of three groups was available. Milliman reviewed the reported utilization metrics for reasonableness, but without insight as to the groups' morbidity profile, only extreme outliers would be identifiable as unreasonable. Ultimately, all data points were retained for the development of the consensus impact factors.

For each reported Medicare Advantage client, the vendors submitted utilization on a requested and approved basis. The approved percentage for each service category was calculated for the first year of the program. For each service category Milliman excluded the highest two and lowest two approved percentages. Table 3 provides the 70<sup>th</sup> percentile, 30<sup>th</sup> percentile, and straight average of the approved percentages for each service category.

Table 3

**RADIOLOGY BENEFITS MANAGEMENT PROGRAMS  
Development of Consensus Impact Factors  
By Service Category**

<b>Service Category</b>	<b>30<sup>th</sup> Percentile of Approved Percentage</b>	<b>Average Approved Percentage</b>	<b>70<sup>th</sup> Percentile of Approved Percentage</b>
Computerized Tomography (CT)	88.9%	89.8%	91.3%
Magnetic Resonance Imaging / Angiography (MRI/MRA)	79.1%	82.6%	84.1%
Positron Emission Tomography (PET)	78.0%	80.2%	82.5%

Note: Based on first year program experience.

Although the Radiology Benefits Management vendors' Medicare Advantage experience is drawn from multiple years' implementation experience, the first year approved percentage is generally consistent, as seen by the narrow range between the 30<sup>th</sup> and 70<sup>th</sup> percentile impact factors in Table 3.

**RADIOLOGY BENEFIT MANagements IMPACT – SUBSEQUENT YEARS**

In addition to the first year impact directly related to the prior approval process, the impact from the Radiology Benefits Management programs extends into the subsequent years. The rate of growth in utilization for advanced imaging services is expected to be lower under a Radiology Benefits Management program than it would have been without the program. In particular, the slower rate of growth is expected to be generated from the clinical discipline fostered by the Radiology Benefits Management programs with respect to the adoption of new technologies and the expansion of existing technologies to new purposes.

For this analysis, post-implementation experience was available for two to four years for most of the Medicare Advantage plans. Although the Medicare Advantage data from the contributing vendors suggests that trends in the post-implementation periods may be significantly below the unmanaged growth rate, there are not enough years of evidence to construct a trend curve for a multi-year projection period.

The Radiology Benefit Management vendors anecdotally reported that experience with their commercial business has consistently demonstrated that utilization rate increases have been constrained to the low single digits and, in some cases, negative utilization rates have been achieved. To illustrate the additional savings associated with the impact on trend in the subsequent years, an alternate savings scenario assumes the projected utilization trends are reduced to half of the utilization rate value shown in Table 2 that was used to develop the baseline projections.

**PROJECTED IMPACT**

Table 2 illustrated the components of trend used to establish the baseline projections: (1) enrollment growth, (2) unit price changes, and (3) utilization rate changes. The presence of a Radiology Benefits Management program will not impact enrollment growth nor unit price changes. A Radiology Benefits Management program will only impact the utilization rate for covered services.

The baseline advanced imaging expenditures are developed in Table 4. The trend assumptions shown in Table 2 have been used to construct the baseline (i.e., status quo) advanced imaging allowed charges. Table 4 provides the annual trend assumptions and projected advanced imaging allowed charges by modality.

Table 4

**RADIOLOGY BENEFITS MANAGEMENT PROGRAMS**  
**Development of Projected Advanced Imaging Baseline Allowed Charges**  
**By Service Category**  
**Allowed Charges in \$000,000**

Twelve Month Time Period	Composite Trend Assumption	Subtotal	CT	MRI / MRA	PET
CY 2009		\$7,881.4	\$4,473.9	\$2,675.4	\$732.1
FY 2011	-1.0%	7,801.4	4,428.5	2,648.2	724.7
FY 2012	8.6%	8,470.6	4,808.4	2,875.4	786.9
FY 2013	9.0%	9,233.1	5,241.2	3,134.2	857.7
FY 2014	9.7%	10,124.3	5,747.1	3,436.7	940.5
FY 2015	10.9%	11,231.8	6,375.8	3,812.7	1,043.4
FY 2016	10.2%	12,379.3	7,027.1	4,202.2	1,150.0
FY 2017	9.9%	13,605.8	7,723.4	4,618.5	1,263.9
FY 2018	8.8%	14,809.6	8,406.7	5,027.1	1,375.7
FY 2019	8.3%	16,041.7	9,106.1	5,445.4	1,490.2
FY 2020	8.1%	17,342.4	9,844.5	5,886.9	1,611.0
FY 2011 through FY 2020		\$121,040.0	\$68,708.7	\$41,087.3	\$11,243.9

- Notes: 1. CY 2009 allowed expenditures extrapolated from Medicare 5% Sample.  
 2. Components of trend shown in Table 2.  
 3. Allowed charges include the patient's cost sharing responsibility.

Table 5 provides the development of the advanced imaging allowed charges in the first year of a Radiology Benefits Management program. The projections assume the Radiology Benefits Management program is fully implemented at October 1, 2011. The first year savings have been developed assuming the three levels of impact factors developed in Table 3.

Table 5

**RADIOLOGY BENEFITS MANAGEMENT PROGRAMS**  
**Estimated Advanced Imaging Allowed Charges**  
**In First Year of Radiology Benefits Management Program Implementation**  
**By Service Category**  
**Allowed Charges in \$000,000**

	Subtotal	CT	MRI / MRA	PET
Baseline	\$8,470.6	\$4,808.4	\$2,875.4	\$786.9
30 <sup>th</sup> Percentile Impact	\$7,162.6	\$4,273.2	\$2,275.7	\$613.6
Average Impact	\$7,320.9	\$4,315.9	\$2,374.1	\$631.0
70 <sup>th</sup> Percentile Impact	\$7,455.3	\$4,387.8	\$2,418.3	\$649.1

Note: Represents FY 2012 estimated allowed charges assuming the trend rates illustrated in Table 2 and the impact fact in Table 3. Allowed charges include the patient's cost sharing responsibility.

The subsequent years' savings have been developed assuming (1) no change in the utilization rate trend shown in Table 2 and (2) a 50% reduction in utilization rate trend in all post-implementation years. Table 6 illustrates allowed charges in the ten year

projection period assuming no change in trend, beyond the first year impact of the Radiology Benefits Management program implemented in fiscal year 2012. Table 7 illustrates allowed charges in the ten year projection period assuming a 50% reduction in utilization rate trend in each year following program implementation. In both tables the baseline projection remains unchanged and is consistent with the values developed in Table 2.

**Table 6**  
**RADIOLOGY BENEFITS MANAGEMENT PROGRAMS**  
**Estimated Advanced Imaging Expenditures**  
**In Ten Year Projection Period**  
**Assuming No Change in Forecasted Utilization Rate Trend**  
**Allowed Charges in \$000,000**

	Baseline Trend Assumption	Baseline	Post-Implementation Trend Assumption	30 <sup>th</sup> Percentile Impact	Average Impact	70 <sup>th</sup> Percentile Impact
FY 2011		7,801.4		7,801.4	7,801.4	7,801.4
FY 2012	8.6%	8,470.6	8.6%	7,162.6	7,320.9	7,455.3
FY 2013	9.0%	9,233.1	9.0%	7,807.3	7,979.9	8,126.3
FY 2014	9.7%	10,124.3	9.7%	8,560.8	8,750.2	8,910.7
FY 2015	10.9%	11,231.8	10.9%	9,497.4	9,707.4	9,885.5
FY 2016	10.2%	12,379.3	10.2%	10,467.6	10,699.1	10,895.4
FY 2017	9.9%	13,605.8	9.9%	11,504.7	11,759.1	11,974.8
FY 2018	8.8%	14,809.6	8.8%	12,522.6	12,799.5	13,034.4
FY 2019	8.3%	16,041.7	8.3%	13,564.5	13,864.4	14,118.8
FY 2020	8.1%	17,342.4	8.1%	14,664.3	14,988.6	15,263.6
Subtotal		\$121,040.0		\$103,553.1	\$105,670.5	\$107,466.1
Savings				(\$17,486.9)	(\$15,369.4)	(\$13,573.9)

- Notes:
1. Baseline trend assumptions and baseline estimated allowed charges developed in Table 2.
  2. Post-implementation trend assumption is that Radiology Benefit Management program has no additional impact on trend other than the first year (FY 2012) decrease in approved services. That is, post-implementation trends are equal to the baseline trend assumptions.
  3. Allowed charges include the patient's cost sharing responsibility.

Table 7

**RADIOLOGY BENEFITS MANAGEMENT PROGRAMS**  
**Estimated Advanced Imaging Allowed Charges**  
**In Ten Year Projection Period**  
**Assuming 50% Reduction in Forecasted Utilization Rate Trend**  
**Allowed Charges in \$000,000**

	<b>Baseline Trend Assumption</b>	<b>Baseline</b>	<b>Post-Implementation Trend Assumption</b>	<b>30<sup>th</sup> Percentile Impact</b>	<b>Average Impact</b>	<b>70<sup>th</sup> Percentile Impact</b>
FY 2011		7,801.4		7,801.4	7,801.4	7,801.4
FY 2012	8.6%	8,470.6	8.6%	7,162.6	7,320.9	7,455.3
FY 2013	9.0%	9,233.1	7.4%	7,693.6	7,863.7	8,008.0
FY 2014	9.7%	10,124.3	8.1%	8,313.3	8,497.1	8,653.0
FY 2015	10.9%	11,231.8	9.3%	9,088.4	9,289.4	9,459.8
FY 2016	10.2%	12,379.3	8.6%	9,871.0	10,089.3	10,274.4
FY 2017	9.9%	13,605.8	8.3%	10,691.0	10,927.4	11,127.9
FY 2018	8.8%	14,809.6	7.3%	11,467.5	11,721.1	11,936.1
FY 2019	8.3%	16,041.7	6.7%	12,240.6	12,511.3	12,740.9
FY 2020	8.1%	17,342.4	6.5%	13,040.4	13,328.8	13,573.3
Subtotal		\$121,040.0		\$97,369.9	\$99,350.6	\$101,030.2
Savings				(\$23,670.1)	(\$21,689.4)	(\$20,009.8)

- Notes:
1. Baseline trend assumptions and baseline estimated allowed charges developed in Table 2.
  2. Post-implementation trend assumption is that Radiology Benefit Management program will reduce utilization trend by half in all subsequent years. That is, utilization rate trend will be 1.5% per year beginning in FY 2013; all other components of trend are consistent with Table 2.
  3. Allowed charges include the patient's cost sharing responsibility.

## ADDITIONAL CONSIDERATIONS

The estimates of the impact of a Radiology Benefit Management program were developed for total allowed charges. On average, patients are responsible for 22% of the allowed charges for these services. Therefore, the savings to the Medicare program will be approximately 78% of the amounts illustrated.

The estimates of the impact of a Radiology Benefit Management program exclude the costs of the program associated with implementation and ongoing administration by a Radiology Benefit Management vendor. The estimates assume the Radiology Benefit Management program is fully implemented on October 1, 2011. If the program were phased in or if the implementation were later than this assumed date, the savings estimates would be reduced.

The savings estimates assume the program adopted by the Medicare fee-for-service program would be similar in scope and effectiveness as the current client programs. If the Medicare program were materially modified the savings estimates would need to be adjusted. The analysis quantified savings from the anticipated reduction in advanced imaging services associated with a Radiology Benefits Management program. The study did not evaluate the impact of the program on outcomes or quality of care.

The savings estimates were developed for computerized tomography (CT), magnetic resonance imaging / magnetic resonance angiography (MRI/MRA), and positron emission tomography (PET) procedures. Nuclear cardiology procedures were not included in the estimates. Further, services provided in the hospital inpatient setting, Skilled Nursing Facility, hospice, or emergency room setting were excluded. The baseline estimates and associated savings would need to be revised if the excluded services were included within the scope of the program.

The methodology is transparently presented in this report in order to provide greater understanding of both the assumptions and the results. The results of this analysis differ from prior published analysis, in particular research published by the Congressional Budget Office (CBO) late in 2008, which indicates a savings potential of one billion dollars over a ten-year period<sup>2</sup> as compared to the \$13 to \$24 billion estimated in the Milliman analysis. The reasons underlying this difference are not clear because the CBO analysis did not include underlying assumptions or methodologies. However, there are a few key characteristics of the Milliman analysis that may be unique and are worth noting:

- In accordance with actuarial standards of practice, the Milliman analysis includes a range of possible estimates. The high-end of the range assumes tight management of care on every individual, and represents the upper end of the savings potential based on the assumptions articulated here. That said, radiology providers have the capacity to manage care to Medicare populations, since they are already doing so with other insured populations, so achieving the higher-end of the range is possible.
- The Milliman analysis is extrapolated from actual Medicare Advantage data, and thus represents a “real world” estimate that charts to actual empirical data and to the behavior of today’s Medicare population.
- Milliman’s Health Cost Guidelines®, which calculate “loosely managed” and “well managed” care utilization benchmarks, indicate that the savings opportunity from managing radiology care may be even greater under certain conditions, with the potential to reduce costs by close to 50%, so the savings potential from managing radiology may actually be even higher than what is estimated here.

## LIMITATIONS

This report is intended for use by NIA and Magellan Health Services, Inc. in discussions with Medicare decision makers. It may be released to third parties, but must be distributed in its entirety. Milliman does not intend to benefit and assumes no duty or liability to any third parties who receive the information herein. We do not intend this information to benefit any third party even if we permit the distribution of our work product to such third party.

The results presented in this document are based upon historic experience and assumptions, as described. As such, the results are projections of future experience if the assumptions were realized. If emerging experience differs materially from the assumptions described, the resulting estimates will be affected. The provision of healthcare within the Medicare program is

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<sup>2</sup> “Budget Options, Vol. 1: Health Care.” Dec. 2008. Available at <http://www.cbo.gov/ftpdocs/99xx/doc9925/12-18-HealthOptions.pdf>

influenced by many factors which may have been simplified in this modeling exercise. Any user of this report should rely upon their own experts before drawing any conclusions about the impact of Radiology Benefits Management programs.

Milliman relied on summaries provided by NIA and the other contributor. If, for any reason, the information provided was inaccurate or incomplete, the results of this analysis may likewise be inaccurate or incomplete. Milliman reviewed the submitted information for reasonableness, but did not audit the underlying claims source. Milliman did not review the clinical guidelines supporting each Radiology Benefits Management program. It was assumed that the two programs (any others in the market) may have different clinical edits, but are intended to achieve the same outcome of clinically appropriate utilization.

Guidelines issued by the American Academy of Actuaries require actuaries to include their professional qualifications in all actuarial communications. I am a member of the American Academy of Actuaries, and I meet the qualification standards for performing the analyses in this report.

**APPENDIX**

**SUPPLEMENTAL DETAIL SUPPORTING THE DEVELOPMENT OF THE BASELINE TRENDS OVER THE TEN YEAR PROJECTION PERIOD**

Table 2 of the report summarizes the trend assumptions used to develop the baseline projections. This section provides additional detail to support the selection of those trend factors.

The CBO’s Medicare Baseline report forecasts Medicare spending for 10 years, as does the National Health Expenditures projection. These sources provide trend projections for many service categories, but neither isolates the advanced imaging services. Table 8 provides the annual growth rates for the two relevant components of the CBO’s projections<sup>3</sup> for fiscal years 2012 through 2020. The “Hospital Outpatient Services” category is used to represent projected changes to the outpatient hospital facility component of advanced imaging services. The “Physician Fee Schedule” category is used to represent projected changes to the professional and office setting component of advanced imaging services. The annual growth rates include the effect of (1) enrollment growth, (2) unit price changes, and (3) utilization rate changes.

Enrollment growth is quantified in the CBO document and can be isolated. The enrollment trend has been shown in Table 8. Unit price increases are not explicitly isolated in the CBO document. As a placeholder, Table 8 reports the projected annual change in the Physician Medicare Economic Index (MEI). The third component of trend – the change in utilization rates – has been calculated.

**Table 8**

**RADIOLOGY BENEFITS MANAGEMENT PROGRAMS  
CBO Medicare Baseline Trend Assumptions  
FY 2012 through FY 2020**

	Hospital Facility Proxy: Hospital Outpatient Services					Professional and Office Setting Proxy: Physician Fee Schedule			
	Composite Trend <sup>1</sup>	Change in Part A Fee-for-Service Enrollment <sup>2</sup>	Physician Medicare Economic Index (MEI) <sup>3</sup>	Implied Utilization Rate Trend <sup>4</sup>		Composite Trend <sup>1</sup>	Change in Part A Fee-for-Service Enrollment <sup>2</sup>	Physician Medicare Economic Index (MEI) <sup>3</sup>	Implied Utilization Rate Trend <sup>4</sup>
FY 2012	7.8%	5.1%	0.3%	2.3%	FY 2012	0.8%	5.1%	0.3%	-4.4%
FY 2013	9.8%	5.3%	0.5%	3.7%	FY 2013	6.0%	5.3%	0.5%	0.2%
FY 2014	9.8%	5.3%	1.1%	3.1%	FY 2014	7.2%	5.3%	1.1%	0.7%
FY 2015	10.5%	5.7%	1.9%	2.6%	FY 2015	7.8%	5.7%	1.9%	0.1%
FY 2016	9.9%	4.6%	2.3%	2.7%	FY 2016	6.4%	4.6%	2.3%	-0.6%
FY 2017	8.4%	3.8%	2.8%	1.6%	FY 2017	6.1%	3.8%	2.8%	-0.6%
FY 2018	7.5%	3.1%	2.5%	1.7%	FY 2018	6.7%	3.1%	2.5%	1.0%
FY 2019	6.9%	2.7%	2.4%	1.6%	FY 2019	6.3%	2.7%	2.4%	1.1%
FY 2020	8.4%	2.7%	2.2%	3.3%	FY 2020	6.7%	2.7%	2.2%	1.7%

- Notes:
1. FY 2010 through FY 2020 from CBO’s August 2010 Baseline: Medicare – Annual Growth Rates for Components of Benefit Payments
  2. CBO’s August 2010 Baseline: Medicare – Growth in Part A Enrollment Fee-for-Service
  3. CBO’s August 2010 Baseline: Medicare – Physician Medicare Economic Index
  4. Implied utilization rate trend calculated as  

$$\text{Utilization Rate Trend} = \{(1 + \text{Composite Trend Factor}) \div [(1 + \text{Enrollment Trend}) \times (1 + \text{Unit Price Trend})]\} - 1$$

<sup>3</sup>CBO’s August 2010 Baseline: MEDICARE

As shown in Table 8, the implied utilization rate trend associated with the physician fee schedule services is lower in fiscal year 2012 than for any other year. The CBO's projections are required to use assumptions consistent with existing legislation. The underlying reimbursement rate assumption is not explicitly stated in the CBO's projections. Milliman has used the Medicare Economic Index as a proxy for that component of trend. However, in fiscal years 2012 (and 2011, which is not shown in Table 8), the CBO would have reflected the scheduled reduction associated with the Sustainable Growth Rate (SGR) calculation which was introduced in the Balance Budget Act of 1997. Consistently, Congress has passed legislation to delay the reductions to the physician fee schedule associated with the SGR. The CBO's projections must reflect the future reductions to the extent that legislation has not yet been passed to delay them or mitigate them. However, it may be more reasonable to assume that the physician fee schedule will not be dramatically modified. The low implied utilization rate trend in fiscal year 2012 may not be anticipated in the CBO's projections; rather, the CBO may have anticipated that the physician fee schedule reimbursement rates would be reduced, contributing to the low composite trend illustrated.

The Medicare Payment Advisory Committee (MedPAC), the Government Accountability Office, and others have documented a high rate of growth in expenditures associated with advanced imaging services, particularly between 2000 and 2006. As a result, the Stark Law and other payment reforms were introduced to try to moderate the rate of growth. It is unclear how the rate of growth in the utilization of advanced imaging services will be affected long term.

John Iglehart, in the *New England Journal of Medicine*<sup>4</sup>, found that the utilization rate for imaging procedures increased 70% over the seven year time period from 2000 to 2007, or 7.8% annually. For comparison, the average utilization rate increase represented in Table 2 from 2011 to 2018 is 1.3% annually (across both components of imaging services). A utilization rate of 3% annually was selected to forecast the expenditures associated advanced imaging services from fiscal year 2011 through fiscal year 2020. This assumption reflects a significant reduction from the historically observed trend levels, while recognizing higher trend levels for advanced imaging services than are anticipated for all services combined.

The CBO's Medicare Baseline report is useful as a source for trend projections in future years, when reimbursement increases have not yet been established. The calendar year 2009 observed experience was restated to fiscal year 2011 levels using the changes in reimbursement that were implemented over the time period. Outpatient advanced imaging services are reimbursed through multiple mechanisms, depending upon the provider associated with the service. The three mechanisms are Ambulatory Payment Classifications (APCs), the physician fee schedule, and the outpatient prospective payment system (OPPS).

There were significant changes to the reimbursement for advanced imaging services under the physician fee schedule and the OPPS. The three primary changes were (1) to increase the equipment utilization rate underlying the reimbursement, (2) to modify the methodology and discount level related to the multiple procedure discount which provides for lower marginal reimbursement when two or more advanced imaging services are performed in one encounter, and (3) to introduce new CPT-4 codes to describe the combined abdomen / pelvis CT scan. These changes have been incorporated into a composite change in reimbursement to move the calendar year 2009 experience to a fiscal year 2011 basis. The estimated composite change in the APC reimbursement from 2009 to 2011 was an increase of 0.6% for advanced imaging services. The estimated composite change in the reimbursement for services adjudicated under the physician fee schedule or OPPS was a decrease of 15%.

In addition to the reimbursement rate change, enrollment trends were also applied to the calendar year 2009 experience, consistent with the information in the CBO's August 2010 Baseline. Utilization trends were held at 0%. It should be noted that the introduction of the combined abdomen / pelvis CT scan will impact the number of services reported (by replacing two previously reported procedures with a single one). Rather than reflect the impact through the utilization rate trend, the impact has been reflected in the reimbursement rate impact described above.

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<sup>4</sup> Iglehart, John K.; Health Insurers and Medical-Imaging Policy – A Work in Progress; *The New England Journal of Medicine*; 360; 10; March 5, 2009.