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Options Paper

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Overview

The Centers for Medicare & Medicaid Services (CMS) has articulated a vision for health care—*the right care, for every person, every time*. To achieve this vision, CMS seeks to implement policies that will promote the delivery of care that is safe, effective, timely, patient-centered, efficient, and equitable. Current Medicare hospital payment policies reward the delivery of quantity rather than quality of care, and provide neither incentive nor support to improve quality of care. Today, hospitals are usually paid the same for services rendered regardless of the quality of care they provide, and in some cases, hospitals may even receive additional payment for treatment of avoidable complications. Value-based purchasing (VBP), which links payment more directly to performance, is a key policy mechanism that CMS is adopting to transform itself from being a passive payer to an active purchaser of care for millions of Medicare beneficiaries. CMS' hospital payment policy moving forward will focus on purchasing value for the Medicare program, so that hospitals will receive differential payments as a function of their performance.

In 2006, Congress passed Public Law 109-171, the Deficit Reduction Act of 2005 (DRA), which under Section 5001(b) authorized CMS to develop an approach to value-based purchasing for Medicare hospital services commencing Fiscal Year 2009. Value-based purchasing in the DRA applies only to subsection (d) hospitals, and does not apply to Critical Access Hospitals or to other hospital types that are not paid under the Inpatient Prospective Payment System (IPPS).

The proposed Medicare Hospital VBP Program, which is described in this Options Paper, builds on the important groundwork established by Medicare's Reporting Hospital Quality Data for Annual Payment Update (RHQDAPU) Program. Since Fiscal Year 2004, RHQDAPU has provided differential payments to hospitals that publicly report their performance on a defined set of inpatient care performance measures, as originally mandated under the 2003 Medicare Modernization Act and expanded under DRA Section 5001(a). The Tax Relief and Health Care Act of 2006 expanded the RHQDAPU

Program to include measures for hospital outpatient services (by Fiscal Year 2009) and Ambulatory Surgery Centers (by Fiscal Year 2010). CMS proposes to replace the current hospital quality reporting program—RHQDAPU—with the VBP Program. Building on the foundation of the RHQDAPU Program, the new VBP Program would encompass both public reporting and financial incentives for better performance as tools to drive improvements in clinical quality, patient-centeredness, and efficiency.

VPB Plan Goals, Assumptions, and Design Considerations

CMS has established a set of goals for the Medicare Hospital VBP Program that will guide program design and implementation. CMS believes that to reach these goals, it must transform itself from being a passive payer of services to an active purchaser of care. Value-based purchasing is a key policy mechanism that CMS proposes to employ moving forward to achieve its desired programmatic goals.

In the following sections of this Options Paper, we describe:

- 1) The Performance Assessment Model that CMS proposes to use to score a hospital's performance,
- 2) The methods for computing a hospital's performance score and translating the score into an incentive payment,
- 3) Options regarding the basis and allocation of VBP incentive payments,
- 4) Proposed selection criteria for performance measures and candidate measures for Fiscal Year 2009 and beyond,
- 5) Options for transitioning from the existing RHQDAPU Program to VBP,

Goals for the VBP Program

- Improve clinical quality
- Address problems of underuse, overuse, and misuse of services
- Encourage patient-centered care
- Reduce adverse events and improve patient safety
- Avoid unnecessary costs in the delivery of care
- Stimulate investments in structural components and the re-engineering of care processes system-wide
- Make performance results transparent to and useable by consumers
- Avoid creating additional disparities in health care and work to reduce existing disparities

- 6) A proposed re-design of the data submission and validation infrastructure to support the VBP program requirements, and
- 7) Public reporting of performance results.

The design of the proposed VBP Program is predicated on the following assumptions:

- The VBP Program would start in Fiscal Year 2009 (October 1, 2008).
- A specified percentage of hospital payment would be conditional on hospital performance, assessed using VBP incentive payment measures.
- The VBP Program could include measures for different purposes: incentive payment, public reporting, and measure development. All measures used for incentive payment would also be publicly reported.
- Hospitals would be required to submit data on all measures applicable to their patient population and service mix to qualify for incentive payment.
- The VBP Program would reward hospitals that improve their quality performance as well as those that achieve high levels of performance.
- The VBP Program would use both financial incentives and public reporting to drive quality improvement.
- The VBP Program would build on the existing measures and on the data submission, validation, and public reporting infrastructure of the RHQDAPU Program.
- The VBP Program would transition from and replace the current RHQDAPU Program.
- The VBP program would not include additional funding beyond the Annual Payment Updates (APU).
- The VBP Program would move rapidly to achieve a comprehensive measure set by expanding the measures available for assessing clinical quality, including HCAHPS to begin to assess patient-centered care, and including efficiency measures. It is anticipated that the VBP Program would also incorporate hospital outpatient measures as required for the RHQDAPU Program by the Tax Relief and Health Care Act of 2006.

- CMS would include, as a key component of the VBP Program design, ongoing evaluation to assess Program effects and unintended consequences, and adjust the design based on lessons learned during implementation.

In developing the Options Paper, CMS took into careful consideration the comments on the December Issues Paper provided by hospitals and other affected stakeholders at the 1st Listening Session held on January 17, 2007 and submitted in writing. The key points, by topic area, emphasized by numerous stakeholders, were as follows:

Incentives

- Reward both improvement and attainment (“Improvement in performance coupled with exceeding a pre-determined threshold provides a balanced approach that will engage a broader array of institutions.”).
- “Raise all boats”—do not pick winners and losers.
- Spread payments broadly to engage and incentivize more hospitals.
- Be sensitive to potential impacts on access to care.

Measures

- Use absolute thresholds, specified in advance, so that hospitals can plan ahead.
- Don’t retire “topped off” measures (“Hospitals need positive feedback about things they are doing well, as well as constructive feedback on areas needing improvement.”).
- Create a single VBP program in which rural and small hospitals can participate. Measure services that small and rural hospitals provide.
- Align measures to minimize burden.
- Emphasize outcomes and process measures linked to outcomes, but be sensitive to unintended consequences (“The fastest way to improve my score is to ‘fire’ my complex patients.”).
- Develop measures that assess coordination of care during episodes and over time.

Data Infrastructure and Validation

- Develop a process for data resubmission.
- Improve the current validation process—use a combination of random and targeted audits as well as less frequent audits but using larger samples.
- Strike a balance between timeliness and validity.

Public Reporting

- Simplify Hospital Compare for ease of use.
- Focus on composites at the condition level.
- Disclose uncertainty and variability in scores based on small numbers.
- Avoid negative labeling when measures are suppressed due to small numbers.

Performance Assessment Model

The Performance Assessment Model is the methodology that CMS is proposing to use to score a hospital’s performance and to compute an overall VBP performance score, which then would be translated into a level of incentive payment. Each hospital’s performance would be assessed using the methodology on an annual basis. In structuring the proposed Performance Assessment Model, CMS focused on developing a flexible design that could apply to the rapidly expanding and varied set of performance measures envisioned for the VBP Program.

Overview of Performance Assessment Model

- A hospital must submit data for all VBP measures that apply to its patient population and service mix, regardless of whether the measure is for incentive payment, public reporting, or measure development.
- The hospital receives a performance score on each measure for incentive payment.
- The hospital receives 0 to 10 points for each measure based on either the attainment or improvement scoring criteria.
- The hospital’s overall VBP performance score is determined by aggregating the scores across all VBP measures for which it has a minimum number of cases.
- The overall performance score, reflected as a percentage of points earned out of the total possible points for which the hospital is eligible, is then translated into the incentive payment using an “exchange function.”

The proposed model would reward hospitals for performance based on attainment in the measurement year or improvement from the prior year's baseline performance. This approach would enable all hospitals to engage in the VBP Program, even if they begin with a low absolute level of performance.

Under the Performance Assessment Model, a hospital would be eligible to earn a maximum of 10 points on *each* of the VBP measures that is applicable to its patient population and service mix. For each such measure, the hospital would receive a score based on attainment and a score based on improvement. The greater of the attainment or improvement score would be the hospital's score for that measure.

Each measure has a "benchmark" and an "attainment threshold" that are determined from the distribution of national hospital performance on that measure during the previous reporting period. Because these

scoring "cut points" are determined from actual hospital performance, they provide realistic markers of performance expectations. These parameters and the "attainment range" and "improvement range" they define are used to determine a hospital's score on each measure. The methodology used to determine these parameters is described below.

Performance Assessment Model Terminology

For each measure:

Benchmark: the reference point defining high level of performance

Attainment threshold: the minimum level of performance required to receive attainment points

Attainment range: the scale between the attainment threshold and benchmark

Improvement range: the scale between the hospital's prior year score (baseline) on the measure and the benchmark

Setting Benchmarks and Attainment Thresholds

To provide an empirical basis for designing and testing of the Performance Assessment Model, a database was created containing the 20 RHQDAPU process-of-care measures reported on Hospital Compare by more than 3000 IPPS hospitals for 2004 and 2005, the most recent data available. Analyses were conducted to explore different statistical

approaches to establishing attainment thresholds and benchmarks, to evaluate the effect of different “cut points” on different hospital sub-groups (*e.g.*, urban/rural, bed size, teaching status, and percentage of Medicare hospital days), and to examine issues associated with hospitals having a small number of cases to report on individual measures and/or being able to report on only a few measures. The attainment thresholds and benchmarks used in the examples illustrating the proposed Performance Assessment Model were developed through analysis of this database (see Figures 1 – 3).

It should be emphasized that the proposed scoring model is specific to clinical process-of-care measures, like those currently in the RHQDAPU Program. Data are not yet available to support similar empirical analysis of the 30-day mortality measures and HCAHPS patient experience measures, which also are proposed to be included for the initial Fiscal Year 2009 VBP measure set, as described in the Measures section below. CMS would refine or adjust the proposed Performance Assessment Model to reflect the unique scoring properties of other types of measures as they are introduced into the VBP Program. CMS is proposing to apply the basic concept of measuring performance on both attainment and improvement to all measures that are introduced into the VBP Program for use in incentive payment.

An analysis of the 2004-2005 Hospital Compare data demonstrated the need for a different approach to set benchmarks and attainment thresholds for “topped out” measures as compared to measures on which the performance of hospitals is still broadly distributed. Table 1 displays benchmarks and attainment thresholds that CMS is proposing.

Table 1: Benchmarks and Attainment Thresholds

Measure Designation	Benchmark	Attainment Threshold
Standard method for measures with a broad distribution of performance scores	Mean of the top decile	50 th percentile
Method for topped out measures	90% performance	60% performance

For measures with a broad distribution of performance scores, CMS would apply the standard method for establishing benchmarks: the benchmark, which represents exemplary performance, would be set at the mean value of the top-performing 10 percent of all hospitals in the previous reporting period. The attainment threshold would be defined as the performance of the median hospital (50th percentile performance) in the previous reporting period. These parameters would be used to judge performance in the current performance year. Therefore, hospitals that perform in the current year at least as well as the mid-performing hospital in the previous reporting period would earn points for attainment.

As all hospitals improve their performance over time on any given measure, variation in performance will decrease, and the distribution of hospital scores for that measure will concentrate at high values. As hospital performance on a measure improves, the values of both the benchmark and attainment threshold increase. In the case where hospital performance is very concentrated at high values, a measure has topped out – defined as those measures where the value for the 75th percentile is not statistically different from the value for the 90th percentile.

Scoring a topped out measure presents a number of problems. First, requiring hospitals to meet or exceed an empirical benchmark that is statistically indistinguishable from a perfect score in order to earn all 10 points could result in unintended consequences as hospitals strive for the top tail of the distribution. Examples of unintended consequences include inappropriate delivery of a service to some patients, unduly conservative decisions to exclude some patients from being counted toward the measure, or an undesirable focus on achieving a perfect score at the expense of real improvements in quality. Second, for topped out measures, it is more difficult to differentiate among hospitals performing above the median in a meaningful clinical or practical way.

However, topped out measures could still be considered valid indicators of appropriate care. In instances where a measure has topped out, CMS would use a method that sets the benchmark at .90, which represents a 90% performance rate. This would allow a great

number of high-performing hospitals to reach the benchmark and earn all 10 points for the measure. CMS proposes to set the attainment threshold for topped out measures at .60 representing a 60% performance rate. This defines a fairly large attainment range over which hospitals can earn points for attainment. Hospitals can also earn points for improvement on topped out measures. Indeed, part of the rationale for continuing to incentivize topped out measures is to drive quality improvement among the subset of hospitals that have not yet achieved a high level of performance.

The empirically determined benchmark and attainment thresholds contained in this Options Paper are for illustrative purposes only. CMS would empirically establish benchmarks and attainment thresholds for any given year using national data for the previous reporting period. The actual benchmarks and attainment thresholds for the Fiscal Year 2009 VBP Program would be established using the most recent data available at the start of program implementation.

As data for other types of measures (*e.g.*, patient experience and outcomes) are collected nationally and become available, CMS would conduct analyses to establish appropriate benchmarks and attainment thresholds required to score these types of measures for the VBP financial incentive.

Scoring Performance Based on Attainment

For each VBP measure that counts toward incentive payment, a hospital could earn from 0 to 10 points for attainment based on where its score for the measure fell relative to the attainment threshold and the benchmark. All attainment points would be rounded to the nearest whole number (*e.g.*, attainment points of 9.6 would be rounded to 10 points).

- If the hospital's score is equal to or greater than the benchmark, then the hospital receives 10 points for attainment.
- If the hospital's score is within the attainment range (greater than the attainment threshold, but below the benchmark), then the hospital receives a score between 1 and 9 based on a discrete linear scale established for the attainment range.

- If a hospital's score is equal to or less than the attainment threshold (*i.e.*, the lower bound of the attainment range), then the hospital receives 0 points for attainment.

Scoring Performance Based on Improvement

For each VBP measure tied to incentive payment, a hospital could earn from 0 to 9 points for improvement based on improving its score on the measure from its prior year's performance.¹ A unique improvement range for each hospital on each VBP measure would be established to define the distance between the hospital's prior year score on a measure and the national benchmark for the measure. All improvement points would be rounded to the nearest whole number.

- If the hospital's score is between the hospital's previous year score and the benchmark, within the improvement range, then the hospital receives a score between 0 and 9 based on the discrete linear scale that defines the improvement range.
- If a hospital's score is equal to or lower than its previous year's score on the measure, then the hospital receives 0 points for improvement.

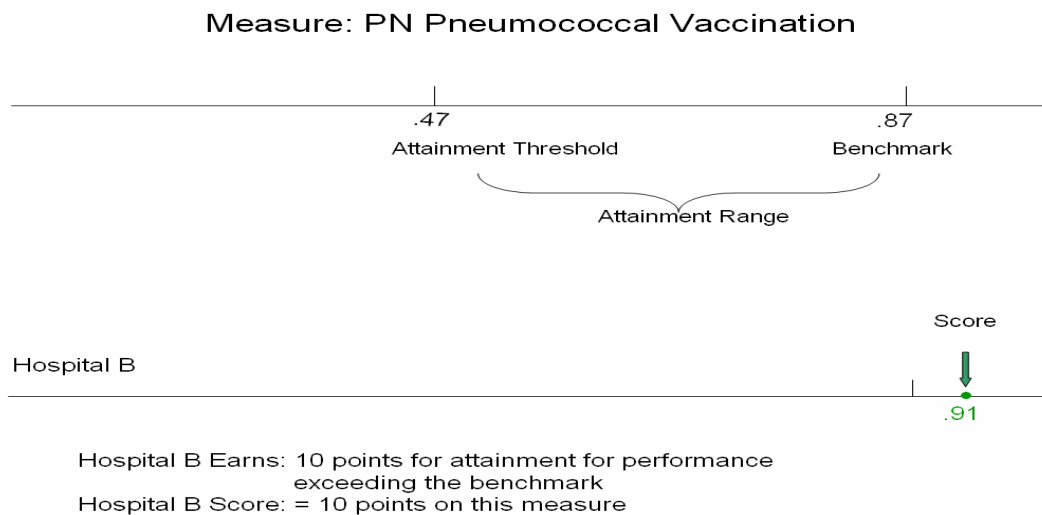
Examples of How the Scoring Model Works

Examples are presented here to illustrate how the proposed Performance Assessment Model would be applied. The hospitals in these examples were selected from the empirical database created from the 2004 and 2005 RHQDAPU data to support Model development. Appendix A demonstrates scoring of four hospitals on five measures and the calculation of the resulting performance score to further illustrate the proposed Model.

¹ If a hospital's performance meets or exceeds the benchmark, no improvement score would be calculated.

In Figure 1, Hospital “B” is scored on the pneumonia measure “patients assessed and given pneumococcal vaccine.” The benchmark calculated for this measure was 0.87, mean value of the top decile in 2004, and the attainment threshold was 0.47, performance of the median hospital in 2004. Hospital B’s measure rate in 2005 was 0.91,² which exceeds the benchmark; thus, Hospital B would earn the maximum of 10 points for attainment. Hospital B’s improvement from its previous year’s score on this measure is not relevant, and would not be calculated, because it has earned the maximum 10 points for the measure.

Figure 1: Example of Hospital Earning Quality Points by Exceeding Benchmark

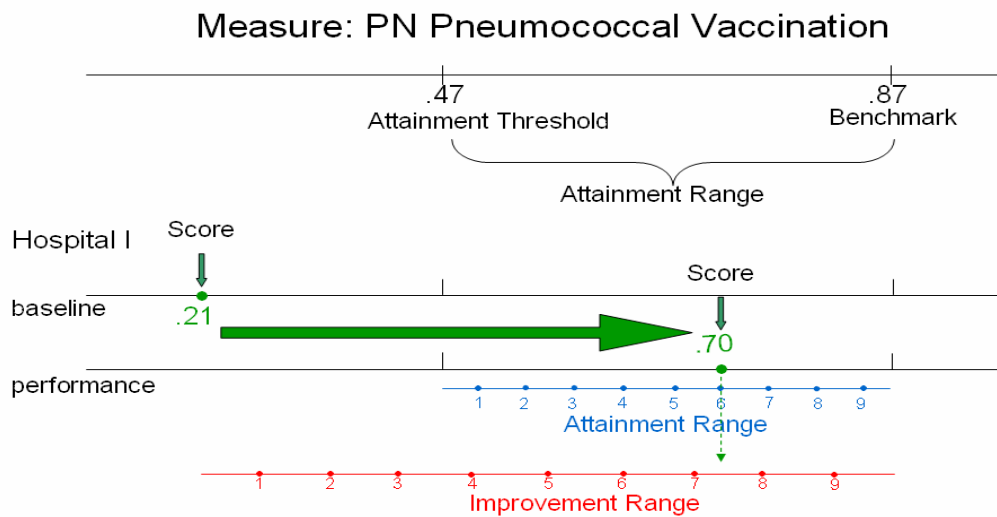


In Figure 2, Hospital I’s points are determined for the same pneumococcal vaccine measure. Hospital I’s measure rate in the previous year was 0.21 and its measure rate in this performance year is 0.70. Because Hospital I’s performance exceeds the attainment threshold of 0.47, its current year performance lies in the attainment range. Applying the attainment scale, Hospital I’s measure rate of 0.70 earns 6 points. Because Hospital I’s

² A hospital’s performance rate on a measure is expressed as a decimal. In the illustration, Hospital B’s performance rate of 0.91 means that 91% of applicable patients admitted for pneumonia were assessed and given the pneumococcal vaccine.

performance is greater than its previous year's performance, it can also be scored on the basis of improvement. Applying the improvement scale, Hospital I's year-to-year improvement from 0.21 to 0.70 earns 7 points. Using the greater of the two scores, Hospital I receives 7 points for this measure (rounded down to the nearest integer).

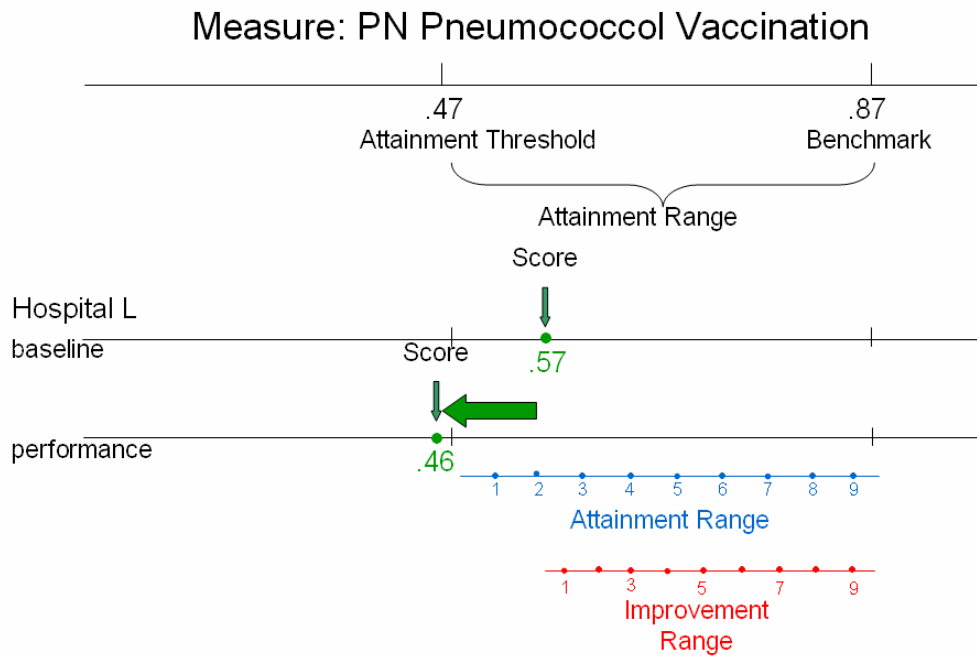
Figure 2: Example of Hospital Earning Quality Points by Attainment or Improvement



Hospital I Earns: 6 points for attainment
 7 points for improvement
 Hospital I Score: maximum of attainment or improvement
 = 7 points on this measure

In Figure 3, Hospital L's performance in the previous year was 0.57, and its performance in the current year is 0.46 (a decline of 0.11 points). Because Hospital L's performance is lower than the threshold of 0.47, it will receive 0 points based on attainment. Hospital L also receives 0 points for improvement, because its performance is lower than its prior year's performance. In this example, Hospital L receives 0 points for the measure.

Figure 3: Example of Hospital Earning No Quality Points



Hospital L Earns: 0 points for attainment
 0 points for improvement
 Hospital L Score: maximum of attainment or improvement
 = 0 points on this measure

Calculation of the Overall VBP Performance Score

A hospital’s overall VBP performance score would be based on all measures that count toward the financial incentive for which the hospital submitted data and for which it had a sufficient number of cases. The number of measures for each hospital would vary, depending on the services that the hospital provides (*e.g.*, some hospitals may not perform percutaneous coronary intervention; this measure, therefore, would not apply to them). As described above, for each applicable measure a hospital receives a score from 0 to 10 based on the higher of the attainment or improvement score. The points earned for each measure would be summed to determine *total earned points*:

Total earned points = Sum of points earned across all reported measures

Each hospital also would have a corresponding universe of *total possible points* which is calculated as:

Total possible points = Total number of measures reported by hospital x 10 pts

The hospital's VBP performance score is a percent computed as follows:

VBP performance score = Total earned points / Total possible points x 100%

Because the performance score is based only on the measures for which a hospital can report, given its patient population and service mix, the scores are normalized across hospitals that report different numbers of measures. To further illustrate the application of the proposed Performance Assessment Model, we have provided hospital scoring examples in Appendix A.

Translation of VBP Performance Score into Incentive Payment

CMS is proposing a method for translating the VBP performance score into the incentive payment, which would provide three parameters that could be varied to achieve policy goals. These are:

- The *minimum performance level* below which a hospital would receive none of the VBP incentive. This parameter allows CMS to lower or raise the bar for the base level of overall performance that is required to earn incentive payments.
- The *benchmark level of performance* required for a hospital to obtain its full incentive amount.
- The *exchange rate* for performance scores between the minimum and benchmark performance levels that would translate the performance score to the percent of the VBP incentive payment earned. The structure of the exchange rate would allow policy makers to determine how difficult it would be to qualify for the full incentive payment. As such, the exchange rate could be 1:1, more than 1:1, or less than 1:1, or could vary across the range of performance scores.

Figures 4 and 5, "Translating Performance Score into Incentive Payment," illustrate how the three parameters could be used under different formulas to translate scores into payments. Potential use of these parameters would give CMS flexibility in determining

how hospitals would receive incentive payments. The horizontal axes in both Figures 4 and 5 represent hospital VBP performance scores ranging from 0% to 100%. The vertical axes represent the percent of the incentive payment earned conditional on quality performance, ranging between 0% and 100%, or potentially greater depending on other policy choices.

In Figure 4, no minimum performance level is required before a hospital would be able to qualify for an incentive payment. The benchmark performance level above which a hospital would earn its full incentive payment is set at 85%, and the exchange rate is a linear function between 0 and 85%. Because hospitals with a performance score of 85% receive 100% of the incentive and the exchange rate is proportional for lower scores, hospitals earn slightly more than 1% of the incentive payment for each 1% increment in their performance score. Below the figure is a table showing the percent of incentive payments earned by the hospitals used in the scoring examples presented in Appendix A.

Figure 4: Example of Linear Approach to Translating Performance Scores into Incentive Payment

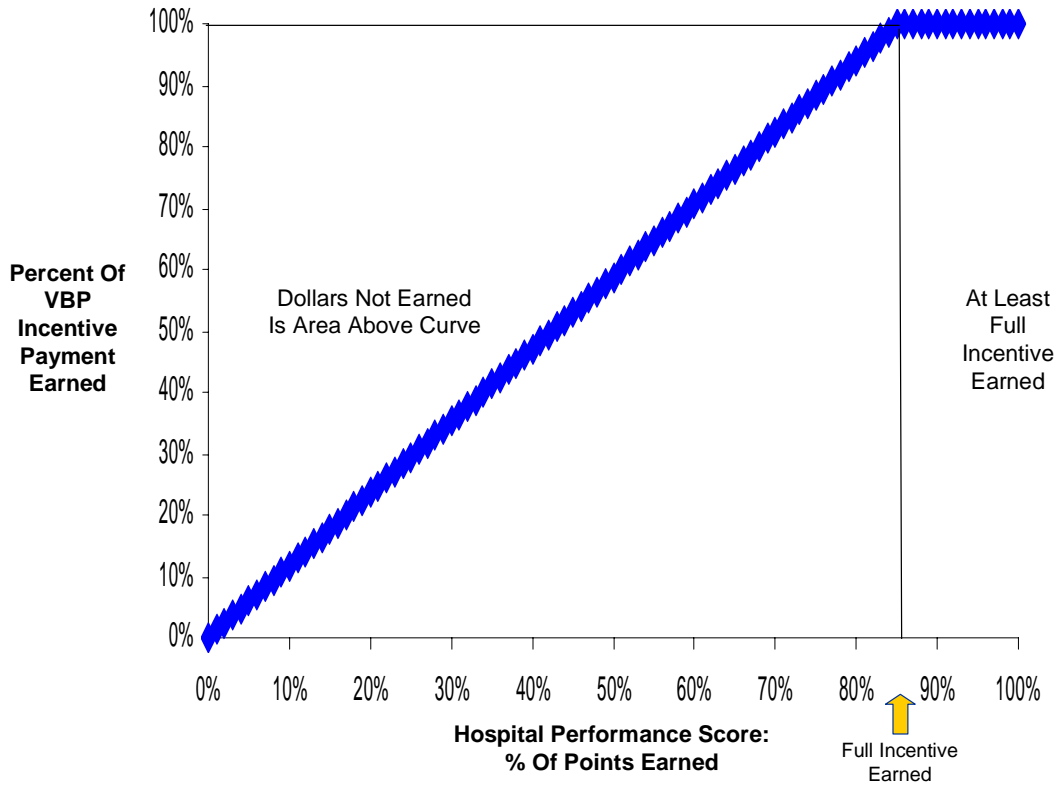


Illustration of Linear Exchange Rate

Hospital	Overall Performance Score (% of total points achieved)	Incentive Payment (% of payment earned)
Hospital B	100%	100%
Hospital A	58%	68%
Hospital I	75%	88%
Hospital L	6%	7%

Figure 5 illustrates a non-linear exchange function to translate performance scores into incentive payments. In this example, the minimum performance level required before a hospital would be able to qualify for an incentive payment is set at 10%, while the benchmark level of performance for a hospital to receive its full incentive is set at 90%.

The shape of the exchange rate would allow policy makers to determine the distribution of the incentive payments. As shown in Figure 5, steeper slopes represent proportionally greater returns to the performance score, and flatter slopes represent proportionally lower returns to the performance score. Creating a steep curve for lower VBP performance

scores could acknowledge the likely higher initial fixed costs associated with launching a significant quality improvement program within a hospital, followed possibly by lower incremental costs associated with ongoing quality assurance. Below Figure 5 is a table showing the percent of incentive payments earned by the hospitals used in the scoring examples presented in Appendix A.

Figure 5: Example of Non-Linear Approach to Translating Performance Scores into Incentive Payment

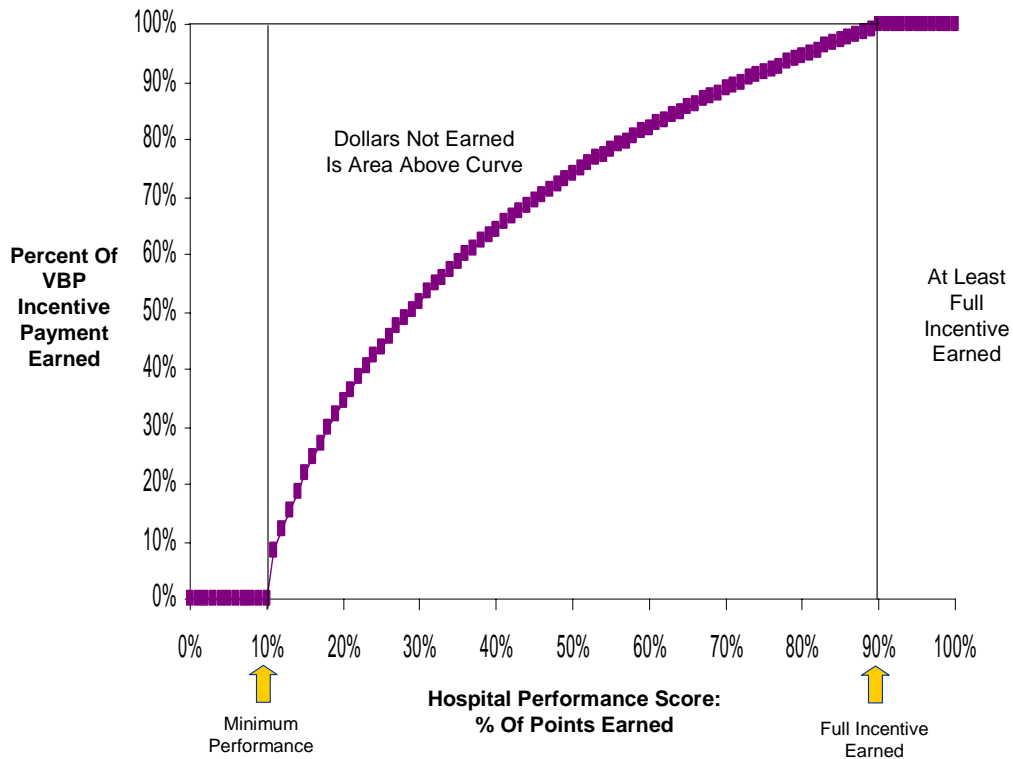


Illustration of Non-Linear Exchange Function

Hospital	Overall Performance Score (% of total points achieved)	Incentive Payment (% of payment earned)
Hospital B	100%	100%
Hospital A	58%	80%
Hospital I	75%	92%
Hospital L	6%	0%

As the exchange rate curves illustrate, some hospitals would not perform well enough to earn the full incentive payment, thereby creating a pool of residual dollars that could be used for a range of policy objectives described below.

Options Regarding Structuring Incentive Payments

CMS is examining several policy options for two key issues related to structuring the incentive payment: 1) the basis of the incentive payment, and 2) the allocation of unearned residual incentive dollars.

Basis of Incentive Payments

It is proposed that the VBP incentive be a percentage of the DRG payment with the percentage allocated to the VBP incentive payment established annually. CMS is seeking comments on which components of the DRG payment should be included as the basis of the incentive. At one end of the spectrum, the incentive could be a percentage of the base DRG payment only, with geographic and DRG relative weight adjustments. This approach would link the incentive payment most directly to the clinical services provided during a patient stay. On the other end of the spectrum, CMS could base the incentive on all components of the IPPS payment:

- Capital costs in addition to operating costs.
- Disproportionate Share Hospital (DSH) payments.
- Indirect Medical Education (IME) payments.
- Outlier payments for cases that are unusually costly

Comments from stakeholders will assist CMS in evaluating the advantages and disadvantages of being narrower or broader in establishing the basis for the quality incentive and the treatment of the specific components.

This approach represents a change from the RHQDAPU Program, which ties payment to the annual payment update. CMS proposes this approach because it provides a mechanism for establishing a percent of payment tied to a quality incentive regardless of the size of the APU, including in years with a zero or negative APU. Similar to the mechanism used in the RHQDAPU Program, the VBP payment incentive would be tied to the reimbursement each hospital receives for the hospitalization of a Medicare beneficiary.

Allocation of Residual VBP Incentive Payments

Not all hospitals will earn the full VBP incentive payment, thereby creating a pool of funds that can generate savings to the Medicare program or that could be distributed in whole or part as an additional quality incentive. Possible options for sharing some or all of this pool with hospitals include:

- 1) Option 1: Distribute to all hospitals based on their VBP performance scores.
- 2) Option 2: Distribute to top performers only, potentially with a cap so that no single hospital receives an unusually large payment.

Option 1 allows for a full distribution of the incentive dollars among all hospitals that earn VBP incentive payments. In the context of the exchange rate function shown in Figure 5, application of Option 1 would shift upward the exchange rate until all incentive dollars are distributed. Option 2 creates a mechanism to identify hospitals that have emphasized quality and to reward them financially. Again referring to Figure 5, the remaining dollars could, for example, be distributed to those hospitals with VBP performance scores that exceed 90% by extending the exchange rate curve beyond the benchmark performance level, rather than capping the incentive at 100% as is currently shown.

VBP Measures

Measures for the VBP Program would be developed from the foundation already established for public reporting. Performance measures currently in use in the RHQDAPU Program are selected from measures endorsed by the National Quality Forum (NQF) for the purposes of public reporting and quality improvement. All measures to be included in the VBP Program would meet the basic requirements for measures used for public reporting. CMS believes that using performance measures as a basis for incentive payments will require a more stringent screening of candidate measures.

CMS is proposing to evaluate candidate VBP measures based on the following selection criteria, many of which already serve as a basis for evaluating the suitability of measures for public reporting and accountability purposes:

- Importance,
- Scientific acceptability,
- Feasibility,
- Improvability,
- Usability,
- Controllability,
- Potential for unintended consequences, and
- Contribution to comprehensiveness.

FY2009 VBP Measures

The proposed selection criteria were applied to 20 RHQDAPU measures for which CMS had 2004-2005 data from Hospital Compare available for analysis and to two additional measures for which data were not available: 1) prophylactic antibiotic selection for surgical patients and 2) influenza vaccination status for pneumonia patients.

Based on the application of these criteria, at this time five current RHQDAPU measures are not recommended for inclusion in the FY2009 VBP measure set on which a financial incentive would be based. The measures and the reasons for their proposed exclusion at this time are presented to illustrate the decision-making process CMS proposes to apply for VBP measure selection:

- **Beta blocker at arrival for Acute Myocardial Infarction (AMI-6):** The clinical evidence base for this measure appears to be changing, and the measure is under evaluation and discussion regarding the need for respecification by the American College of Cardiology (ACC) and American Heart Association (AHA). CMS is following this discussion closely and will await measure stability prior to including in the VBP Program.
- **Left ventricular ejection fraction (LVEF) assessment for Heart Failure (HF-2):** This assessment is encompassed within, and therefore largely redundant with, the ACE inhibitor (ACE-I) or Angiotensin receptor blocker (ARB) measures for

AMI (AMI-3) and heart failure (HF-3). This illustrates that nested services may make little contribution to comprehensiveness of the VBP measure set.

- **Oxygenation assessment for Pneumonia (PN-1):** This measure has topped out³ so completely that there is little opportunity for improvement. Therefore, this measure informs neither CMS nor the public about relative hospital performance and does not require incentives for improvement.
- **Initial antibiotic received within 4 hours of hospital arrival for Pneumonia (PN-5b):** This measure is pending replacement. It currently is undergoing re-specification due to reports of unintended consequences.
- **Prophylactic antibiotic selection for surgical patients (SCIP-Inf-2):** The guidelines for this measure and the availability of specific antibiotics have been unstable over time, so this measure has not been publicly reported. As a result, experience with the measure in public reporting, on which to base performance assessment, is lacking.

Some of these measures may be re-evaluated for inclusion in the VBP depending on the resolution of the issues identified.

Table 2 contains the 20 Fiscal Year 2009 candidate measures proposed to be used in evaluating performance for a financial incentive. All of these measures will be included in the Fiscal Year 2008 RHQDAPU Program. Based on hospital scores for 2005 (see Appendix B), six of the candidate measures have been designated as topped out measures. It is anticipated that as hospitals' performance on the RHQDAPU measures continues to improve over the next two years, more of the proposed measures will be designated topped out prior to the FY2009 implementation of the VBP Program.

³ A measure is considered topped out if the performance of reporting hospitals is very close to a perfect score, such that the value for the 75th percentile is not statistically different from the value for the 90th percentile.

Table 2: Fiscal Year 2009 Candidate Measures for VBP Financial Incentive

Clinical Quality – Process-of-Care Measures		Entered RHQDAPU
<i>Acute Myocardial Infarction (AMI)</i>		
AMI-1	Aspirin at arrival*	11/2004
AMI-2	Aspirin prescribed at discharge*	11/2004
AMI-3	ACE inhibitor (ACE-I) or Angiotensin receptor blocker (ARBs) for left ventricular systolic dysfunction*	11/2004
AMI-4	Adult smoking cessation advice/counseling*	4/2005
AMI-5	Beta blocker prescribed at discharge*	11/2004
AMI-7a	Thrombolytic agent received within 30 minutes of hospital arrival	4/2005
AMI-8a	Primary percutaneous coronary intervention (PCI) received within 90 minutes of hospital arrival	4/2005
<i>Heart Failure (HF)</i>		
HF-1	Discharge instructions	4/2005
HF-3	ACE inhibitor (ACE-I) or Angiotensin receptor blocker (ARBs) for left ventricular systolic dysfunction	11/2004
HF-4	Adult smoking cessation advice/counseling*	4/2005
<i>Pneumonia (PN)</i>		
PN-2	Pneumococcal vaccination status	11/2004
PN-3b	Blood culture performed in emergency department before first antibiotic received in hospital	4/2005
PN-4	Adult smoking cessation advice/counseling	4/2005
PN-6	Appropriate antibiotic selection	9/2005
PN-7	Influenza vaccination status	1/2006
<i>Surgical Care Improvement / Surgical Infection Prevention (SCIP/SIP)</i>		
SCIP-Inf-1	Prophylactic antibiotic received within 1 hour prior to surgical incision	9/2005
SCIP-Inf-3	Prophylactic antibiotics discontinued within 24 hours after surgery end time	9/2005
	30-day AMI mortality	6/2007
	30-day HF mortality	6/2007
	HCAHPS	12/2007

Note: * Denotes topped out measure. All of the process-of-care measures with the exception of the influenza vaccine and the prophylactic antibiotic selection measures were used in analysis that supported development of the proposed Performance Assessment Model.

Beyond these candidate measures, the measure set for Fiscal Year 2009 would also include hospital outpatient measures currently under development, as required by Section 109 of the Tax Relief and Health Care Act of 2006.

Additional Measures for Fiscal Year 2010 and Beyond

As shown below in Table 3, the VBP measure set is expected to evolve rapidly beyond the relatively limited set of conditions and services now covered. Expanding the number and types of measures would support a more comprehensive approach to measuring hospital performance, as envisioned by the goals of the VBP Program.

Table 3: Evolution of VBP Measures Over Time

FY2010 – FY2011	FY2012 and Beyond
<ul style="list-style-type: none"> • Efficiency measures • Outcome measures • Emergency care measures • Care coordination measures • Patient safety measures • Structural measures 	<ul style="list-style-type: none"> • Performance areas where gaps are identified and new measure development is expected to be needed

CMS understands that introducing new measures into VBP for Fiscal Year 2010 and beyond would require the development and/or thorough evaluation of additional measures. CMS is committed to working with consensus organizations and other stakeholders to identify gaps in measures, prioritize areas for measure development, and identify existing measures for inclusion in VBP. All newly developed measures would be tested prior to their introduction into VBP. New measures also would be submitted to NQF for endorsement. CMS would continue to collaborate with the Joint Commission to align measure specifications for those measures that CMS has in common with the Joint Commission and would maintain measures to ensure that specifications are consistent with scientific evidence and coding systems. Updates to measure specifications and the technical manual would be maintained in the public domain.

Figure 6 illustrates the staged approach that CMS is proposing to introduce newly developed measures into the VBP Program. Measures would be introduced into VBP using a staged approach.

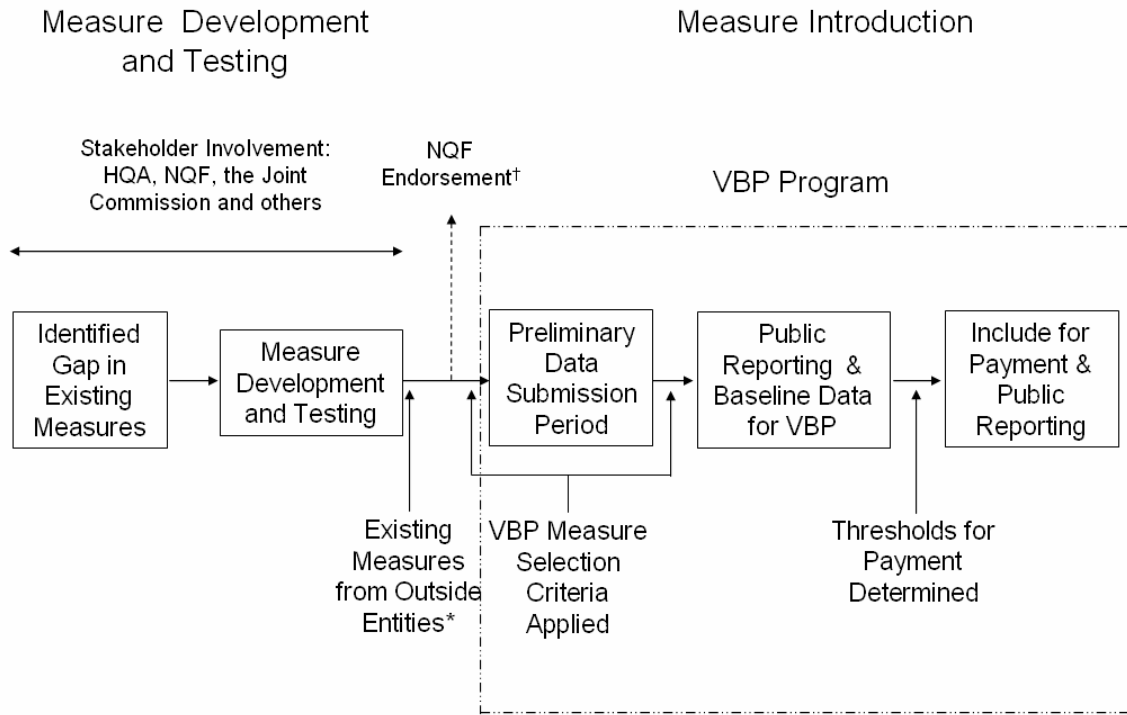
- First, measures would undergo a “preliminary data submission period” without public reporting or the application of performance-based incentives. This time

would allow hospitals to become familiar with the measure specifications and data submission requirements in advance of public reporting and performance incentives. Hospitals would be required to submit data to CMS during the preliminary data submission period to be eligible for the VBP incentive as a whole.

- Second, the new measures would be publicly reported for a period before they would be included for the financial incentive.
- Third, measures would be included in the financial incentive. It is possible that not all measures would take this last step if it is determined that, although they add value by being publicly reported, they are not appropriate for the financial incentive.

For measures progressing to the financial incentive component of the VBP Program, this period of public reporting would provide national data for use in determining a new measure's benchmark and attainment threshold and would also establish each hospital's baseline score on a measure for determining improvement in the subsequent year.

Figure 6: Proposed Process for Introducing Newly Developed Measures into VBP

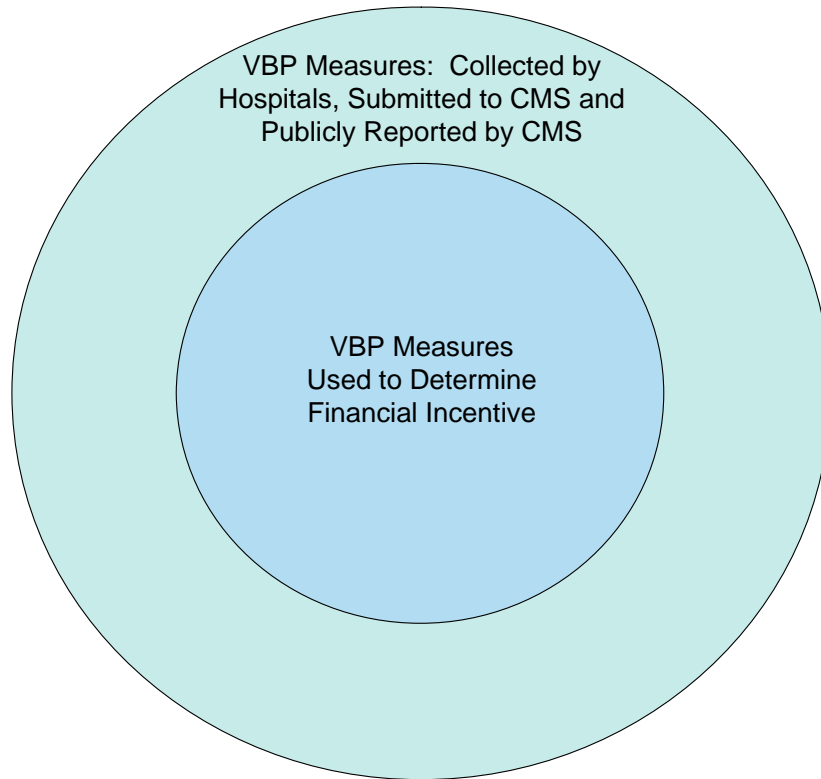


*Measures without substantial field experience will be tested as needed

†Measures will be submitted for NQF endorsement, but need not await final endorsement before proceeding to the next step in the introduction process

CMS anticipates that measures would be retired from the VBP Program over time for a variety of reasons, including changes in science and changes in policy objectives. Using the VBP measures selection criteria, CMS would periodically reassess measures to determine their appropriateness for continued use in the VBP program. CMS may determine that a measure no longer warrants a financial incentive even though the measure continues to have value for public reporting. In this case, hospitals still would be required to report data on the measure in order to be eligible for the VBP financial incentive. Thus, as Figure 7 illustrates, not all measures included in the VBP program would necessarily be used for scoring to determine the amount of financial incentive, but all except those in the preliminary data submission period would be publicly reported.

Figure 7: Universe of VBP Measures



Small Numbers on Individual Performance Measures

Under the current RHQDAPU Program, many hospitals report a small number of cases in the measure denominator for one or more of the measures proposed for use in VBP. Small numbers on individual measures occur for a variety of reasons, including low patient volumes, the use of sampling, and the use of discretionary exclusions for patients who are otherwise eligible for a measure. For hospitals with small numbers of cases that can be scored for a given performance measure, the performance estimate that is calculated could be highly variable. Very low numbers of cases provide only limited approximations of the true underlying performance of the hospital.

CMS is aware that some hospitals may have too few cases for certain measures to produce a stable estimate of performance. This issue was raised in comments CMS received at the January 17, 2007 Listening Session. Currently, CMS is exploring various

approaches to address the problem of small numbers to enable the participation of small hospitals in the VBP Program. At this stage, CMS is asking for input on the small number issue. Over the next few months a broad range of options will be evaluated and will be addressed in the final VBP Report.

One option that CMS has initially explored in the context of the existing process-of-care measures would be to combine reporting on a minimum number of cases and/or minimum number of measures to determine whether a hospital could be scored for the VBP incentive payment. This approach would be applied as follows:

- Require a minimum of 10 cases per measure (in the measure denominator, after exclusions) reported and included for VBP, AND
- Require a minimum of 5 reported measures (with 10 or more cases each) OR a minimum of 50 unique effective cases (associated with fewer than 5 reported measures) for full involvement in VBP.

The allowance for 50 cases separately from the requirement of 5 measures would enable full participation by hospitals with limited service lines, such as specialty hospitals, which may have sufficient volumes to report on a restricted set of measures. CMS' objective would be to maximize the use of information available from hospitals, while limiting risk related to truly sparse information.

Table 4 illustrates the number of measures that hospitals would be scored on if CMS applied a minimum requirement of 10 cases in the denominator of a measure.⁴ The numbers in the table are based on analysis of the 2005 Hospital Compare data for 16 measures. The number of measures on which hospitals could be scored will likely increase by the time the VBP Program would start in Fiscal Year 2009 for the following reasons:

- Reporting on some of the 16 measures was voluntary in 2005 (*i.e.*, outside of RHQDAPU), so reporting in subsequent years is likely to be more complete;

⁴ Table 4 does not display urban and rural hospitals separately because hospitals of the same bed size reported similar number of measures, irrespective of locale.

- Additional measures would be entering the VBP measure set for which small hospitals are likely to have adequate numbers of patients (*e.g.* emergency care measures).

However, it is likely that a small percentage of hospitals may not have a sufficient number of measures on which they could be scored to participate fully in the VBP financial incentive, and this situation will disproportionately affect small hospitals. CMS appreciates that this is an issue and asks for comments on how these hospitals could participate as the measure set expands. CMS also seeks comments on alternative approaches to including these hospitals in the VBP financial incentive, such as:

- Rolling up data over multiple time periods,
- Reducing or eliminating the minimum case requirement and minimum measure requirement, but implementing a smaller financial incentive for hospitals with small numbers of measures to recognize that the reliability of the performance scores may be compromised by small numbers, or
- Providing a small number waiver.

Table 4: Effect of Small Numbers by Hospital Bed Size

Number of measures able to be scored	All Hospitals		1-99 Beds		100-199 Beds		200+ Beds	
	Number of hospitals	%	Number of hospitals	%	Number of hospitals	%	Number of hospitals	%
0 measures	49	1.4	42	3.5	7	0.7	0	0.0
1-2 measures	165	4.9	154	13.0	10	0.9	1	0.1
3-4 measures	82	2.4	70	5.9	10	0.9	2	0.2
5-6 measures	303	9.0	170	14.3	83	7.7	50	4.5
7-8 measures	289	8.5	235	19.8	46	4.3	8	0.7
9-10 measures	491	14.5	276	23.2	171	15.9	44	3.9
11-12 measures	551	16.3	182	15.3	276	25.7	93	8.3
13-14 measures	899	26.6	49	4.1	315	29.4	535	47.6
15-16 measures	556	16.4	11	0.9	155	14.4	390	34.7
	3385	100.0	1189	100.0	1073	100.0	1123	100.0

Note: Data represent a count of hospitals having a minimum of 10 cases to score a measure.

Transitioning from RHQDAPU to VBP

A number of approaches could be taken to transition from the current RHQDAPU Program to the proposed VBP Program. Two options are described below:

1) **Option 1:** A phased approach, illustrated as follows:

- **Fiscal Year 2009** — 1st reporting year for VBP
 - 100% of the VBP incentive payment would be based on reporting of all VBP measures;
 - Measures reported in Fiscal Year 2009 would serve as the basis for determining Fiscal Year 2010 attainment scores;
 - FY2008 RHQDAPU measures would serve as the baseline period for computing year-to-year improvement between Fiscal Year 2008 and Fiscal Year 2009.
- **Fiscal Year 2010** — 2nd reporting year for VBP
 - The incentive payment would be based 50% on performance and 50% on public reporting of all VBP measures.
- **Fiscal Year 2011** — 3rd reporting year for VBP
 - The incentive payment would be based 100% on performance, conditional on hospitals submitting data on all measures for which they are eligible to report.

2) **Option 2:** An aggressive approach, illustrated as follows:

- **Fiscal Year 2009** — 2nd reporting year for VBP
 - The VBP incentive payments would be based 100% on performance;
 - Measures reported for Fiscal Year 2008 RHQDAPU would provide the basis for determining a hospital's attainment scores;
 - Measures reported for Fiscal Year 2007 RHQDQPU would provide the baseline data for calculating improvement scores between Fiscal Year 2007 and Fiscal Year 2008;

- This approach would limit the Fiscal Year 2009 measure set for performance assessment to those measures that are in the Fiscal Year 2007 RHQDAPU Program to enable scoring on improvement as well as attainment.

Under either approach, hospitals would submit data on all VBP Program measures appropriate to their patient population and service mix, including new measures being introduced, as a requirement for participation in the incentive program. As is illustrated in Figure 6, the design of the VBP Program would ensure that all performance measures have a preliminary data submission period (with no public reporting) to allow hospitals and their data support vendors to get familiar with the data specifications. Additionally, new VBP measures would be publicly reported for a period prior to inclusion in the financial incentive portion of the program.

Redesign of the Data Infrastructure to Support VBP Program

Although the VBP Program is proposed to build upon the existing RHQDAPU Program, CMS recognizes that the existing data infrastructure would need to be modified and strengthened to fully support the VBP Program requirements. In particular, it would be important to ensure the accuracy and improve the timeliness of the data used for making incentive payment determinations and for public reporting.

Streamlined and Improved Data Submission Process

CMS is proposing several options to minimize time lags associated with data submission and validation to improve the overall submission process and to tie financial incentives more closely to the recent performance of a hospital.

Compress the Data Submission Period: The structure of the RHQDAPU Program currently allows hospitals 4.5 months (135 days) to submit data following the close of each quarter. This timetable hampers CMS' ability to provide hospitals timely feedback for quality improvement purposes and to make timely determinations for the Annual Payment Update. Under the VBP Program, CMS is proposing to decrease the submission period to 60 days following the close of the reporting period and to move from the

current quarterly submission process to a monthly process. Both steps would significantly improve CMS' ability to provide more timely feedback and allow for the use of more recent data for public reporting and incentive payment determinations.

Allow Data Resubmissions: CMS understands that there are situations in which a hospital or its vendor makes an error during the submission process. The current RHQDAPU process does not allow for data resubmission. Under the VBP Program, CMS is proposing to allow hospitals up to 30 days after the close of each data submission period (prior to the lock down of the data to determine incentive payments) to resubmit their data. Resubmissions would not be allowed once the annual payment determination deadline is reached (*i.e.*, August 1st of each year).

Improve Data Submission Feedback Reports: Under the VBP Program, CMS would redesign feedback reports and tools to give hospitals a real-time scorecard to assess the completeness of their data submissions and for determining whether the hospital has met its annual VBP reporting requirements. The scorecard would also display preliminary measure rates with comparisons to benchmarks and a hospital's previous performance. The scorecard would be simple to make it user-friendly. It would serve as an important tool for hospitals to identify whether they need to make data corrections, and it could be used for quality improvement purposes. CMS would also improve feedback by using customized e-mails to "push" information to hospitals detailing current status in relation to the VBP program requirements, which could include notifying hospital senior leadership by e-mail about their current compliance status with the annual VBP reporting requirements.

Enhance User Support: For the VBP Program, CMS would expand its existing data submission infrastructure to provide full-level user support during business hours in all time zones (7 a.m. Eastern-7 p.m. Hawaiian).

Strengthening Data Validation

Under the RHQDAPU Program, CMS conducts validation at the data element level on a small number of records for every hospital that participates in RHQDAPU. The current

strategy calls for review of 20 randomly selected charts per year, which is too small a number to assess the accuracy of the performance measure rate. This level of validation is considered insufficient for the purposes of the proposed VBP Program.

CMS is proposing a revised methodology to strengthen the validation to assess the accuracy of measure rates and to minimize the likelihood of gaming among hospitals.

CMS is proposing to use the following approach to auditing hospital data:

- Select hospitals on both a “targeted” and “random” basis. For each hospital selected, CMS would review approximately 50 charts per year. The dual audit selection strategy for auditing would serve two functions: (1) to minimize gaming and (2) to enable CMS to more completely assess the overall quality of data submissions across the broader population of hospitals. CMS would target hospitals for audit if their submitted data indicated they would likely receive an unusually high incentive payment amount or if they had unusual data patterns, such as an abnormally high rate of exclusions.
- This approach would ensure that in any given year, all hospitals have an opportunity to be selected in the sample. The annual audit would include approximately 800 hospitals per year; a hospital would have roughly a 1 in 5 chance of being reviewed in any given year. If issues were uncovered in the audit year data, the previous years’ data could be examined.
- The audit would focus on the accuracy of abstraction to calculate measure rates (80-90% accuracy rate). The current RHQDAPU approach focuses on accuracy of the many individual elements used to construct a measure, rather than determining the accuracy of a measure rate.

CMS is also proposing to conduct the validation and appeals process post-payment to avoid having the validation process delay incentive payment determinations and public reporting. A hospital that fails audit would incur adjustments to the next year’s payment and would have its performance results suppressed for reporting on Hospital Compare for the following 12 months. To streamline the process and ensure greater continuity, CMS is also proposing that a small number of contractors would perform these audits, and that

other organizations besides the Quality Improvement Organizations (QIOs) would be eligible to bid for these contracts.

Strengthening the Ability to Compute Stable Performance Rates: Sampling Methodology

To improve the stability of performance estimates, CMS is proposing to increase the minimum required sample size for each measure under the VBP Program. Under the current RHQDAPU Program, a substantial number of hospitals have small effective sample sizes (fewer than 25 cases per condition) on which to estimate performance rates. This may be a function of hospitals either not submitting enough cases to comply with sampling requirements or applying exclusion criteria too broadly. As part of the VBP Program, CMS would require that hospitals submit aggregate population and sample counts so that compliance with data submission and sampling requirements could be assessed. In addition to increasing the minimum required sample size, the VBP Program would also penalize hospitals for not complying with sampling requirements—which would be determined in the context of data validation.

CMS Program Infrastructure - QIO Technical Assistance

CMS would continue to provide technical assistance in improving quality of care and quality measurement through its 53 QIOs. Hospitals have relied on the QIOs for many years to provide experts and hands-on support at the local grass roots level. This level of support would continue to be required in the VBP Program to improve quality measurement and quality of care.

Creating a Single Hospital Quality Data Repository and Data Infrastructure

In an effort to minimize burden on hospitals, CMS is seeking comment on the desirability of creating a single hospital quality data repository, data infrastructure, and validation methodology in collaboration with the Joint Commission and other stakeholders.

Public Reporting

CMS believes that public reporting is an important tool for motivating hospitals to improve quality of care and for helping Medicare beneficiaries to choose a quality provider. CMS proposes to build upon the existing Hospital Compare website as the platform for displaying performance results. CMS would pursue a public reporting strategy that:

- Addresses the needs of multiple stakeholder audiences,
- Employs display methods and/or decision supports that facilitate fair and accurate decision-making, and
- Tests understanding of performance data displays.

Content: Measures that can meaningfully contribute to informed consumer decision-making would be part of the VBP Program and publicly reported on the CMS Medicare Hospital Compare website, regardless of whether they are included in determining VBP financial incentive payments. Measure results, reflecting hospital performance in a given year, would be displayed in a manner understandable to a consumer audience. Data meaningful primarily to other audiences or for other purposes, such as health services research, would be handled differently and presented on another CMS website.

CMS expects that in Fiscal Year 2009 the Hospital Compare website would contain performance results for the existing RHQDAPU measures, the HCAHPS patient experience survey, and 30-day mortality measures for acute myocardial infarction and heart failure. As new measures are introduced to the VBP Program, the Hospital Compare site would expand to include the additional content. CMS also would explore the usefulness of presenting trend data on the Hospital Compare site.

To convey quality data in a manner that is easily understood by consumers, the presentation of performance results, as well as the thresholds and benchmarks used for public reporting, may differ from those used to score hospitals for incentive payment determination. For example, the actual mean of the top decile and median of the distribution for topped out measures could be displayed rather than the 0.90 benchmark

and 0.60 attainment threshold proposed for use in scoring. In addition, performance based on attainment, but excluding improvement, could be summarized for public reporting at the condition-specific or hospital-specific levels. CMS seeks input on ways to explain, in a user-friendly way, the concepts of measurement imprecision and statistical confidence.

Addressing the Small Numbers Problem: An earlier section of this Options Paper described how CMS is proposing to address the issue of small numbers for the purposes of scoring performance for an incentive payment. In the context of public reporting, there may be situations where it would be appropriate for CMS to suppress data for hospitals with small numbers because their performance estimates would not be sufficiently stable to inform consumer choice. Unless a hospital's data are suppressed because the submission failed validation, CMS proposes to describe the reason for data suppression using neutral language.

Data Displays: CMS would work to modify data displays so that Medicare beneficiaries could more easily interpret performance results. Strategies that CMS is proposing to achieve this goal include:

- Using composites (summary measures);
- Providing decision support tools that would allow beneficiaries to sort data within specific regions to match their preferences (*e.g.*, sorting hospitals alphabetically, or to sort by performance on a particular measure or on a composite of measures);
- Using benchmarks to help consumers interpret results.

Composites for public reporting would be tested to insure that they help consumer understanding. CMS seeks comments on the design, tailoring, and testing of decision support tools and other consumer-friendly enhancements for the Hospital Compare website.

Other Issues Related to Transparency: Stakeholders have expressed interest in more detailed and/or additional data related to the VBP Program. CMS notes the following regarding additional information that would be made available to the public:

- CMS proposes that information about the specific amounts of VBP incentive payments to hospitals be published on www.cms.hhs.gov.
- CMS recognizes the value and importance of making Hospital Compare data available for research and evaluation purposes. Making archived quarterly data available in a SAS format on the www.cms.hhs.gov is currently being addressed.

APPENDIX A: Example of Scoring Hospital Performance

Measure	Benchmark*	Attainment Threshold*	Hospital A					Hospital B					Hospital I					Hospital L				
			Performance*		Points			Performance*		Points			Performance*		Points			Performance*		Points		
			Baseline	Current	Attainment	Improvement	Awarded	Baseline	Current	Attainment	Improvement	Awarded	Baseline	Current	Attainment	Improvement	Awarded	Baseline	Current	Attainment	Improvement	Awarded
^Patients Given Aspirin at Arrival-AMI	.90	.60	.77	.75	5	0	5	.99	.99	10	na	10	.40	.78	6	7	7	.78	.60	0	0	0
^Patients Given ACE Inhibitor for LVSD-AMI	.90	.60	.78	.77	6	0	6	.67	1.0	10	na	10	Too few patients to include in calculation of performance score					.33	.38	0	1	1
^Smoking Cessation-HF	.90	.60	.81	.73	4	0	4	.65	.99	10	na	10	.11	.75	5	8	8	.60	.62	1	1	1
Patients Assessed and Given Pneumococcal Vaccination-PN	.87	.47	.69	.67	6	0	6	.88	.91	10	na	10	.21	.70	6	7	7	.57	.46	0	0	0
Surgery Patients who Received Antibiotic(s) one Hour Before Incision-Surgery	.96	.77	.96	.92	8	0	8	.96	.97	10	na	10	.25	.85	4	8	8	.81	.79	1	0	1
Potential Points			50					50					40					50				
Points Earned			29					50					30					3				
Performance Score			58%					100%					75%					6%				

*Benchmarks, Attainment Thresholds and Baseline Performance based on 2004 Hospital Compare Data; "Current" Performance based on 2005 Hospital Compare Data. ^Denotes measures that are topped out.

APPENDIX B: 2005 Quality Scores by Measure
All Hospitals Reporting in both 2004 and 2005

Condition	Measure Name	n*	5th pcntl	10th pcntl	25th pcntl	Median	75th pcntl	90th pcntl	95th pcntl
Heart Attack	Patients Given ACE Inhibitor or ARB for Left Ventricular Systolic Dysfunction (LVSD)	2781	0.50	0.57	0.74	0.85	0.95	1.00	1.00
	Patients Given Adult Smoking Cessation Advice/Counseling	2200	0.34	0.50	0.81	0.94	1.00	1.00	1.00
	Patients Given Aspirin at Arrival	3204	0.75	0.84	0.91	0.96	0.98	1.00	1.00
	Patients Given Aspirin at Discharge	3137	0.63	0.73	0.87	0.95	0.99	1.00	1.00
	Patients Given Beta Blocker at Arrival	3198	0.59	0.71	0.84	0.92	0.97	1.00	1.00
	Patients Given Beta Blocker at Discharge	3146	0.60	0.71	0.86	0.94	0.98	1.00	1.00
	Patients Given PCI Within 120 Minutes Of Arrival	1092	0.29	0.40	0.56	0.69	0.80	0.88	0.91
	Patients Given Thrombolytic Medication Within 30 Minutes Of Arrival	1107	0.00	0.00	0.00	0.33	0.50	0.73	1.00
	Heart Failure	Patients Given ACE Inhibitor or ARB for Left Ventricular Systolic Dysfunction (LVSD)	3218	0.58	0.65	0.75	0.83	0.91	0.97
Patients Given Adult Smoking Cessation Advice/Counseling		2688	0.38	0.50	0.71	0.86	0.96	1.00	1.00
Patients Given Assessment of Left Ventricular Function (LVF)		3305	0.49	0.66	0.81	0.90	0.96	0.98	0.99
Patients Given Discharge Instructions		2705	0.10	0.20	0.40	0.59	0.77	0.89	0.95
Pneumonia		Patients Assessed and Given Pneumococcal Vaccination	3287	0.13	0.23	0.44	0.62	0.77	0.88
	Patients Given Adult Smoking Cessation Advice/Counseling	2686	0.38	0.48	0.65	0.82	0.93	0.99	1.00
	Patients Given Initial Antibiotic(s) within 4 Hours After Arrival	3290	0.53	0.61	0.69	0.77	0.85	0.90	0.92
	Patients Given Oxygenation Assessment	3302	0.95	0.97	0.99	1.00	1.00	1.00	1.00
	Patients Given the Most Appropriate Initial Antibiotic(s)	2661	0.61	0.67	0.76	0.82	0.86	0.90	0.92
	Patients Having a Blood Culture Performed Prior to First Antibiotic Received in Hospital	2723	0.67	0.72	0.78	0.84	0.89	0.92	0.94
	SIP	Surgery Patients Who Received Preventative Antibiotic(s) One Hour Before Incision	644	0.45	0.59	0.74	0.84	0.91	0.94
Surgery Patients Whose Preventative Antibiotic(s) are Stopped Within 24 hours After Surgery		601	0.29	0.42	0.58	0.73	0.84	0.91	0.95

* Number of hospitals reporting out of 3518 hospitals; A subset of these measures were not in RHQDAPU but were voluntarily reported in 2004 and 2005.