



## California Physician Performance Initiative (CPPI) COMPOSITE SCORE METHODOLOGY: QUESTIONS AND ANSWERS

The purpose of this document is to explain the methodological approach used to score physicians using composite measures of clinical quality performance.

### **Q. What is a composite score?**

- A. A composite score is a measure of performance that combines a number of individual measures into a blended score. The composite is based only on the measures for the particular patients that each physician sees during the measurement period.

### **Q. What are the key elements of the CPPI method for constructing a composite score?**

A. *The key elements of the composite scoring method are:*

- i. Individual quality measures are organized into 4 clinical domains – prevention, diabetes, cardiovascular and respiratory (see Appendix A),*
- o The clinical domains organization helps to ensure that the individual measures are related to a single underlying quality construct (e.g., diabetes care),*
  - o To address the potential for differences among specialties PCPs are measured on all four composites and specialists are measured separately: cardiologists on cardiac care, endocrinologists on diabetes care, and allergists/pulmonologists on respiratory care.*
  - o The individual measures within each composite are positively correlated or associated with one another. Correlations were examined at both the patient and physician level. The correlations suggest an association among all of the measures in a composite through a common underlying measure of domain-specific quality.<sup>1</sup>*

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<sup>1</sup> *The correlations tended to be positive and small to moderate, but not strong. This is important because: 1) negatively correlated measures would be conflicting, 2) perfectly correlated measures would be redundant, and 3) the composite methodology assumes that the individual measures within a composite are uncorrelated conditional on the physician's true underlying quality.*

- ii. *Physicians who have results for at least half of the composite's individual measures are eligible for the composite scoring. (Note: Physicians that were attributed fewer than 10 unique patients were omitted from composite scoring),*
- iii. *Composite scores are based only on measures for which a physician has patient cases,*
- iv. *A physician's scores for each measure within the composite are combined using a statistical method called Item Response Theory (IRT). The features of this approach are described in more detail below. IRT models are commonly used in education to estimate a latent trait like a student's math ability, based on responses to a set of math questions. For physician performance, the underlying physician trait is quality of care and the individual measures are akin to the role of test questions in the math example.*

**Q. Why use composites to score physicians on their performance?**

**A. Composites**

- i. *Strengthen the estimate of a physicians "true" performance (i.e., improve the reliability<sup>2</sup> of measures), to better distinguish performance among physicians;*
- ii. *Are succinct; they are used to communicate results in a summary form, which is easier to digest;*
- iii. *Help to generalize the level of performance for a particular area of patient care by making inferences beyond the individual measures (e.g., a set of diabetes measures, when combined, can represent a physician's diabetes care).*

**Q. Can composite measures help a physician identify ways to improve patient care?**

- A.** *To be useful to physicians for their own patient care improvement work, composites should be accompanied by their component parts – the individual measure results. CPPI composite reports include the individual measure results along with the composite scores.*

**Q. Physicians have different mixes of patients, some more clinically complex. Physicians also have different mix of measures with varying levels of difficulty in performing these measures. Does the composite method address for these types of differences across physicians that might affect a physician's score?**

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<sup>2</sup> Reliability is a key measure of the scientific soundness of a measure and is represented as a ratio of signal-to-noise. The signal in this case is the proportion of the variability in quality that can be explained by real differences in performance. A reliability of zero implies that all of the variability in a measure is attributable to measurement error. A reliability of one implies that all of the variability is attributable to real differences in performance.

A. *Yes, the composite method accounts for the inherent difficulty of each individual measure. Some measures are more difficult to achieve a high score; the difficulty is gauged by the average performance across all physicians on a particular measure. Additionally, the method gives more weight in the calculation to individual measures for which the information is more reliable. Individual measure estimates that are based on more patients (i.e., a larger patient sample) provide a more precise estimate of performance and better distinguishes results among physicians. The measures with higher reliability are weighted more heavily in the calculation.*

**Q. Physician results based on a small number of patients (i.e., sample sizes) have more measurement error which increases the likelihood of misclassifying a physician's performance. Does the composite method address this problem?**

A. *Yes, the method gives more weight in the calculation to individual measures for which the information is more reliable. Individual measure estimates that are based on more patients (i.e., larger patient sample) will provide a stronger estimate of performance and better distinguishes performance.*

**Q. Does this composite method score physicians on the types of patients they see or on a "standard population of patients?"**

A. *The CPPI composite method scores physicians on the actual types of patients they see. The method does not use a standard patient population rate.*

**Q. Does the composite score represent a physician's actual patient results?**

A. *Not entirely; the method primarily evaluates a physician on the patients they see; for those measures in which the physician sees fewer patients (less information) the method 'borrows' information from peers who treat similar patients.*

**Q. Why does the composite method 'borrow information from other physicians to score a given physician?**

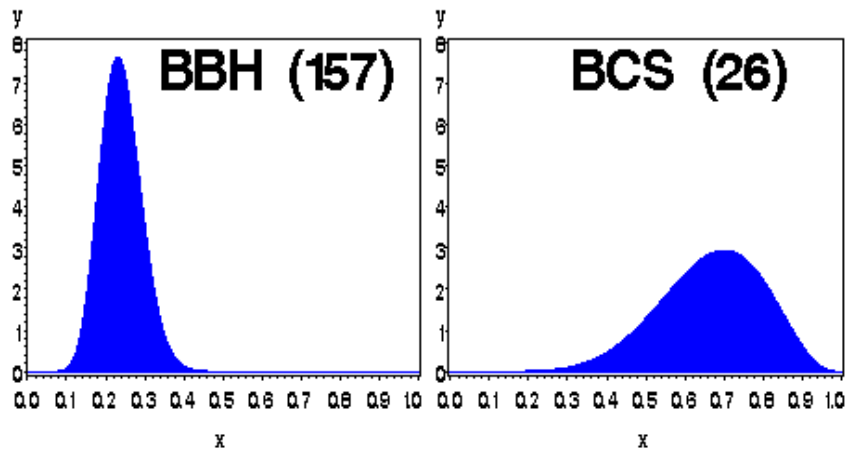
A. *The composite relies only on measures for which a physician has a score. The method 'borrows' information to handle measures with few observations for a given physician. The method uses all of the available information for that physician and it combines information about the physician's score with the entire distribution of physician scores to minimize the measurement error. It gives more credit to the physician's individual score when it is based on a large sample or when scores vary greatly among physicians and it gives it less credit when the score is based on a small sample or when scores vary little among physicians.*

**Q. Composites combine multiple measures – how are the measures weighted to combine them?**

A. *Individual measures are weighted to form a composite. "Weights" are derived empirically, based on the properties of the measures data. They are not determined by*

an expert or other third-party. The properties determine the amount of influence each measure is given in the composite. Among the composites key properties are:

- The degree of difficulty in performing each measure, as determined by the mean score across all physicians. Measures with low average performance suggest high scores are more difficult to achieve; and,
- The ability to differentiate performance among physicians—or the spread in performance. Those measures that have wide variation in performance among physicians better distinguish performance with smaller sample sizes; in contrast, for measures with little variation it is difficult to distinguish performance absent very large sample sizes. As the graph below illustrates, Breast Cancer Screening (BCS) requires only 26 patients in the denominator to achieve a reliable estimate due to the wide variation in performance among physicians, while Beta Blocker after a Heart Attack (BBH) requires 157 patients. The BBH's smaller variation in scores is seen in the concentration of results in the 10-40% score range.



**Q. Do certain measures have greater weight/impact than other measures when scoring a composite?**

A. Yes, measures that are more difficult to achieve and that better distinguish performance are more heavily weighted.

**Q. How does the composite scoring work for measures in which most physician scores are similar?**

A. Measures for which physicians have similar scores (high or low), have less influence on the composite score. In this situation the measure does not discriminate well – there is less physician-to-physician variation in scores and this dampens the influence that that measure has on the composite score.

**Q. What does the practice site level composite score mean?**

- A. *The practice site composite score is the result for a set of patients, who are attributed to two or more physicians who share a practice, for the clinical domain that the composite represents. It is an aggregated practice site result not a physician-level result. Patients are attributed to the practice site where the patient was seen most frequently. Regardless of whether the patient was seen by one or more physicians in that site, that patient's results are attributed to every physician in the practice site. As such, each physician is assigned the same composite score which represents the combined experience of all patients scored for a given composite.*

**Appendix A: Cycle 4: Measure Mapping to Physician Clinical Composites Domains**

	1	2	3	4	5	6	7
<b>Composite</b>	<b>Preventive</b>	<b>Cardiovascular</b>	<b>Cardiovascular</b>	<b>Diabetes</b>	<b>Diabetes</b>	<b>Respiratory</b>	<b>Respiratory</b>
<b>Specialt(ies) to be Included</b>	<b>PCP</b>	<b>PCP</b>	<b>Cardiology</b>	<b>PCP</b>	<b>Endocrinology</b>	<b>PCP</b>	<b>Pulm and Allergy</b>
<b>Measure</b>							
Breast Cancer Screening	Y						
Colorectal Cancer Screening	Y						
Cervical Cancer Screening	Y						
Cholesterol Management for Pts With Cardiovascular Conditions - LDL Screening		Y	Y				
Comprehensive Diabetes Care - LDL Screening		Y	Y	Y	Y		
Comprehensive Diabetes Care - HbA1c testing				Y	Y		
Comprehensive Diabetes Care - Nephropathy				Y	Y		
Percentage of patients with CAD who also have diabetes who were prescribed ACE inhibitor or ARB therapy		Y	Y				
Persistence of Beta-Blocker Treatment After a Heart Attack		Y	Y				
Annual Monitoring for Patients on Persistent Medications - Total Coronary Artery Disease		Y	Y	Y			
Heart Failure: Left Ventricular Ejection Fraction Testing		Y	Y				
Heart Failure: Warfarin Therapy for Patients with Atrial Fibrillation		Y	Y				
Use of Spirometry Testing in the Assessment and Diagnosis of COPD						Y	Y
Pharmacotherapy Management of COPD Exacerbation - Corticosteroid						Y	Y
Pharmacotherapy Management of COPD Exacerbation - Bronchodilator						Y	Y
Disease Modifying Anti-Rheumatic Drug Therapy for Rheumatoid Arthritis							



## California Physician Performance Initiative (CPPI) Clinical Quality Measures 2009

CPPI assessed physician performance using clinical quality measures that are evidence based, nationally standardized and which have been endorsed by major consensus bodies (i.e., the National Quality Forum and the American Medical Association's (AMA) Physician Consortium on Performance Improvement PCPI). The measures address both preventive care and chronic condition management. The measures were reviewed and approved by the CPPI Physician Advisory Group and California Cooperative Healthcare Reporting Initiative (CCHRI) Executive Committee.

The 16 measures listed below were scored using insurance claims data for the September 2007 through September 2008 measurement year. Please note that the Pharmacotherapy Management of COPD Exacerbation measure has two numerators (Systemic Corticosteroids and Bronchodilators) producing two rates. Therefore, 17 rates are available in total. CPPI used measure specifications from the National Committee for Quality Assurance (NCQA) Healthcare Effectiveness Data and Information Set 2008 (HEDIS) ([www.ncqa.org](http://www.ncqa.org)) and the Physician Consortium for Performance Improvement (PCPI) ([www.ama-assn.org](http://www.ama-assn.org)).

	Measure Name	Measure Description	Relevant Specialties for the Measure	Measure Source	Exclusions
<b>Adult Diagnostic and Preventive Care</b>					
1	Breast Cancer Screening	Women, age 42-69 on 9/30/2008, who had mammogram during 10/01/2006-9/30/2008.	Family practice, internal medicine, gynecology, and OB/GYN.	HEDIS	Bilateral mastectomy,  Unilateral mastectomy (2 occurrences on 2 different dates)
2	Colorectal Cancer Screening	Patients, age 51-80, who had a FOBT during 10/01/07 to 9/30/08 or a sigmoidoscopy or DCBE during 10/01/03 to 9/30/08 or a colonoscopy during 10/01/98 to 9/30/08.	Family practice, internal medicine, and gastroenterology.	HEDIS	Diagnosis of colorectal cancer or total colectomy.
3	Cervical Cancer Screening	Women, age 21-64 on 9/30/2008, who had a PAP test during 10/01/2005-9/30/2008.	Family practice, internal medicine, gynecology and OB/GYN.	HEDIS	Hysterectomy
<b>Diabetes Care for Adults</b>					
4	Diabetes Care: LDL Screening	Diabetics, age 18-75, who had an LDL-C screening during 10/01/2007- 9/30/2008	Family practice, internal medicine, endocrinology and cardiology.	HEDIS	Polycystic ovaries, gestational or steroid induced diabetes.
5	Diabetes Care: HbA1c Screening	Diabetics, age 18-75, who had an HbA1c screening test during 10/01/2007- 9/30/2008.	Family practice, internal medicine and endocrinology.	HEDIS	Polycystic ovaries, gestational or steroid induced diabetes.
6	Diabetes Care: Nephropathy	Diabetics, age 18-75, who had a nephropathy screening test or evidence of nephropathy	Family practice, internal medicine, endocrinology and nephrology.	HEDIS	Polycystic ovaries, gestational or steroid

	Screening	10/01/2007- 9/30/2008			induced diabetes.
<b>Cardiovascular Disease Care</b>					
7	Cardiovascular Care: LDL Monitoring for Cardiovascular Disease Patients	Patients, age 18-75, who were hospitalized during 10/01/06 to 9/30/08 for an AMI, CABG, or PTCA, or were diagnosed with IVD during 10/01/06 to 9/30/08, and who had an LDL test during 10/01/07 to 9/30/08.	Family practice, internal medicine and cardiology.	HEDIS	None
8	Cardiovascular Care: Beta Blocker Therapy at 6 Months After a Heart Attack	Patients, age 35+, who were hospitalized during 4/01/07 to 3/31/08 for an AMI and received beta-blocker therapy for the 6 months after discharge.	Family practice, internal medicine and cardiology.	PCPI	Contraindication to beta blocker therapy.
9	Coronary Artery Disease: LDL Drug Therapy	Coronary artery disease patients, age 18+ on 10/1/2007, who were prescribed a lipid-lowering therapy	Family practice, internal medicine and cardiology, endocrinology.	PCPI	None
10	Coronary Artery Disease: LDL Drug Therapy for CAD Patients Who Also Have Diabetes	Coronary artery disease patients, age 18+ on 10/1/2007, who also have diabetes, who were prescribed ACE inhibitor or ARB therapy	Family practice, internal medicine and cardiology, and endocrinology.	HEDIS	Contraindication to ACE/ARB therapy
11	Heart Failure Patients: Left Ventricular Ejection Fraction Testing	Heart failure patients aged 18+ who were hospitalized 10/01/2007- 9/30/2008 and had a LVEF test.	Family practice, internal medicine and cardiology.	PCPI	None
12	Heart Failure Patients: Warfarin Therapy for Patients with Atrial Fibrillation	Heart failure patients, age 18+, who were hospitalized with paroxysmal or chronic atrial fibrillation during 10/01 2007- 9/30/2008 and were prescribed warfarin therapy.	Family practice, internal medicine and cardiology.	PCPI	Contraindication to warfarin therapy
<b>Medication Management</b>					
13	Monitoring Patients on Persistent Medications	Combined rate for patients, age 18+, who were prescribed at least a 180-days supply of ambulatory medication therapy for (1) ACE inhibitors or ARBs; (2) Digoxin; or (3) Diuretics during 10/1/2007- 9/30/2008	Family practice, internal medicine and cardiology.	HEDIS	None
<b>Chronic Obstructive Pulmonary Disease Care</b>					
14	COPD Care: Pharmacotherapy	Patients age 40+, with a COPD exacerbation, with an inpatient discharge or ED encounter between	Family practice, internal medicine,	HEDIS	None

	Management of COPD Exacerbation	10/1/2007 – 8/31/2008, who received a bronchodilator within 30 days.  Patients age 40+, with a COPD exacerbation, with an acute inpatient discharge or ED encounter between 10/1/2007 – 8/31/2008, who received a systemic corticosteroid within 14 days of the event.	allergy/immunology and pulmonology.		
15	COPD Care:  Use of Spirometry Testing	Patients age 42+, with a new or newly active COPD diagnosis between 4/1/2007 – 3/31/2008, who received spirometry testing two years prior to diagnosis or within 6 months of diagnosis.	Family practice, internal medicine, allergy/immunology and pulmonology.	HEDIS	None
<b>Musculoskeletal Conditions</b>					
16	Disease Modifying Anti-rheumatic Drug Therapy for Rheumatoid Arthritis	Patients, age 18+, diagnosed with rheumatoid arthritis who received at least one ambulatory prescription for a disease modifying anti-rheumatic drug during 10/01/2007-9/30/2008.	Family practice, internal medicine and rheumatology.	HEDIS	HIV, pregnancy



## California Physician Performance Initiative (CPPI) Clinical Composites 2009

Individual quality measures were organized into 4 clinical domains: prevention, diabetes, cardiovascular and respiratory. The clinical domains organization helps to ensure that the individual measures are related to a single underlying quality composite (e.g., diabetes care). The composites were reviewed and approved by the CPPI Physician Advisory Group and California Cooperative Healthcare Reporting Initiative (CCHRI) Executive Committee.

The following table presents which individual measures were included in each of the four composites. Individual measure specifications used for composites are identical to the measure descriptions provided in the table above. Relevant specialty for each composite is also provided. Composites were grouped by PCP and subspecialists.

	Composite Name	Individual Measures Included in Composite	Relevant Specialties for the Composite
1	Prevention	<ol style="list-style-type: none"> <li>1. Breast Cancer Screening</li> <li>2. Cervical Cancer Screening</li> <li>3. Colorectal Cancer Screening</li> </ol>	Family practice and internal medicine.
2A	Cardiovascular - PCP	<ol style="list-style-type: none"> <li>1. Cardiovascular Care: LDL Monitoring for Cardiovascular Disease Patients</li> <li>2. Cardiovascular Care: Beta Blocker Therapy at 6 Months After a Heart Attack</li> <li>3. Coronary Artery Disease: LDL Drug Therapy</li> <li>4. Coronary Artery Disease: LDL Drug Therapy for CAD Patients With Diabetes</li> <li>5. Heart Failure Patients: Left Ventricular Ejection Fraction Testing</li> <li>6. Heart Failure Patients: Warfarin Therapy for Patients with Atrial Fibrillation</li> <li>7. Diabetes Care: LDL Screening</li> <li>8. Monitoring Patients on Persistent Medications</li> </ol>	Family practice and internal medicine.
2B	Cardiovascular - Specialist	<ol style="list-style-type: none"> <li>1. Cardiovascular Care: LDL Monitoring for Cardiovascular Disease Patients</li> <li>2. Cardiovascular Care: Beta Blocker Therapy at 6 Months After a Heart Attack</li> <li>3. Coronary Artery Disease: LDL Drug Therapy</li> <li>4. Coronary Artery Disease: LDL Drug Therapy for CAD Patients With Diabetes</li> <li>5. Heart Failure Patients: Left Ventricular Ejection Fraction Testing</li> <li>6. Heart Failure Patients: Warfarin Therapy for Patients with Atrial Fibrillation</li> <li>7. Diabetes Care: LDL Screening</li> <li>8. Monitoring Patients on Persistent Medications</li> </ol>	Cardiologists.

	<b>Composite Name</b>	<b>Individual Measures Included in Composite</b>	<b>Relevant Specialties for the Composite</b>
3A	Diabetes - PCP	<ol style="list-style-type: none"> <li>1. Diabetes Care: LDL Screening</li> <li>2. Diabetes Care: HbA1c Screening</li> <li>3. Diabetes Care: Nephropathy Screening</li> <li>4. Monitoring Patients on Persistent Medications</li> </ol>	Family practice, internal medicine.
3B	Diabetes - Specialist	<ol style="list-style-type: none"> <li>1. Diabetes Care: LDL Screening</li> <li>2. Diabetes Care: HbA1c Screening</li> <li>3. Diabetes Care: Nephropathy Screening</li> </ol>	Endocrinology.
4A	Respiratory - PCP	<ol style="list-style-type: none"> <li>1. COPD Care: Use of Spirometry Testing</li> <li>2. COPD Care: Pharmacotherapy Management of COPD Exacerbation</li> </ol>	Family practice, internal medicine.
4B	Respiratory - Specialist	<ol style="list-style-type: none"> <li>1. COPD Care: Use of Spirometry Testing</li> <li>2. COPD Care: Pharmacotherapy Management of COPD Exacerbation</li> </ol>	Allergy/immunology and pulmonology.