



## Home Health Star Ratings Proposed Methodology

### What Are Star Ratings?

Consumer research has shown that summary quality measures and the use of symbols, such as stars, to represent performance are valuable to consumers. Star ratings can help consumers more quickly identify differences in quality and make use of the information when selecting a health care provider. In addition to summarizing performance, star ratings can also help home health agencies (HHAs) identify areas for improvement. They are useful to consumers, consumer advocates, health care providers, and other stakeholders, when updated regularly to present the most current information available.

### Why Star Ratings for Home Health?

The Affordable Care Act calls for transparent, easily understood information on provider quality to be publicly reported and made widely available. In order to provide home health care consumers with a summary quality measure in an accessible format, CMS proposes to publish a star rating for home health agencies on Home Health Compare starting in 2015. This is part of CMS' plan to adopt star ratings across all Medicare.gov Compare websites. Star ratings are currently publicly displayed on Nursing Home Compare, Physician Compare, and the Medicare Advantage Plan Finder, and they are scheduled to be displayed on Dialysis Facility Compare and Hospital Compare in 2015.

Public reporting is a key driver for improving health care quality by supporting consumer choice and incentivizing provider quality improvement. CMS currently reports 27 process, outcome and patient experience of care quality measures on the Home Health Compare website, to help consumers and their families make choices about who will provide their home health care. The proposed star rating would become an additional measure available on the website. Several alternative methods of calculating the star rating were considered, borrowing from the methods used for other care settings, such as nursing homes, dialysis facilities, and managed care. After consideration of these alternatives, we propose the methodology below for HHC Star Ratings.

### Selecting Measures for Inclusion in Home Health Compare Star Ratings

The star rating methodology proposed for use on Home Health Compare includes 10 of the 27 currently reported process and outcome quality measures. Proposed measures included in star ratings were chosen based on the following criteria:

1. The measure should apply to a substantial proportion of home health patients, and have sufficient data to report for a majority of home health agencies.
2. The measure should show a reasonable amount of variation among home health agencies, and it should be possible for a home health agency to show improvement in performance.
3. The measure should have high face validity and clinical relevance.
4. The measure should be stable and not show substantial random variation over time.



Based on these criteria, the proposed measures below were selected for inclusion. Appendix A provides more detail about the measure selection process.

| Process Measures  | Outcome Measures  |
|---|---|
| Timely Initiation of Care                                       | Improvement in Ambulation   |
| Drug Education on all Medications Provided to Patient/Caregiver | Improvement in Bed Transferring   |
| Influenza Immunization Received for Current Flu Season          | Improvement in Bathing  |
| Pneumococcal Vaccine Ever Received                              | Improvement in Pain Interfering With Activity<br>Improvement in Dyspnea<br>Acute Care Hospitalization |

### Which HHAs will Receive Star Ratings?

All Medicare-certified HHAs will be eligible to receive a star rating. Currently, HHAs must have at least 20 complete quality episodes for data on a measure to be reported on Home Health Compare. Completed episodes are paired start or resumption of care and end of care OASIS assessments. Episodes must have discharge date within the 12-month reporting period regardless of admission date. To have a star rating computed for Home Health Compare, HHAs must have reported data for 6 of the 10 measures used in the calculation.

### Proposed Star Rating Calculation

A Special Open Door Forum (SODF) on “Adding Star Ratings to Home Health Compare” was held on December 17, 2014 to describe the proposed star rating calculation. After considering numerous comments and suggestions made during the SODF and received from stakeholders after the SODF, several alternative methodologies were tested empirically. The selected methodology from among these tested alternatives is proposed here.

The updated proposed methodology addresses several stakeholder concerns including the difficulty in distinguishing differences in quality for the large number of agencies falling in the middle (3 star) category (over 50 percent) and the need to allow for finer distinctions than whole star ratings by reporting results based on half star increments. Other adjustments include:

- An initial ranking of agencies by deciles, rather than quintiles;
- An adjustment of the initial ranking by comparing each agency’s measure scores to the national agency median, rather than the national average. This is intended to provide a more balance distribution for measures that are skewed;
- The initial rankings are adjusted by 0.5 star instead of a full star based on the results of the statistical significance test based on comparison to the national median agency value;
- Updated algorithm for translating the composited adjusted star rating into an overall star rating. The algorithm is now designed to assign half star ratings on a scale from one to five stars.

The proposed methodology for calculating the star rating is based on a combination of individual measure rankings and the statistical significance of the difference between the performance of an



individual HHA on each proposed measure (risk-adjusted, if an outcome measure) and the performance of all HHAs. A HHA’s quality measure values are compared to the national agency median, and their rating is adjusted to reflect the differences relative to other agencies’ quality measure values. These adjusted ratings are then combined into one overall star quality measure star rating that summarizes each of the 10 individual measures.

The specific steps are as follows:

1. First, HHAs’ scores on each of the 10 proposed quality measures are sorted low to high and divided into 10 approximately equal size groups (deciles) of agencies. For all proposed measures, except acute care hospitalization, a higher measure value means a better score.
2. An HHA’s score on each proposed measure is then assigned its decile location, e.g. bottom tenth, top tenth , etc., as a preliminary rating. Each decile is assigned an initial ranking from 0.5 to 5 in 0.5 increments (e.g., 0.5, 1, 1.5, 2, etc.)
3. The initial rating is then adjusted according to the statistical significance of the difference between the agency’s individual quality measure score and the national agency median for that quality measure. Because all the proposed measures are proportions (e.g., proportion of patients who improved in getting in and out of bed), the calculation uses a binomial significance test.
  - If the agency’s initial rating for a measure is anything other than a 2.5 or 3 (the two middle decile categories) , and the binomial test of the difference yields a probability value greater than .05 (meaning not significantly different from the national agency median), the initial rating is adjusted to the next half star level closer to the middle categories. The results from these analyses are referred to as the adjusted ratings.
4. To obtain one overall score for each HHA, the adjusted ratings are averaged across the 10 measures and rounded to the nearest half star. An overall star rating is then assigned to each agency so that ratings will range from 1 to 5 in half star increments (see table below). Thus, there are 9 star categories, with 3.0 stars being the middle category in this distribution.

| <b>Overall score after averaging across QMs and rounding to the nearest half star</b> | <b>HHC Star Rating</b> |
|---|------------------------|
| 4.5 and 5.0   | 5 ★★★★★★               |
| 4.0   | 4.5 ★★★★★☆             |
| 3.5   | 4.0 ★★★★★              |
| 3.0   | 3.5 ★★★★★☆             |
| 2.5   | 3.0 ★★★★★              |
| 2.0   | 2.5 ★★★★★☆             |
| 1.5   | 2.0 ★★★★★              |
| 1.0   | 1.5 ★★★★★☆             |
| 0.5   | 1 ★★★★★                |



## Distribution of Home Health Compare Star Ratings

This proposed methodology was applied using Home Health Compare data for Calendar Year 2013. Only agencies that had data for at least 20 patients for six of the ten proposed measures were included in our analysis. Table 1 shows the distribution of star ratings among the HHAs when the proposed methodology is applied. The percent of agencies with an overall rating of one star is less than one percent, while the percent of HHAs receiving five stars is close to three percent. Fewer than 25 percent of agencies fall into the middle star category of 3 (24.32%), with an approximately equal percentage (24.23) receiving 3.5 stars.

**Table 1: Distribution of Overall Quality Measure Star Ratings, CY 2013**

| Quality Measure Star Rating | Percent |
|-----------------------------|---------|
| ★                           | 0.10    |
| ★★                          | 1.66    |
| ★★★                         | 7.41    |
| ★★★★                        | 15.83   |
| ★★★★★                       | 24.32   |
| ★★★★★                       | 24.23   |
| ★★★★★                       | 16.07   |
| ★★★★★                       | 7.70    |
| ★★★★★                       | 2.69    |

Appendix B provides information about the stability of HHC star ratings over time when using the proposed methodology.

### Next Steps

CMS will continue to solicit stakeholder feedback on star rating methodology through February 13, 2015. In addition, a Frequently Asked Questions document is posted on the CMS website (<http://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/HomeHealthQualityInits/HHQIHomeHealthStarRatings.html>), which will be updated based on questions received. The star ratings methodology will be finalized based on feedback received and additional technical analysis.



## Appendix A: Evaluation of Measures for Inclusion in the Star Rating Calculation

Twenty-two of the twenty-seven measures currently reported on Home Health Compare were considered for inclusion in the proposed star ratings. The criteria used to evaluate measures for inclusion in the star rating calculation were:

1. applicability to a substantial proportion of home health patients, and reported for a majority of home health agencies;
2. a reasonable amount of variation among home health agencies, and potential for improvement in performance;
3. face validity and clinical relevance; and
4. stability over time.

Table A.1 lists the 22 potential measures for inclusion with the following relevant statistics: the number of HHAs with data; the number of patient episodes of care for which each measure is applicable; national rates and distribution among home health agencies; and stability as measured by the correlation of home health agency scores between 2012 and 2013.

Most of the candidate measures met the criteria of applicability to the home health population and ability to report for most home health agencies. One process measure, “Heart Failure Symptoms Addressed,” and one outcome measure, “Surgical Wound Healing,” did not meet an acceptable threshold for these criteria.

The criteria of variability in performance and opportunity to show improvement was assessed by comparing the 20<sup>th</sup> percentile and 80<sup>th</sup> percentile columns, as shown in Table A.1. Of the thirteen process measures, eight had very little room for improvement, as indicated by an average home health agency rate of ninety-five percent or more, a similarly high 20<sup>th</sup> percentile value and an 80<sup>th</sup> percentile value of 100 percent. The process measure, “Foot Care and Education for Patients with Diabetes,” was almost as “topped out” as the other eight measures, and was marginal with respect to the number of home health agencies with enough data to report. Based on the combination of criteria, this measure was also eliminated from consideration.

Although the OASIS-based outcome measure “Improvement in Oral Medication Management” was not topped out, it showed a lower rate of improvement than the remaining outcome measures. This measure was ultimately excluded since it also showed weaker face validity than the remaining outcome measures (for example, cognitively impaired patients who appropriately rely on a caregiver for oral medication management may not show improvement in the measure).

After applying the first three measure selection criteria, the remaining measures included four process measures, five OASIS-based outcome measures, and two claims-based utilization outcome measures. To apply the final criterion, stability over time, we correlated home health agency scores of these remaining measures (shown in the last column of Table A.1) for 2012 and 2013. All of the remaining measures showed positive correlations between 2012 scores and 2013 scores, and the correlations for the process and OASIS-based outcome measures were all in the .60 to .80 range. Based on this, all four process measures and five OASIS-based outcome measures were proposed for inclusion in home health star ratings. As for the two claims-based measures, the year-to-year correlations were more modest. Only one of these claims-based measures, “Acute Care Hospitalization,” was initially proposed for inclusion in star ratings, because reducing potentially avoidable hospital use is an important national goal.



**Table A.1: Characteristics of Home Health Compare Quality Measures<sup>1</sup>**

| Home Health Compare Quality Measure                              | HHAs with Data | Episodes of Care (Thousands) | National Rate (Pct) | Median HHA Rate | 20th Percentile | 80th Percentile | Correlation 2012 with 2013 |
|--|----------------|------------------------------|---------------------|-----------------|-----------------|-----------------|----------------------------|
| Timely Initiation of Care <sup>2</sup>                           | 10,426         | 6,095                        | 92                  | 93              | 85              | 97              | 0.699                      |
| Drug Education on all Meds Provided to Pt/Caregiver <sup>2</sup> | 10,423         | 6,038                        | 93                  | 96              | 88              | 99              | 0.717                      |
| Fall Risk Assessment   | 10,240         | 5,410                        | 98                  | 100             | 98              | 100             | 0.468                      |
| Depression Assessment  | 10,421         | 6,061                        | 98                  | 99              | 96              | 100             | 0.819                      |
| Influenza Vaccine Received for Current Flu Season <sup>2</sup>   | 10,047         | 3,838                        | 72                  | 75              | 58              | 86              | 0.762                      |
| Pneumococcal Vaccine Ever Received <sup>2</sup>                  | 10,399         | 5,940                        | 71                  | 75              | 51              | 88              | 0.787                      |
| Foot Care and Education for Patients With Diabetes               | 9,103          | 2,110                        | 94                  | 97              | 91              | 100             | 0.659                      |
| Pain Assessment  | 10,438         | 6,123                        | 99                  | 99              | 98              | 100             | 0.751                      |
| Pain Intervention/Treatment                                      | 10,223         | 4,978                        | 98                  | 100             | 98              | 100             | 0.685                      |
| Heart Failure Symptoms Addressed                                 | 4,189          | 440                          | 98                  | 100             | 96              | 100             | 0.391                      |
| Pressure Ulcer Prevention Intervention                           | 8,723          | 2,519                        | 96                  | 99              | 94              | 100             | 0.645                      |
| Pressure Ulcer Prevention in Plan of Care                        | 8,937          | 2,621                        | 97                  | 99              | 96              | 100             | 0.672                      |
| Pressure Ulcer Risk Assessment                                   | 10,438         | 6,123                        | 99                  | 99              | 96              | 100             | 0.786                      |
| Improvement In Ambulation <sup>2</sup>                           | 9,562          | 4,087                        | 61                  | 59              | 49              | 67              | 0.689                      |
| Improvement In Bed Transferring <sup>2</sup>                     | 9,389          | 3,804                        | 57                  | 59              | 42              | 64              | 0.720                      |
| Improvement In Bathing <sup>2</sup>                              | 9,625          | 4,190                        | 67                  | 66              | 55              | 75              | 0.740                      |
| Improvement In Pain Interfering With Activity <sup>2</sup>       | 9,486          | 3,451                        | 68                  | 67              | 54              | 79              | 0.776                      |
| Improvement In Dyspnea <sup>2</sup>                              | 9,263          | 2,996                        | 65                  | 64              | 46              | 75              | 0.787                      |
| Surgical Wound Healing   | 4,587          | 689                          | 89                  | 92              | 86              | 96              | 0.544                      |
| Improvement In Oral Medication Management                        | 9,134          | 3,086                        | 51                  | 49              | 37              | 58              | 0.725                      |
| Emergent Care Without Hospital Admission                         | 9,301          | 2,775                        | 12                  | 12              | 15              | 9               | 0.310                      |
| Acute Care Hospitalization <sup>2</sup>                          | 9,301          | 2,775                        | 16                  | 15              | 18              | 12              | 0.220                      |

<sup>1</sup> All statistics apply to calendar year 2013, except for the last two measures, which apply to Q4 2012 – Q3 2013. The correlations are between CY 2012 and CY 2013, except for the last two measures, which are between Q4 2011-Q3 2012 and Q4 2012 – Q3 2013.

<sup>2</sup> Measure selected for inclusion in star rating calculation.



## **Appendix B: Stability of the Ratings over Time**

To assess the stability of the proposed methodology from year to year, the star ratings were also calculated using the Home Health Compare data for 2012. A statistical measure of inter-rater agreement (a Kappa coefficient) was used to test the stability of star ratings between the two years. Table B-1 below shows the star ratings comparison from year to year for those agencies in which ratings could be calculated for both years. Using the proposed methodology, 43% of HHAs had no change in star rating, 44% changed by ½ star, 11% changed by 1 star, 2% by 1 ½ stars, less than a half percent changed by 2 to 2 ½ stars, and no HHAs changed by 3 stars or more. The very small number of HHAs that gained or lost two stars suggest that the star ratings are fairly stable from year to year. The weighted Kappa (which takes into account not only the number of HHAs that change ratings, but also the numerical magnitude of changes) is 0.5610, showing good agreement between the 2012 star ratings and the 2013 star ratings.





**Table B-1: Year-to-Year Stability of Star Ratings – CY2012 vs. CY2013**

| Overall Quality Measure<br>Star Rating 2013 | Overall Quality Measure Star Rating 2012 |       |       |        |        |        |        |       |       |       |         |
|---|--|-------|-------|--------|--------|--------|--------|-------|-------|-------|---------|
|   | 1  | 1.5   | 2     | 2.5    | 3      | 3.5    | 4      | 4.5   | 5     | Total | Percent |
| 1   | 0  | 6     | 1     | 0      | 0      | 0      | 0      | 0     | 0     | 7     | 0.08%   |
| 1.5   | 2  | 35    | 53    | 22     | 5      | 2      | 0      | 0     | 0     | 119   | 1.35%   |
| 2   | 0  | 41    | 246   | 225    | 73     | 18     | 7      | 0     | 0     | 610   | 6.91%   |
| 2.5   | 1  | 18    | 190   | 574    | 452    | 110    | 18     | 5     | 2     | 1370  | 15.52%  |
| 3   | 0  | 9     | 74    | 401    | 986    | 521    | 120    | 24    | 3     | 2138  | 24.22%  |
| 3.5   | 0  | 2     | 19    | 133    | 568    | 960    | 429    | 67    | 8     | 2186  | 24.76%  |
| 4   | 0  | 1     | 5     | 38     | 162    | 415    | 602    | 203   | 36    | 1462  | 16.56%  |
| 4.5   | 0  | 0     | 2     | 8      | 24     | 98     | 233    | 268   | 65    | 698   | 7.91%   |
| 5   | 0  | 0     | 0     | 0      | 5      | 11     | 26     | 81    | 114   | 237   | 2.68%   |
| <b>Total</b>                                | 3  | 112   | 590   | 1401   | 2275   | 2135   | 1435   | 648   | 228   | 8827  |         |
| <b>Percent</b>                              | 0.07%                                    | 1.27% | 6.68% | 15.87% | 25.77% | 24.19% | 12.67% | 7.34% | 2.58% |       |         |
| <b>Frequency Missing = 2977</b>             |  |       |       |        |        |        |        |       |       |       |         |