Partnership for Quality Measurement
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Full Measure Submission to PQM

Instructions: You must complete all required fields (denoted by *) to submit your measure. You may save your progress as a draft prior to submitting your measure.

Some fields are required only if your measure is an electronic Clinical Quality Measure (eCQM), an initial (new) measure, or a maintenance measure. These are indicated at the beginning of the questions in brackets, e.g., *[For initial submissions only]*.

Measure Specifications

Note: *If you have changes to information submitted via the Intent to Submit, please edit the original content for the Full Measure Submission.*

If applicable, provide a rationale for why measured entities should report this measure with other measures to appropriately interpret results. *

The patient's ability to independently manage oral medications reliably and safely is an important patient safety factor, impacting the effectiveness of the patient's treatment regimen and health-related outcomes. Patients need certain abilities to successfully manage their oral medications and may have difficulty safely taking their oral medications and/or may need help from another person or other assistance (e.g., from a drug diary or dispensing device) to accomplish this activity safely. High-quality care for Improvement in Oral Medication Management includes successful collaboration between provider and patient, reconciliation of all medications across the continuum of care, and meaningful education efforts. Home health care staff can evaluate patients' needs for, and can teach them how to use, devices to assist with taking the correct medication dose at the correct time. Developing and improving abilities related to management of oral medications contributes to quality of life and can allow patients to live as long as possible in their own environment. Improvement in this measure will contribute to the overall general health of the patient with impaired ability to manage oral medications and is an indicator of effective, high-value home health care.

Provide a URL to a web page specific for this measure containing current detailed specifications, including code lists, risk model details, and supplemental materials. *

Do not enter a URL to a home page or to general information. If no URL is available, indicate "not available."

Home Health Quality Measures | CMS

Home Health Quality Reporting Program Measure Calculations and Reporting User's Manual, Version 2.0 (cms.gov)

[If the measure is an eCQM] If your measure is an electronic clinical quality measure (eCQM), please attach the zipped output from the Measure Authoring Tool (MAT). * Not Applicable.

If you did not use the MAT, please contact PQM Support. Use the specification fields for the plain-language description of the specifications.

☐ MAT output attached

☒ MAT output not attached (explain) This measure is not an eCQM.

If you select "MAT output not attached" a text box will open for you to provide an explanation.

Do you have a data dictionary, code table, or value sets (and risk model codes and coefficients, if applicable)? *

☒Yes
☐No

☐ Attached Excel or csv file -- attach file here if answered yes
Please put all information into one workbook. Excel formats are preferred (.xlsx or .csv).

☐If no, attest that all information will be provided in other fields in the submission.

Provide details needed to calculate the numerator. *
All information required to identify and calculate the cases from the target population (denominator) with the target process, condition, event, or outcome such as definitions, time period for data collection, specific data collection items/responses, code/value sets. If your list of codes with descriptors is greater than will fit in this text box you must attach an excel or csv file in the previous question. Please provide lists of individual codes with descriptors that exceed one page in an Excel or csv file in response to the field requesting the data dictionary, code table, or value sets.
The number of home health episodes of care from the denominator in which the value recorded for the OASIS item M2020 ("Management of Oral Medications") on the discharge assessment is numerically less than the value recorded on the start (or resumption) of care assessment, indicating less impairment at discharge compared to start/resumption of care.

Provide details needed to calculate the denominator. *
All information required to identify and calculate the target population/denominator such as definitions, time period for data collection, specific data collection items/responses, code/value sets. Please provide lists of individual codes with descriptors that exceed one page in an Excel or csv file in response to the field requesting the data dictionary, code table, or value sets.
Home health quality episodes ending with a discharge from the agency during the reporting period (M0100[2]=09), except for those meeting the exclusion criteria.

Describe denominator exclusions. *
Briefly describe exclusions from the denominator cases, if any. Enter "None" if the measure does not have denominator exclusions.
Home health quality episodes for which the patient, at start/resumption of care, was able to take oral medications correctly without assistance or supervision (M2020[1] = 00) or patient has no oral medications prescribed (M2020[1] = (NA,'^',') or M2020[2] = (NA)) or the patient was nonresponsive (M1700[1] = 04 or M1710[1] = NA or M1720[1] = NA) or the episode is covered by the generic exclusions (see following section).

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Provide details needed to calculate denominator exclusions. *
Enter "None" if the measure does not have denominator exclusions. All information required to identify and calculate exclusions from the denominator such as definitions, time period for data collection, specific data collection items/responses, code/value sets. If the lists of codes with descriptors exceeds one page in Word, then please provide these lists in an Excel or csv file in response to the field requesting the data dictionary, code table, or value sets.
Home health episodes of care for which (1) at start/resumption of care OASIS item M2020 = 0, indicating the patient was able to take the correct oral medication(s) and proper dosage(s) at the correct time; or (2) at start/resumption of care, OASIS item M1700 "Cognitive Functioning" is 4, or M1710 "When Confused" is NA, or M1720 "When Anxious" is NA, indicating the patient is non-responsive; or (3) the patient did not have a discharge assessment because the episode of care ended in transfer to inpatient facility or death at home; or patient has no oral medications prescribed (M2020[1] = (NA,'^',') or M2020[2] = (NA)), or (5) the episode is covered by one or more of the generic exclusions:

a. Pediatric home health patients (less than 18 years of age).
b. Home health patients receiving maternity care only.
c. Home health patients receiving non-skilled care only.
d. Home health patients for which neither Medicare nor Medicaid are a payment source.
e. The episode of care does not end during the reporting period.
f. If the home health agency sample includes fewer than 20 episodes after all other patient-level exclusions are applied, or if the agency has been in operation less than six months, then the data is suppressed from public reporting on Home Health Compare.
g. Hospice exclusion: Episodes of care that end in a non-institutional hospice on or after January 1, 2023 are excluded: M2420 “Discharge Disposition” is 3 and M0100 “Reason For Assessment” is 9.

Table 1 provides the episode counts by exclusion criterion for episodes of care that started and ended in CY 2022. In CY 2022, 1,817,918 episodes of care were excluded from the denominator for *Improvement in Management of Oral Medications (#0176)* due to meeting at least one exclusion criterion. Approximately 94,000 episodes of care in CY 2022 ended in a discharge to non-institutional hospice. This exclusion criterion is only applicable to episodes of care ending on or after January 1, 2023 and is therefore not listed in **Table 1.**

Table 1: *Episodes Excluded from Denominator for Improvement in Management of Oral Medications (#0176), CY 2022*

Exclusion Criteria	**Episode Count**
Patient is non-responsive at SOC/ROC (M1700[1] = "04")	76,560
Patient is non-responsive at SOC/ROC (M1710[1] = "NA")	13,171
Patient is non-responsive at SOC/ROC (M1720[1] = "NA")	16,571
Patient died or was transferred to inpatient facility at EOC (M0100[2] ≠ "09")	1,548,958
Totally independent at SOC/ROC (no room for improvement)**	274,273
Sum of Excluded Episodes*	1,817,918
Numerator (Eligible Episodes that Improved)	3,532,602
Denominator (All Eligible Episodes)	4,262,622
Denominator (All Eligible Episodes for Home Health Agencies with ≥ 20 Episodes)	4,247,370

Note: EOC = End of Care. SOC = Start of Care. ROC = Resumption of Care.
* Sum may be lower than the sum of individual exclusion criteria due to some episodes qualifying for more than one exclusion category.
** Includes patients without prescribed oral medications.

Please select the most relevant type of score. *
☐ Categorical, e.g., yes/no
☐ Continuous variable, e.g., average
☐ Count
☒ Rate/proportion
☐ Composite scale
☐ Other scoring method
Please specify (text box)

Select the appropriate interpretation of the measure score. *
☒ Better quality = Higher score
☐ Better quality = Lower score
☐ Better quality = Score within a defined interval
☐ Passing score defines better quality
☐ N/A
Please specify (text box) For example, cost and efficiency measures

Diagram or describe the calculation of the measure score as an ordered sequence of steps. *
Identify the denominator, denominator exclusions, denominator exceptions, numerator, numerator exclusions, time period of data collection, risk adjustment, and any other calculations.

Upload diagram if applicable (file types: PDF, visio, jpg, png)

S.14. Calculation Algorithm/Measure Logic

1. Define an episode of care (the unit of analysis): Data from matched pairs of OASIS assessments for each episode of care (start or resumption of care paired with a discharge or transfer to inpatient facility) are used to calculate individual patient outcome measures.

2. Identify target population: All quality episodes of care ending during a specified time interval (usually a period of twelve months), subject to generic and measure-specific exclusions. Cases meeting the target outcome are those where the patient indicates less impairment in taking oral medications correctly at discharge than at start (or resumption) of care: M2020_CRNT_MGMT_ORAL_MDCTN [2] < M2020_CRNT_MGMT_ORAL_MDCTN [1].

3. Aggregate the Data: The observed outcome measure value for each home health agency is calculated as the percentage of cases meeting the target population (denominator) criteria that meet the target outcome (numerator) criteria.

4. Risk Adjustment: The expected probability for a patient is calculated using the following formula:

$$P\ (x\ ) = 1/(1 + e^{\ -(a\ +\sum b\ _i x\ _i)})$$

Where:

P(x) = predicted probability of achieving outcome x
a = constant parameter listed in the model documentation
b_i = coefficient for risk factor i in the model documentation
x_i = value of risk factor i for this patient

Predicted probabilities for all patients included in the measure denominator are then averaged to derive an expected outcome value for the home health agency. This expected value is then used, together with the observed (unadjusted) outcome value and the expected value for the national population of patients for the same data collection period, to calculate a risk-adjusted outcome value for the home health agency. The formula for the adjusted value of the outcome measure is as follows:

$$X(A_{ra}) = X(A_{obs}) + X\left(N_{exp}\right) - X(A_{exp})$$

Where:

$X(A_{ra})$ = Agency risk-adjusted outcome measure value
$X(A_{obs})$ = Agency observed outcome measure value
$X(A_{exp})$ = Agency expected outcome measure value
$X(N_{exp})$ = National expected outcome measure value

If the result of this calculation is a value greater than 100%, the adjusted value is set to 100%. Similarly, if the result is a negative number the adjusted value is set to zero.

Provide all information required to stratify the measure results, if necessary. *

Include the stratification variables, definitions, specific data collection items/responses, code/value sets, and the risk-model covariates and coefficients for the clinically-adjusted version of the measure when appropriate. Please provide lists of individual codes with descriptors that exceed one page in an Excel or csv file in response to the field requesting the data dictionary, code table, or value sets.

Not Applicable.

Select the data sources for which you have tested and specified the measure. *

Select all that apply.

☐ Administrative Data
☐ Claims Data
☐ Electronic Health Records
☐ Other Electronic Clinical Data
☐ Paper Patient Medical Records
☐ Registries
☒ Standardized Patient Assessments
☐ Patient-Reported Data and/or Survey Data *(opens the questions noted below if selected)*
☐ Non-Medical Data
☐ Other Data Source

Please specify (text box)

If you selected Patient-Reported Data and/or Survey Data you will see these questions:

Provide the survey, tool, questionnaire, or scale used as a data source for your measure.

☐ Available at measure-specific web page (provide the URL)

Please specify (text box)

☐ Attached

Please indicate the responder for your survey, tool, questionnaire, or scale.

☐ Patient
☐ Family or other caregiver
☐ Clinician
☐ Other

Please specify (text box)

Are proxy responses allowed?

☐ Yes
☐ No

If yes, please describe how. *

Required if checked yes above

For survey/patient-reported data, provide instructions for data collection and guidance on minimum response rate. Provide the data needed to calculate the response rates for reporting with performance measure results. *

Identify the specific data source or data collection instrument. *

For example, provide the name of the database, clinical registry, collection instrument, and describe how the measured entities will collect the data (e.g., the standard methods, modes, and languages of administration).

OASIS Data Sets | CMS

Indicate whether the measure has a minimum sample size to calculate the measure and provide any instructions needed for obtaining the sample and guidance on minimal sample size. *

Not Applicable.

Importance

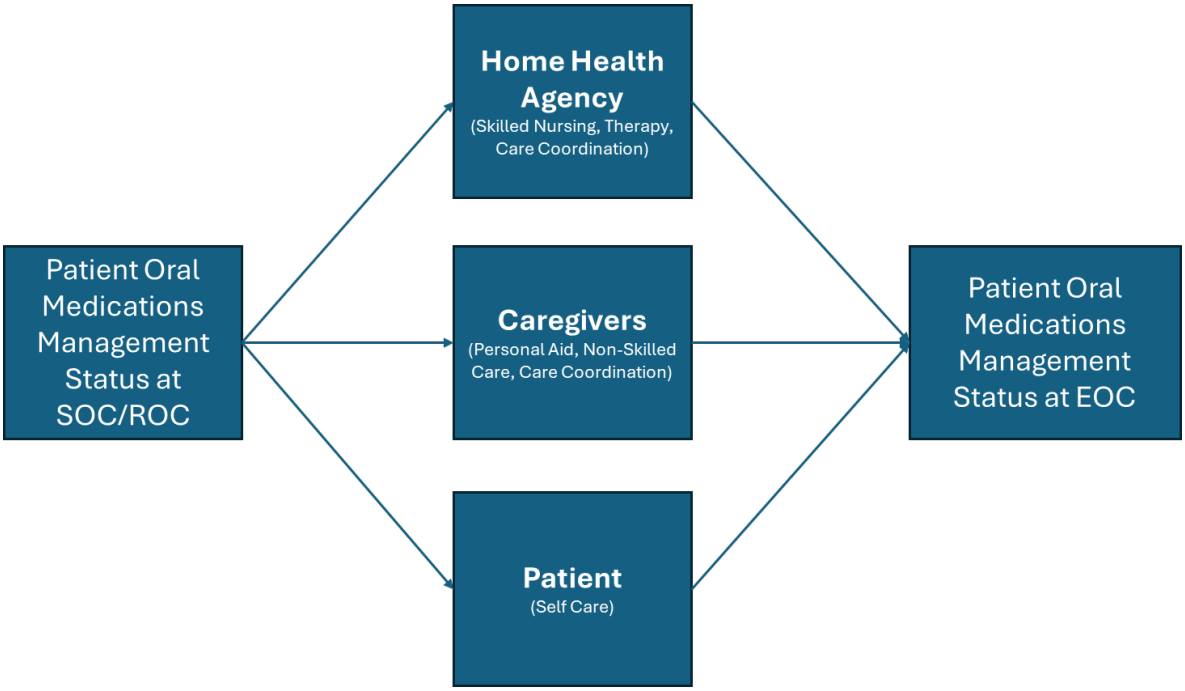
Attach a logic model and provide a description of the relationship between structures and processes and the desired outcome. *

Briefly describe the steps between the health care structures and processes (e.g., interventions, or services) and the desired health outcome(s). The relationships in the diagram should be easily understood by general, non-technical audiences. Indicate the structure, process, or outcome being measured.

Attachment (pdf, word)

Improvement in Management of Oral Medications (#0176) measures whether the patient's ability to take the correct oral medications and proper dosage(s) at the correct times at end of care (EOC) improves relatives to their ability to take the correct oral medications and proper dosage(s) at the correct times at start or resumption of care (SOC/ROC). To improve, patients will receive support from three primary sources: their home health agency, caregivers, and themselves. For *Improvement in Management of Oral Medications (#0176)*, we are concerned with attributing the improvement to the home health agency's care. Thus, we risk-adjust the observed improvement to account for differences in patient characteristics at SOC/ROC (see **Figure 1** for a visual depiction of the logic model).

Figure 1: *Logic Model for Improvement in Management of Oral Medications (#0176)*



Summarize evidence of measure importance from the literature, linking the structure/process/intermediate outcome to the desired health outcome. *

A patient's ability to independently manage oral medications reliably and safely is an important safety factor and can lead to improved management of chronic and acute illness, and the reduction of medication errors (Sheehan, et al, 2018). Conversely, the inability to manage oral medication can lead to adverse health outcomes and unnecessary hospitalization (Khezrian, et al, 2020; Sokol, et al, 2005; World Health Organization, 2019). Post-acute care patients often struggle to obtain medications, understand their safe administration, and techniques related to safe self-management (Mortelmans, et al, 2021; Tomlinson, et al, 2020). All these problems contribute to medication errors, which are the third leading cause of death in the USA (Makary & Daniel, 2016). In order to safely manage medications, patients and their caregivers need support and education (Kairuz, et al, 2008). Home health care staff can evaluate patients' needs and can teach them how to use devices to assist with taking the correct medication dose at the correct time. High-quality care in Improvement in Oral Medication Management includes successful collaboration between provider and patient, reconciliation of all medications across the continuum of care, and meaningful education efforts. Research has shown that when patients and families receive this type of support, it leads to improved medication adherence and better clinical outcomes (Lyngstad, et al, 2013; Dineen-Griffin, et al, 2019; Yang, et al, 2022). The appropriate management of medications is essential to assure the efficacy of treatment regimens among patients, and the safe administration of medications.

Dineen-Griffin, S., Garcia-Cardenas, V., Williams, K., & Benrimoj, S. I. (2019). Helping patients help themselves: a systematic review of self-management support strategies in primary health care practice. *PloS one*, *14*(8), e0220116.

Kairuz, T., Bye, L., Birdsall, R., Deng, T., Man, L., Ross, A., ... & Tautolo, E. (2008). Identifying compliance issues with prescription medicines among older people. *Drugs & aging*, *25*(2), 153-162.

Khezrian, M., McNeil, C.J., Murray, A.D., Myint, P.K., (2020). An overview of prevalence, determinants and health outcomes of polypharmacy. Ther. Adv. Drug Saf. 11, 1–10. https://doi.org/10.1177/2042098620933741

Lyngstad, M., Melby, L., Grimsmo, A., & Hellesø, R. (2013). Toward increased patient safety? Electronic communication of medication information between nurses in home health care and general practitioners. *Home Health Care Management & Practice*, *25*(5), 203-211.

Makary, M. A., & Daniel, M. (2016). Medical error—the third leading cause of death in the US. *Bmj*, *353*.

Mortelmans, L., De Baetselier, E., Goossens, E., Dilles, T. (2021). What happens after hospital discharge? Deficiencies in medication management encountered by geriatric patients with polypharmacy. Int. J. Environ. Res. Public Health 18 (13), 7031. https://doi.org/ 10.3390/ijerph18137031.

Sheehan, O. C., Kharrazi, H., Carl, K. J., Leff, B., Wolff, J. L., Roth, D. L., ... & Boyd, C. M. (2018). Helping older adults improve their medication experience (HOME) by addressing medication regimen complexity in home healthcare. *Home healthcare now*, *36*(1), 10-19.

Sokol, M.C., McGuigan, K.A., Verbrugge, R.R., Epstein, R.S. (2005). Impact of medication adherence on hospitalization risk and healthcare cost. Med. Care 43 (6), 521–530. https://doi.org/10.1097/01.mlr.0000163641.86870.af.

Tomlinson, J., Silcock, J., Smith, H., Karban, K., Fylan, B. (2020). Post-discharge medicines management: the experiences, perceptions and roles of older people and their family carers. Health Expect. 23 (6), 1603–1613. https://doi.org/10.1111/hex.13145.

World Health Organization (2019). Medication safety in polypharmacy: technical report. https://apps.who.int/iris/handle/10665/325454

Yang C, Lee DTF, Wang X, Chair SY. (2022) Effects of a nurse-led medication self-management intervention on medication adherence and health outcomes in older people with multimorbidity: A randomised controlled trial. Int J Nurs Stud. 2022 Oct;134:104314. doi: 10.1016/j.ijnurstu.2022.104314. Epub 2022 Jun 22. PMID: 35849886.

[For initial endorsement] **If implemented, what is the measure's anticipated impact on important outcomes?** *
Please cite evidence to identify adverse events and costs avoided. Cite business case, if applicable.
Not Applicable.

[*For maintenance review*] **Provide evidence of performance gap or measurement gap by providing performance scores on the measure as specified (current and over time) at the specified level of analysis.** *
Please include mean, standard deviation, minimum, maximum, interquartile range, and scores by deciles. Describe the data source including number of measured entities, number of patients, dates of data. If a sample, provide characteristics of the entities included. If performance scores are unavailable for the measure, please explain.
Improvement in Management of Oral Medications (#0176) is calculated using CMS's Home Health Quality Reporting Program's assessment tool, the Outcome and Assessment Information Set (OASIS). All components of the measure are defined using data from the OASIS, including the numerator, denominator, exclusions, and risk factors. The measure is risk adjusted to account for patient characteristics at the start of care or resumption of care (SOC/ROC). The denominator consists of unique quality episodes, i.e. a SOC/ROC assessment paired with an end of care (EOC) assessment.

While all the data used to report results in this form are derived from the OASIS, the periods used to generate results vary. Trends are presented from the calendar year 2019 (CY 2019) to CY 2022. We restrict descriptive characteristics, reliability, and validity to CY 2022, the most recent calendar year of data currently available. The results generated for risk adjustment use CY 2021 data, the data used during the most recent maintenance reevaluation and risk adjustment update.

Table 2 presents performance for *Improvement in Management of Oral Medications (#0176)* from CY 2019 to CY 2022 among home health agencies that exceed the public reporting threshold of at least 20 quality episodes of care. Overall, mean performance has been trending upwards, with a low of 0.713 in CY 2019 and a high of 0.770 in CY 2022. The lower and upper bounds of the interquartile range have also increased with each year. Despite the steady increases year-over-year, there remains a performance gap for *Improvement in Management of Oral Medications (#0176)*. Fewer than 70 percent of quality episodes exhibit improvement among the lowest quartile of home health agencies, and between 20 and 25 percent of quality episodes fail to improve for the average home health agency (see **Tables 2** and **3**).

Aside from CY 2020, which was affected by the COVID public health emergency reporting requirements, roughly 4.2 million quality episodes are used to score the measure. The measure is publicly reported for over 7,000 home health

agencies.

Table 2: *Risk-adjusted Performance by Year among Home Health Agencies Exceeding the Public Reporting Threshold (n>=20)*

CY	2019	2020	2021	2022
Mean	0.713	0.737	0.752	0.770
Standard Deviation	0.155	0.157	0.162	0.168
Minimum	0.028	0.000	0.000	0.000
Maximum	1.000	1.000	1.000	1.000
Interquartile Range	[0.631, 0.814]	[0.653, 0.843]	[0.667, 0.864]	[0.691, 0.887]
Home Health Agencies (N)	7,279	7,144	7,321	7,498
Total Episodes (N)	4,163,839	3,956,774	4,204,736	4,247,370

Table 3 presents performance for *Improvement in Management of Oral Medications (#0176)* for CY 2022 by home health agency size among home health agencies that exceed the public reporting threshold. From bottom decile to top decile, the distribution in performance is tight with a minimum at Decile 1 of 0.639 and a maximum at Decile 9 of 0.849, a 0.21 difference in mean score. Smaller home health agencies perform worse on the measure, with Deciles 1 to 4 performing lower than the overall mean score and Deciles 5 to 10 performing higher.

Table 3: *CY 2022 Risk-Adjusted Performance by Home Health Agency Size Decile among Home Health Agencies Exceeding the Public Reporting Threshold (n>=20)*

	Overall	Decile									
		1	2	3	4	5	6	7	8	9	10
Mean Score	0.770	0.639	0.691	0.718	0.735	0.764	0.805	0.824	0.836	0.849	0.843
Home Health Agencies (N)	7,498	754	763	739	750	751	746	747	750	749	749
Total Episodes (N)	4,247,370	20,480	36,075	55,085	84,116	126,528	189,978	286,724	448,677	752,046	2,247,661

[For initial endorsement] **Please explain why existing measures/quality improvement programs are insufficient for addressing this health care need.** *
Not Applicable.

Provide evidence the target population (e.g., patients) values the measured outcome, process, or structure, and finds it meaningful. *
Please describe how and from whom you obtained input.
The public can comment on the home health quality reporting program when notice of proposed rulemaking is published as well as through the consensus-based entity (CBE) public commenting. No comments have been received in this time period regarding this measure. The target of this performance-based measure is the Medicare-certified home health agency. Functional status was confirmed as a domain of importance for quality measurement at a recent Technical Expert Panel (TEP).

Feasibility

[*For Initial Endorsement*] **Describe the feasibility assessment conducted showing you considered the people, tools, tasks, and technologies necessary to implement this measure**. If an eCQM, please also attach your

completed feasibility scorecard. *
Please explain and upload the feasibility scorecard if applicable.
Not Applicable.

Describe how the feasibility assessment informed the final measure specifications, indicating any decisions made to adjust the measure in response to feasibility assessment. *
OASIS data collection and submission are a requirement of the Medicare Home Health Conditions of Participation. Medication management assessment is conducted as part of usual clinical practice, and information on a patient's ability to manage their oral medications used to calculate this measure is recorded in the relevant OASIS items embedded in the home health agency's clinical assessment. OASIS data are collected by the home health agency during the care episode and submitted electronically to CMS via the Internet Quality Improvement and Evaluation System (iQIES). No issues regarding availability of data, missing data, timing or frequency of data collection, patient confidentiality or implementation have become apparent since OASIS-E was implemented January 1, 2023.

Indicate whether your measure or any of its components are proprietary, with or without fees. *

☐ Proprietary measure or components (e.g., risk model, codes)
☐ Proprietary measure or components with fees
☒ Not a proprietary measure and no proprietary components

Describe any fees, licensing, or other requirements to use any aspect of the measure as specified (e.g., value/code set, risk model, programming code, algorithm). *
Required if checked in previous question that this is a proprietary measure or components (with or without fees)
None.

Scientific Acceptability

Describe the data or sample used for testing (include dates, source). If you used multiple data sources for different aspects of testing (e.g., reliability, validity, risk adjustment), identify how the data or sample are different for each aspect of testing. *
While all the data used to report results in this form are derived from the OASIS, the periods used to generate results vary. We restrict descriptive characteristics, reliability, and validity to CY 2022, the most recent calendar year of data currently available, and the results generated for exclusions and risk adjustment use CY 2021 data, the data used during the most recent maintenance reevaluation and risk adjustment update.

Please provide descriptive characteristics of measured entities included in the analysis (e.g., size, location, type). *
If you used a sample, describe how you selected measured entities for inclusion in the sample.
Table 4 identifies the publicly reporting home health agencies by size and Census region. This distribution of home health agencies is used for reliability and validity testing. 7,498 home health agencies have 20 or more quality episodes starting and ending in CY 2022.

***Table 4:** CY 2022 Home Health agency Characteristics among Home Health Agencies Exceeding the Public Reporting Threshold (n>=20)*

Home Health Agency Group		Number of Home Health Agencies	Percent of Home Health Agencies
	Total	7,498	100.00%
Size	Quartile 1 (20 to 74 episodes)	1,899	25.33%

Home Health Agency Group		Number of Home Health Agencies	Percent of Home Health Agencies
	Quartile 2 (75 to 205 episodes)	1,858	24.78%
	Quartile 3 (206 to 589 episodes)	1,869	24.93%
	Quartile 4 (590 to 38,578 episodes)	1,872	24.97%
Location of Home Health Agency by Census Region	Northeast	605	8.07%
	Midwest	1,643	21.91%
	South	3,030	40.41%
	West	2,179	29.06%
	Missing	41	0.55%

Identify the number and descriptive characteristics (e.g., age, sex, race, diagnosis), of the level(s) of analysis, for example, patient, encounter or episode, separated by level of analysis and data source. *

If you used a sample, describe how you selected the patients for inclusion in the sample. If there is a minimum case count used for testing, you must reflect that minimum in the specifications.

Table 5 identifies the patient characteristics of quality episodes treated by publicly reporting home health agencies. Characteristics are reported by sex, race, age, and Census region. This distribution of quality episodes is used for reliability and validity testing. 4,247,370 quality episodes started and ended in CY 2022 and met the denominator exclusion and public reporting requirements.

Table 5: *CY 2022 Patient Characteristics for Quality Episodes of Care for Home Health Agencies Exceeding the Public Reporting Threshold (n>=20)*

Population Group		Number of Episodes	Percent of Episodes
	Total	4,247,370	100.00%
Sex	Male	1,661,542	39.12%
	Female	2,585,828	60.88%
Race	White	3,278,135	77.18%
	Black	513,588	12.09%
	Hispanic	310,021	7.30%
	Other	145,626	3.43%
Age	Under 65	566,769	13.34%
	65-74	1,228,405	28.92%
	75-84	1,416,364	33.35%
	85 and Over	1,035,832	24.39%
Location of Home Health Agency by Census Region	Northeast	876,973	20.65%
	Midwest	862,599	20.31%
	South	1,700,311	40.03%
	West	784,224	18.46%
	Missing	23,263	0.55%

If there are differences in the data or sample used for different aspects of testing (e.g., reliability, validity, exclusions, risk adjustment), please identify how the data or sample are different for each aspect of testing. *

Reliability

Select the level of reliability testing conducted. *
Please select all that apply.

☒ Patient or Encounter-Level (e.g., inter-abstractor reliability)

☒ Accountable Entity-Level (e.g., signal-to-noise analysis)

☐ Not applicable
Please explain why reliability testing was not conducted

For each level of reliability testing conducted, describe the method of reliability testing and what it tests. *
Describe the steps, do not just name a method. What type of error does it test? Provide the statistical analysis used.
Below, we address reliability at two levels: (1) the performance measure and (2) the underlying data element: OASIS item M2020 (Management of Oral Medications: Patient's current ability to prepare and take all oral medications reliably and safely, including administration of the correct dosage at the appropriate times/intervals. Excludes injectable and IV medications. NOTE: This refers to ability, not compliance or willingness.).

Reliability of the Performance Measure Score: Abt measured the extent to which differences in each quality measure were due to actual differences in agency performance versus variation that arises from measurement error. Statistically, reliability depends on performance variation for a measure across agencies, the random variation in performance for a measure within an agency's panel of attributed beneficiaries, and the number of beneficiaries attributed to the agency. High reliability for a measure suggests that comparisons of relative performance across agencies are likely to be stable over different performance periods, and that the performance of one agency on the quality measure can confidently be distinguished from another. Potential reliability values range from zero to one, where one (highest possible reliability) means that all variation in the measure's rates is the result of variation in differences in performance across agencies, while zero (lowest possible reliability) means that all variation is a result of measurement error.

To assess measure reliability, Abt used a split-half reliability test. First, we randomly divided each publicly reporting home health agency's quality episodes into two separate equally sized groups. Then, we calculated risk-adjusted performance rates for each group. Then, using the paired performance rates, we calculated the absolute agreement intra-class correlation statistic or ICC(2,1) with a Spearman-Brown correction to address the artificial reduction in home health agency size by half. Additionally, we recalculate ICC(2,1) within each agency size decile, where size is measured as the number of quality episodes treated after denominator and public reporting exclusions.

- Reliability of the Underlying Data Element: The measure is calculated by comparing patient functioning at the start and end of a home health quality episode, as reported by the home health OASIS data set. Patient ability to ambulate is based on response to OASIS item M2020 (Management of Oral Medications: Patient's current ability to prepare and take all oral medications reliably and safely, including administration of the correct dosage at the appropriate times/intervals. Excludes injectable and IV medications):
    0. Able to independently take the correct oral medication(s) and proper dosage(s) at the correct times.
    1. Able to take medication(s) at the correct times if:
        a. individual dosages are prepared in advance by another person, OR
        b. another person develops a drug diary or chart.
    2. Able to take medication(s) at the correct times if given reminders by another person at the appropriate times.
    3. Unable to take medication unless administered by another person.

    NA No oral medications prescribed.

In 2016 and 2017, Abt and partners conducted a field test of new and existing OASIS items on 12 home health agencies in four states for 213 home health patients.[1] Home health registered nurses and physical therapists, trained by the study team, collected data during home visits at start of care (SOC) or resumption of care (ROC), and/or at discharge. Follow-up visits were conducted within 24 hours of the initial field test visit, by a different registered nurse or physical therapist to test interrater reliability. M2020 was one of the existing OASIS items that was tested. Interrater reliability was assessed for SOC or ROC and at Discharge with a linear weighted kappa. The number patients for which inter-rater reliability could be tested was 105 at SOC/ROC and 84 at discharge.

The kappa statistic is generally considered to be the "gold standard" statistic associated with item reliability as it factors in the possibility of chance agreement. Kappa values are reported as decimal values between 0.00 (poor) and 1.00 (perfect). These can be interpreted using the following seven categories:2

- Poor < 0.10
- Slight = 0.10 to 0.20
- Fair = 0.21 to 0.40
- Moderate = 0.41 to 0.60
- Substantial = 0.61 to 0.80
- Near perfect = 0.81 to 0.99
- Perfect = 1.00

Provide the statistical results from reliability testing for each level of reliability testing conducted. *

If you conducted accountable entity-level testing, provide the reliability results for each decile in the table.

- **Reliability of the Performance Measure Score**: **Table 6** summarizes the distribution of reliability scores for the 7,498 home health agencies exceeding the public reporting threshold of at least 20 eligible quality episodes of care.

Table 6: *CY 2022 Split-Half Reliability among Home Health Agencies Exceeding the Public Reporting Threshold (n>=20)*

	Overall	Decile									
		1	2	3	4	5	6	7	8	9	10
Reliability	0.943	0.846	0.903	0.942	0.956	0.968	0.975	0.977	0.979	0.983	0.992
Home Health Agencies (N)	7,498	754	763	739	750	751	746	747	750	749	749
Total Episodes (N)	4,247,370	20,480	36,075	55,085	84,116	126,528	189,978	286,724	448,677	752,046	2,247,661

- **Reliability of the Underlying Data Element**: The inter-rater reliability (weighted kappa) values for M2020 Management of Oral Medications was 1.00 at SOC/ROC and 0.65 at discharge.

Provide your interpretation of the results in terms of demonstrating reliability. *

[1] Abt Associates (2018). "OASIS Field Test Summary Report: Outcome and Assessment Information Set (OASIS) Quality Measure Development and Maintenance Project."
[2] Landis JR, Koch GG. The measurement of observer agreement for categorical data. Biometrics, 1977. 33(1):159-174.

How do the results support an inference of reliability for the measure?

- **Reliability of the Performance Measure Score:** The ICC(2,1) statistics exceed 0.800, even within the decile with the smallest home health agencies, suggesting strong reliability and acceptability for drawing inferences about home health agencies.
- **Reliability of the Underlying Data Element:** Based on the weighted kappa statistics the inter-rater reliability indicated perfect agreement at SOC/ROC (1.00) and substantial agreement at discharge (0.65). Given the scale of the response to this OASIS item (four possible responses and "NA"), we conclude that the item achieves sufficient reliability.

Validity

Select the level of validity testing conducted. *
Please select all that apply.

☒ Patient or Encounter-Level (e.g., sensitivity and specificity)

☒ Accountable Entity Level (e.g., criterion validity)

☐ Not applicable
Please explain why validity testing was not conducted

If validity testing was performed, select the type of validity testing conducted. *
Please select all that apply.

☒ Empirical validity testing
☐ Systematic assessment of face validity of performance measure score as an indicator of quality or resource use (i.e., the score is an accurate reflection of performance on quality or resource use and can distinguish good from poor performance).

For each level of testing conducted, describe the method of validity testing and what it tests. *
Describe the steps, do not just name a method and what you tested (e.g., accuracy of data elements compared with authoritative source, relationship to another measure as expected). What statistical analysis did you use? Include analysis of missing data and any exclusions.
Below, we address validity at two levels: (1) the performance measure and (2) the underlying data element: OASIS item M2020 (Management of Oral Medications: Patient's current ability to prepare and take all oral medications reliably and safely, including administration of the correct dosage at the appropriate times/intervals. Excludes injectable and IV medications. NOTE: This refers to ability, not compliance or willingness.).

- **Validity of the Performance Measure Score:** Abt assessed the convergent validity of the measure. Convergent validity refers to the extent to which measures that are designed to assess the same construct are related to each other. To evaluate the convergent validity of the measure, Abt calculated the Spearman rank correlations of the *Improvement in Management of Oral Medications (#0176)* measure with other relevant OASIS-based measures and the fee-for-service (FFS) claims-based measure *Discharge to Community (#3477)* measure.

  The Spearman rank correlation assesses the statistical dependence between the rankings of two variables. In our case, we rank home health agencies according to *the Improvement in Management of Oral Medications (#0176)* measure and other home health agency-level measures.

- **Validity of the Underlying Data Element:** The OASIS item M2020: Management in Oral Medications has been used continuously as part of the OASIS since 2001. The behaviorally benchmarked

responses were updated and improved based on input from clinicians and technical experts. The OASIS instrument has been published in the Federal Register for comment (both items and measures based off those items) and no objections or suggestions for revision have been noted regarding the response options.

The original OASIS item was originally carefully designed for measuring and ultimately enhancing patient outcomes as part of the National OBQI Demonstration project (1995 – 2000). OASIS items were derived by first specifying a set of patient outcomes considered critical by home care experts (e.g., nurses, physicians, therapists, social workers, administrators) for evaluating the effectiveness of care. These outcomes were chosen from the most important domains of health status addressed by home care providers. OASIS data items were developed, tested in hundreds of agencies, and refined for measuring outcomes to evaluate and enhance the effectiveness of home care. OASIS data items and measurement methods were reviewed by multidisciplinary panels of research methodologists, clinicians, home care managers, and policy analysts. Several tests of validity were conducted for each OASIS item, including Management in Oral Medications. Validity testing included:

1) Consensus validity by expert researcher/clinical panels for outcome measurement and risk factor measurement
2) Consensus validity by expert clinical panels for patient assessment and care planning
3) Criterion or convergent/predictive validity for outcome measurement/risk factor measurement
4) Convergent/predictive validity: case mix adjustment for payment
5) Validation by patient assessment and care planning

Descriptions for these validation assessments are taken from the "Volume 4: OASIS Chronicle and Recommendation" OASIS and Outcome-Based Quality Improvement in Home Health Care, November 2001, Center for Health Services Research, University of Colorado Health Sciences Center, Denver, CO.

Provide the statistical results from validity testing for each level of validity testing conducted. *

- **Validity of the Performance Measure Score:** **Table 7** shows the Spearman rank correlations of the *Improvement in Management of Oral Medications (#0176)* measure with other publicly reported measures of home health quality derived from OASIS assessments and Medicare Fee-for-Service (FFS) claims.

Table 7: *CY 2022 Convergent Validity among Home Health Agencies Exceeding the Public Reporting Threshold (n>=20)*

Home Health Quality Measures	Spearman Rank Correlations
Improvement in Ambulation/Locomotion (#0167)	0.7506
Improvement in Bathing (#0174)	0.7618
Improvement in Bed Transferring (#0175)	0.7037
Discharge to Community (Claims-based) (#3477)	0.1766

- **Validity of the Underlying Data Element:** As noted above,
  1. *Consensus validity:* The item was reviewed by panels of researchers and clinicians and was recommended for measuring patient outcomes relevant to home health care provision and quality measurement, or for risk adjustment of outcome analyses.
  2. *Consensus validity by expert clinical panels for patient assessment and care planning:* The item was reviewed by a panel of clinical experts and was recommended for inclusion in a core set of data items for patient assessment and care planning.
  3. *Criterion or convergent/predictive validity for outcome measurement/risk factor measurement:* The item was tested empirically for use in conjunction with outcome measures or risk factors predictive of patient outcomes. The item was found to be related to other indicators of health status and patient outcomes in a statistically significant and clinically meaningful way.

4. *Convergent/predictive validity:* Case-mix adjustment for payment: The item was tested and is used in the grouping algorithm that, in part, determines the per-episode payment to home health agencies for care provided under the Medicare home health benefit.
5. *Validation by patient assessment and care planning:* The item has been used by clinicians for patient assessment and care planning in several hundred home health agencies and has been reported by practicing clinicians to be effective and useful for these purposes.

Results of these validation assessments are taken from the "Volume 4: OASIS Chronicle and Recommendation" OASIS and Outcome-Based Quality Improvement in Home Health Care, November 2001, Center for Health Services Research, University of Colorado Health Sciences Center, Denver, CO.

Provide your interpretation of the results in terms of demonstrating validity. *
How do the results support an inference of validity for the measure?

- **Validity of the Performance Measure Score:** As detailed in **Table 7**, the *Improvement in Management of Oral Medications (#0176)* measure displays a statistically significant positive correlation with several publicly reported measures that similarly assess patient functioning and *Discharge to Community (#3477)*, which lends evidence to the measure's validity. While it is possible that patients independent with function such as ambulation, bathing and bed transferring are dependent with management of oral medications it is more likely that patients with higher levels of independence in functional abilities are also more independent with management of their medications. Alternatively, it may be that strong performance on the other OASIS-based measures directly leads to an improvement in management of oral medications. It may also be the case that high quality agencies perform well on both the *Improvement in Management of Oral Medications (#0176)* measure and other OASIS-based measures of patient functioning and communication due to cultural or organization-level factors.
- **Validity of the Underlying Data Element:** Item validity was established based on results of testing described above. In addition, the item was also reviewed as part of the OMB/PRA review process for the most recent OASIS data set revision which allowed for two national comment periods (60 days and 30 days) wherein the face validity of the item was supported by the comments received.

Risk Adjustment

Check all methods used to address risk factors *
☒ Statistical risk model with risk factors
Specify number of risk factors (text box)
☐ Stratification by risk category
Specify number of categories (text box)
☐ Other
Specify other (text box)
☐ No risk adjustment or stratification.
If select no, this question appears
Is the measure an outcome or resource measure?
☐ Yes
☐ No

IF you select yes this question appears: **If an outcome or resource use measure is not risk adjusted or**

stratified, provide rationale and analyses to demonstrate there is no need to control for differences in patient characteristics (i.e., case mix) to achieve fair comparisons across measured entities. *

The following questions are shown and required if the user selects Statistical risk model with risk factors, Stratification by risk category or Other above:

Attach a conceptual model that illustrates the pathway between the social and/or functional status-related risk factors, patient clinical factors, quality of care, and the measured outcome. Please explain the rationale for the model. *

Consider age, gender, race/ethnicity, urbanicity/rurality, Medicare/Medicaid dual eligibility status, indices of social vulnerability (e.g., Centers for Disease Control and Prevention Social Vulnerability Index), and markers of functional risk in the conceptual model. If social and/or functional risk factors are not available but are included in the conceptual model, consider potential bias in the risk model, and describe its direction and magnitude. Address the validity of the measure in light of this bias.

Attachments (word, pdf)

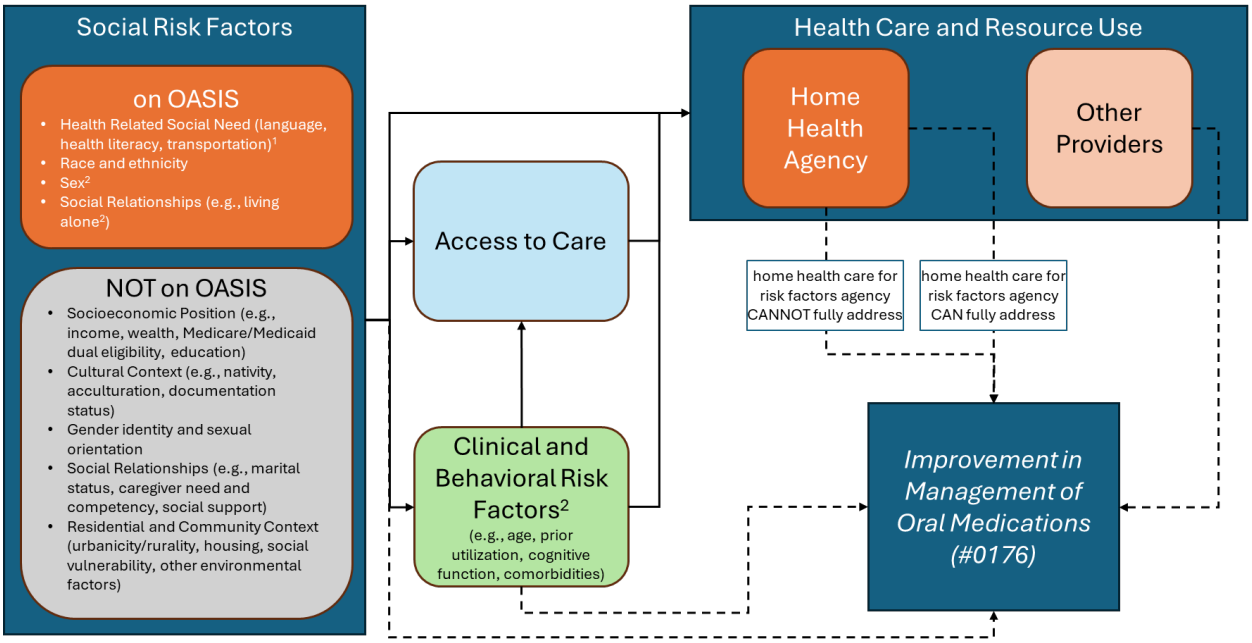
A patient's improvement in management of oral medications is dependent on a variety of factors, including social risk factors, clinical and behavioral risk factors, and access to care. The conceptual model shown in **Figure 2** is inspired by a similar conceptual model proposed by the Committee on Accounting for Socioeconomic Status in Medicare Payment Programs. In this conceptual model, social risk factors influence access to care and clinical and behavioral risk factors, as well as the measure itself. In turn, clinical and behavioral risk factors influence health care and resource use, access to care, and the measure itself. Access to care only influences health care and resource use. Finally, the home health agency affects the measure through interventions like skilled nursing, therapy, and care coordination. These interventions *may be able to address some social, clinical, or behavioral risk factors, in part if not fully.*

Improvement in Management of Oral Medications (#0176) attempts to measure a home health agency's ability to improve patient management of oral medications while the patient is in its care; however, because certain factors are outside of its control, we risk-adjust the measure. Risk adjustment is used to promote incentives for home health agencies to provide the same care to patients regardless of patient characteristics at SOC/ROC.

The risk factors that can be fully addressed should not be included in the risk adjustment model because the home health agency is expected to be responsible for addressing that risk factor. For instance, if all other risk factors are identical, a home health agency is expected to provide two patients with identical quality care regardless of race or ethnicity.

By contrast, a patient who is living alone will have different needs than a patient who lives in a congregate setting. While a home health agency is expected to adapt its care to different living situations, it is not expected to address all the needs for a patient living alone, like having professionals on staff readily available during emergencies. Similarly, a home health agency is not expected to influence the patient's clinical and behavioral status at SOC/ROC. As a result, relevant clinical and behavioral risk factors to oral medication management are included in the risk adjustment model.

Figure 2: *A Conceptual Model*



[1] Health related social need items were added to OASIS-E in 2023 and are not a part of this submission.
[2] Selected in current risk adjustment model
Source: National Academies of Sciences, Engineering, and Medicine; Health and Medicine Division; Board on Health Care Services; Board on Population Health and Public Health Practice; Committee on Accounting for Socioeconomic Status in Medicare Payment Programs; Steinwachs DM, Stratton K, Kwan LY, editors. Washington (DC): National Academies Press (US); 2017 May 18.

Provide descriptive statistics on the distribution across the measured entities of the risk variables identified in the conceptual model. *

Table 8 shows the mean and standard deviation of the observed value for *Improvement in Management of Oral Medications (#0176)* by risk factor in CY 2022.

Table 8: *Observed Improvement in Management of Oral Medications (#0176): Mean and Standard Deviation, CY 2022*

Risk Factor	Mean	Std. Dev
Age: 0-54	0.841	0.366
Age: 55-59	0.862	0.345
Age: 60-64	0.863	0.344
Age: 70-74	0.879	0.326
Age: 75-79	0.855	0.352
Age: 80-84	0.820	0.384
Age: 85-89	0.779	0.415
Age: 90-94	0.733	0.442
Age: 95+	0.672	0.47
Ambulation/Locomotion: One-handed device on all surfaces	0.734	0.442
Ambulation/Locomotion: Two-handed device/human assist on steps	0.735	0.441
Ambulation/Locomotion: Walks only with supervision or assist	0.872	0.334
Ambulation/Locomotion: Chairfast or bedfast	0.664	0.472
Anxiety: Less often than daily	0.809	0.393

Risk Factor	Mean	Std. Dev
Anxiety: Daily, but not constantly	0.792	0.406
Anxiety: All of the time	0.803	0.398
Availability of Assistance: Around the clock	0.806	0.395
Availability of Assistance: Regular daytime	0.854	0.353
Availability of Assistance: Regular nighttime	0.891	0.312
Behavioral: Memory deficit	0.651	0.477
Behavioral: None	0.88	0.325
Behavioral: Verbally disruptive, physical aggression, disruptive, or delusional	0.561	0.496
Frequency of Disruptive Behavior: Once a month or less	0.764	0.425
Frequency of Disruptive Behavior: Several times a month	0.742	0.437
Frequency of Disruptive Behavior: Several times a week	0.74	0.439
Frequency of Disruptive Behavior: At least once daily	0.695	0.46
Bowel Incontinence Frequency: Less than once a week	0.767	0.423
Bowel Incontinence Frequency: One to three times a week	0.68	0.467
Bowel Incontinence Frequency: Four to six times a week or more	0.552	0.497
Bowel Incontinence Frequency: Ostomy for bowel elimination	0.841	0.366
Cognitive Functioning: Requires prompting under stress	0.806	0.395
Cognitive Functioning: Requires assist in special circumstances	0.669	0.471
Cognitive Function: Requires considerable assist/totally dependent	0.452	0.498
Confused: In new or complex situations	0.816	0.388
Confused: Sometimes	0.658	0.474
Confused: Constantly	0.413	0.492
Dyspnea: Walking more than 20 feet, climbing stairs	0.848	0.359
Dyspnea: Moderate exertion	0.832	0.373
Dyspnea: Minimal to no exertion	0.849	0.358
Eating: Requires set up, intermittent assist or modified consistency	0.842	0.365
Eating: Unable to feed self and must be assisted throughout meal	0.674	0.469
Eating: Requires tube feedings, or no nutrients orally or via tube	0.677	0.468
Patient is male	0.83	0.375
HCC: Lymphoma and other cancers	0.821	0.383
HCC: Ischemic or unspecified stroke	0.663	0.473
HCC: Hemiplegia/hemiparesis	0.747	0.435
HCC: Monoplegia, other paralytic syndromes	0.807	0.395
HCC: Atherosclerosis of the extremities with ulceration or gangrene	0.796	0.403
HCC: Chronic obstructive pulmonary disease	0.849	0.358
HCC: Fibrosis of lung and other chronic lung disorders	0.844	0.363
HCC: Aspiration and specified bacterial pneumonias	0.768	0.422
HCC: Dialysis status	0.796	0.403
HCC: Chronic kidney disease, stage 5	0.828	0.378
HCC: Chronic kidney disease, severe (stage 4)	0.817	0.386
HCC: Pressure ulcer of skin with necrosis through to muscle, tendon, or bone	0.561	0.496

Risk Factor	Mean	Std. Dev
HCC: Pressure ulcer of skin with full thickness skin loss	0.623	0.485
HCC: Chronic ulcer of skin, except pressure	0.821	0.384
HCC: Major head injury	0.71	0.454
HCC: Diabetes with chronic complications	0.833	0.373
HCC: Amputation status, lower limb/amputation complications	0.846	0.361
HCC: Protein-calorie malnutrition	0.782	0.413
HCC: End-stage liver disease	0.82	0.384
HCC: Cirrhosis of liver	0.839	0.367
HCC: Dementia with complications	0.548	0.498
HCC: Dementia without complication	0.603	0.489
HCC: Substance use with psychotic complications	0.745	0.436
HCC: Schizophrenia	0.7	0.458
HCC: Major depressive, bipolar, and paranoid disorders	0.792	0.406
HCC: Personality disorders	0.729	0.445
HCC: Quadriplegia	0.505	0.5
HCC: Paraplegia	0.7	0.458
HCC: Spinal cord disorders/injuries	0.812	0.391
HCC: Amyotrophic lateral sclerosis and other motor neuron disease	0.572	0.495
HCC: Cerebral palsy	0.57	0.495
HCC: Muscular dystrophy	0.714	0.452
HCC: Multiple sclerosis	0.779	0.415
HCC: Parkinson's and Huntington’s diseases	0.711	0.453
HCC: Seizure disorders and convulsions	0.742	0.438
HCC: Metastatic cancer and acute leukemia	0.765	0.424
HCC: Coma, brain compression/anoxic damage	0.716	0.451
HCC: Respirator dependence/tracheostomy status	0.798	0.401
HCC: Cardio-respiratory failure and shock	0.847	0.36
HCC: Congestive heart failure	0.828	0.377
HCC: Lung and other severe cancers	0.832	0.374
Discharged from post-acute facility in past 14 days	0.832	0.374
Living Arrangement: Lives alone	0.902	0.297
Living Arrangement: Lives in congregate setting (ALF)	0.599	0.49
Ability to Dress Lower Body: Needs clothing/shoes laid out	0.812	0.391
Ability to Dress Lower Body: Assist needed putting on clothing	0.862	0.345
Ability to Dress Lower Body: Entirely dependent upon someone else	0.738	0.44
Management of Oral Meds: Reminders needed	0.835	0.371
Management of Oral Meds: Unable	0.852	0.355
Payment Source: Medicaid only	0.854	0.353
Payment Source: Medicare HMO only	0.838	0.369
Payment Source: Medicare and Medicaid	0.782	0.413
Payment Source: Other Combination	0.858	0.349

Risk Factor	Mean	Std. Dev
PHQ2to9: No Depression Screening	1	0
Pressure ulcer: Stage II or higher or unstageable present	0.647	0.478
Risk for Hospitalization: Difficulty complying with medical instruction in past 3 months	0.829	0.377
Risk for Hospitalization: Reports exhaustion	0.843	0.364
Risk for Hospitalization: Multiple hospitalizations in past 6 months	0.832	0.374
Risk for Hospitalization: None of the above	0.831	0.375
Risk for Hospitalization: Recent mental/emotional decline in past 3 months	0.809	0.393
Resumption of Care	0.774	0.418
Start of Care from Community	0.781	0.414
Supervision and Safety: Caregiver provides	0.795	0.403
Supervision and Safety: Caregiver uncertain	0.875	0.33
Supervision and Safety: Caregiver needs training	0.827	0.379
Status of Surgical Wound: Epithelialized	0.906	0.291
Status of Surgical Wound: Fully granulating or early/partial granulation	0.882	0.322
Status of Surgical Wound: Not healing	0.928	0.259
Stasis Ulcer: 1 observable stasis ulcer	0.806	0.395
Stasis Ulcer: Multiple observable stasis ulcers	0.799	0.401
Toilet Hygiene Assistance: Needs supplies laid out	0.848	0.359
Toilet Hygiene Assistance: Needs assistance	0.862	0.345
Toilet Hygiene Assistance: Entirely dependent	0.662	0.473
Toilet Transferring: To/from/on/off toilet with human assist	0.857	0.35
Toilet Transferring: Able to self-transfer to bedside commode	0.849	0.359
Toilet Transferring: Unable to transfer to/from toilet or commode	0.725	0.446
Transferring: With minimal human assist or with device	0.779	0.415
Transferring: Bears weight and pivots only	0.868	0.338
Transferring: Unable or bedfast	0.715	0.451
Ability to Dress Upper Body: Needs clothing laid out	0.862	0.345
Ability to Dress Upper Body: Needs assistance putting on clothing	0.852	0.355
Ability to Dress Upper Body: Entirely dependent upon someone else	0.63	0.483
Urinary incontinence/catheter: Catheter	0.738	0.44
Urinary incontinence/catheter: Incontinent	0.782	0.413

If using statistical risk models, provide detailed risk model specifications (query or algorithm), including the risk model method, risk factor data sources, and equations. Please attach an excel file providing the risk factors, coefficients, codes with descriptors, and definitions. *

Attachment (excel)

The risk adjustment methodology used is based on logistic regression analysis which results in a statistical prediction model for each outcome measure. For each patient who is included in the denominator of the outcome measure, the model is used to calculate the predicted probability that the patient will experience the outcome. The predicted probability for a patient is calculated using the following formula:

$$P\ (x\ ) = 1/(1 + e^{\ -(a\ + \Sigma\, b\ _i x\ _i)})$$

Where:

$P(x)$ = predicted probability of achieving outcome x
a = constant parameter listed in the model documentation
b_i = coefficient for risk factor i in the model documentation
x_i = value of risk factor i for this patient

Predicted probabilities for all patients included in the measure denominator are then averaged to derive an expected outcome value for the agency. This expected value is then used, together with the observed (unadjusted) outcome value and the expected value for the national population of patients for the same data collection period, to calculate a risk-adjusted outcome value for the home health agency. The formula for the adjusted value of the outcome measure is as follows:

$$X(A_{ra}) = X(A_{obs}) + X(N_{exp}) - X(A_{exp})$$

Where:

$X(A_{ra})$ = Agency risk-adjusted outcome measure value
$X(A_{obs})$ = Agency observed outcome measure value
$X(A_{exp})$ = Agency expected outcome measure value
$X(N_{exp})$ = National expected outcome measure value

If the result of this calculation is a value greater than 100%, the adjusted value is set to 100%. Similarly, if the result is a negative number the adjusted value is set to zero.

For a more detailed summary of risk adjustment specifications including definitions of the risk factors, please consult the Home Health Quality Reporting Program Risk Adjustment Technical Specifications 2024 (PDF).[3]

Detail the statistical results of the analysis used to test and select risk factors for inclusion in or exclusion from the risk model/stratification. *

The risk adjustment model was developed using OASIS national repository data from assessments submitted between January 1, 2021, and December 31, 2021 (~6.2 million quality episodes). The population of 6.2 million quality episodes for calendar year 2021 was split in half such that 3.1 million quality episodes were used as a developmental sample and 3.1 million quality episodes were used as a validation sample. The following process was used to identify unique contributing risk factors to the prediction model:

1. Risk factors were identified based on OASIS items that will remain or will be added following the transition to OASIS-E. The statistical properties of the items were examined to specify risk factors (e.g., item responses were grouped when there was low prevalence of certain responses). Team clinicians then reviewed all risk factors for clinical relevance and redefined or updated risk factors as necessary. These risk factors were divided into 31 content focus groups (e.g., functional status, Hierarchical Condition Categories, etc.). Where possible, risk factors were defined such that they flagged mutually exclusive subgroups within each content focus group. When modelling these risk factors, the exclusion category was set to be either the risk factor flag for most independent or the most frequent within each content focus group.
2. A logistic regression specification was used to estimate coefficients among the full set of candidate risk factors. Those risk factors that are statistically significant at probability <0.0001 are flagged for further review in Step 3.
3. Each risk factor flagged in Step 2 was reviewed to determine which one of the two groups its content focus group resided. Either its content focus group was explicitly tiered by increasing severity or it was not. This classification determined which risk factor covariates were kept and which were dropped from the final risk adjustment specification. For content focus groups that are explicitly tiered by increasing severity, either all risk factors are included within a content focus group or none of them. For example, if response option levels 1 and 2 for M1800 Grooming were statistically significant at a probability of <0.0001 for a particular outcome, then response option level 3 for M1800 Grooming was added to the list even if it was not statistically significant. If none of the risk factors within an explicitly tiered content focus group was statistically significant at <0.0001, the entire content focus group was removed from the model.
4. A logistic regression was computed on the list of risk factors kept after Step 3 above.
5. Goodness of fit and reliability statistics (McFadden's R^2, C-statistic, and Intra-Class Correlation) were calculated to measure how well the predicted values generated by the prediction model were related to the

[3] https://www.cms.gov/files/document/risk-adjustment-technicalspecifications2024.pdf

actual outcomes. Separate bivariate correlations were constructed between the risk factors and the outcomes to confirm the sign and strength of the estimated coefficients in the logistic model.

6. The initial model was reviewed by a team of at least three experienced home health clinicians. Each risk factor was reviewed for its clinical plausibility. Clinicians were asked about the direction indicated by the coefficient in the risk adjustment model and how it compares to their perceived bivariate relationship given their experience treating patients in the home. Risk factors that were not clinically plausible were revised or eliminated if revisions were not possible.
7. The risk factors that were deemed not clinically plausible were revised or eliminated, and Steps 3, 4, and 5 in this process were repeated. The resulting logistic regression equation was designated as the risk adjustment model for the outcome.
8. The risk adjustment model was applied to the validation sample and goodness of fit statistics were computed. The statistics were similar to the goodness of fit statistics computed with the development sample. As additional testing, home health agencies were stratified across several observable characteristics, and the distributions of the risk-adjusted outcomes were checked to confirm that values remained similar across strata.

Using CY 2021 data, the updated risk adjustment model specification yielded a McFadden's R^2 of 0.1980 and a C-Statistic of 0.8139 on the validation sample. Please refer to **Appendix A** for details on the risk factor coefficients, including standard deviations and p-values.

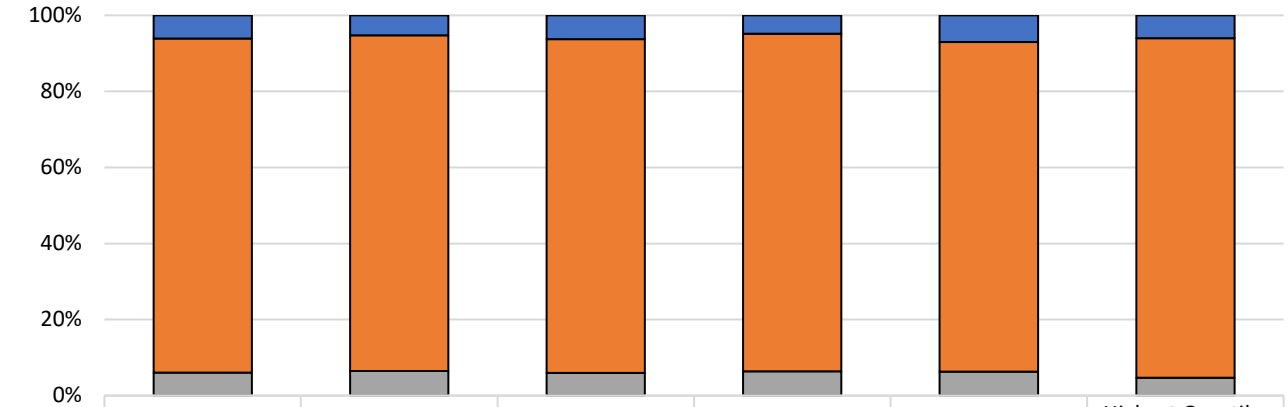
Detail the statistical results of the analysis used to test and select risk factors for inclusion in or exclusion from the risk model/stratification. *

Provide the approach and results of calibration and discrimination testing. Describe any over- or under-prediction of the model for important subgroups. Please attach results of calibration and discrimination testing. *

Attachment (pdf, jpg, png)

We calibrated the most recent risk adjustment update by comparing changes in performance for home health agencies overall and by important subgroups (urbanicity/rurality, size, and share of quality episodes with non-white patients) to the prior risk adjustment specification. The results in **Figure 3** below indicate that most home health agencies overall and by subgroup perform equally well based on the updated risk adjustment model compared to the prior model, ranging between 86 percent among urban home health agencies and 88.6 percent among home health agencies with the highest percentage of non-white patients.

Figure 3: *Comparison of Quintile Ranking between the Current Model and the Prior Model*



	Overall	Rural HHAs	Urban HHAs	Small HHAs	Large HHAs	Highest Quartile Non-White
Better	6.071%	5.267%	6.235%	4.869%	7.052%	6.002%
Same	87.898%	88.286%	87.818%	88.764%	86.675%	89.272%
Worse	6.031%	6.447%	5.947%	6.367%	6.273%	4.726%

Equity

Describe how this measure contributes to efforts to advance health equity (*optional*). *Provide a description of your methodology and approach to empirical testing of differences in performance scores across multiple socio-contextual variables (e.g., race, ethnicity, urbanicity/rurality, socio-economic status, gender, gender identity, sexual orientation, age). Provide an interpretation of the results, including interpretation of any identified differences and consideration of negative impact or unintended consequences on subgroups.*
Across home health agencies, we compared *Improvement in Management of Oral Medications (#0176)* CY 2022 performance by subgroups for urbanicity/rurality, size, and share of quality episodes with non-white patients (see **Figure 4**).

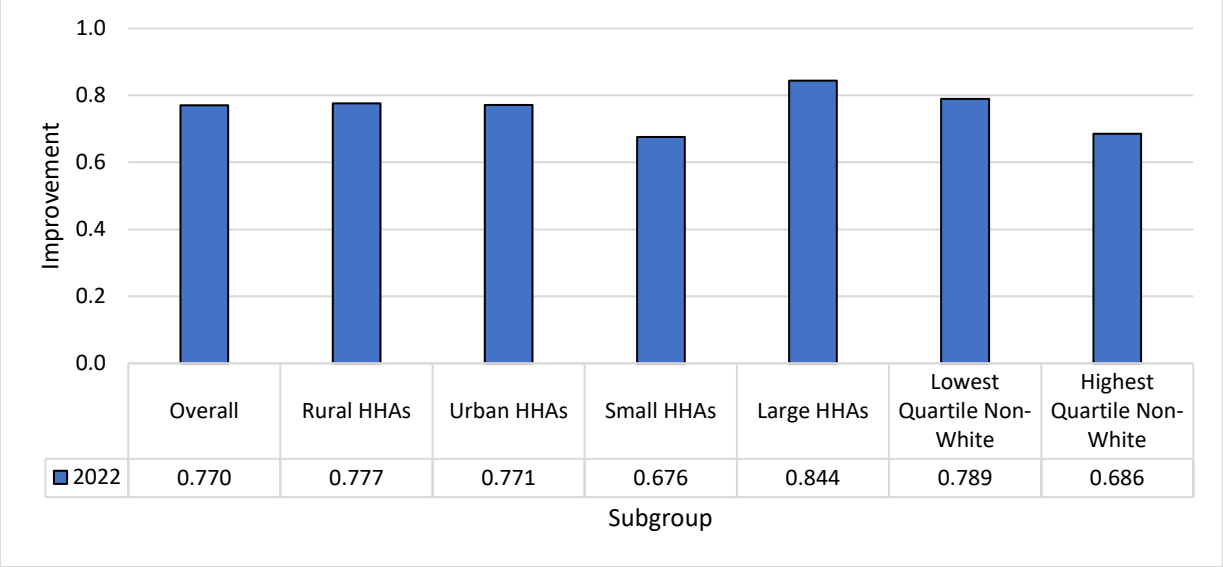
We define urbanicity as home health agencies located within a Core-Based Statistical Area (CBSA) as defined by the Office of Management and Budget (OMB). Urban home health agencies on average performed slightly worse at 0.771 than rural home health agencies at 0.777.

We define large home health agencies as home health agencies with quality episode counts in the top quartile for CY 2022 and small home health agencies as being in the bottom quartile. Large home health agencies perform much better at 0.844 than small home health agencies at 0.676.

For “Highest Quartile Non-White” home health agencies, we use the M0140: Race/Ethnicity OASIS item to identify the patient’s race/ethnicity as non-white. Home health agencies in the lowest quartile share of quality episodes with non-white patients perform better at 0.789 than home health agencies in the highest quartile at 0.686.

The results, particularly for home health agency size and percentage of non-white patients, indicate a performance gap across home health agencies by subgroup. CMS is monitoring the persistence of these gaps and investigating next steps for addressing through reevaluated measure specifications or other policies (see https://www.cms.gov/medicare/quality/home-health-quality-reporting-program/home-health-qrp-health-equity for additional resources).

Figure 4: *Risk-adjusted Improvement in Management of Oral Medications (#0167) by Subgroup, CY 2022*



Use & Usability

Use

[For initial endorsement] **Check all current or planned uses** *

☐ Public Reporting
☐ Public Health/Disease Surveillance
☐ Payment Program
☐ Regulatory and Accreditation Programs
☐ Professional Certification or Recognition Program
☐ Quality Improvement with Benchmarking (external benchmarking to multiple organizations)
☐ Quality Improvement (Internal to the specific organization)
☐ Other
Please specify (text box)

Not Applicable.

[For maintenance review] **Check all current uses:** *

x Public Reporting
☐ Public Health/Disease Surveillance
x Payment Program
☐ Regulatory and Accreditation Programs
☐ Professional Certification or Recognition Program
x Quality Improvement with Benchmarking (external benchmarking to multiple organizations)
x Quality Improvement (Internal to the specific organization)
☐ Other
(please specify (text box)
☐ Not in use
Please provide more information as to why the measure is not in use (text box)

[For maintenance review] **Please provide the following information describing the program(s) in which the measure is used**: *

Name of the program and sponsor *(text box)*
URL *(text box)*
Purpose *(text box)*
Geographic area and percentage of accountable entities and patients included *(text box)*
Level of analysis and care setting. *(text box)*

You may add additional programs or sponsors

Public Reporting
Care Compare Find Healthcare Providers: Compare Care Near You | Medicare
Quality Improvement (External to the specific organization)
Home Health Star Ratings Home Health Star Ratings | CMS

Usability

What are the actions measured entities must take to improve performance on this measure? How difficult are those actions to achieve? *

All home health agencies with at least 20 qualifying quality episodes of care receive quarterly measure reports on all their publicly reported measures. In addition, providers can run on-demand, confidential reports showing individual measure results and national averages, through CMS' iQIES system. There is an email box that home health agencies may submit questions to as well as a website on which the latest measure updates are posted. The OASIS Guidance Manual describes the OASIS-based reports that are available, report use(s), and provides guidance about OASIS and quality improvement. Home health agencies make use of these reports to monitor and improve the quality of care.

[For maintenance only] **Summarize the feedback on measure performance and implementation from the measured entities and others. Describe how you obtained feedback.** *
Home health agencies receive quarterly measure reports on all their measures. There is an email box that home health agencies may submit questions to as well as a website on which the latest measure updates are posted. Because of the changes made to the OASIS in the OASIS-E version (effectively January 1, 2023), risk models for publicly reported outcome measures have been updated. CMS makes available information about risk models and covariates on its website.

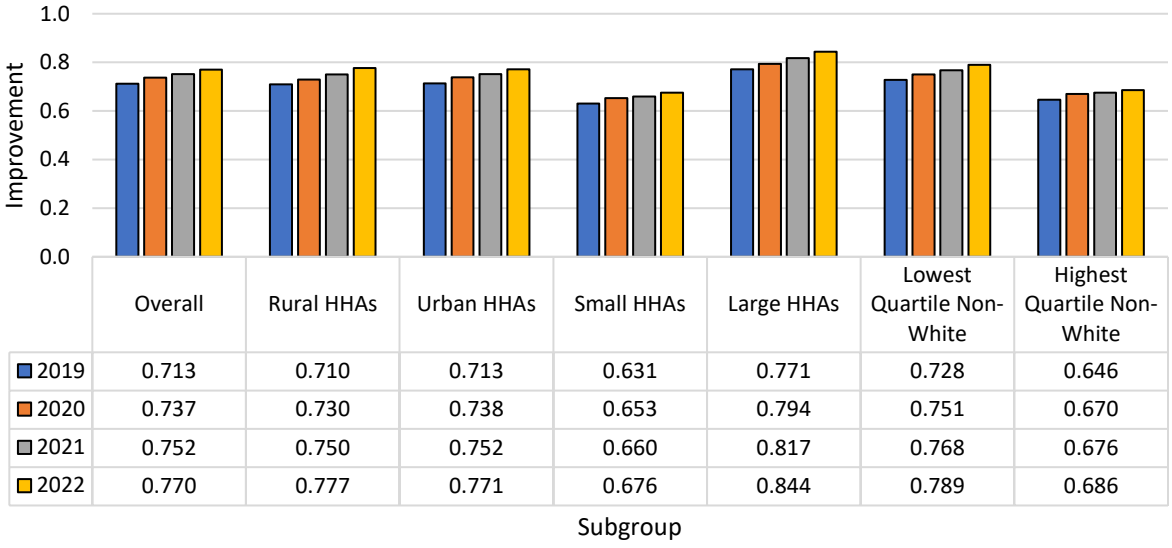
[For maintenance only] **Describe how you considered the feedback when developing or revising the measure specifications or implementation, including whether you modified the measure and why or why not.** *
No measures specifications changes requested or made.

[For maintenance only] **Discuss any progress on improvement (trends in performance results, including performance across sub-populations if available, number and percentage of people receiving high-quality healthcare, geographic area, number and percentage of accountable entities and patients included). If use of the measure demonstrated no improvement, provide an explanation.** *
The measure is important to report publicly. Although improvements in performance are small, home health agencies continue to improve overall, and for each subgroup measured over time. Performance gaps still exist, indicating that further improvement is possible. Publicly reported measure results illustrate variation in performance across home health agencies that may inform patient and family choice of a home health agency.

Improvement
Progress toward achieving the goal of high-quality, efficient healthcare for individuals or populations is demonstrated. If not in use for performance improvement at the time of initial endorsement, then a credible rationale describes how the performance results could be used to further the goal of high-quality, efficient healthcare for individuals or populations.

4b1. **Refer to data provided in 1b but do not repeat here. Discuss any progress on improvement (trends in performance results, number and percentage of people receiving high-quality healthcare; Geographic area and number and percentage of accountable entities and patients included.) If no improvement was demonstrated, what are the reasons? If not in use for performance improvement at the time of initial endorsement, provide a credible rationale that describes how the performance results could be used to further the goal of high quality, efficient healthcare for individuals or populations.**
Figure 5 presents trends in risk-adjusted *Improvement in Management of Oral Medications (#0176)* by subgroup. In addition to overall improvement from CY 2019 to CY 2022, each subgroup improves. We expect improvement to be driven in part by the implementation of the Quality of Patient Care (QoPC) Star Rating beginning in July 2015 and the Home Health Value Based Purchasing (HHVBP) Model in 2016. Results prior to 2019 showed dramatic improvement (not shown), while improvement in 2019-2022 was smaller. Nonetheless, QoPC Star Rating and HHVBP still provide incentives for home health agencies to improve on this measure. We anticipate continued improvement as HHVBP expands nationwide in 2023. Data will not reflect this policy change, as we only report results through CY2022.

Figure 5: *Trends in Risk-adjusted Improvement in Management of Oral Medications (#0176) by Subgroup, CY 2019 – CY 2022*



	Overall	Rural HHAs	Urban HHAs	Small HHAs	Large HHAs	Lowest Quartile Non-White	Highest Quartile Non-White
2019	0.713	0.710	0.713	0.631	0.771	0.728	0.646
2020	0.737	0.730	0.738	0.653	0.794	0.751	0.670
2021	0.752	0.750	0.752	0.660	0.817	0.768	0.676
2022	0.770	0.777	0.771	0.676	0.844	0.789	0.686

[For maintenance only] **Explain any unexpected findings (positive or negative) during implementation of this measure, including unintended impacts on patients.** *

Recent improvement in this measure has been relatively large compared to historical trends. We believe these large improvements are due to the implementation of two initiatives that involve this measure – the QoPC Star Ratings and HHVBP – beginning in 2015 and 2016.

We do not find any unexpected findings during implementation of this measure at this time.

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APPENDIX A: IMPROVEMENT IN MANAGEMENT OF ORAL MEDICATIONS (#0176)

Pseudo-R2 = 0.1980; C-Statistics =0.8139; Number of Risk Factors = 128

Covariate Label	Coeff	SE	Odds Ratio	95% Lower	95% Upper	P Value
Age: 0-54	-0.103	0.015	0.902	0.875	0.930	0.000
Age: 55-59	-0.084	0.015	0.920	0.893	0.947	0.000
Age: 60-64	-0.113	0.012	0.893	0.872	0.915	0.000
Age: 70-74	-0.039	0.009	0.962	0.946	0.979	0.000
Age: 75-79	-0.139	0.010	0.870	0.854	0.887	0.000
Age: 80-84	-0.289	0.011	0.749	0.734	0.765	0.000
Age: 85-89	-0.419	0.012	0.658	0.642	0.674	0.000
Age: 90-94	-0.577	0.014	0.562	0.546	0.578	0.000
Age: 95+	-0.777	0.018	0.460	0.443	0.477	0.000
Patient is male	-0.058	0.005	0.944	0.934	0.954	0.000
Payment Source: Medicare HMO only	-0.030	0.023	0.971	0.928	1.016	0.197
Payment Source: Medicare and Medicaid	-0.363	0.048	0.695	0.633	0.764	0.000
Payment Source: Medicaid only	-0.178	0.029	0.837	0.790	0.887	0.000
Payment Source: Other Combination	0.073	0.034	1.076	1.007	1.149	0.031
Start of Care from Community	-0.346	0.013	0.708	0.690	0.726	0.000
Resumption of Care	-0.380	0.011	0.684	0.669	0.699	0.000
Discharged from post-acute facility in past 14 days	-0.157	0.011	0.855	0.837	0.873	0.000
Risk for Hospitalization: Multiple hospitalizations in past 6 months	-0.036	0.009	0.964	0.947	0.982	0.000
Risk for Hospitalization: Recent mental/emotional decline in past 3	0.057	0.013	1.059	1.032	1.086	0.000
Risk for Hospitalization: Difficulty complying with medical instruction	0.094	0.015	1.098	1.067	1.130	0.000
Risk for Hospitalization: Reports exhaustion	0.107	0.013	1.113	1.086	1.141	0.000
Risk for Hospitalization: None of the above	0.241	0.038	1.273	1.182	1.371	0.000
Availability of Assistance: Regular nighttime	-0.116	0.024	0.890	0.850	0.933	0.000
Availability of Assistance: Regular daytime	-0.316	0.021	0.729	0.700	0.760	0.000
Availability of Assistance: Around the clock	-0.395	0.016	0.673	0.653	0.695	0.000

Covariate Label	Coeff	SE	Odds Ratio	95% Lower	95% Upper	P Value
Living Arrangement: Lives alone	0.282	0.012	1.326	1.295	1.357	0.000
Living Arrangement: Lives in congregate setting (ALF)	-0.748	0.025	0.473	0.450	0.497	0.000
Pressure ulcer: Stage II or higher or unstageable present	-0.364	0.014	0.695	0.676	0.714	0.000
Stasis Ulcer: 1 observable stasis ulcer	-0.046	0.028	0.955	0.905	1.008	0.096
Stasis Ulcer: Multiple observable stasis ulcers	-0.168	0.030	0.846	0.797	0.897	0.000
Status of Surgical Wound: Epithelialized	0.366	0.013	1.442	1.406	1.480	0.000
Status of Surgical Wound: Fully granulating or early/partial granulation	0.312	0.021	1.367	1.311	1.424	0.000
Status of Surgical Wound: Not healing	0.521	0.017	1.684	1.628	1.743	0.000
Dyspnea: Walking more than 20 feet, climbing stairs	0.283	0.024	1.327	1.265	1.392	0.000
Dyspnea: Moderate exertion	0.365	0.025	1.440	1.370	1.513	0.000
Dyspnea: Minimal to no exertion	0.568	0.028	1.765	1.669	1.866	0.000
Urinary incontinence/catheter: Incontinent	-0.256	0.013	0.774	0.754	0.794	0.000
Urinary incontinence/catheter: Catheter	-0.444	0.017	0.642	0.620	0.664	0.000
Bowel Incontinence Frequency: Less than once a week	-0.107	0.019	0.898	0.866	0.932	0.000
Bowel Incontinence Frequency: One to three times a week	-0.246	0.017	0.782	0.756	0.809	0.000
Bowel Incontinence Frequency: Four to six times a week or more	-0.416	0.027	0.660	0.626	0.696	0.000
Bowel Incontinence Frequency: Ostomy for bowel elimination	-0.108	0.019	0.898	0.865	0.932	0.000
Cognitive Functioning: Requires prompting under stress	-0.278	0.013	0.757	0.738	0.777	0.000
Cognitive Functioning: Requires assist in special circumstances	-0.469	0.018	0.626	0.604	0.648	0.000
Cognitive Function: Requires considerable assist/totally dependent	-0.676	0.024	0.509	0.485	0.534	0.000
Confused: In new or complex situations	-0.278	0.012	0.757	0.739	0.776	0.000
Confused: Sometimes	-0.499	0.016	0.607	0.589	0.626	0.000
Confused: Constantly	-0.808	0.025	0.446	0.424	0.468	0.000
Anxiety: Less often than daily	0.019	0.011	1.020	0.998	1.041	0.071
Anxiety: Daily, but not constantly	0.065	0.014	1.067	1.039	1.096	0.000
Anxiety: All of the time	0.191	0.025	1.210	1.153	1.271	0.000
PHQ2to9: Needs further eval	-0.121	0.018	0.886	0.856	0.917	0.000
PHQ2to9: No Depression Screening	-0.296	0.025	0.744	0.709	0.780	0.000
Behavioral: None	0.364	0.019	1.439	1.385	1.494	0.000
Behavioral: Memory deficit	-0.084	0.013	0.919	0.895	0.944	0.000

Covariate Label	Coeff	SE	Odds Ratio	95% Lower	95% Upper	P Value
Behavioral: Verbally disruptive, physical aggression, disruptive, or	-0.288	0.018	0.749	0.723	0.777	0.000
Frequency of Disruptive Behavior: Once a month or less	0.252	0.023	1.286	1.230	1.345	0.000
Frequency of Disruptive Behavior: Several times a month	0.221	0.026	1.248	1.185	1.314	0.000
Frequency of Disruptive Behavior: Several times a week	0.221	0.025	1.247	1.188	1.308	0.000
Frequency of Disruptive Behavior: At least once daily	0.184	0.028	1.203	1.138	1.271	0.000
Ability to Dress Upper Body: Needs clothing laid out	0.054	0.036	1.056	0.984	1.134	0.133
Ability to Dress Upper Body: Needs assistance putting on clothing	-0.175	0.039	0.840	0.779	0.906	0.000
Ability to Dress Upper Body: Entirely dependent upon someone else	-0.425	0.044	0.654	0.600	0.713	0.000
Ability to Dress Lower Body: Needs clothing/shoes laid out	0.164	0.041	1.179	1.088	1.276	0.000
Ability to Dress Lower Body: Assist needed putting on clothing	0.186	0.041	1.205	1.112	1.305	0.000
Ability to Dress Lower Body: Entirely dependent upon someone else	0.239	0.047	1.270	1.159	1.392	0.000
Toilet Transferring: To/from/on/off toilet with human assist	0.197	0.030	1.218	1.149	1.292	0.000
Toilet Transferring: Able to self-transfer to bedside commode	0.237	0.030	1.267	1.194	1.345	0.000
Toilet Transferring: Unable to transfer to/from toilet or commode	0.312	0.035	1.366	1.274	1.463	0.000
Toilet Hygiene Assistance: Needs supplies laid out	0.002	0.030	1.002	0.946	1.062	0.942
Toilet Hygiene Assistance: Needs assistance	-0.116	0.038	0.891	0.827	0.959	0.002
Toilet Hygiene Assistance: Entirely dependent	-0.383	0.045	0.682	0.624	0.745	0.000
Transferring: With minimal human assist or with device	0.066	0.032	1.069	1.004	1.138	0.038
Transferring: Bears weight and pivots only	0.371	0.036	1.449	1.352	1.554	0.000
Transferring: Unable or bedfast	0.317	0.039	1.373	1.272	1.482	0.000
Ambulation/Locomotion: One-handed device on all surfaces	-0.037	0.042	0.964	0.888	1.045	0.371
Ambulation/Locomotion: Two-handed device/human assist on steps	-0.195	0.041	0.823	0.759	0.891	0.000
Ambulation/Locomotion: Walks only with supervision or assist	0.144	0.046	1.154	1.054	1.264	0.002
Ambulation/Locomotion: Chairfast or bedfast	-0.417	0.049	0.659	0.598	0.725	0.000
Eating: Requires set up, intermittent assist or modified consistency	-0.044	0.016	0.957	0.927	0.988	0.007
Eating: Unable to feed self and must be assisted throughout meal	-0.216	0.024	0.806	0.768	0.845	0.000
Eating: Requires tube feedings, or no nutrients orally or via tube	-0.569	0.028	0.566	0.535	0.598	0.000
Management of Oral Meds: Reminders needed	1.263	0.020	3.538	3.402	3.679	0.000
Management of Oral Meds: Unable	1.680	0.024	5.364	5.120	5.619	0.000
Supervision and Safety: Caregiver provides	-0.303	0.019	0.739	0.712	0.767	0.000

Covariate Label	Coeff	SE	Odds Ratio	95% Lower	95% Upper	P Value
Supervision and Safety: Caregiver needs training	-0.110	0.023	0.896	0.857	0.937	0.000
Supervision and Safety: Caregiver uncertain	-0.133	0.033	0.876	0.822	0.934	0.000
HCC: Metastatic cancer and acute leukemia	-0.660	0.022	0.517	0.495	0.539	0.000
HCC: Lung and other severe cancers	-0.350	0.019	0.704	0.678	0.732	0.000
HCC: Lymphoma and other cancers	-0.250	0.023	0.778	0.744	0.814	0.000
HCC: Diabetes with chronic complications	-0.125	0.009	0.883	0.866	0.899	0.000
HCC: Protein-calorie malnutrition	-0.211	0.020	0.810	0.778	0.842	0.000
HCC: End-stage liver disease	-0.396	0.038	0.673	0.625	0.724	0.000
HCC: Cirrhosis of liver	-0.292	0.027	0.747	0.708	0.787	0.000
HCC: Dementia with complications	-0.563	0.020	0.570	0.547	0.593	0.000
HCC: Dementia without complication	-0.492	0.014	0.612	0.595	0.629	0.000
HCC: Substance use with psychotic complications	-0.279	0.067	0.756	0.663	0.863	0.000
HCC: Schizophrenia	-0.446	0.038	0.640	0.594	0.690	0.000
HCC: Major depressive, bipolar, and paranoid disorders	-0.121	0.017	0.886	0.857	0.915	0.000
HCC: Personality disorders	-0.523	0.105	0.593	0.482	0.729	0.000
HCC: Quadriplegia	-0.941	0.041	0.390	0.360	0.423	0.000
HCC: Paraplegia	-0.171	0.033	0.843	0.790	0.900	0.000
HCC: Spinal cord disorders/injuries	-0.168	0.032	0.845	0.793	0.901	0.000
HCC: Amyotrophic lateral sclerosis and other motor neuron disease	-1.490	0.052	0.225	0.203	0.250	0.000
HCC: Cerebral palsy	-0.745	0.037	0.475	0.442	0.510	0.000
HCC: Muscular dystrophy	-0.642	0.065	0.526	0.463	0.598	0.000
HCC: Multiple sclerosis	-0.327	0.025	0.721	0.687	0.757	0.000
HCC: Parkinson's and Huntington’s diseases	-0.389	0.013	0.678	0.661	0.695	0.000
HCC: Seizure disorders and convulsions	-0.255	0.014	0.775	0.753	0.797	0.000
HCC: Coma, brain compression/anoxic damage	-0.461	0.064	0.630	0.556	0.715	0.000
HCC: Respirator dependence/tracheostomy status	-0.452	0.060	0.636	0.566	0.715	0.000
HCC: Cardio-respiratory failure and shock	-0.078	0.014	0.925	0.901	0.950	0.000
HCC: Congestive heart failure	-0.168	0.008	0.845	0.832	0.859	0.000
HCC: Ischemic or unspecified stroke	-0.389	0.052	0.678	0.612	0.750	0.000
HCC: Hemiplegia/hemiparesis	-0.405	0.012	0.667	0.651	0.683	0.000

Covariate Label	Coeff	SE	Odds Ratio	95% Lower	95% Upper	P Value
HCC: Monoplegia, other paralytic syndromes	-0.167	0.038	0.846	0.785	0.912	0.000
HCC: Atherosclerosis of the extremities with ulceration or gangrene	-0.313	0.040	0.731	0.677	0.790	0.000
HCC: Chronic obstructive pulmonary disease	-0.129	0.009	0.879	0.863	0.895	0.000
HCC: Fibrosis of lung and other chronic lung disorders	-0.122	0.027	0.885	0.839	0.933	0.000
HCC: Aspiration and specified bacterial pneumonias	-0.287	0.027	0.751	0.712	0.792	0.000
HCC: Dialysis status	-0.667	0.038	0.513	0.476	0.554	0.000
HCC: Chronic kidney disease, stage 5	-0.458	0.017	0.632	0.612	0.654	0.000
HCC: Chronic kidney disease, severe (stage 4)	-0.072	0.017	0.931	0.900	0.962	0.000
HCC: Pressure ulcer of skin with necrosis through to muscle, tendon, or bone	-0.336	0.040	0.715	0.661	0.774	0.000
HCC: Pressure ulcer of skin with full thickness skin loss	-0.107	0.024	0.899	0.858	0.941	0.000
HCC: Chronic ulcer of skin, except pressure	-0.147	0.019	0.864	0.832	0.897	0.000
HCC: Major head injury	-0.214	0.049	0.807	0.734	0.888	0.000
HCC: Amputation status, lower limb/amputation complications	-0.240	0.030	0.787	0.742	0.834	0.000
Constant	0.909	0.063	2.481	2.192	2.807	0.000