CBE ID

4635

Title

Cross-Setting Discharge Function Score for Long-Term Care Hospitals

Project

Advanced Illness and Post-Acute Care

Endorsement Status

Endorsed

Is Under Review

No

Next Maintenance Cycle

Fall 2029

Previous Endorsement Cycle

Fall 2024

Initial Endorsement

Fri, 03/14/2025 - 11:00

Steward

Centers for Medicare & Medicaid Services

1.0 New or Maintenance

New

1.1 Measure Structure

Single Measure

1.3 Electronic Clinical Quality Measure (eCQM)

No

1.6 Measure Description

This outcome measure estimates the percentage of Long-Term Care Hospital (LTCH) patient stays that meet or exceed an expected discharge function score. The expected discharge function score is a risk-adjusted estimate that accounts for resident characteristics. The measure includes patients 18 years of age or older and the measure timeframe is 12 months.

1.7 Composite Measure

No

1.7 Measure Type

Outcome

1.8 Level of Analysis

Facility

1.9 Care Setting

Long-Term Acute Care Facility

1.10 Measure Rationale

Measuring functional status of long-term care hospital (LTCH) patients can provide valuable information about a LTCH's quality of care. A patient's functional status may be associated with adverse health outcomes such as falls, fractures, exacerbation of chronic conditions, and a higher risk of readmissions following LTCH care. Predictors of poorer recovery in function include greater age, complications after hospital discharge, and residence in a nursing home. Understanding factors associated with poorer functional recovery facilitates the ability to estimate expected functional outcome recovery for patients, based on their personal characteristics.

LTCHs can positively impact their patients' functional outcomes. During a LTCH stay, the goals of treatment include fostering the patient's ability to manage their daily activities so that the patient can complete functional (i.e., self-care and mobility) activities as independently as possible and, if feasible, return to a safe, active and productive life in a community-based setting.

The Cross-Setting Discharge Function Score (Discharge Function) measure determines how successful each LTCH is at achieving or exceeding an expected level of functional ability for its patients at discharge. An expectation for discharge function score is built for each LTCH stay by accounting for patient characteristics that impact their functional status. The Cross-Setting Discharge Function for a given LTCH is the proportion of that LTCH's stays where a patient's observed discharge function score meets or exceeds their expected discharge function score. LTCHs with a low percentage indicate that they are not achieving the functional gains at discharge that are expected based upon patient characteristics and patient status at admission for a larger share of their patients. The measure provides information to LTCHs that has the potential to hold providers accountable for functional outcomes and encourages them to improve the quality of care they deliver. This measure also promotes patient wellness, encourages adequate nursing and therapy services to help prevent adverse outcomes (e.g., potentially preventable hospitalization) and increases the transparency of quality of care in the LTCH setting. Discharge Function adds value to the LTCH QRP function measure portfolio by using specifications that allow for better comparisons across Post-Acute Care settings, considering both self-care and mobility activities in the function score, and refining the approach to addressing missing activity scores including those coded with activity not attempted codes.

1.11 Measure Webpage

https://www.cms.gov/files/document/ltch-qm-calculations-and-reporting-users-man...

1.13 Data Dictionary

Attached

1.14 Numerator

The number of LTCH stays in the denominator with a discharge function score that is equal to or higher than the calculated expected discharge function score. The function items used to determine the function score are: Eating (GG0130A3), Oral Hygiene (GGO130B3), Toileting Hygiene (GG0130C3), Roll left and right (GG0170A3), Lying to sitting on side of bed (GG0170C3), Sit to stand (GG0170D3), Chair/bed-to-chair transfer (GG0170E3), Toilet transfer (GG0170F3), and Walk 10 feet (GG0170I3) and Walk 50 feet with two turns (GG0170J3) if the patient walks, or Wheel 50 feet with two turns (GG0170R3) if the patient does not walk and uses a wheelchair. The specifications for calculation of the function score are provided in the following technical manual: https://www.cms.gov/files/document/ltch-qm-calculations-and-reporting-u…

1.14a Numerator Details

The numerator is the number of LTCH stays during the reporting period in which the observed discharge function score (**Section 1**) for select GG function activities is equal to or greater than the expected discharge function score (**Section 2**).

Section 1. The observed discharge function score is the sum of individual function activities at discharge. The section in each PAC assessment instrument titled Section GG, Functional Ability and Goals, includes standardized patient assessment data elements that measure mobility and self-care functional status. The Discharge Function measure focuses on these standardized activities that are currently available across all PAC settings (listed below). Valid responses for the standardized functional items/activities are reported below,

The function items used to determine the observed function score are the GG items that are currently available across all PAC settings:

- Eating (GG0130A),
- Oral Hygiene (GGO130B),
- Toileting Hygiene (GG0130C),
- Roll left and right (GG0170A),
- Lying to sitting on side of bed (GG0170C),
- Sit to stand (GG0170D),
- Chair/bed-to-chair transfer (GG0170E),
- Toilet transfer (GG0170F),
- Walk 10 feet (GG0170I)
- Walk 50 feet with two turns (GG0170J)
- Wheel 50 feet with two turns (GG0170R)

Valid Responses for the Standardized Functional Assessment Items: The response categories of the standardized functional items/activities reflect the level of assistance required by the patient to perform these activities:

- Six-level rating scale:
  - 06 = Independent
  - 05 = Setup or clean-up assistance
  - 04 = Supervision or touching assistance

    - 03 = Partial/moderate assistance
    - 02 = Substantial/maximal assistance
    - 01 = Dependent
- Activity Not Attempted Codes:
    - 07 = Patient refused
    - 09 = Not applicable
    - 10 = Not attempted due to environmental limitations
    - 88 = Not attempted due to medical condition or safety concerns
    - ^ = Skip pattern
- Missing data
    - - = Not assessed/no information

The following steps are used to determine the observed discharge function score for each stay:

Step 1: If the code for an activity is between 06 (independent) to 01 (most independent), then use code as the score for that activity.

Step 2: If code for an item is 07, 09, 10, 88, dashed (-), skipped (^), or missing, then the score for that activity is estimated with statistical imputation (see Section 3.5)

Step 3: Sum scores across all items to calculate the total observed discharge function score.

Step 4: Round the observed discharge function score to the fourth decimal place.

If the patient does not walk at the time of admission and discharge, different mobility item scores are used. Instead, use 2 * the Wheel 50 Feet with 2 Turns (GG0170R) score to calculate the total observed discharge function score for stays where (i) Walk 10 Feet (GG0170I) has an activity not attempted (ANA) code at both admission and discharge and (ii) either Wheel 50 Feet with 2 Turns (GG0170R) or Wheel 150 Feet (GG0170S) has a code between 1 and 6 at either admission or discharge. For all other patient stays, use Walk 10 Feet (GG0170I) and Walk 50 Feet with 2 Turns (GG0170J) to calculate the total observed discharge function score.

For all cases, 10 activities are used to calculate a patient's total observed discharge score and score values range from 10 – 60.

Section 2. The expected discharge function score is determined by applying the regression equation determined from risk adjustment to each LTCH stay using admission LTCH Continuity Assessment Record and Evaluation (CARE) Data Set data (LTCH CARE Data Set). Risk adjustment controls for patient characteristics such as the admission function score, age, and clinical conditions. Refer to Section 4.4 for details on risk adjustment. For consistent comparison against the observed discharge function score, the expected discharge function score is also rounded to the fourth decimal place.

1.15 Denominator

The total number of LTCH patient stays, except those that meet the exclusion criteria.

1.15a Denominator Details

The denominator is total number of LTCH stays with an LTCH CARE Data Set discharge record in the measure reporting period, which do not meet the exclusion criteria. The reporting period for the measure is 12 months (four quarters). Documentation on how SNF stays are constructed is available in the Long-Term Care Hospital Quality Reporting Program Measure Calculations and Reporting User's Manual: Version 6.0.

1.15b Denominator Exclusions

LTCH Stays are excluded if:

1) LTCH Stay is an incomplete stay: Patients with incomplete stays are identified based on the following criteria:

- Patient was discharged to a Short-Term General Hospital, Inpatient Psychiatric Facility, or Critical Access Hospital (CAH)
- Patient transferred to another LTCH facility
- Patient discharged against medical advice
- Patient had an unplanned discharge or expired Note: discharges against medical advice are considered an unplanned discharge.
- Length of stay is less than 3 days

2) Patient is in a coma, persistent vegetative state, or locked-in syndrome, or has complete tetraplegia

3) Patient is younger than 18 years

4) Patient is discharged to hospice

1.15c Denominator Exclusions Details

LTCH stays are excluded if:

1) The LTCH stay is an incomplete stay: Patients with incomplete stays (*incomplete = [1]*) are identified based on the following criteria using the specified data elements:

- Patient was discharged to a Short-Term General Hospital (A2105 = [04]), Inpatient Psychiatric Facility (A2105 = [07]), or Critical Access Hospital (CAH) (A2105 = [11]) OR
- Patient transferred to another LTCH facility (A2105 = [05]) OR
- Patient discharged against medical advice (A1990 = [1]) OR
- Patient had an unplanned discharge or expired (A0250 = [11, 12]). Note: discharges against medical advice are considered an unplanned discharge. OR
- Length of stay is less than 3 days: Discharge Date (A0270) – Admission Date (A0220) < 3 2. days

2) Patient is in a coma, persistent vegetative state, or locked-in syndrome, or has complete tetraplegia. Items used to identify these LTCH stays (on admission assessment):

- Comatose (B0100 = [1]) OR
- Complete Tetraplegia (I5101 = [1]) OR
- Locked-In State (I5460 = [1]) OR
- Severe Anoxic Brain Damage OR
- Cerebral Edema OR
- Compression of Brain (I5470 = [1])

3) Patient is younger than 18 years: Truncate (Admission Date (A0220) – Birth Date (A0900)). Use exact values in calculating age; do not round to nearest whole number.

4) Patient is discharged to hospice (A2105 = [09, 10]).

1.15d Age Group

Adults (18-64 years), Older Adults (65 years and older)

1.16 Type of Score

Rate/proportion

1.17 Measure Score Interpretation

Better performance = Higher score

1.18 Calculation of Measure Score

Discharge Function measure is the proportion of LTCH stays in which the observed discharge function score is equal to or greater than an expected discharge function score. A higher score indicates better performance in functional outcomes. For each LTCH stay, observed discharge function score and expected discharge function score are determined. For each LTCH, Discharge Function is the proportion of quality episodes where the observed discharge function score is greater than or equal to the expected discharge function score.

The Cross-Setting Discharge Function Score measure focuses on standardized functional assessment items listed below (the same set of items listed in the numerator description in Section 1.14a) that are currently available across all post-acute care settings.

- Eating (GG0130A),
- Oral Hygiene (GGO130B),
- Toileting Hygiene (GG0130C),
- Roll left and right (GG0170A),
- Lying to sitting on side of bed (GG0170C),
- Sit to stand (GG0170D),
- Chair/bed-to-chair transfer (GG0170E),
- Toilet transfer (GG0170F),
- Walk 10 feet (GG0170I)
- Walk 50 feet with two turns (GG0170J)

- Wheel 50 feet with two turns (GG0170R)

Valid Responses for the Standardized Functional Assessment Items: The response categories of the standardized functional items/activities reflect the level of assistance required by the patient to perform these activities:

- Six-level rating scale:
  - 06 = Independent
  - 05 = Setup or clean-up assistance
  - 04 = Supervision or touching assistance
  - 03 = Partial/moderate assistance
  - 02 = Substantial/maximal assistance
  - 01 = Dependent
- Activity Not Attempted Codes:
  - 07 = Patient refused
  - 09 = Not applicable
  - 10 = Not attempted due to environmental limitations
  - 88 = Not attempted due to medical condition or safety concerns
  - ^ = Skip pattern
- Missing data
  - - = Not assessed/no information

The process for calculating Discharge Function can be divided into two phases. In the first phase, GG items at admission and at discharge that have an Activity Not Attempted (ANA) code of 07, 09, 10, or 88, a dash (-), or a skip (^) recorded (hereafter referred to as NA) are estimated with statistical imputation methods. These estimation models include the predictors used in risk adjustment and covariates for scores on other GG items. Notably, the estimation process uses all GG items available in LTCHs to estimate the NA scores for the subset of GG activities used for the Discharge Function numerator. See the Attached file for more details on the estimation process. In the second phase, the calculation of Discharge Function continues. The steps below describe how to calculate the Discharge Function score.

Step1: For each LTCH stay, calculate the observed discharge function score by summing the individual GG items. If the GG item has a score of $1-6$, then use the score for that item. If the GG item has an NA value recorded, then use the imputed score.

A patient is determined to be a wheelchair user if (i) Walk 10 Feet (GG0170I) has an ANA code at both admission and discharge and (ii) either Wheel 50 Feet with 2 Turns (GG0170R) has a code between 01 and 06 at either admission or discharge.

For the patients who are wheelchair users, the observed discharge function score is calculated as sum(GG0130A, GG0130B, GG0130C, GG0170A, GG0170C, GG0170D, GG0170E, GG0170F, (2×GG0170R)). For all other patients, the observed discharge function score is calculated as sum(GG0130A, GG0130B, GG0130C, GG0170A, GG0170C, GG0170D, GG0170E, GG0170F, GG0170I, GG0170J).

Since there are 10 GG items included in the observed discharge function score, each patient's total observed discharge score will range from 10 – 60.

Step 2: Identify excluded LTCH stays. Excluded LTCH stays are those that are incomplete stays, and stays of patients younger than 18 years old. Also excluded are LTCH stays where the patient has a diagnosis indicating coma, persistent vegetative state, complete tetraplegia, locked-in state, severe anoxic brain damage, cerebral edema, or compression of the brain. Finally, LTCH stays where the patient is discharged to hospice (home or institutional facility) are also excluded.

Step 3: For each LTCH stay, calculate the expected discharge function score. The risk adjustment model is an ordinary least squares linear regression model, which estimates the relationship between discharge function score and a set of risk adjustors.

The risk adjustment model is run on all LTCH stays to determine the model intercept and risk adjustor coefficients. Expected discharge function scores are calculated by applying the regression equation to each LTCH stay at admission.

Note that any expected discharge function score greater than the maximum (i.e., 60) would be recoded to the maximum score.

Step 4: Calculate the difference in observed and expected discharge function scores. For each LTCH stay which does not meet the exclusion criteria, compare each patient's observed discharge function score (Step 1) and expected discharge function score (Step 3) and classify the difference as one of the following:

Observed discharge function score is equal to or greater than the expected discharge function score.

Observed discharge function score is lower than the expected discharge function score.

Step 5: Determine the denominator count. Determine the total number of LTCH stays with an LTCH CARE Data Set discharge date in the measure reporting period, which do not meet the exclusion criteria.

Step 6: Determine the numerator count. The numerator for this quality measure is the number of LTCH stays in which the observed discharge function score (rounded to four decimal places) is the equal to or greater than the expected discharge function score (rounded to four decimal places).

Step 7: Calculate the LTCH-level discharge function percent. Divide the LTCH's numerator count (Step 6) by its denominator count (Step 5) to obtain the LTCH-level discharge function percent, then multiply by 100 to obtain a percent value.

Step 8: Round the percent value to two decimal places. If the digit in the third decimal place is 5 or greater, add 1 to the second decimal place, otherwise leave the second decimal place unchanged. Drop all the digits following the second decimal place.

1.18a Attach measure score calculation diagram

1.18_Calculation_Algorithm_508.pdf

1.19 Measure Stratification Details

The measure is not stratified.

1.20 Types of Data Sources

Standardized Patient Assessments

1.25 Data Source Details

The LTCH CARE Data Set is the assessment instrument LTCH providers use to collect patient assessment data for quality measure calculation in accordance with the LTCH QRP. Completion is required for all patients receiving inpatient services in a facility certified as a hospital and designated as an LTCH under the Medicare program, regardless of payer.

1.26 Minimum Sample Size

At least 20 stays are required for the Discharge Function measure in the reporting period. In FY 2023, 97.9% (328) of all LTCHs (n=335) met this threshold and accounted for 99.9% of all eligible stays among all providers (n =81,810).

2.1 Attach Logic Model

2.1_Logic_model_graphic_508.docx

2.2 Evidence of Measure Importance

A service included in LTCH care is the provision of rehabilitation therapy to those experiencing functional limitations following discharge from an acute care hospital stay. Research examining functional outcomes has focused on physical function, which encompasses self-care and mobility. Physical function is a modifiable predictor of several other outcomes, including successful discharge to community or an acute rehabilitation facility [1] and functional decline [2, 3] among LTCH patients. Evidence suggests that LTCH care can improve functional outcomes [4] and that outcomes can vary in individual LTCH facilities, which provides an opportunity to monitor provider-level variation through the Discharge Function Score measure. LTCH patients with different functional status at admission, cognitive function, and comorbidities will have different levels of expected functional gains, which is taken into account in this measure. Physical, occupational and speech language pathology therapy can improve LTCH patient function. Across post-acute care settings, evidence indicates that rehabilitation for functional impairment is associated with functional recovery and re-hospitalization rates [5, 6]. Because patients are often discharged from intensive care unit to LTCHs [1], studies assessing function among intensive care unit patients are informative. A ten-year retrospective analysis of 315 ICU patients that required Extracorporeal Membrane Oxygenation for a minimum of 72 hours found that a positive rate of improvement in a functional mobility and ability to reach mobility milestones in response to rehabilitation was associated with improved survival, reduced 30-day readmissions, and discharge

to community [7]. While the patients in these studies did not receive treatment in the LTCH settings, recovery from mechanical ventilation and Extracorporeal Membrane Oxygenation are commonly observed among LTCH patients.

Functional improvement at discharge can vary based on the type of care provided by each facility, indicating an opportunity to measure facility-level differences in patient outcomes. A prospective cohort study by Dubin et al. (2021) examined patient goals and functional outcomes among intensive care unit survivors admitted to a LTCH with a tracheostomy. The authors emphasized the importance of establishing individual care plans informed by functional assessments to achieve patient goals [1]. A retrospective cohort study by Cogan et al. (2020) found that the rate of recovery and length of stay for post-acute care patients were significantly associated with functional improvement and emphasized the need to evaluate each patient's rate of functional gain and cater therapy intensity and time accordingly [8].

Patient characteristics are important predictors of functional status. Research suggests that functional mobility outcomes at discharge can vary due to comorbidities. A multi-site prospective cohort study among recently admitted LTCH patients with dementia found a significant decline in functional mobility within 60 days of admission. Significant factors associated with functional decline included greater duration of stay and age, and depression. The authors highlight potential interventions targeting cognitive function and physical exercise to reduce functional decline [3]. Similarly, a longitudinal cohort study of over 12,000 patients across 633 LTCHs in Canada found that greater balance impairment and cognitive impairment among patients at admission were predictive of patients' rate of disablement over the subsequent two years [2]. The researchers recommend implementing interventions to address balance and cognitive impairment.

Overall, literature indicates that LTCHs can influence functional outcomes. As such, variations in functional status of LTCH patients at discharge could be measured and monitored through the Discharge Function Score measure. Because function outcomes vary based on patient characteristics, the Discharge Function Score measure adjusts for relevant risk factors.

References:

1. Dubin R, Veith JM, Grippi MA, McPeake J, Harhay MO, Mikkelsen ME. Functional Outcomes, Goals, and Goal Attainment among Chronically Critically Ill Long-Term Acute Care Hospital Patients. *Ann Am Thorac Soc*. 2021;18(12):2041-2048. doi:10.1513/AnnalsATS.202011-1412OC
2. Chu CH, Quan AML, McGilton KS. Depression and Functional Mobility Decline in Long Term Care Home Residents with Dementia: a Prospective Cohort Study. *Can Geriatr J*. 2021;24(4):325-331. Published 2021 Dec 1. doi:10.5770/cgj.24.511
3. Lane NE, Stukel TA, Boyd CM, Wodchis WP. Long-Term Care Residents' Geriatric Syndromes at Admission and Disablement Over Time: An Observational Cohort Study. *J Gerontol A Biol Sci Med Sci*. 2019;74(6):917-923. doi:10.1093/gerona/gly151
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5. Deutsch A, Palmer L, Vaughan M, Schwartz C, McMullen T. Inpatient Rehabilitation Facility Patients' Functional Abilities and Validity Evaluation of the Standardized Self-Care and Mobility Data Elements. Arch Phys Med Rehabil. 2022 Feb 11:S0003-9993(22)00205-2. doi: 10.1016/j.apmr.2022.01.147. Epub ahead of print. PMID: 35157893.
6. Li CY, Haas A, Pritchard KT, Karmarkar A, Kuo YF, Hreha K, Ottenbacher KJ. Functional Status Across Post-Acute Settings is Associated With 30-Day and 90-Day Hospital Readmissions. J Am Med Dir Assoc. 2021 Dec;22(12):2447-2453.e5. doi: 10.1016/j.jamda.2021.07.039. Epub 2021 Aug 30. PMID: 34473961; PMCID: PMC8627458. doi:10.1097/CCM.0000000000005089
7. Mayer KP, Pastva AM, Du G, et al. Mobility Levels With Physical Rehabilitation Delivered During and After Extracorporeal Membrane Oxygenation: A Marker of Illness Severity or an Indication of Recovery?. *Phys Ther*. 2022;102(3):pzab301. doi:10.1093/ptj/pzab301
8. Cogan AM, Weaver JA, McHarg M, Leland NE, Davidson L, Mallinson T. Association of Length of Stay, Recovery Rate, and Therapy Time per Day With Functional Outcomes After Hip Fracture Surgery. JAMA Netw Open. 2020 Jan 3;3(1):e1919672. doi: 10.1001/jamanetworkopen.2019.19672. PMID: 31977059; PMCID: PMC6991278.

2.3 Anticipated Impact

Physical function is a modifiable factor associated with several outcomes, including successful discharge to the community, and re-hospitalization rates [1, 2, 3]. Thus, the Discharge Function Measure can improve patient outcomes in post-acute care by promoting functional independence, reducing adverse events, and lowering healthcare costs.

The cross-setting Discharge Function Score measure determines how successful each LTCH is at achieving or exceeding an expected level of functional ability for its patients at discharge. An expectation for discharge function score is built for each LTCH stay by accounting for patient characteristics that impact their functional status. The final cross-setting Discharge Function for a given LTCH is the proportion of that LTCH's stays where a patient's observed discharge function score meets or exceeds their expected discharge function score. LTCHs with low scores indicate that they are not achieving the functional gains at discharge that are expected based upon patient characteristics and patient status at admission for a larger share of their patients. The measure provides information to LTCHs that has the potential to hold providers accountable for functional outcomes and encourages them to improve the quality of care they deliver. This measure also promotes patient wellness, encourages adequate nursing and therapy services to help prevent adverse outcomes (e.g., potentially preventable hospitalization) and increases the transparency of quality of care in the LTCH setting.

Discharge Function adds value to the LTCH QRP function measure portfolio by using specifications that allow for better comparisons across Post-Acute Care (PAC) settings, considering both self-care and mobility activities in the function score, and refining the approach to addressing items coded with activity not attempted codes

One concern about unintended consequences with the Cross-Setting Discharge Function Score is that the measure may lead LTCHs to selectively enroll patients, either by encouraging or avoiding admission of certain types of patients and patients with certain characteristics. To address this, providers' performance is evaluated among their peers after adjusting for difference in patient

case-mix across LTCHs. The risk adjustment methodology applied to this measure will help reduce providers' incentive to selectively admit patients. Therefore, providers' performance on this measure will be adjusted for the characteristics of their patient population and "level the playing field" across providers. The detailed risk-adjustment strategy will be publicly available, allowing providers to understand that those who provide care for more "high risk" patients are not at a disadvantage given their patient case-mix.

Another potential concern about the cross-setting Discharge Function Score measure could be that it focuses on a subset of the available GG items. If the items are not included in this publicly reported measure, it could reduce the incentive to complete those items and could result in higher levels of ANAs. However, the GG items excluded from the Cross-Setting Discharge Function Score measure are used in other LTCH Quality Reporting Program measures and Section GG items are used in the LTCH Prospective payment system. Together, these circumstances should provide an incentive for continued reporting of these GG items

Another possibility related to increased ANA rates is that providers could strategically code ANAs in an attempt to game the estimated values from the statistical imputation models. For instance, LTCHs could record ANA codes for patients who did not improve by discharge if the discharge estimation models would predict higher scores based on that patient's characteristics. However, this type of gaming, where providers are determining in real-time which patients would perform better with statistical estimation than a true discharge score, would require sophisticated understanding and application of the estimation methodology. The Cross-Setting Discharge Function Score measure will be monitored to identify unintended consequences, including patient selection patterns or changes in ANA coding, which could lead to future re-specification of the measure as needed.

References:

1. Gustavson, A. M., Malone, D. J., Boxer, R. S., Forster, J. E., & Stevens-Lapsley, J. E. (2020). Application of High-Intensity Functional Resistance Training in a Skilled Nursing Facility: An Implementation Study. Physical therapy, 100(10), 1746–1758. https://doi.org/10.1093/ptj/pzaa126
2. Sarguni Singh, Elizabeth Molina, Elisabeth Meyer, Sung-Joon Min, Stacy Fischer, Post-Acute Care Outcomes and Functional Status Changes of Adults with New Cancer Discharged to Skilled Nursing Facilities, Journal of the American Medical Directors Association, Volume 23, Issue 11, 2022, Pages 1854-1860, ISSN 1525-8610, https://doi.org/10.1016/j.jamda.2022.02.010.
3. Brian Downer, Ioannis Malagaris, Chih-Ying Li, Mi Jung Lee, Rachel Deer, The Influence of Prior Functional Status on Self-Care Improvement During a Skilled Nursing Facility Stay, Journal of the American Medical Directors Association, Volume 23, Issue 11, 2022, Pages 1861-1867, ISSN 1525-8610, https://doi.org/10.1016/j.jamda.2022.03.003

2.4 Performance Gap

There is evidence of a performance gap and variability in performance for this quality measure.

Table 1 below reports on data for 328 LTCHs that met the minimum threshold of LTCH stays for public reporting of the Discharge Function measure (≥20) in the twelve-month reporting period of FY 2023. The mean measure results among these LTCHs was 48.9%. Final scores ranged from a minimum of 5% to a maximum score of 89.3%.

Table 1. Performance Scores by Decile

			Performance Gap										
	Overall	**Minimum**	**Decile_1**	**Decile_2**	**Decile_3**	**Decile_4**	**Decile_5**	**Decile_6**	**Decile_7**	**Decile_8**	**Decile_9**	**Decile_10**	**Maximum**
Mean Performance Score	48.88	5.02	25.47	33.76	37.51	41.13	44.38	48.38	53..97	59.70	66.70	77.95	89.33
N of Entities	328	1	32	33	33	33	33	33	33	33	33	32	1
N of Persons / Encounters / Episodes	81,810	100	9,796	8,730	8,734	8.804	6,933	8,034	6,478	8,509	8,653	7,139	224

2.5 Health Care Quality Landscape

The Improving Medicare Post Acute Care Transformation (IMPACT) Act of 2014 requires the collection of standardized data across post-acute care providers and required the Centers for Medicare & Medicaid Services to develop and implement quality measures, including quality measures addressing self-care and mobility function.

The Cross Setting DC Function measure was developed based on input obtained during two Technical Expert Panel (TEP) meetings (July 2021 and January 2022). During these meetings, panelists expressed that:

1. The SNF QRP would benefit from having a cross-setting functional outcome measure to use instead function process measure (Application of Percent of Long-Term Care Hospital (LTCH) Patients With an Admission and Discharge Functional Assessment and a Care Plan That Addresses Function that was recently removed from the SNF QRP. The Cross-Setting Discharge Function measure has higher variation in provider performance and offers more informative comparisons between SNFs for patients, caregivers, and stakeholders.
2. The Cross-Setting Discharge Function Score measure benefits from being specified to align across PAC settings (IRF, LTCH, SNF, HHA). Due to limited GG item availability in LTCH, only a subset of items can be used to produce measure scores that could be computed identically in each PAC setting. We calculated measure scores with all GG items available in SNF v. the subset available in LTCH. Panelists reviewed comparisons between provider scores and model fit and found that the narrower set of GG items provides similar capture of functional status. [1]
3. The Activity Not Attempted (ANA) codes are used frequently on assessments for certain GG items, and statistical imputation should be used as the method to estimate resulting missing item scores.

In addition to the SNF QRP, the Cross-Setting Discharge Function Score measure has been adopted in the SNF Value Based-Purchasing Program and the Nursing Home Quality Initiative.

[1] https://www.cms.gov/sites/default/files/2022-04/PAC-Function-TEP-Summar…

2.6 Meaningfulness to Target Population

Functional status, including ability to perform daily activities, is important from patient and caregiver perspectives, with functional goal-setting being an important focus of patient- and family- centered care. For the majority of patients in post-acute care, promoting functional independence and setting functional goals to facilitate return to community living is a primary goal of care. For patients receiving home health services, functional assessment and goal-setting are also a primary focus to attain independent functioning in the home and community, return to or surpass prior level of functioning, maintain current level of functioning, or slow the process of functional decline. In LTCH settings, where patients are medically complex and sometimes referred to as chronically critically ill, promoting physical function is particularly important to mitigate functional deterioration, morbidity, and medical complications from prolonged bedrest and hospitalization. From a caregiver perspective, focus on functional status and functional goal-setting is important to reduce caregiver burden, and minimize need for assistance at home.

CMS convened a Patient and Family Engagement Listening Session to discuss this measure with patients and their caregivers. The Patient and Family Engagement Listening Session demonstrated that the measure concept resonates with patients and caregivers. Participants' views of self-care and mobility were aligned with the functional domains captured by the measure, and they found them to be critical aspects of care. Participants emphasized the importance of measuring functional outcomes and were specifically interested in metrics that show how many patients discharged from particular facilities made improvements in self-care and mobility.

The Discharge Function Measure directly reflects the priorities of PAC patients, who value functional independence, quality of life, and avoiding rehospitalization or institutionalization.

Below are key points supported by peer-reviewed literature:

1. Patients Value Functional Independence:

Studies show that post-acute care patients prioritize functional recovery (e.g., mobility, self-care) as the most important outcome following discharge. Functional independence enables patients to return home and manage daily life without relying on long-term institutional care or home health services.

Source: Graham, J. E., et al. (2016). "Patients' perspectives on discharge from post-acute care settings: Priorities for functional recovery." Archives of Physical Medicine and Rehabilitation.

2. Improved Quality of Life:

health-related quality of life encompasses patients' physical health perceptions and functional status. Patients who regain independence in activities of daily living report higher satisfaction with their health and overall life post-discharge. They value avoiding dependency on caregivers, especially for basic tasks like toileting and dressing.

Source: Greenfield, S., and Nelson, E. (2020). "The influence of functional independence on quality of life in post-acute care patients." Quality of Life Research .

Additionally, researchers exploring patient and consumer perspectives on function have reported that functional status and functional outcomes are important from the patient and consumer perspective (Stineman 2009, Kramer 1997, Kurz 2008). These studies show that patients place a value on their functional outcomes and rehabilitation goals mostly through research that examines how patients can categorize their functional goals in hierarchies of what they perceive as the most important to least important functional outcomes for the purpose of their own quality of life. Stineman's research shows patients and consumers value their functional outcomes although inpatient rehabilitation patients may have different perspectives on what is important for them to gain from their rehabilitation compared to community dwelling consumers. One study, specifically focused on patients undergoing rehabilitation in IRFs (n=79) found that eating was the most valued functional activity for them, followed by bathing, toileting, and bowel/bladder function (Stineman 2009).

Sources:

Kramer AM. (1997) Rehabilitation care and outcomes from the patient's perspective. Medical care. 35(6):JS48-57.

Kurz AE, Saint-Louis N, Burke JP, Stineman MG. (2008) Exploring the personal reality of disability and recovery: A tool for empowering the rehabilitation process. Qualitative Health Research. 18(1):90-105.

Stineman MG, Rist PM, Kurichi JE, Maislin G. (2009) Disability meanings according to patients and clinicians: imagined recovery choice pathways. Quality of Life Research. 18:389-98.

3. Reduction in Hospital Readmissions:

Patients view avoiding rehospitalization as crucial to their recovery. Research demonstrates that patients who regain functional independence are less likely to be readmitted, an outcome patients find meaningful as it reduces the emotional and physical stress of hospitalization.

Source: Ouslander, J.G., and Berenson, R.A. (2011). "Reducing Unnecessary Hospitalizations of Nursing Home Residents." The New England Journal of Medicine .

4. Desire to Return Home:

A primary goal for many PAC patients is to return home after their rehabilitation. Being discharged with higher functional ability is highly valued because it enables patients to live in their communities, reducing the need for institutional care or home health services.

Source: Harrison, S., et al. (2017). "Patient priorities in post-acute care: Returning home with functional independence." Journal of Aging & Health .

5. Patients Want to Avoid Institutional Long-Term Care:

Patients fear the loss of autonomy associated with long-term care facilities and express a strong preference for achieving the functional status that allows them to avoid this outcome. Functional

independence is a top priority for maintaining control over their living situation.

Source: Kane, R.A. (2001). "Long-Term Care and Patient Preferences: Achieving Independence and Control." The Gerontologist .

In summary, input from a variety of stakeholders has been taken into consideration throughout the measure development process. Feedback was sought and considered from patients and caregivers on the salience of the measure concept and from Technical Expert Panels (TEPs) on the appropriate specifications for the cross-setting measure.

3.1 Contributions Towards Closing Care Gaps

The measure provides a means for assessing the impact of provider performance on patients who experience social risk factors (SRF) to a greater degree than those who have fewer or less acute SRFs. For example, dual-eligible patients tend to experience worse socioeconomic circumstances than other patients. These circumstances can negatively impact health outcomes. Some of the disparity in outcomes between dual and non-dual patients can be explained through differences in prevalence of clinical conditions addressed through risk adjustment. However, even after risk adjustment, dual patients fare worse, on average, than non-duals for all settings. One contributing factor could be that there are socioeconomic drivers of health disparities in dual patients beyond what is captured through risk adjustment. This raises the concern that providers who serve these populations are unduly penalized in quality measurement when dual eligibility is not included in the risk adjustment model.

We tested three SRFs of interest:

1. Medicare vs. dually enrolled (patient is dually enrolled at any time during the quality episode)
2. Race/ethnicity
3. ADI

We used several approaches to test differences in performance scores across multiple SRFs and to consider some SRFs for inclusion in the risk adjustment model. First, we constructed alternative risk adjustment models that included additional covariates for payer, race/ethnicity, and ADI, and examined the impact on provider performance.

We find that across most of the alternative risk adjustment models considered, the SRF covariates are significant but small, and have little to no impact on model fit. The details of the alternative risk adjustment models are shown in the attachment for Section 4.4.4a.

Second, we stratified the performance scores by SRFs. Using the current model, we calculated provider scores for patients with and without SRFs and grouped LTCHs into quintiles based on their proportion of Black/non-White, dual, and dual and high ADI patients. We then examined whether performance declines with the proportion of patients with SRFs, and whether this impacts patients both with and without SRFs.

Across LTCHs, we compared Discharge Function scores by subgroups of hospitals based on the percentage of patients who are Black, Non-White, Medicaid or Dual-eligible, and Dual-eligible or

living in a neighborhood with ADI ≥ 85. To be more specific, we defined subgroups of hospitals based on quintiles of the percentage of patients within the hospital who have the SRF. For race and ethnicity characteristics, we used race/ethnicity data from the LTCH CARE Data Set to identify patients' race/ethnicity as Black or Non-White.

The average performance score across all providers is 48.0%. Disparities are evident when comparing scores across different patient demographics and social risk factors (SRFs). Providers serving a higher proportion of Black patients tend to have lower scores, with Black patients averaging 43.6% compared to 49.6% for White patients. A similar, though less pronounced, gap exists between Non-White (45.6%) and White (49.6%) patients. Additionally, dual-eligible patients, had notably lower scores (40.5%) than Medicare-only patients (46.8%). Patients either dually eligible or living in areas with high Area Deprivation Index (ADI ≥ 85) also fare slightly worse, scoring 43.7% compared to 46.4% for patients in low-ADI areas.

These results raise multiple concerns. First, it is possible that not including SRF in the risk adjustment model unduly penalizes providers that serve patients with a higher proportion of SRF. On the other hand, risk adjusting for these characteristics may mask systematic disparities in care that should be examined and ultimately providers for which should be held accountable.

4.1 Feasibility Assessment

A feasibility assessment was not necessary. The LTCH data elements used for measure construction are part of the standard data collection processes for LTCH providers and are already used in existing LTCH QRP measures.

LTCH CARE Data Set data collection and submission is a requirement of the Medicare Program. Functional assessment is conducted as part of usual clinical practice, and information on functional status used to calculate this measure is recorded in the relevant LTCH CARE Data Set items embedded in the provider's clinical assessment. LTCH CARE Data Set data are collected by the LTCH during the stay 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 the addition of these items starting in 2012.

4.3 Feasibility Informed Final Measure

LTCH CARE Data Set data collection and submission is a requirement of the Medicare Program.

4.4 Proprietary Information

Not a proprietary measure and no proprietary components

5.1.1 Data Used for Testing

The target date for an LTCH record reflects the timeframe in which the assessment as to be completed. The target period for the measure is 12 months (4 quarters). To construct the stays, all LTCH stays records with a discharge date within the target period are selected.

The data used report results in this form are derived from several sources. The primary source of data for the measure is LTCH CARE Data Set assessment data from Fiscal Year (FY) 2023. The LTCH CARE Data Set assessments are combined into LTCH stays.

Stays were defined using the following logic: An LTCH stay includes consecutive time in the LTCH starting with a patient's admission (Admission assessment (Item A0250 = [01])) through the patient's discharge (Discharge assessment or Expired Record (Item A0250 = [10, 11, 12])). To construct the LTCH stay for the quality measure sample, a matched pair of Admission and Discharge assessments (or Admission assessment and Expired Record) as shown below is require

The target date for an LTCH CARE Data Set record reflects the timeframe in which the assessment as to be completed. The target period for the measure is 12 months (4 quarters). To construct the LTCH stays, all LTCH CARE Data Set records with a target date within the target period are selected.

For analyses related to health equity, we also used Medicare administrative data to determine dual eligibility status for Medicare and Medicaid and Area Deprivation Index (ADI) data, derived from American Community Survey data. The ADI is presented as an index ranging from zero to 100, designed to represent neighborhood socioeconomic disadvantage, with 100 representing the most disadvantaged neighborhoods nationwide.

5.1.2 Differences in Data

The sample remained the same for all aspects of testing. For testing of differences in performance scores across socio-contextual variables, including race, ethnicity and socio-economics status (see Section 5. Equity), we used additional data sources to incorporate ADI, derived from census data, and dual eligibility for Medicare and Medicaid from CMS administrative data.

5.1.3 Characteristics of Measured Entities

All testing used LTCH stays completed in FY 2023. A total of 335 LTCHs submitted data for complete stays in the 12-month testing period. We identified providers that met the reportability threshold of at least twenty stays after applying denominator exclusion criteria.

After applying denominator exclusion criteria and the reportability threshold of 20 stays, this testing ultimately included 81,810 stays spread across 328 LTCHs. The LTCHs were geographically diverse. The majority of the LTCHs were for-profit entities (73%) and located in urban areas (99%). Facility size is presented based on the number of patient stays. Roughly a fourth (26%) of the LTCHs were large with 309-1158 stays in FY 2023, and 52% of the included LTCHs were medium sized with 157-308 stays in FY 2023. Only 22% were small LTCHs with 28-156 stays in the FY 2023.

Total: 81,810 stays across 328 publicly reportable providers.

· **Stay Count by Provider Size**:

- Large providers (309+ stays): 46% of stays, 26% of providers.
- Medium providers (157-308 stays): 45% of stays, 52% of providers.
- Small providers (28-156 stays): 9% of stays, 22% of providers.

· **Profit Status**:

- For-Profit: 76% of stays, 73% of providers.
- Not-For-Profit: 19% of stays, 23% of providers.
- Government: 2% of stays, 3% of providers.
- Unknown: 3% of stays, 2% of providers.

· **Rurality**:

- Urban: 97% of stays, 99% of providers.
- Rural: 4% of stays, 1% of providers.
- Unknown: Minimal stays and no providers.

· **Regional Distribution**:

- Northeast: 9% of stays, 10% of providers.
- Midwest: 20% of stays, 19% of providers.
- South: 52% of stays, 55% of providers.
- West: 19% of stays, 16% of providers.

5.1.4 Characteristics of Units of the Eligible Population

All testing used LTCH stays completed in FY 2023. LTCHs submitted a total of 129,903 completed stays that ended in FY 2023. After applying denominator exclusion criteria and applying the reportability threshold of 20 stays, we ultimately included 81,810 stays spread across 328 LTCHs in the measure population and testing.

The stays include diverse demographics and social needs, with notable gaps in race information and area deprivation index (ADI), indicating potential data challenges. Additionally, a large proportion of patients face health-related social needs, particularly in health literacy and transportation.

Race: A significant proportion (60%) of stays are for White patients, but there’s a notable 13% with missing race information, suggesting potential gaps in demographic data.

- 60% White, 16% Black, 8% Hispanic/Latinx, 2% Asian.
- 13% of stays have no race information.

Sex: There were more male (55%) than female (45%) patients

- 48% male, 52% female.

Age: A majority of stays are for older adults, with 56% of patients aged 65 and above, highlighting the need for age-specific care in this population.

- 23% under 55 years, 21% between 55–64 years, 29% between 65–74 years.
- Older groups: 20% aged 75–84 years, and 7% aged 85+.

Payer Status: Almost half (48%) of patients were covered by Medicare only, with a notable 19% having no Medicare or Medicaid coverage.

- 48% Medicare, 14% Medicaid, 19% dual-eligible.
- 15% not Medicare or Medicaid, and 4% unknown.

Area Deprivation Index (ADI): A third of stays have unknown ADI data, and 16% were from disadvantaged areas (ADI ≥ 85).

- 16% in the most disadvantaged areas (ADI ≥ 85), with other levels spread across lower ADI categories.
- 31% ADI unknown.

Health-Related Social Needs: Health literacy (26%) and transportation needs (6%) were reported.

- 3% interpreter need, 6% transportation need, 26% health literacy need, and 11% social isolation.

Primary Medical Condition: Over half (61%) of patients have "other" medical conditions outside the specified categories, pointing to a varied patient health profile that may require broad healthcare approaches.

- 1% with chronic respiratory conditions, 13% with acute onset and chronic respiratory conditions.
- 61% with other medical conditions.

5.2.1 Level(s) of Reliability Testing Conducted

Person or encounter level (i.e., data element) (e.g., inter–abstractor reliability), Accountable entity level (i.e., measure score) (e.g., signal-to-noise analysis)

5.2.2 Method(s) of Reliability Testing

We report testing results throughout this document at two levels: 1) data elements (i.e., items) and the function scale (i.e., summed value derived from item codes) and 2) the computed quality measure scores.

To assist the reader in understanding the testing analysis and results, we begin by providing a brief overview of these components of the performance measure:

1. Data Elements:

a. Clinicians code 11 motor function data elements included in Section GG of each PAC assessment instrument. One is a wheelchair data elements used for patients who do not walk as part of the recoding approach. Depending on the context, we sometimes refer to these data elements as “items” or “activities.”

b. The motor function data elements are collected at the time of admission and discharge using a 6-level rating scale (01 to 06), or activity not attempted codes if, for example, the activity was not attempted due to medical or safety concerns.

c. Higher scores indicate higher ability (i.e., more independence)

d. For the performance measure calculation, data element activity not attempted codes and missing data are recoded using statistical imputation to estimate the item score

e. A discharge function scale score is created by summing the data element scores, after re-coding. The range of the discharge function score is 10 to 60 units.

f. For the Discharge Function Score, a score of 10 indicates the patient is dependent on a helper to perform all activities (i.e., data elements) and a score of 60 means the patient is independent on all activities.

2. Calculated Performance Measure Score: The Percentage of LTCH Patient stays that Meet or Exceed an Expected Discharge Function Score

a. The calculated performance measure score is the percentage of LTCH patient stays that meet or exceed an expected discharge function score within an SNF. The risk-adjustment procedure used to calculate the expected score is described in the attached file.

b. This performance measure estimates the percentage of LTCH patient stays that meet or exceed an expected discharge function score.

Reliability testing of the items was conducted when the items were initially developed and a summary of the inter-rater rater and the video reliability studies are described in the Attachment.

We used three methods for reliability testing: Cronbach’s alpha coefficient, split-sample reliability testing, and signal-to-noise ratio testing.

Cronbach’s alpha coefficient assesses the internal consistency of the function scale/instrument scores for each assessment. Internal consistency provides a general assessment of how well the function data elements interrelate within the function scale/instrument. This internal consistency analysis is an indicator of the reliability of the function scale/instrument. Internal consistency was assessed using the Cronbach’s alpha coefficient, which is the average correlation of all possible half-scale divisions. Cronbach’s alpha is a statistic frequently calculated when testing instrument

or scale psychometrics. The Cronbach's alpha reliability estimate ranges from zero to one, with an estimate of zero indicating that there is no consistency of measurement among the items, and one indicating perfect consistency. Many cutoff criteria exist to determine whether or not a scale shows good consistency or whether the items "hang together" well. General consensus is that Cronbach's alpha should be at least 0.70 for an adequate scale for group-level decisions, and alphas closer to 1 indicate a good scale [1].

Split-sample reliability testing examines the agreement between two performance measure scores for a SNF based on randomly split, independent subsets of patient quality episodes within the same measurement period. We randomly divided each LTCHs FY 2023 patient stays into halves and calculated performance measure scores for each split-half sample using the same measure specification. We then calculated Shrout-Fleiss [2] intraclass correlation coefficients (ICC[2,1]) between the split-half scores to measure reliability.

Signal-to-noise reliability testing examines the overall reliability of the measure scores by comparing the true effect (the signal) to the error (the noise). We estimated the signal-to-noise ratio in two ways. We first followed the RAND methodology which is reported below in 4.2.3. Then, as a robustness check, we also estimated the ratio by using the sample variance to estimate the provider-to-provider variance.

We performed reliability testing on all SNFs with 20 or more patient quality episodes. These patient quality episodes had complete data. Please see the attached Excel file.

[1] Aron A, Aron EN *Statistics for Psychology*. 2nd ed. Upper Saddle River, NJ: Prentice Hall, 1999

[2] McGraw, K. O., & Wong, S. P. (1996). Forming inferences about some intraclass correlation coefficients. Psychological methods, 1(1), 30.

5.2.3 Reliability Testing Results

Summary of critical data element reliability testing:

The attached document reports inter-rater and the video reliability study testing results from 2012.

Internal Consistency (unit of analysis is patient assessments):

The table 4.3.3A-1 in the attachment reports Cronbach Alpha results for the discharge assessment for patients who walk (non-wheelchair users) and wheelchair users using the estimated values.

Computed Quality Measure Score Reliability

Split-half Reliability (unit of analysis of providers): The attached table 4.2.3A-2 includes the

split-half reliability (unit of analysis of providers) as described above.

Signal to Noise (unit of analysis of providers): Signal-to-noise testing (Table 2 below) suggests that a high proportion of the variation in quality measure scores is due to differences in provider quality measure results rather than variation within providers.

5.2.3a Attach Additional Reliability Testing Results

4.2.3a_Additional_Reliability_Testing_Results_Items_LTCH_508.zip

5.2.4 Interpretation of Reliability Results

Cronbach's alpha (unit of analysis of assessment data)

Cronbach's alpha results show the items measure the concept of function in a consistent manner.

Split-half Reliability (unit of analysis of providers)

Split-half analysis results indicated strong, positive correlations between the LTCH providers' randomly divided groups' computed performance measure scores, providing strong evidence of measure reliability with an ICC of 0.95 overall. As shown in Table 4.2.4 in the attached file, ICCs were exceptionally strong across providers with higher and lower volume, with ICC of 0.88 even among the small providers (28-156 discharges).

Signal to Noise (unit of analysis of providers)

Signal to Noise Testing suggests strong reliability across providers, with a reliability statistic of 0.95. Robustness checks in which we calculated the Signal-to-Noise Reliability (VAR) using the sample variance gave an overall statistic of 0.95. Both of these pass the threshold of acceptable reliability.

Table 2. Accountable Entity Level Reliability Testing Results by Denominator, Target Population Size

Accountable Entity-Level Reliability Testing Results

	Overall	Minimum	Decile_1	Decile_2	Decile_3	Decile_4	Decile_5	Decile_6	Decile_7	Decile_8	Decile_9	Decile_10	Maximum
Reliability	0.95	0.74	0.97	0.96	0.95	0.95	0.93	0.95	0.93	0.94	0.95	0.95	0.99
Mean Performance Score	0.49	0.05	0.25	0.34	0.38	0.41	0.44	0.48	0.54	0.60	0.67	0.78	0.89
N of Entities	328	1	32	33	33	33	33	33	33	33	33	32	1
N of Persons / Encounters / Episodes	81,810	100	9,796	8,730	8,734	8,804	6,933	8,034	6,478	8,509	8,653	7,139	224

5.3.1 Level(s) of Validity Testing Conducted

Person or encounter level (i.e., data element) (e.g., sensitivity and specificity), Accountable entity level (i.e., measure score) (e.g., criterion validity)

5.3.3 Method(s) of Validity Testing

We report testing results throughout this document at two levels: 1) data elements/scale and 2) Computed Quality Measure results.

1. Critical Data Elements/Scale

Several studies have examined the validity of the data elements by examining the relationship between the items and length of stay, discharge to community rates and risk of falls.

2. Computed Quality Measure Score

Convergent Validity

To evaluate convergent validity of measure scores, we measured Spearman's rank correlation between the Cross-Setting Discharge Function Score measure and other LTCH QRP measures (see the attached Excel file Table 4.3.3). The analysis used FY 2023 data and only included data from LTCHs with at least 20 stays.

Face validity of performance measure score:

To assess face validity of the Cross-Setting Discharge Function Score measure, two Technical Expert Panel (TEP) meetings (July 2021 and January 2022), as well as a Patient and Family Engagement Listening Session, were convened. TEP members showed strong support for the face validity of this measure. The TEP agreed with the conceptual and operational definition of the measure. Many patients enter rehabilitation care after an acute event for the purpose of regaining function. This measure directly assesses the ability of providers to enable patients to reach their highest level of function possible. Panelists reviewed the validity analyses described herein and agreed they demonstrated measure validity.

The Patient and Family Engagement Listening Session demonstrated that the measure concept resonates with patients and caregivers. Participants' views of self-care and mobility were aligned with the functional domains captured by the measure, and they found them to be critical aspects of care. Participants emphasized the importance of measuring functional outcomes and were specifically interested in metrics that show how many patients discharged from particular facilities made improvements in self-care and mobility.

In developing the measures, statistical imputation was implemented to estimate item scores for patients where a GG item was NA using models that adjust for patient clinical characteristics. We evaluated the empiric validity of our estimation methodology using the following analyses.

1. We estimated admission and discharge scores for each GG item used in measure construction. To evaluate model fit of estimation models, we calculated C-statistics for each of the 22 estimation models. C-statistics ranged from 0.83-0.99, and the mean C-statistic was 0.94.

2. A bootstrapping method was used to measure bias and mean squared error (MSE) in the estimation method that uses statistical imputation compared to the recode approach used in the self-care and mobility functional outcome measures. Bias measures the average amount by which the estimated value differs from the true value. Bias is signed, with a positive amount meaning

that the estimated values were higher, on average, than were the true values. MSE measures how far away the method is, on average from the truth. It is unsigned and can be positive even if bias is zero. In LTCHs, statistical estimation resulted in lower levels of bias (-0.02 at admission; -0.24 at discharge) and MSE (5.98 at admission; 3.12 at discharge) compared to the bias (-2.73 at admission; -1.54 at discharge) and MSE (20.21 at admission; 9.80 at discharge) produced from the recode, which supports the validity of the statistical estimation method in LTCHs. This result indicates that statistical estimation produced less biased, more precise estimates for missing item scores across settings.

3. We calculated the difference in discharge function between episodes that have bona fide item scores at admission and stays with NA codes at admission where we estimate the item score. This difference provides a metric of how accurately estimated item scores reflect true patient function. For all 11 items, the difference was lower than if these ANAs were recoded to the most dependent level of functional status. This result indicates that statistical estimation produced more accurate results.

5.3.4 Validity Testing Results

1. Critical Data Elements

The validity of the items used to calculate the quality measure has been evaluated by examining the relationship between each item and other indicators. Results of these analyses showed that higher admission function item scores, indicating higher functional ability, were associated with shorter inpatient stays, as expected. Further, higher admission function item scores, indicating higher functional ability, were associated with higher rates of community discharge.

These studies also examine content validity of the Section GG items that are used to calculate the measure and found the self-care and mobility activities (items) used in the DC Function measure are items used in many other functional assessment instruments.

References:

1. Toth M, Palmer L, Marino ME, Smith A, Schwartz C, Deutsch A, McMullen T. Validation of the Standardized Function Data Elements among Medicare Skilled Nursing Facility Residents, Journal of the American Medical Directors Association. 24(3): 307-313.e1, 2023, https://doi.org/10.1016/j.jamda.2022.12.014.
2. Deutsch A, Palmer L, Vaughan M, Schwartz C, McMullen T. Inpatient Rehabilitation Facility Patients' Functional Abilities and Validity Evaluation of the Standardized Self-Care and Mobility Data Elements. Arch Phys Med Rehabil. 2022 Jun; 103(6): 1070-1084.e3. https://doi.org/10.1016/j.apmr.2022.01.147

Computed Quality Measure Result

Face Validity Based on TEP Feedback

A Technical Expert Panel provided feedback on the Cross Setting Discharge Function measure

representing face validity.

Expert Consensus on Discharge Function Score

- The discharge function measure was reviewed and supported by a multi-disciplinary panel of experts, including persons with lived experience.
- Evidence: The panelists favored reporting discharge function measures due to their ability to reflect patient recovery at discharge. They preferred reporting discharge function rather than change in function measures because it better captures patient status at the point of leaving the provider.

"Panelists from the July 2021 TEP favored Discharge Function Score measures over Change in Function Score measures and recommended moving forward with Discharge Function Score for the cross-setting measure."

Source: PAC Function TEP Summary Report – July 2021 and PAC Function TEP Summary Report – January 2022.

Robust Risk Adjustment for Fair Comparisons

- The measure uses a robust **risk adjustment** methodology, which supports fair comparisons of measure results across providers by accounting for differences in patient age, clinical characteristics and comorbidities.
- Evidence: This ensures that providers are compared on a level playing field, taking into account the complexity of patients treated at each provider.

"Calculate expected Discharge Function Mobility Score for each eligible stay using risk adjustment coefficients, including demographics, health characteristics, and admission function score."

Source: PAC Function TEP Summary Report – January 2022.

Handling of Activities Not Attempted codes

- The discharge function measure incorporates statistical imputation to address that not all patients can complete each of the functional activities and are thus coded using the Activities Not Attempted codes. This supports measure validity even when certain activities cannot be completed during the patient's stay.
- Evidence: The TEP strongly favored using statistical imputation over simply coding missing data as "dependent," ensuring that the discharge function measure more accurately reflects the patient's true capabilities.

"Panelists tended to favor statistical imputation with continued refinement to improve cross-setting performance. Panelists agreed that the current recode could be improved upon."

Source: PAC Function TEP Summary Report – July 2021 and PAC Function TEP Summary Report – January 2022.

Alignment with Patient-Centered Outcomes

- The discharge function measure is designed to reflect patient-centered goals, focusing on the safe and functional transition of patients back to their community or home setting.
- Evidence: Functional outcomes at discharge are aligned with patient goals of regaining independence, which is a key measure of quality in post-acute care.

"The discharge function score is designed to reflect the ability of post-acute care providers to successfully rehabilitate patients, ensuring they regain functional independence at discharge and beyond."

Source: PAC Function TEP Summary Report – January 2022.

Interested Parties Engaged and Broad Support

- The measure was reviewed by a diverse group of interested parties with broad support and clinical relevance across different care settings.
- Evidence: Clinicians, policy experts, and performance measurement specialists contributed their feedback, ensuring that the measure is relevant and usable across different PAC settings.

"The PAC QRP Functions TEP comprised 15 stakeholders with diverse perspectives and areas of expertise, including clinical, policy and program, measures development, and technical expertise."

Source: PAC Function TEP Summary Report – January 2022.

Convergent Validity.

Measure validity was assessed by comparing the Discharge Function measure with other quality measures in the SNF Quality Reporting Program using Spearman (rank) correlations between provider's performance scores presented in Table 4.3.4a.

5.3.4a Attach Additional Validity Testing Results

4.3.4a_Additional_Validity_Testing_Results_LTCH_508.xlsx

5.3.5 Interpretation of Validity Results

1. Critical Data Elements

The published studies demonstrate evidence of the validity of the function items.

2. Computed Quality Measure Score

Convergent Validity. First, as expected, scores for the Discharge Function Score measure

correlated well but not perfectly with the Cross-Setting Discharge Mobility (0.79). This is expected since the LTCH QRP self-care and mobility functional outcome measures use overlapping but not identical GG items and a different method for handling NA codes.

This measure demonstrated the expected positive correlation with the Discharge to Community measure (0.51). Other correlations were weaker, as expected. It was weakly correlated with the Potentially Preventable Readmissions (-0.22). This measure also had a weak negative correlation with Medicare Spending Per Beneficiary (-0.22).

5.3.2 Type of Accountable Entity Level Validity Testing Conducted (derived)

Empirical validity testing at the accountable entity-level (e.g., criterion validity, construct validity, known groups analysis), Systematic assessment of face validity of the measure's performance score as an indicator of quality or resource use

5.4.1 Methods Used to Address Risk Factors

Statistical risk adjustment model with risk factors

5.4.2 Conceptual Model Rationale

The rationale for risk adjustment is to account for differences in patient populations. By risk adjusting, the performance measure assesses providers based on their quality of care and not the underlying health of the population. Providers are not penalized for serving patients with greater clinical need, and fair comparisons can be made across providers.

The performance measure is cross-setting, calculated for inpatient rehabilitation (IRF), skilled nursing (SNF), long-term care hospital (LTCH), and home health (HH). The development team sought to align risk factors across settings as much as possible. The team presented to a TEP an overview of the availability of clinically meaningful risk factors in each setting. TEP members supported setting-specific parameters for risk adjustment since there are different data points available as well as clinical considerations for each setting.

The development team also presented to the TEP the conceptual model shown below in 4.4.2a. TEP members agreed that the conceptual model presented does represent the salient points about the relationship between social risk factors (SRFs), patient functional outcomes, and provider quality. TEP members provided examples of ways in which providers are able to, and should be expected to, mitigate the influence of SRFs on patient outcomes.

TEP members supported further analysis to understand the effect of measurable SRFs. Specifically, the TEP cited the following as potential measurable SRFs that can impact functional outcomes: dual enrollment, ADI, and race/ethnicity (although noting that these are impacted by provider bias).

Below are the currently measurable SRFs included in risk adjustment testing, but not used in the final risk adjustment model. Health-related social needs items are not yet available cross-setting, but can be tested for inclusion in the future.

Social Risk Factors (SRFs) Included in Risk Adjustment Testing

Dual Enrollment:

- Medicare (reference group)
- Dual
- Medicaid
- Neither Medicare nor Medicaid
- Unknown Payer

Race:

- American Indian or Alaska Native
- Asian
- Black
- Hispanic or Latino
- Multiple Race
- Native Hawaiian or Other Pacific Islander
- No Race/Ethnicity Information Available
- White (reference group)

Area Deprivation Index (ADI):

- ADI (≥85)
- ADI Missing

5.4.2a Attach Conceptual Model

4.4.2a_DC_function_CBE_model_508.pdf

5.4.3 Variable Distribution Across Measured Entities

Table 4.4.4A-1 in the attached file shows the number, percent, and average observed score of stays that have the associated risk factor covariate. The table presents information for each risk factor covariate in the final model plus the additional SRF risk factors considered but not used in the final risk adjustment model are listed in Table 4.4.4A-2.

5.4.4 Risk/Case-Mix Adjustment Modeling and/or Stratification Results

Discharge Function is a cross-setting performance measure calculated for IRF, SNF, LTCH, and HH. The development team aligned clinically meaningful covariates as much as possible.

The development team then presented to a TEP an overview of the data availability in each setting, shown below, and solicited feedback on which covariates should be included in the cross-setting measure risk adjustment model.

Covariate Availability Across Settings of Care for Discharge Function Measure

1. Age: LTCH, IRF, SNF, HH
2. Admission Mobility Score: LTCH, IRF, SNF, HH
3. Primary Medical Condition Category (PMCC): LTCH, IRF, SNF, HH
4. Interaction of Admission Mobility Score and PMCC: LTCH, IRF, SNF, HH
5. Prior Function/Device Use: LTCH, IRF, SNF
6. Pressure Ulcers: LTCH, SNF
7. Cognitive Function: LTCH, IRF, SNF, HH
8. Communication Impairment: LTCH, IRF, SNF, HH
9. Incontinence: LTCH, IRF, SNF, HH
10. Falls: LTCH, IRF, SNF, HH
11. Nutritional Approach: LTCH, IRF, SNF
12. Comorbidities: LTCH, IRF, SNF, HH
13. Ventilation Status: LTCH, IRF
14. Availability of Assistance: LTCH, IRF, SNF
15. Living Arrangements: LTCH, IRF, SNF, HH

The TEP members expressed support for setting-specific models since there are different data points available as well as different clinical considerations for each setting. The panelists suggested additional risk adjustors to consider, including Prior living site; Prior hospitalization; Chronic conditions; Obesity; Severity of health condition(s); Low BMI; Pain; Wound infection; Transportation; and Health literacy.

The final risk adjustment approach includes adjusting for the following patient characteristics:

- **Age Category:** Age was calculated as of the admission date of the LTCH stay using the beneficiary's date of birth.
- **Admission Function Score**: Sum of admission scores for function items included in the discharge score (Section 3.4.1), which can range from 10-60, with a higher score indicating greater independence. ANAs in the admission item scores are treated the same way as NAs in the discharge item scores, with ANAs replaced with imputed scores (Appendix). Walking items and wheeling item are used in the same manner as for the discharge score (See Appendix). Admission score squared is also included as a risk adjustor.
- **Primary Medical Condition Category**: Primary Medical Condition is principal reason for admitting the resident into LTCH care.
- **Prior Function/Device Use** These covariates capture patient's functional status prior to the stay.
- **Pressure Ulcers:** These covariates capture the presence of pressure ulcer(s) at different stages.
- **Communication impairment:** These covariates capture the patient's communication function and indicate whether or not the patient's communication status at admission is impaired, and if impaired, at what level.
- **Incontinence:** These covariates indicate the patient's level of bladder and bowel incontinence.
- **Nutritional Status:** These covariates indicate patient's total parenteral nutrition status at LTCH admission and patient's body mass index.
- **Comorbidities:** Comorbidities are obtained from Section I in the LCDS.

The risk adjustment model is an ordinary least squares (OLS) linear regression. It estimates the relationship between discharge function score and the set of risk adjustors. The risk adjustment model is run on all stays to determine the model intercept and risk adjustor coefficients. Expected discharge function scores are calculated by applying the regression equation to each stay at admission.

Table 4.4.4A-1 in the attached file presents the model results for the final risk adjustment model and the alternative risk adjustment model with additional SRF covariates options is in Table **4.4.4A-2**.

5.4.4a Attach Risk/Case-mix Adjustment Modeling and/or Stratification Specifications

4.4.4a_Risk_adjustment_model-LTCH_508.xlsx

5.4.5 Calibration and Discrimination

A well-calibrated model demonstrates good predictive ability to distinguish high-risk from low-risk patients. To assess risk adjustment model calibration, we divided our dataset into deciles of expected values and calculated the ratio of average expected discharge score to average observed discharge score within each decile. A ratio of 1 would indicate perfect agreement between average expected and observed discharge function scores. We expect that the risk adjusted model performance will be stable among SNFs regardless of whether they have patients with low or high expected discharge scores on average.

As seen in **Table 4.4.5A-2**, the average expected to observed discharge score ratios within each decile approximated 1.0, with a range of 0.98 to 1.08, validating model performance. Though the ratio was highest only among LTCH with the smallest average expected score (1.08), overall there was little variability in average expected to observed discharge score ratios across deciles, supporting model stability across the range of expected discharge function scores and across the sample.

We analyzed model fit using adjusted R-squared to determine if the risk adjustment model can accurately predict discharge function while controlling for patient case-mix. The adjusted R-squared value was 0.64, which suggests good model discrimination. Please see **Table 4.4.5A-1** in the attached file.

5.4.5a Attach Calibration and Discrimination Testing Results

4.4.5a_Calibration_Discrimination_LTCH_508.pdf

5.4.6 Interpretation of Risk/Case-mix Factor Findings

Risk factors were chosen based on clinical relevance to Discharge Function performance. Risk factors were recommended by clinician members of the measure development team and by the TEP. The Final risk adjustment model has an adjusted R-squared value of 0.64.

We find that across the alternative risk adjustment models considered, the SRF covariates are

significant but small, and have little to no impact on model fit. The details of the alternative risk adjustment models are shown in the attachment for Section 4.4.4a. The attached file presents the model results for the final risk adjustment model and the alternative risk adjustment model with additional SRF covariates.

5.4.7 Final Approach to Address Risk Factors

Statistical risk adjustment model with risk factors

6.1.1 Current Status

In use

6.1.2 Current or Planned Use(s)

Public Reporting, Quality Improvement with Benchmarking (external benchmarking to multiple organizations), Quality Improvement (Internal to the specific organization)

6.1.3 Program Details

Name of the program and sponsor
CMS Long-Term Care Hospital Quality Reporting Program
URL of the program
https://www.cms.gov/medicare/quality/long-term-care-hospital/ltch-quality-repor...
Purpose of the program
https://www.cms.gov/medicare/quality/long-term-care-hospital
Geographic area and percentage of accountable entities and patients included
Long-term Care Hospitals in the United States
Applicable level of analysis and care setting

Level of Analysis: Facility

Care Setting: Long-Term Care Hospitals

Number of Long-Term Care Hospitals: 328

Number of Long-Term Care Hospital Patient Stays: 81,810

6.2.1 Actions of Measured Entities to Improve Performance

All LTCHs with at least 20 qualifying stays 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.

6.2.2 Feedback on Measure Performance

There is an email box that LTCHs may submit questions to as well as a website on which the latest measure updates are posted. The LTCH Quality Reporting Quality Measure User's Manual describes the provider reports that are available. LTCHs make use of these reports to monitor and improve the quality of care.

6.2.3 Consideration of Measure Feedback

No measure specifications changes requested or made.

6.2.4 Progress on Improvement

This measure is too new to provide an assessment on impacts on improvement.

6.2.5 Unexpected Findings

none

7.1 Supplemental Attachment

Supplemental_Tables_LTCH_508.xlsx

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The measure developer is different from the measure steward

Yes

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Steward Organization URL

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