Cal Long Term Care Compare

Measures That Matter Nursing Home Program: CLTCC Methodology Notes

Evaluation and Construction of Composite Measures of Nursing Home Mobility and Function Quality Measures in the Short-Stay and Long-Stay Settings

Aim of Reporting Mobility and Function Composites: To encourage quality improvement in resident mobility and function throughout the California skilled nursing facility (SNF) industry and improve consumer decision making.

Summary: Improvement or at least maintaining the resident's mobility and function are important to residents and families. The ability to walk and care for oneself has significant impact on quality of life, independence, cognition, and community participation, which is why these capabilities are required to be reported. The measures about mobility and function also are considered indicators of care quality and useful for SNFs to monitor for quality improvement purposes.[1,2,3,4] Based on these considerations, CLTCC created the Measures That Matter program to identify bright spots of care among SNFs' performance in resident mobility and function care. The composites differentiate between:

a. **short stay residents**, who generally stay an average of two weeks (but less than 100 days) to recover from an injury or illness that required hospitalization, and
b. **long stay residents**, who reside permanently or more than 100 days in a SNF.

This document describes the methods used to create the Long-stay (LS) and the Short-stay (SS) Mobility and Function composite measures.

Overview of Method to Identify and Select SNFs for the Resident Mobility and Function Composite Measures

Our investigation began with testing the validity of using a single composite measure that combined long-stay and short stay outcome measures reported on the CMS Care Compare website. The CMS measures are validated and used for national reporting; therefore, robust data are available to compare salient processes of care and care outcomes among most California SNFs. In addition, most of these measures have been in public reporting programs for several years. As a result, nursing homes have long experience with these measures, which have also been supported by various stakeholder groups interested in improving long term care outcomes.

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[2] Bischoff, L. L., Cordes, T., Meixner, C., Schoene, D., Voelcker-Rehage, C., & Wollesen, B. (2021). Can cognitive-motor training improve physical functioning and psychosocial wellbeing in nursing home residents? A randomized controlled feasibility study as part of the PROCARE project. *Aging Clinical and Experimental Research*, *33*, 943-956.

[3] Aubertin-Leheudre, M., & Rolland, Y. (2020). The importance of physical activity to care for frail older adults during the COVID-19 pandemic. *Journal of the American Medical Directors Association*, *21*(7), 973.

[4] Edemekong, P.F., Bomgaars, D., Sukumaran, S., & Levy, S.B. (2019). Activities of Daily Living (ADLs).

Step 1: Review of Publicly Available SNF Quality Measures

Initial investigation of possible measure candidates included an evaluation of the distributions and correlational matrices of all the publicly available outcome and process measures for both SS and LS SNF residents. This step included input from our expert panel. Based on the evaluation results, we set aside measures with strong ceiling or floor effects (examples of check-box process measures where everyone is close to 100%), which indicates insufficient variation across facilities. We also set aside brand-new measures and measures for which the correlation with other measures was in the incorrect direction.

Step 2: Exploring Measure Relationships: Pearson Correlational Coefficient and Exploratory Factor Analyses

We used two methods to analyze the relationships among the selected CMS measures to determine those that should be included in the composite measure: A) *Pearson Correlation Coefficient* and B) *Exploratory Factor Analysis.* Table 1 presents the eight mobility and function measures we selected to investigate a combined LS-SS composite (two LS measures and six SS measures) and an additional 19 measures (nine LS measures and ten SS measures) to investigate individual LS and SS composites.

Table 1. Descriptions of all CMS mobility and functions measures

	Measures	Data Source	Data Duration	Optimal Direction of Score
Combined LS-SS Composite Investigation				
Long-Stay (LS) Measures	LS401: Percentage of long-stay residents whose need for help with activities of daily living increased	CMS MDS Quality Measures	07/01/2021 to 06/30/2022	Lower is better
	LS451: Percentage of long-stay residents whose ability to move independently worsened	CMS MDS Quality Measures	07/01/2021 to 06/30/2022	Lower is better
Short-Stay (SS) Measures	SS001: Percentage of SNF residents whose functional abilities were assessed, and functional goals were included in their treatment plan	CMS SNF Quality Reporting Program- Provider Data	01/01/2021 to 12/31/2021	Higher is better
	SS022: Change in residents' ability to care for themselves at discharge	CMS SNF Quality Reporting Program- Provider Data	01/01/2021 to 12/31/2021	Higher is better
	SS023: Change in residents' ability to move around at discharge	CMS SNF Quality Reporting Program- Provider Data	01/01/2021 to 12/31/2021	Higher is better
	SS024: Percentage of residents who are at or above an expected ability to care for themselves at discharge	CMS SNF Quality Reporting Program- Provider Data	01/01/2021 to 12/31/2021	Higher is better
	SS025: Percentage of residents who are at or above an expected ability to move around at discharge	CMS SNF Quality Reporting Program- Provider Data	01/01/2021 to 12/31/2021	Higher is better

	Measures	Data Source	Data Duration	Optimal Direction of Score
	SS471: Percentage of short-stay residents who improved in their ability to move around on their own at discharge	CMS MDS Quality Measures	07/01/2021 to 06/30/2022	Higher is better
Long Stay Composite Investigation				
Long-Stay (LS) Measures	LS404: Percentage of long-stay residents who lose too much weight	CMS MDS Quality Measures	07/01/2021 to 06/30/2022	Lower is better
	LS405: Percentage of low-risk long-stay residents who lose control of their bowels or bladder	CMS MDS Quality Measures	07/01/2021 to 06/30/2022	Lower is better
	LS406: Percentage of long-stay residents who have or had a catheter inserted and left in their bladder	CMS MDS Quality Measures	07/01/2021 to 06/30/2022	Lower is better
	LS407: Percentage of long-stay residents with a urinary tract infection	CMS MDS Quality Measures	07/01/2021 to 06/30/2022	Lower is better
	LS408: Percentage of long-stay residents who have symptoms of depression	CMS MDS Quality Measures	07/01/2021 to 06/30/2022	Lower is better
	LS410: Percentage of long-stay residents experiencing one or more falls with major injury	CMS MDS Quality Measures	07/01/2021 to 06/30/2022	Lower is better
	LS453: Percentage of long-stay, high risk residents with pressure ulcers	CMS MDS Quality Measures	07/01/2021 to 06/30/2022	Lower is better
	LS551: Number of hospitalizations per 1,000 long-stay resident days	CMS Medicare Claims Quality Measures	04/01/2021 to 03/31/2022	Lower is better
	LS552: Number of outpatient emergency department visits per 1,000 long-stay resident days	CMS Medicare Claims Quality Measures	04/01/2021 to 03/31/2022	Lower is better
Short Stay Measure Composite				
Short Stay Measures	SS005: Percentage of SNF residents whose functional abilities were assessed, and functional goals were included in their treatment plan	CMS SNF Quality Reporting Program- Provider Data	01/01/2021 to 12/31/2021	Higher is better
	SS013: Percentage of SNF residents who experience one or more falls with major injury during their SNF stay	CMS SNF Quality Reporting Program- Provider Data	01/01/2021 to 12/31/2021	Higher is better
	SS038: Percentage of residents with pressure ulcers/pressure injuries that are new or worsened	CMS SNF Quality Reporting Program- Provider Data	01/01/2021 to 12/31/2021	Higher is better
	Nursing Retention: Nursing staff retention rate	LTC Facility Integrated Disclosure and Medi-Cal Cost Report Data	01/01/2021 to 12/31/2021	Higher is better

	Measures	Data Source	Data Duration	Optimal Direction of Score
	Nursing turnover: Nursing staff turnover rate	LTC Facility Integrated Disclosure and Medi-Cal Cost Report Data	01/01/2021 to 12/31/2021	Higher is better
	PT_minutes: Physical therapist staff minutes per resident per day	CMS Provider Dara	04/01/2021 to 06/30/2022	Higher is better
	Std_hrd_aid: Nursing assistant (NA) hours per resident per day	CMS Provider Dara	04/01/2021 to 06/30/2022	Higher is better
	Std_hrd_voc: Licensed vocational/practical nurse (LVN/LPN) hours per resident per day	CMS Provider Dara	04/01/2021 to 06/30/2022	Higher is better
	Std_hrd_rn: Registered nurse (RN) hours per resident per day	CMS Provider Dara	04/01/2021 to 06/30/2022	Higher is better
	Std_hrd_tot_wknd: Total number of nurse staff hours per resident per weekend day	CMS Provider Dara	04/01/2021 to 06/30/2022	Higher is better

Pearson correlation coefficient analysis: This analysis explores the strength and directional relationships among eight LS and SS CMS mobility and function measures we used to explore a combined LS-SS mobility and function composite measure (Table 1). Table 2 shows the results of the Pearson correlation coefficient analysis: two LS measures (LS401 and LS451) were strongly, positively correlated with each other (correlation coefficient: 0.62213, *p*-value: <0.001) and four SS measures (SS022, SS023, SS024, and SS025) showed significantly strong to very strong positive correlations with each other. SS001 did not correlate with any other SS measures (SS022, SS023, SS024, SS025, and SS471), but it had a very weak, statistically significant negative correlation with the two LS measures. SS471 had weak to very weak negative correlation with two LS measures, respectively, and it also had very weak, statistically significant positive correlations with four SS measures (SS022, SS023, SS024, and SS025).

Table 2. Pearson correlation coefficient between eight CMS mobility-related measures

Correlational Coefficient	LS401	LS451	SS001	SS022	SS023	SS024	SS025	SS471
LS401	1	**0.62213*****	**-0.12341*****	0.03349	**0.06446***	**0.08201***	**0.06758***	**-0.24875*****
LS451		1	**-0.17564*****	0.05282	-0.00784	-0.00367	-0.00356	**-0.18910*****
SS001			1	-0.03803	0.04187	-0.02706	0.00601	0.05153
SS022				1	**0.65135*****	**0.81443*****	**0.63455*****	**0.08576****
SS023					1	**0.69231*****	**0.93950*****	**0.15559*****
SS024						1	**0.69943*****	**0.06522***
SS025							1	**0.14434*****
SS471								1

Notes: **Bold** text shows statistically significant results. *p*-value: <0.001***; <0.01**; <0.05*

Very Strong Correlation: >0.8 (positive) or <-0.8 (negative); Strong Correlation: 0.6-0.8 (positive) or -0.6 to -0.8 (negative); Moderate Correlation: 0.4-0.6 (positive) or -0.4 to -0.6 (negative); Weak Correlation: 0.2-0.4 (positive) or -0.2 to -0.4 (negative); Very Weak Correlation: <0.2 (positive) or >-0.2 (negative).

Exploratory factor analysis Next, we developed four models using the exploratory factor analysis to learn about the measures' internal reliability and the underlying structure between the eight mobility measures. Model 1 and Model 2 included LS and SS measures (Model 2 omitted SS001). Both models revealed similar results: almost all SS measures have a high factor loading (factor loading: 0.86 to 0.92) in Factor 1 and the two LS measures have a high factor loading (factor loading: 0.83 to 0.86) in Factor 2.

Model 3 and Model 4 included only SS measures (Model 4 omitted SS001); four SS measures have a high factor loading (factor loading: 0.86 to 0.92) in Factor 1. Since SS001 showed small or negative factor loading in Model 1 and Model 3, we excluded it in the subsequent models that explored individual composites for LS and SS (Table 4).

Table 3. Exploratory factor analyses for eight CMS mobility-related measures

	Model 1			Model 2			Model 3		Model 4	
	Check	Factor 1	Factor 2	Check	Factor 1	Factor 2	Check	Factor 1	Check	Factor 1
LS401	√	0.13197	**0.83367**	√	0.11728	**0.86109**				
LS451	√	0.07505	**0.83098**	√	0.06016	**0.84232**				
SS001	√	-0.03081	-0.40961				√	-0.06244		
SS022	√	**0.86075**	0.00042	√	**0.86049**	0.00904	√	**0.86337**	√	**0.85599**
SS023	√	**0.91702**	-0.07736	√	**0.91850**	-0.04847	√	**0.90994**	√	**0.91986**
SS024	√	**0.88761**	0.0061	√	**0.88726**	0.01761	√	**0.89563**	√	**0.88789**
SS025	√	**0.91325**	-0.05436	√	**0.91411**	-0.03451	√	**0.90910**	√	**0.91587**
SS471	√	0.14856	-0.47257	√	0.15670	-0.49987	√	**0.12059**	√	**0.18161**

Note: **Bold** text shows measures with high factor loading that are used in subsequent models to explore separate LS and SS composites using additional SS and LS quality measures

Based on the results of the Pearson correlation coefficient and exploratory factor analyses, we concluded that a combined LS-SS mobility and function composite measure is invalid.

We repeated these steps to explore the mobility measures' internal reliability for separate LS and SS composites by adding additional SS and LS CMS quality measures to the factor analyses.

In Table 4, Model 1 includes LS measures only. Two LS mobility measures and additional LS measures show high factor loading in Factor 1 (LS401, LS451, LS404, LS405, LS406, LS407, LS410, LS552). These 8 measures, highlighted in bold, were moved forward to the confirmatory factor analysis (see next section). The measures that did not load on Factor 1 addressed concepts such as symptoms of depression, pressure ulcers, and hospitalizations, which do not directly address the concept of mobility and function. These 3 measures were not retained for confirmatory factor analysis (LS408, LS453, LS551).

Models 2 through 6 focus on SS mobility measures only. We tested whether process measures (e.g., percentage of SNF residents whose functional abilities were assessed, and functional goals were included in their treatment plan), measures of nursing retention and turnover, and measures of staff hours per resident per day, could be included in the same SS composite. Through several iterations and modeling approaches, it became clear that these latter sets of measures did not load on the same factor, making a single-factor solution impossible.

Table 4. Exploratory factor analyses for the 11 LS and 16 SS mobility-related measures

Mobility measures (original 8)	Model 1 (LS only)		Model 2 (SS only)		Model 3 (SS only)		Model 4 (SS only)		Model 5 (SS only)		Model 6 (SS only)	
	Check	Factor 1	Check	Factor 1	Check	Factor 1	Check	Factor 1	Check	Factor 1	Check	Factor 1
LS401	√	**0.77279**										
LS451	√	**0.78709**										
SS001												
SS022			√	**0.84138**	√	**0.83061**	√	**0.85966**	√	**0.84746**	√	**0.83923**
SS023			√	**0.92634**	√	**0.92231**	√	**0.90911**	√	**0.91797**	√	**0.91972**
SS024			√	**0.88529**	√	**0.88819**	√	**0.88374**	√	**0.88771**	√	**0.88885**
SS025			√	**0.92120**	√	**0.91667**	√	**0.90801**	√	**0.91355**	√	**0.91343**
SS471			√	**0.22027**	√	0.09892	√	**0.11079**	√	**0.10345**	√	0.06714
Additional 19 LS and SS mobility-related measures												
LS404	√	**0.35097**										
LS405	√	**0.62908**										
LS406	√	**0.26986**										
LS407	√	**0.49783**										
LS408	√	-0.12566										
LS410	√	**0.54305**										
LS453	√	-0.05606										
LS551	√	-0.18176										
LS552	√	**0.34949**										
SS005			√	0.09349	√	0.04071			√	0.05841	√	0.04962
SS013			√	0.07122	√	0.06550			√	0.04381	√	0.03158
SS038			√	-0.09123	√	-0.04615			√	-0.03264	√	-0.00271
Nursing Retention					√	0.00593					√	0.00032
Nursing Turnover					√	0.04134					√	0.02672
PT_Minutes					√	0.05811					√	0.09955
Std_Hrd_Aid							√	-0.01050	√	-0.00193	√	-0.02654
Std_Hrd_Voc							√	-0.03401	√	-0.02120	√	-0.01771
Std_Hrd_RN							√	-0.00965	√	-0.06563	√	0.06576
Std_Hrd_Tot_Wknd							√	-0.02668	√	-0.05584	√	-0.00957

Note: **Bold** text shows measures with at least 0.1 factor loading.

Step 3: Confirmatory Factor Analysis: Models and Score Calculations

Step 3 focuses on performing a confirmatory factor analysis to calculate the factor score for each SNF. Based on the Model 1 results in Table 4, which includes all 11 LS measures in the exploratory factor analysis, we chose for the confirmatory factor analysis the eight LS measures (LS401, LS451, LS404, LS405, LS406, LS407, LS410, LS552) from Factor 1 (the largest eigenvalue) that had a factor loading of ≥0.25. Similarly, for the SS confirmatory analysis, we chose the five SS measures (i.e., SS022, SS023, SS024, SS025, SS471) with the highest factor loading in Factor 1 (i.e., largest eigenvalue) across most of the models (Table 5). All these LS and SS measures reflect various aspects of resident function, mobility, self-care, or quality of life.

The confirmatory factor analysis used the most updated recent data (i.e., CMS MDS Quality Measures from 1/1/2022 to 12/31/2022, CMS Medicare Claims Quality Measures from 10/1/2021 to 9/30/2022, CMS SNF Quality Reporting Program- Provider Data from 7/1/2021 to 6/30/2022) to produce the factor score. In the confirmatory factor analysis for the LS mobility composite measure (Table 5), five of eight LS measures showed high-to-moderate correlation (i.e., factor loading >0.3), and all of them achieved statistical significance. For the SS composite measure, four of five SS measures showed high correlation and all achieved statistical significance.

Table 5. Confirmatory factor analysis for 8 LS measures and 5 SS measures

	LS Composite measure		SS Composite measure	
	Standardized Factor Loading	***P*-Value**	**Standardized Factor Loading**	***P*-Value**
LS401: Percentage of long-stay residents whose need for help with activities of daily living increased	0.7862	<.0001		
LS404: Percentage of long-stay residents who lose too much weight	0.2256	<.0001		
LS405: Percentage of low-risk long-stay residents who lose control of their bowels or bladder	0.5019	<.0001		
LS406: Percentage of long-stay residents who have or had a catheter inserted and left in their bladder	0.1998	<.0001		
LS407: Percentage of long-stay residents with a urinary tract infection	0.3473	<.0001		
LS410: Percentage of long-stay residents experiencing one or more falls with major injury	0.3043	<.0001		
LS451: Percentage of long-stay residents whose ability to move independently worsened	0.8167	<.0001		
LS552: Number of outpatient emergency department visits per 1,000 long-stay resident days	0.2416	<.0001		
SS022: Change in residents' ability to care for themselves at discharge			0.7697	<.0001
SS023: Change in residents' ability to move around at discharge			0.9834	<.0001
SS024: Percentage of residents who are at or above an expected ability to care for themselves at discharge			0.7383	<.0001
SS025: Percentage of residents who are at or above an expected ability to move around at discharge			0.9543	<.0001
SS471: Percentage of short-stay residents who improved in their ability to move around on their own at discharge			0.1884	<.0001

Note: The confirmatory factor analysis and the calculation of factor score for each facility were executed via "PROC CALIS" and "PROC SCORE" in the SAS Enterprise Guide version 7.15.

The original value for each measure and the output statistics (i.e., mean, standard deviation, and standardized scoring coefficients) from the confirmatory factor analysis were used to produce the LS and SS factor scores for each nursing home facility. The formula of the production is the original value minus the mean and divided by the standard deviation which was then multiplied by the standardized scoring coefficients for each measure. The products of all measures are summed to form the LS (i.e., LS401+LS451+LS404+LS405+LS406+LS407+LS410+LS552) and SS (i.e., SS022+SS023+SS024+SS025+SS471) composite factor scores for each facility. For example, a facility with original value, mean, standard deviation, and standardized scoring coefficients for measure SS022 (change in residents' ability to move around at discharge) are 8.8, 7.51, 2.39, and 0.032, respectively. The product of SS022 is 0.017 ([8.8-7.51]/2.39*0.032), and products for SS023, SS024, SS025, and SS471 of this facility are 0.314, 0.003, 0.295, and 0.001, respectively. Therefore, the SS factor score for this facility is 0.63 (i.e., 0.017+0.314+0.003+0.295+0.001).

We were unable to score the LS composite for 247 SNFs and the SS composite for 249 SNFs due to missing data for one or more measures in the respective LS and SS composite measures. Thus, we were able to report LS scores for 925 SNFs and SS scores for 923 SNFs. The factor score for the LS composite measure ranged between -1.460991 to 3.317127 and the factor score ranged between -4.998486 to 3.566859 for the SS composite measure. Table 6 shows the factor score distribution by percentiles for LS and SS composite measures.

Table 6. Factor scores for SS and LS composite measures by percentiles

	LS composite measure	SS composite measure
Percentiles	**LS Factor Score**	**SS Factor Score**
100th	3.317127	3.566859
99th	2.276057	2.439467
95th	1.466652	1.532987
90th	1.119073	1.179117
75th	0.475477	0.596419
50th	-0.104813	-0.037232
25th	-0.597055	-0.610557
10th	-0.913980	-1.180196
5th	-1.071378	-1.485671
1th	-1.265571	-2.172717
0th	-1.460991	-4.998486

Note: The LS composite measure includes eight LS mobility and function quality measures and the SS composite measure includes five SS quality measures.

Step 4: Classifying SNF Factor Scores into the Top 10% and Next 15% Performance Group Categories

To identify the top 10% of performers, we first acknowledge the difference between the LS and SS measure polarity. In this case, lower scores indicate better outcomes for the selected measures in the LS composite and higher scores indicate better outcomes for selected measures in the SS composite. Therefore, in the LS composite measure, the SNFs with factor scores in the lowest 10% (i.e., 0th – 10th percentiles) are placed into the top 10% performance group; in the SS composite measure, the SNFs with factor scores in the highest 10% (i.e., 91st – 100th percentiles) are placed into the top 10% performance group (Table 7). Similarly, SNFs with LS composite factor scores falling within the 11th – 25th percentile are classified in the next 15% performance group and the SNFs with SS composite factor scores falling within the 76th – 90th percentile of scores are placed in the next 15% performance group.

Table 7. Measure polarity: Defining the top 10% and next 15% requisite factor scores for the LS and the SS mobility and function composite measures

Performance Groups	Factor Score: LS composite measure	Factor Score: SS composite measure
Top 10%	0^{th} – 10^{th} percentiles[a]	91^{st} -100^{th} percentiles[a]
11%-25%	11^{th} – 25^{th} percentiles[b]	76^{th} -90^{th} percentiles[b]
26%-75%	26^{th} – 75^{th} percentiles	26^{th} -75^{th} percentiles
76%-90%	76^{th} – 90^{th} percentiles	11^{th} -25^{th} percentiles
Bottom 10%	91^{st} – 100^{th} percentiles	0^{th} -10^{th} percentiles

[a] Factor score range required to qualify for the Top 10% for LS and SS composite measures for the CLTCC MTM Program.

[b] Factor score range required to qualify for the Next 15% for LS and SS composite measures for the CLTCC MTM Program.

The CLTCC MTM program ultimately groups SNF performance scores into three categories for both the LS and SS resident mobility and function composite: the top 10% (Top Tier) of all California SNFs, the next 15% (Second Tier), and all others (Bottom Tier). However, we share the quintile distribution here of the 1,172 SNF performance scores for the LS (Table 8) and SS (Table 9) mobility and function composite measures.

Table 8. LS mobility and function composite measure: frequency of California SNF factor scores by percentile (n=1,172)

Performance Group	Factor Score Percentile	Number of Facilities	Percentage
Top 10%	0^{th} – 10^{th} percentiles	93	7.94
11%-25%	11^{th} – 25^{th} percentiles	138	11.77
26%-75%	26^{th} – 75^{th} percentiles	462	39.42
76%-90%	76^{th} – 90^{th} percentiles	139	11.86
Bottom 10%	91^{st} – 100^{th} percentiles	93	7.94
Missing		247	21.08

Table 9. SS mobility and function composite measure: frequency of California SNF factor scores by percentile (n=1,172)

Performance Group	Factor Score Percentile	Number of Facilities	Percentage
Top 10%	91^{st} – 100^{th} percentiles	93	7.94
11%-25%	76^{th} – 90^{th} percentiles	138	11.77
26%-75%	26^{th} – 75^{th} percentiles	461	39.33
76%-90%	11^{th} – 25^{th} percentiles	138	11.77
Bottom 10%	0^{th} – 10^{th} percentiles	93	7.94
Missing		249	21.25

Step 5: Applying Guardrail Exclusion Criteria to SNFs in the Initial Top Tier Performance Groups

The mobility and function composite measures are one of many quality measures used to assess the quality of care delivered by SNFs. Some SNFs may have significant deficits in other areas of care that warrant exclusion from this MTM program. As such, we identified six guardrail criteria for each composite measure to ensure SNFs in the initial top tiers of performers are not unduly recognized for better care.

Guardrails A-C are applied first for both composite categories. Next a manual review of state AA, A, or abuse icons are performed by the research team for the remaining SNFs. We review citations from the three most recent years based on the date of the incident. A citation may be waived due if the written report is unclear how the facility was responsible, or if citation was issued outside of the 3 most recent years.

Guardrail Exclusion Criteria for Long Stay Composite	Guardrail Exclusion Criteria for Short Stay Composite
A. Special focus facility (SFF) or SFF candidate on the CMS watch list B. **Any** CMS performance rating of 1 or 2 stars (i.e., star ratings = overall, staffing, health inspection, long term care, short term care) C. Bottom 10% group score of the SS composite measure.	A. Special focus facility (SFF) or SFF candidate on the CMS watch list B. **Any** CMS performance rating of 1 or 2 stars (i.e., star ratings = overall, staffing, health inspection, long term care, short term care) C. Bottom 10% group score of the LS composite measure.

Manual review of 3 additional guardrails

Research team subject matter experts reviewed case-by-case for exclusion, SNFs with **any**:

- Abuse icon,
- State AA citations, or
- State A citations

Long Stay Composite Results (2024)

SNFs that initially scored in the top 25% of the LS composite measure were reassigned to the "Bottom" tier (i.e., 26th – 75th percentile) if they met **any** of the guardrail exclusion criteria.

This section demonstrates the application of guardrail exclusions to the data in the 2024 update. Table 10 shows that, among the initial 93 SNFs scoring in the top 10% of the LS composite group, 66 SNFs were omitted leaving 27 SNFs in the top 10% of performers for LS resident mobility and function care composite measure. Among the initial 139 SNFs that scored in the 11th – 25th percentile in the LS composite group, 96 SNFs were omitted leaving 43 SNFs in the next 15% of top performers in the LS resident mobility and function care composite measure.

Having any CMS rating of 1 or 2 stars was the most common reason for exclusion among the top 25% of LS composite performers. No facilities required a manual review of reasons for abuse icons because they were already excluded for having 1 or 2 stars. Five SNFs had one State A Citation each for review; all five were excluded. (One facility was in the original top tier-long stay and second tier-short stay.)

Table 10. LS composite measure: distribution of guardrail exclusion reasons among the top 25% of SNFs

Guardrail Reasons		Top 10% LS composite group score	Next 15% LS composite group score
		N=93	N=139
		Number of SNFs omitted by category	Number of SNFs omitted by category
Only	SFF/SFF-C	1	0
	Any CMS 1 or 2 star	54	79
	SS Bottom 10%	1	1
	SFF + any CMS 1 or 2 star	2	5
	SFF + SS Bottom 10%	0	0

More than 1 reason	Any 1 or 2 star+ SS Bottom 10%	4	6
	All 3 guardrails	1	3
Expert manual review	CMS Abuse icon	0	0
	State AA citation	0	0
	State A citation	3	2
	Total SNFs Excluded based on data and expert review	66	96
	Final # of SNFs Included	**27**	**43**

Note: SFF/SSF-C: Special focus facility or SFF candidate on the CMS watch list; any CMS performance rating is 1 or 2 star; bottom 10% group score of the SS composite measure; manual review of CMS assigned abuse icon, state AA or A state citations issued as between 4/2/2023 and 4/1/2024.

Short Stay Composite Results (2024)

Table 11 shows that, among the initial 93 SNFs scoring in the top 10% of the LS composite group, 46 SNFs were omitted leaving 47 SNFs in the top 10% of performers for SS resident mobility and function care composite measure. Among initial 140 SNFs that scored in the 11th – 25th percentile in the SS composite, 84 were omitted leaving 56 SNFs in the next 15% of top performers in the SS resident mobility and function care composite measure.

Similar to the LS composite, the most common reason for omitting SS composite performers was having a CMS rating of 1 or 2 stars. No facilities required a manual review of reasons for abuse icons because they were already omitted for having 1 or 2 stars. Four facilities had one State A Citation each; two had one State AA Citation each; and, one had three State A citations. All six facilities were omitted. (One facility was in the original top 10% long stay and 11th – 25th percentile short stay.)

Table 11. SS composite measure: distribution of guardrail exclusion reasons among the top 25% of SNFs

Guardrail Reasons		Top 10% SS composite group score	Next 15% SS composite group score
		N=93	**N=140**
		Number of SNFs omitted by category	**Number of SNFs omitted by category**
Only	SFF/SFF-C	0	0
	Any CMS 1 or 2 star	37	68
	LS Bottom 10%	3	2
More than 1 reason	SFF + any CMS 1 or 2 star	1	3
	SFF + LS Bottom 10%	0	0
	Any 1 or 2 star+ LS Bottom 10%	3	7
	All 3 guardrails	0	0
Expert manual review	CMS Abuse icon	0	0
	State AA citation	2	0
	State A citation	0	4
	Total SNFs Excluded based on data and expert review	46	84
	Final # of SNFs Included	**47**	**56**

Note: SFF/SSF-C: Special focus facility or SFF candidate on the CMS watch list; any CMS performance rating is 1 or 2 star; bottom 10% group score of the LS composite measure; manual review of CMS assigned abuse icon, state AA or A state citations issued between 4/2/2023 and 4/1/2024.

Step 6: Finalists for the MTM Nursing Home Care LS and SS Mobility and Function Composites

Tables 12 and 13 show the distribution of SNF finalists among the LS and SS performance categories after accounting for the guardrail criteria for the 2024 data. As mentioned earlier, the SNFs that were in the original top 25% performance group, but met one or more guardrail criteria were moved to the "Bottom" Tier (i.e., 26th – 75th percentile). Ultimately, 162 SNFs moved from the LS composite measure's top 25th percentile to the "Bottom" Tier (Table 12). 130 SNFs moved from the SS composite measure's top 25th percentile to the "Bottom" Tier (Table 13).

Table 12. Distribution of final performance scores for the LS composite measure among 1,168 SNFs

LS Factor Score Percentile Range	Number of SNFs	Percentage of SNFs
Top Tier (0th – 10th percentile)	27	2.31
Second Tier (11th– 25th percentile)	43	3.68
Bottom Tier (76th percentile and below)	858	73.46
Missing	240	20.55

Table 13. Frequency of final group score for SS composite measure among 1,168 SNFs

SS Factor Score Percentile Range	Number of SNFs	Percentage of SNFs
Top Tier (91st – 100th percentiles)	47	4.02
Second Tier (76th – 90th percentiles)	56	4.79
Bottom Tier (76th percentile and below)	830	71.06
Missing	235	20.12

Conclusion

The 2024 Measures that Matter program ultimately identified 27 SNFs that scored in the Top Tier of the long stay setting Mobility and Function composite measure and 47 SNFs that scored in the Top Tier of the short stay setting Mobility and Function composite measure. One SNF scored in the Top Tier of both composite measures.