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Skilled Nursing Facility Quality Reporting Program - Specifications for the Quality Measures Adopted through the Fiscal Year 2016 Final Rule

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SKILLED NURSING FACILITY QUALITY REPORTING PROGRAM:
SPECIFICATIONS FOR THE QUALITY MEASURES ADOPTED THROUGH THE FISCAL
YEAR 2016 FINAL RULE

RTI International

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SECTION 1

CROSS-SETTING MEASURES DEVELOPMENT WORK: AN INTRODUCTION

The Improving Medicare Post-Acute Care Transformation (IMPACT) Act, enacted Oct. 6, 2014, directs the Secretary of Health and Human Services to “specify quality measures on which Post-Acute Care (PAC) providers are required under the applicable reporting provisions to submit standardized patient assessment data” in several domains, including incidence of major falls, skin integrity, and function. The IMPACT Act requires the implementation of quality measures to address these measure domains in home health agencies (HHAs), skilled nursing facilities (SNFs), long-term care hospitals (LTCHs), and inpatient rehabilitation facilities (IRFs).

The IMPACT Act also requires, to the extent possible, the submission of such quality measure data through the use of a PAC assessment instrument and the modification of such instrument as necessary to enable such use; for SNFs, this requirement refers to the Minimum Data Set (MDS) 3.0.

For more information on the statutory history of the SNF QRP, please refer to the FY 2015 SNF PPS final rule. More information on the IMPACT Act is available at <https://www.govtrack.us/congress/bills/113/hr4994>.

In this document, we present specifications for the following three (3) quality measures adopted for the SNF QRP through the FY 2016 SNF PPS Final Rule:

1. Process Measure: Application of Percent of Long-Term Care Hospital Patients with an Admission and Discharge Functional Assessment and a Care Plan That Addresses Function (NQF #2631, Measure Steward: CMS);
2. Outcome Measure: Percent of Residents or Patients with Pressure Ulcers That Are New or Worsened (NQF #0678, Measure Steward: CMS);
3. Outcome Measure: Application of Percent of Residents Experiencing One of More Falls with Major Injury (Long Stay) (NQF #0674, Measure Steward: CMS)

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SECTION 2 QUALITY MEASURES

2.1 Cross-setting Function Quality Measure: Application of Percent of Long-Term Care Hospital Patients with an Admission and Discharge Functional Assessment and a Care Plan That Addresses Function (NQF #2631)

2.1.1 Quality Measure Description

The cross-setting function quality measure is a process measure that is an application of the quality measure Percent of Long-Term Care Hospital Patients with an Admission and Discharge Functional Assessment and a Care Plan that Addresses Function (NQF #2631). This quality measure reports the percent of patients/residents with an admission and a discharge functional assessment and a treatment goal that addresses function. The treatment goal provides evidence that a care plan with a goal has been established for the patient/resident.

This process quality measure requires the collection of admission and discharge functional status data by clinicians using standardized clinical assessment items or data elements that assess specific functional activities, that is, self-care and mobility activities. The self-care and mobility function items are coded using a 6-level rating scale that indicates the patient's/resident's level of independence with the activity. A higher score indicates greater independence. If an activity is not attempted, the reason that the activity did not occur is coded. For this quality measure, documentation of a goal for one of the function items reflects that the patient's/resident's care plan addresses function. The functional goal is recorded at admission for at least one of the standardized self-care or mobility function items using the 6-level rating scale. Subsequent to the admission assessment, goal setting and establishment of a care plan to achieve the goal, at the time of discharge the self-care and mobility functional performance is reassessed using the same 6-level rating scale, enabling the ability to re-assess the patient's/resident's functional abilities.

This quality measure is calculated using data from the Minimum Data Set 3.0 (MDS 3.0) assessment instrument for Skilled Nursing Facility (SNF) residents, the Long-Term Care Hospital (LTCH) Continuity Assessment Record & Evaluation (CARE) Data Set for LTCH patients, and the Inpatient Rehabilitation Facility - Patient Assessment Instrument (IRF-PAI) for IRF patients. Data will be collected separately in each of the three settings using standardized items that have been added to the MDS 3.0, LTCH CARE Data Set, and IRF-PAI. Table 1 in Appendix A shows the standardized items that are included in each data set for this quality measure. Further, CMS will conduct data analyses for measure calculation and measure reporting separately for each of the three settings.

2.1.2 Purpose/Rationale for the Quality Measure

Section 1899B(c)(1) of the Act directs the Secretary to specify quality measures on which PAC providers are required under the applicable reporting provisions to submit standardized patient/resident assessment data and other necessary data specified by the Secretary with respect to five (5) quality domains, one of which is functional status, cognitive function, and changes in function and cognitive function. To satisfy these requirements, we are adopting an application of

the quality measure Percent of Long-Term Care Hospital Patients with an Admission and Discharge Functional Assessment and a Care Plan that Addresses Function (NQF #2631) as a cross-setting quality measure that addresses the domain of functional status, cognitive function, and changes in function and cognitive function. This quality measure reports the percent of patients/residents with an admission and a discharge functional assessment and a goal that addresses function.

The National Committee on Vital and Health Statistics, Subcommittee on Health¹, noted: “[i]nformation on functional status is becoming increasingly essential for fostering healthy people and a healthy population. Achieving optimal health and well-being for Americans requires an understanding across the life span of the effects of people's health conditions on their ability to do basic activities and participate in life situations, that is, their functional status.” This statement is supported by research showing that patient functioning is associated with important patient outcomes such as discharge destination and length of stay in inpatient settings² as well as risk of nursing home placement and hospitalization of older adults living in the community.³ Functioning is important to patients/residents and their family members.^{4,5,6}

The majority of patients/residents who receive PAC services, such as care provided by SNFs, LTCHs and IRFs, have functional limitations, and many of these patients/residents are at risk for further decline in function due to limited mobility and ambulation.⁷ The patient/resident populations treated by SNFs, LTCHs, and IRFs vary in terms of their functional abilities at the time of the PAC admission and their goals of care. For IRF patients and many SNF residents, treatment goals may include fostering the patient's/resident's ability to manage his or her daily activities so that the patient/resident can complete self-care and/or mobility activities as independently as possible, and if feasible, return to a safe, active, and productive life in a community-based setting. Lastly, in addition to having complex medical care needs for an extended period of time, LTCH patients often have limitations in functioning because of the nature of their conditions, as well as deconditioning due to prolonged bed rest and treatment requirements (for example, ventilator use). The clinical practice guideline *Assessment of*

¹ Subcommittee on Health National Committee on Vital and Health Statistics, "Classifying and Reporting Functional Status" (2001).

² Reistetter T. A., Graham J. E., Granger C. V., Deutsch A, Ottenbacher K. J. Utility of Functional Status for Classifying Community Versus Institutional Discharges after Inpatient Rehabilitation for Stroke. *Archives of Physical Medicine and Rehabilitation*, 2010; 91:345-350.

³ Miller E.A., Weissert W. G. Predicting Elderly People's Risk for Nursing Home Placement, Hospitalization, Functional Impairment, and Mortality: A Synthesis. *Medical Care Research and Review*, 57; 3: 259-297.

⁴ Kurz, A. E., Saint-Louis, N., Burke, J. P., & Stineman, M. G. (2008). Exploring the personal reality of disability and recovery: a tool for empowering the rehabilitation process. *Qual Health Res*, 18(1), 90-105.

⁵ Kramer, A. M. (1997). Rehabilitation care and outcomes from the patient's perspective. *Med Care*, 35(6 Suppl), JS48-57.

⁶ Stineman, M. G., Rist, P. M., Kurichi, J. E., & Maislin, G. (2009). Disability meanings according to patients and clinicians: imagined recovery choice pathways. *Quality of Life Research*, 18(3), 389-398.

⁷ Kortebein P, Ferrando A, Lombebeida J, Wolfe R, Evans WJ. Effect of 10 days of bed rest on skeletal muscle in health adults. *JAMA*; 297(16):1772-4.

*Physical Function*⁸ recommends that clinicians should document functional status at baseline and over time to validate capacity, decline, or progress. Therefore, assessment of functional status at admission and discharge and establishing a functional goal for discharge as part of the care plan (i.e., treatment plan) is an important aspect of patient/resident care for all of these PAC providers.

Given the variation in patient/resident populations across the PAC providers, the functional activities that are typically assessed by clinicians for each type of PAC provider may vary. For example, the activity of rolling left and right in bed is an example of a functional activity that may be most relevant for low-functioning patients/residents who are chronically critically ill. However, certain functional activities, such as eating, oral hygiene, lying to sitting on the side of the bed, toilet transfers, and walking or wheelchair mobility, are important activities for patients/residents in each PAC provider. As previously noted, Table 1, in Appendix A, shows the standardized function items that are included in each data set for this quality measure.

Although functional assessment data are currently collected in SNFs, LTCHs, and IRFs, this data collection has employed different assessment instruments, scales, and items. The data collected cover similar topics, but are not standardized across PAC settings. Further, the different sets of functional assessment items are coupled with different rating scales, making communication about patient/resident functioning challenging when patients/residents transition from one type of provider to another. Collection of standardized functional assessment data across SNFs, LTCHs, and IRFs, using standardized data items, would establish a common language for patient/resident functioning, which may facilitate communication and care coordination as patients/residents transition from one type of provider to another. The collection of standardized functional status data may also help improve patient/resident functioning during an episode of care by ensuring that basic daily activities are assessed at the start and end of each episode of care with the aim of determining whether at least one functional goal is established.

The functional assessment items included in the functional status quality measure were originally developed and tested as part of the Post-Acute Care Payment Reform Demonstration (PAC PRD) version of the Continuity Assessment Record and Evaluation (CARE) Item Set, which was designed to standardize assessment of patient's/resident's status across acute and post-acute providers, including SNFs, HHAs, LTCHs, and IRFs. The functional status items on the CARE Item Set are daily activities that clinicians typically assess at the time of admission and/or discharge to determine patients'/residents' needs, evaluate patient/resident progress and prepare patients/residents and families for a transition to home or to another provider.

The development of the CARE Item Set and a description and rationale for each item is described in a report entitled "The Development and Testing of the Continuity Assessment Record and Evaluation (CARE) Item Set: Final Report on the Development of the CARE Item

⁸ Kresevic D. M. Assessment of physical function. In: Boltz M, Capezuti E, Fulmer T, Zwicker D, editor(s). Evidence-based geriatric nursing protocols for best practice. 4th ed. New York (NY): Springer Publishing Company; 2012. p. 89-103.

Set: Volume 1 of 3."⁹ Reliability and validity testing were conducted as part of CMS' Post-Acute Care Payment Reform Demonstration, and we concluded that the functional status items have acceptable reliability and validity. A description of the testing methodology and results are available in several reports, including the report entitled "The Development and Testing of the Continuity Assessment Record And Evaluation (CARE) Item Set: Final Report On Reliability Testing: Volume 2 of 3"¹⁰ and the report entitled "The Development and Testing of The Continuity Assessment Record And Evaluation (CARE) Item Set: Final Report on Care Item Set and Current Assessment Comparisons: Volume 3 of 3."¹¹ The reports are available on CMS' Post-Acute Care Quality Initiatives webpage at: <http://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/Post-Acute-Care-Quality-Initiatives/CARE-Item-Set-and-B-CARE.html>.

The function items to collect data for this cross-setting quality measure are some of the same items that are used to calculate other LTCH function quality measures. For example, function items to collect data for the quality measure Percent of Long-Term Care Hospital Patients with an Admission and Discharge Functional Assessment and a Care Plan that Addresses Function (NQF #2631)¹² includes all of the items in the cross-setting *application* of this quality measure plus some additional items. Table 2, in Appendix B, shows the function items included in this SNF, LTCH, and IRF cross-setting function process measure, an *Application* of Percent of Long-Term Care Hospital Patients with an Admission and Discharge Functional Assessment and a Care Plan that Addresses Function (NQF #2631), and the quality measure Percent of Long-Term Care Hospital Patients with an Admission and Discharge Functional Assessment and a Care Plan that Addresses Function (NQF #2631).

2.1.3 Denominator

Specific denominator definitions for each setting are provided below. There are no denominator exclusion criteria for this measure.

SNF Denominator: The denominator is the number of Medicare Part A covered resident stays.

LTCH Denominator: The denominator is the number of LTCH patient stays.

IRF Denominator: The denominator is the number of Medicare (Part A and Part C) patient stays.

⁹ Barbara Gage et al., "The Development and Testing of the Continuity Assessment Record and Evaluation (CARE) Item Set: Final Report on the Development of the CARE Item Set" (RTI International, 2012).

¹⁰ Ibid.

¹¹ Ibid.

¹² This process measure was adopted for the LTCH QRP through the FY 2015 IPPS/LTCH PPS final rule (79 FR 50298 through 50301).

2.1.4 Numerator

The numerator for this quality measure is the number of patient/resident stays with functional assessment data for each self-care and mobility activity and at least one self-care or mobility goal.

To the extent that a patient/resident has an incomplete stay (for example, for the purpose of being admitted to an acute care facility), collection of discharge functional status data might not be feasible. Therefore, for patients/residents with incomplete stays, admission functional status data and at least one treatment goal would be required, discharge functional status data would not be required to be reported.

Patients/residents with complete and incomplete stays are included in the numerator for this quality measure.

For patients or residents with complete stays:

All patients/residents not meeting the criteria for incomplete stays will be considered complete stays. For patients/residents with a complete stay, all three of the following are required for the patient/resident to be counted in the numerator:

1. A valid numeric score indicating the patient's/resident's functional status, or a valid code indicating the activity was not attempted or could not be assessed for each of the functional assessment items on the admission assessment;
2. A valid numeric score, which is a discharge goal indicating the patient's/resident's expected level of independence, for at least one self-care or mobility item on the admission assessment; and
3. A valid numeric score indicating the patient's/resident's functional status, or a valid code indicating the activity was not attempted or could not be assessed, for each of the functional assessment items on the discharge assessment.

For patients or residents with incomplete stays:

For patients/residents who have an incomplete stay, discharge data are not required to be reported. Patients/residents who have incomplete stays are defined as those patients/residents: (1) with incomplete stays due to a medical emergency, (2) who leave the SNF, LTCH, IRF against medical advice, or (3) who die while in the SNF, LTCH, IRF. Discharge functional status data are not required to be reported for these patients/residents because these data might not be feasible to collect at the time of the medical emergency if the patient/resident dies or if the patient/resident leaves against medical advice.

The following are required for the patients/residents who have an incomplete stay to be counted in the numerator:

1. A valid numeric score indicating the patient's/resident's functional status, or a valid code indicating the activity was not attempted or could not be assessed for each of the functional assessment items on the admission assessment; and

2. A valid numeric score, which is a discharge goal indicating the patient's/resident's expected level of independence, for at least one self-care or mobility item on the admission assessment.

2.1.5 Items Included in the Quality Measure

An important consideration when measuring functional status is that certain activities may not be relevant or feasible to assess for all patients/residents in all types of settings. For example, walking may not occur on admission in a PAC setting because it is not safe for a patient/resident to ambulate. In this situation, a clinician would code that a functional activity was not attempted because it was not safe or feasible for the patient/resident to perform the activity.

The following functional status items are included in this measure:

Self-Care Items

Eating (GG0130A): The ability to use suitable utensils to bring food to the mouth and swallow food once the meal is presented on a table/tray. Includes modified food consistency.

Oral hygiene (GG0130B): The ability to use suitable items to clean teeth. [Dentures (if applicable): The ability to remove and replace dentures from and to the mouth, and manage equipment for soaking and rinsing them.]

Toileting hygiene (GG0130C): The ability to maintain perineal hygiene, adjust clothes before and after using the toilet, commode, bedpan or urinal. If managing an ostomy, include wiping the opening but not managing equipment.

Mobility Items

Sit to lying (GG0170B): The ability to move from sitting on side of bed to lying flat on the bed.

Lying to sitting on side of bed (GG0170C): The ability to safely move from lying on the back to sitting on the side of the bed with feet flat on the floor, and with no back support.

Sit to stand (GG0170D): The ability to safely come to a standing position from sitting in a chair or on the side of the bed.

Chair/bed-to-chair transfer (GG0170E): The ability to safely transfer to and from a bed to a chair (or wheelchair).

Toilet transfer (GG0170F): The ability to safely get on and off a toilet or commode.

For patients/residents who are walking, complete the following items:

Walk 50 feet with two turns (GG0170J): Once standing, the ability to walk at least 50 feet and make two turns.

Walk 150 feet (GG0170K): Once standing, the ability to walk at least 150 feet in a corridor or similar space.

For patients/residents who use a wheelchair, complete the following items:

Wheel 50 feet with two turns (GG0170R): Once seated in wheelchair/scooter, the ability to wheel at least 50 feet and make two turns.

Indicate the type of wheelchair/scooter used (GG0170RR).

0. Manual

1. Motorized

Wheel 150 feet (GG0170S): Once seated in wheelchair/scooter, the ability to wheel at least 150 feet in a corridor or similar space.

Indicate the type of wheelchair/scooter used (GG0170SS).

0. Manual

1. Motorized

Self-Care and Mobility Rating Scale: Codes and Code Definitions

- 6. Independent**—Patient/resident completes the activity by him/herself with no assistance from a helper.
- 5. Setup or clean-up assistance**—Helper SETS UP or CLEANS UP; patient/resident completes activity. Helper assists only prior to or following the activity.
- 4. Supervision or touching assistance**—Helper provides VERBAL CUES or TOUCHING/ STEADYING assistance as patient/resident completes activity. Assistance may be provided throughout the activity or intermittently.
- 3. Partial/moderate assistance**—Helper does LESS THAN HALF the effort. Helper lifts, holds, or supports trunk or limbs, but provides less than half the effort.
- 2. Substantial/maximal assistance**—Helper does MORE THAN HALF the effort. Helper lifts, holds or supports trunk or limbs and provides more than half the effort.

1. **Dependent**—Helper does ALL of the effort. Patient/resident does none of the effort to complete the activity. Or the assistance of 2 or more helpers is required for the patient/resident to complete the activity.

If activity was not attempted, code reason:

07. Patient/resident refused

09. Not applicable

88. Not attempted due to medical condition or safety concerns

2.1.6 Quality Measure Calculation Algorithm

1. For each provider, the stay records of patients/residents meeting the inclusion criteria (i.e., denominator) discharged during the 12 month target time period are identified and counted. This count is the denominator.
2. The records of patients/residents with complete stays are identified and the number of these patient/resident stays with complete admission functional assessment data (codes 1 through 6 or 7, 9 or 88) AND at least one self-care or mobility goal (codes 1 through 6) AND complete discharge functional assessment data (codes 1 through 6 or 7, 9 or 88) is counted.
3. The records of patients/residents with incomplete stays are identified, and the number of these patient/resident records with complete admission functional status data (codes 1 through 6 or 7, 9 or 88) AND at least one self-care or mobility goal (codes 1 through 6) is counted.
4. The counts from step 2 (complete stays) and step 3 (incomplete stays) are summed. The sum is the numerator count.
5. The numerator count is divided by the denominator count to calculate this quality measure, and converted to a percent value by multiplying by 100.

2.1.7 Risk Adjustment

This quality measure is a process measure and is not risk adjusted. The Technical Expert Panel that reviewed this measure did not recommend that this measure be risk-adjusted, because completion of a functional assessment is not affected by the medical and functional complexity of the patient/resident. Rather, clinicians are able to report that an activity was not attempted due to a medical condition or a safety concern, and clinicians take this complexity into account when setting goals. Further, we are aware that patients/residents may have acute events that trigger unplanned discharges, and this measure does not require a functional assessment to be completed in these circumstances. Finally, we have included skip patterns on the assessment instrument that take into account patient/resident complexity. For example, we have a gateway item that asks if the patient/resident walks. If the patient/resident does not walk, then, several items applicable to patient/resident who walks, is skipped for this patient/resident on the assessment instrument. Therefore, risk adjustment of this quality measure is not warranted.

2.2 Cross-Setting Pressure Ulcer Measure: Percent of Residents or Patients with Pressure Ulcers That Are New or Worsened (NQF #0678)

2.2.1 Quality Measure Description

This quality measure reports the percent of patients/short-stay residents with Stage 2-4 pressure ulcers that are new or worsened since admission. The measure is calculated using data from the MDS 3.0 assessment instrument for SNF residents, the LTCH CARE Data Set for LTCH patients, and the IRF-PAI for IRF patients. Data are collected separately in each of the three settings using standardized items that have been harmonized across the MDS 3.0, LTCH CARE Data Set, and IRF-PAI. For residents in a SNF, the measure is calculated by examining all assessments during an episode of care for reports of Stage 2-4 pressure ulcers that were not present or were at a lesser stage since admission. For patients in LTCHs and IRFs, this measure reports the percent of patient stays with reports of Stage 2-4 pressure ulcers that were not present or were at a lesser stage on admission.

Of note, data collection and measure calculation for this measure is conducted separately for each of the three provider settings and will not be combined across settings.

For SNF residents, this measure is restricted to the short-stay population defined as those who have accumulated 100 or fewer days in the SNF as of the end of the measure time window. In IRFs, this measure is limited to Medicare (Part A and Part C) patients. In LTCHs, this measure includes all patients.

2.2.2 Purpose/Rationale for Quality Measure

This quality measure is adopted as a cross-setting quality measure to meet the requirements of the IMPACT Act of 2014 addressing the domain of skin integrity and changes in skin integrity. Data reporting for this measure would affect the payment determination for the FY 2018 and subsequent years for the SNF, LTCH, and IRF. This measure has previously been successfully implemented in SNF/NHs, LTCHs and IRFs. It has been implemented in the CMS Nursing Home Quality Initiative using the MDS since 2011, and is currently publicly reported on CMS' Nursing Home Compare at: <http://www.medicare.gov/nursinghomecompare/search.html>. In addition, the measure was adopted for the LTCH QRP in the FY 2012 IPPS/LTCH PPS final rule (76 FR 51753 through 51756) for the FY 2014 and subsequent years payment determination, and for IRF QRP in the FY 2012 IRF PPS final rule (76 FR 47876 through 47878) for the FY 2014 and subsequent years payment determination. The data for this measure have been collected and submitted by LTCHs and IRFs (using the LTCH CARE Data Set and IRF-PAI, respectively) since October 1, 2012.

This measure is intended to encourage SNF/Nursing Homes (NHs), LTCHs, and IRFs to prevent pressure ulcer development or worsening, and to closely monitor and appropriately treat existing pressure ulcers.

Pressure ulcers are recognized as a serious medical condition. Considerable evidence exists regarding the seriousness of pressure ulcers, and the relationship between pressure ulcers

and pain, decreased quality of life, and increased mortality in aging populations.^{13,14,15,16} Pressure ulcers interfere with activities of daily living and functional gains made during rehabilitation, predispose patients to osteomyelitis and septicemia, and are strongly associated with longer hospital stays, longer IRF stays, and mortality.^{17,18,19} Additionally, patients with acute care hospitalizations related to pressure ulcers are more likely to be discharged to long-term care facilities (e.g., a nursing facility, an intermediate care facility, or a nursing home) than hospitalizations for all other conditions.^{20,21}

Pressure ulcers typically result from prolonged periods of uninterrupted pressure on the skin, soft tissue, muscle, or bone.^{17,21,22} Elderly individuals in SNFs/NHs, LTCHs, and IRFs have a wide range of impairments or medical conditions that increase their risk of developing pressure ulcers, including but not limited to, impaired mobility or sensation, malnutrition or under-nutrition, obesity, stroke, diabetes, dementia, cognitive impairments, circulatory diseases, and dehydration. The use of wheelchairs and medical devices (e.g., hearing aid, feeding tubes, tracheostomies, percutaneous endoscopic gastrostomy tubes), a history of pressure ulcers, or

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- ¹³ Casey, G. (2013). "Pressure ulcers reflect quality of nursing care." *Nurs N Z* 19(10): 20-24.
- ¹⁴ Gorzoni, M. L. and S. L. Pires (2011). "Deaths in nursing homes." *Rev Assoc Med Bras* 57(3): 327-331.
- ¹⁵ Thomas, J. M., et al. (2013). "Systematic review: health-related characteristics of elderly hospitalized adults and nursing home residents associated with short-term mortality." *J Am Geriatr Soc* 61(6): 902-911.
- ¹⁶ White-Chu, E. F., et al. (2011). "Pressure ulcers in long-term care." *Clin Geriatr Med* 27(2): 241-258.
- ¹⁷ Bates-Jensen BM. Quality indicators for prevention and management of pressure ulcers in vulnerable elders. *Ann Int Med.* 2001;135 (8 Part 2), 744-51.
- ¹⁸ Park-Lee E, Caffrey C. Pressure ulcers among nursing home residents: United States, 2004 (NCHS Data Brief No. 14). Hyattsville, MD: National Center for Health Statistics, 2009. Available from <http://www.cdc.gov/nchs/data/databriefs/db14.htm>.
- ¹⁹ Wang, H., et al. (2014). "Impact of pressure ulcers on outcomes in inpatient rehabilitation facilities." *Am J Phys Med Rehabil* 93(3): 207-216.
- ²⁰ Hurd D, Moore T, Radley D, Williams C. Pressure ulcer prevalence and incidence across post-acute care settings. Home Health Quality Measures & Data Analysis Project, Report of Findings, prepared for CMS/OCSQ, Baltimore, MD, under Contract No. 500-2005-000181 TO 0002. 2010.
- ²¹ Institute for Healthcare Improvement (IHI). Relieve the pressure and reduce harm. May 21, 2007. Available from <http://www.ihf.org/IHI/Topics/PatientSafety/SafetyGeneral/ImprovementStories/FSRelievethethePressureandReduceHarm.htm>.
- ²² Russo CA, Steiner C, Spector W. Hospitalizations related to pressure ulcers among adults 18 years and older, 2006 (Healthcare Cost and Utilization Project Statistical Brief No. 64). December 2008. Available from <http://www.hcup-us.ahrq.gov/reports/statbriefs/sb64.pdf>.

presence of a pressure ulcer at admission are additional factors that increase pressure ulcer risk in elderly patients.^{13,17,18,20,23,24,25,26,27,28,29,30}

Pressure ulcers are high-cost adverse events across the spectrum of health care settings, from acute hospitals to home health.^{17,20,22} Pressure ulcer incidence rates vary considerably by clinical setting, ranging from 0.4% to 38% in acute care, 2.2% to 23.9% in (SNFs and NHs, and 0% to 17% in home care.^{23,21} No national survey of pressure ulcer incidence or prevalence has been conducted in LTCHs or IRFs. However, a study evaluating 2009 Medicare FFS claims data from post-acute care facilities found 15,995 secondary diagnosis claims of Stage 3 or 4 pressure ulcers in LTCHs 2,342 secondary diagnosis claims of Stage 3 or 4 pressure ulcers in IRFs; and 9,939 secondary diagnosis claims of Stage 3 or Stage 4 pressure ulcers in SNFs.³¹ Additionally, analysis of LTCH CARE Data Set (for admissions and discharges between October 1, 2012 through March 31, 2014) and IRF-PAI data (for IRF-PAI assessments between October 1, 2012 through March 31, 2014) conducted by CMS's measure development contractor, RTI International, suggests median risk-adjusted incidence of new or worsened pressure ulcers ranging from 1.88% to 2.01% and 0.73% to 1.02% per 12-month measure calculation period in LTCHs and IRFs, respectively.

As reported in the Federal Register, in 2006 the average cost for a hospital stay related to pressure ulcers was \$40,381.³² The Advancing Excellence in America's Nursing Homes Campaign reported that it can cost as much as \$19,000 to treat a single Stage 4 pressure ulcer.³³ Using data from 2009 and 2010, severe (Stage 3 and Stage 4) pressure ulcers acquired during a

²³ Agency for Healthcare Research and Quality (AHRQ). Agency news and notes: pressure ulcers are increasing among hospital patients. January 2009. Available from <http://www.ahrq.gov/research/jan09/0109RA22.htm>.

²⁴ Cai, S., et al. (2013). "Obesity and pressure ulcers among nursing home residents." *Med Care* 51(6): 478-486.

²⁵ DeJong, G., et al. (2014). "Factors Associated with Pressure Ulcer Risk in Spinal Cord Injury Rehabilitation." *Am J Phys Med Rehabil*. 2014 May 29. [Epub ahead of print]

²⁶ MacLean DS. Preventing & managing pressure sores. *Caring for the Ages*. March 2003;4(3):34-7. Available from <http://www.amda.com/publications/caring/march2003/policies.cfm>.

²⁷ Michel, J. M., et al. (2012). "As of 2012, what are the key predictive risk factors for pressure ulcers? Developing French guidelines for clinical practice." *Ann Phys Rehabil Med* 55(7): 454-465.

²⁸ National Pressure Ulcer Advisory Panel (NPUAP) Board of Directors; Cuddigan J, Berlowitz DR, Ayello EA (Eds). *Pressure ulcers in America: prevalence, incidence, and implications for the future. An executive summary of the National Pressure Ulcer Advisory Panel Monograph*. *Adv Skin Wound Care*. 2001;14(4):208-15.

²⁹ Reddy, M. (2011). "Pressure ulcers." *Clin Evid (Online)* 2011.

³⁰ Teno, J. M., et al. (2012). "Feeding tubes and the prevention or healing of pressure ulcers." *Arch Intern Med* 172(9): 697-701

³¹ Bernard SL, Dalton K, Lenfestey N F, Jarrett NM, Nguyen KH, Sorensen AV, Thaker S, West ND. Study to support a CMS report to Congress: Assess feasibility of extending the hospital-acquired conditions—present on admission IPPS payment policy to non-IPPS payment environments. Prepared for Centers for Medicare & Medicaid Services. 2011. Available from: <http://innovation.cms.gov/Files/x/HospAcquiredConditionsRTC.pdf>.

³² Centers for Medicare & Medicaid Services (CMS). Medicare program; changes to the hospital inpatient prospective payment system and fiscal year 2008 rates. *Fed Register*. August 22, 2007;72(162):47205.

³³ Advancing Excellence in America's Nursing Homes (AEANH). Explore our goals.. n.d. Available from <https://www.nhqualitycampaign.org/goals.aspx>

hospital stay were estimated to have increased CMS payments across 90-day episodes of care by at least \$18.8 million a year.³⁴

2.2.3 Denominator

Specific denominator definitions for each setting are provided below.

SNF Denominator: The denominator is the number of short-stay residents with one or more MDS 3.0 assessments that are eligible for a look-back scan (except those with exclusions). A look-back scan is a review of all qualifying assessments within the resident's current episode to determine whether events occurred during the look-back period. All assessments with target dates within the episode are examined to determine whether the event or condition of interest occurred at any time during the episode. Assessment types include: an admission, quarterly, annual, significant change/correction OBRA assessment (A0310A = 01, 02, 03, 04, 05, 06); or a PPS 5-, 14-, 30-, 60-, or 90-day, (A0310B = 01, 02, 03, 04, 05) or discharge with or without return anticipated (A0310F = 10, 11); or SNF PPS Part A Discharge Assessment (A0310H = 1).

LTCH Denominator: The denominator is the number of patient stays with both an admission and discharge LTCH CARE Data Set assessment, except those who meet the exclusion criteria.

IRF Denominator: The denominator is the number of Medicare* (Part A and Part C) patient stays with an IRF-PAI assessment, except those who meet the exclusion criteria.

*IRF-PAI data are submitted for Medicare patients (Part A and Part C) only.

Denominator Exclusions

Specific denominator exclusions for each setting are provided below.

SNF Denominator Exclusions:

1. Short-stay residents are excluded if none of the assessments that are included in the look-back scan has a usable response for items indicating the presence of new or worsened Stage 2, 3, 4 pressure ulcers since the prior assessment. This situation is identified as follows:
 - 1.1 If data on new or worsened Stage 2, 3, and 4 pressure ulcers is missing (M0800A = [-] and M0800B = [-] and M0800C = [-]) then the assessment is not usable and is discarded.
 - 1.2 If all of the assessments that are eligible for the look-back scan are discarded and no usable assessments remain, then the resident is excluded from the numerator and the denominator.

³⁴ Kandilov AMG, Coomer NM, Dalton K. (2014) The impact of hospital-acquired conditions on Medicare program payments. MMRR 4(4): E1-E23.

2. Short-stay resident is excluded if there is no initial assessment available to derive data for risk adjustment (covariates).
3. Death in facility tracking records (A0310F = [12]) are excluded from measure calculations.

LTCH Denominator Exclusions:

1. Patient stay is excluded if data on new or worsened Stage 2, 3, and 4 pressure ulcers are missing on the planned or unplanned discharge assessment; i.e., M0800A = [-] and M0800B = [-] and M0800C = [-].
2. Patient stay is excluded if the patient died during the LTCH stay; i.e., A0250 = [12].
3. Patient stay is excluded if there is no admission assessment available to derive data for risk adjustment (covariates).

IRF Denominator Exclusions:

1. Patient stay is excluded if data on new or worsened Stage 2, 3, and 4 pressure ulcers is missing at discharge; i.e., M0800A = [-] and M0800B = [-] and M0800C = [-].
2. Patient stay is excluded if the patient died during the IRF stay; i.e., Item 44C = [0].

2.2.4 Numerator

Specific numerator definitions for each setting are provided below.

SNF Numerator: The numerator is the number of short-stay residents with an MDS 3.0 assessment during the selected time window who have one or more Stage 2-4 pressure ulcers, that are new or worsened, based on examination of all assessments in a resident's episode for reports of Stage 2-4 pressure ulcers that were not present or were at a lesser stage on prior assessment.

- 1) Stage 2 (M0800A) > 0, OR
- 2) Stage 3 (M0800B) > 0, OR
- 3) Stage 4 (M0800C) > 0

Assessments may be discharge, PPS 5-, 14-, 30-, 60-, 90-day, SNF PPS Part A Discharge Assessment or OBRA admission, quarterly, annual or significant change assessments.

LTCH Numerator: The numerator is the number of stays for which the discharge assessment indicates one or more new or worsened Stage 2-4 pressure ulcers compared to the admission assessment.

- 1) Stage 2 (M0800A) > 0, OR
- 2) Stage 3 (M0800B) > 0, OR
- 3) Stage 4 (M0800C) > 0

IRF Numerator: The numerator is the number of stays for which the IRF-PAI indicates one or more Stage 2-4 pressure ulcer(s) that are new or worsened at discharge compared to admission.

- 1) Stage 2 (M0800A) > 0, OR
- 2) Stage 3 (M0800B) > 0, OR
- 3) Stage 4 (M0800C) > 0.

2.2.5 Measure Time Window

Time windows vary across setting due to considerable variation in facility sizes across the three settings. Specific measure time window descriptions for each setting are provided below.

SNF Time Window: The measure is calculated quarterly using a rolling 6 months of data. Public reporting data reflect the weighted average of three rolling 6-month periods. For SNF residents with multiple episodes of care during the 6 months, only the latest episode will be counted. For SNF residents, the numerator is determined based on a look back across all assessments included in a resident episode, so may extend into the prior measurement period (i.e., look back may be as many as 100 days).

LTCH Time Window: The measure will be calculated quarterly using a rolling 12 months of data. For public reporting, the quality measure score reported for each quarter is calculated using a rolling 12 months of data inclusive of the reporting quarter and the 3 quarters prior. All LTCH stays, except those that meet the exclusion criteria, during the 12 months are included in the denominator and are eligible for inclusion in the numerator. For patients with multiple stays during the 12-month time window, each stay is eligible for inclusion in the measure.

IRF Time Window: The measure will be calculated quarterly using rolling 12 months of data. All IRF records, except those that meet the exclusion criteria, during the 12 months will be included in the denominator and are eligible for inclusion in the numerator. For patients with multiple records during the 12-month time window, each record is eligible for inclusion in the measure.

2.2.6 Risk Adjustment Covariates

Specific covariate definitions for each setting are provided below.

SNF Risk Adjustment Covariates

For each short-stay resident covariate values are assigned, either '0' for covariate condition not present or '1' for covariate condition present, as reported on the initial assessment.

1. Indicator of requiring limited or more assistance in bed mobility self-performance dependence on the initial assessment:

Covariate = [1] (yes) if G0110A1 = [2, 3, 4, 7, 8] (2 – Limited assistance, 3 – Extensive assistance, 4 – Total dependence, 7 – activity occurred only once or twice, 8 – Activity did not occur)

Covariate = [0] (no) if G0110A1 = [0, 1, -] (0 – Independent, 1 – Supervision, ‘-’ – no response)

2. Indicator of bowel incontinence at least occasionally on the initial assessment:

Covariate = [1] (yes) if H0400 = [1, 2, 3] (1 – Occasionally incontinent, 2 – Frequently incontinent, 3 – Always incontinent)

Covariate = [0] (no) if H0400 = [0, 9, -, ^] (0 – Always continent, 9 – Not rated, ‘-’ – No response available, ‘^’ – Valid skip)

3. Have diabetes or peripheral vascular disease on initial assessment:

Covariate = [1] (yes) if any of the following are true:

a. Active peripheral vascular disease (PVD) or peripheral arterial disease (PAD) in the last 7 days (I0900 = [1] (checked))

b. Active diabetes mellitus (DM) in the last 7 days (I2900 = [1] (checked))

Covariate = [0] (no) if I0900 = [0, -, ‘-’] AND I2900 = [0, -]

4. Indicator of Low Body Mass Index (BMI), based on Height (K0200A) and Weight (K0200B) on the initial assessment:

Covariate = [1] (yes) if BMI \geq [12.0] AND \leq [19.0]

Covariate = [0] (no) if BMI $>$ [19.0]

Covariate = [0] (no) if K0200A = [-] OR K0200B = [-] OR BMI $<$ [12.0], (‘-’ = No response available)

Where: BMI = (weight * 703 / height²) = ((K0200B) * 703) / (K0200A²) and the resulting value is rounded to one decimal.

LTCH Risk Adjustment Covariates

For each patient stay covariate values are assigned, either ‘0’ for covariate condition not present or ‘1’ for covariate condition present, as reported on the initial assessment.

1. Indicator of supervision/touching assistance or more for the functional mobility item Lying to Sitting on Side of Bed on the admission assessment:

Covariate = [1] (yes) if GG0160C³⁵ = [01, 02, 03, 04, 07, 09, 88] ([01] = Dependent, [02] = Substantial/maximal assistance, [03] = Partial/moderate assistance, [04]

³⁵ For the April 1, 2016 release of LTCH CARE Data Set, this item will be renumbered to GG0170C.

=Supervision or touching assistance, [07] = Patient refused, [09] = Not applicable, [88] = (activity) not attempted due to medical condition or safety concerns)

Covariate = [0] (no) if GG0160C³⁵ = [05, 06, -, ^] ([05] =Setup or clean-up assistance, [06] = Independent, [-]=No response available, [^] =Valid skip)

2. Indicator of bowel incontinence at least occasionally on the admission assessment:

Covariate = [1] (yes) if H0400 = [1, 2, 3] ([1] = Occasionally incontinent, [2] = Frequently incontinent, [3] = Always incontinent)

Covariate = [0] (no) if H0400 = [0, 9, -, ^] ([0] = Always continent, [9] = Not rated, [-]= No response available, [^] = Valid skip)

3. Have diabetes or peripheral vascular disease on admission assessment:

Covariate = [1] (yes) if any of the following are true:

a. I0900 = [1] (checked)

b. I2900 = [1] (checked)

Covariate = [0] (no) if I0900 = [0, -] AND I2900 = [0, -]

4. Indicator of Low Body Mass Index, based on Height (K0200A) and Weight (K0200B) on the admission assessment:

Covariate = [1] (yes) if $BMI \geq [12.0]$ AND $\leq [19.0]$

Covariate = [0] (no) if $BMI > [19.0]$

Covariate = [0] (no) if K0200A = [-] OR K0200B = [-] OR $BMI < [12.0]$, ('-' = No response available)

Where: $BMI = (\text{weight} * 703 / \text{height}^2) = ((K0200B) * 703) / (K0200A^2)$ and the resulting value is rounded to one decimal.

IRF Risk Adjustment Covariates

For each patient stay covariate values are assigned, either '0' for covariate condition not present or '1' for covariate condition present, as reported on the initial assessment

1. Indicator of requiring minimal or more assistance for the FIM[®] Item (39I) Transfers: Bed, Chair, and Wheelchair on admission:

Covariate = [1] (yes) if 39I FIM Levels = [0, 1, 2, 3, 4] ([0]= Activity does not occur, [1] = Total Assistance (Subject less than 25%), [2]=Maximal Assistance (Subject = 25% or more), [3] = Moderate Assistance (Subject = 50% or more), [4] = Minimal Assistance (Subject = 75% or more))

Covariate = [0] (no) if 39I FIM Levels = [5,6,7, -, ^] ([5] = Supervision (Subject = 100%), [6] = Modified Independence (Device), [7] = Complete Independence (Timely, Safely), [-] = No response available, [^] = Valid skip)

2. Indicator of bowel incontinence at least occasionally on admission:

Covariate = [1] (yes) if Item 32 = [1,2,3,4,5] ([1] = Five or more accidents in the past 7 days, [2] = Four accidents in the past 7 days, [3] = Three accidents in the past 7 days, [4] = Two accidents in the past 7 days, [5] = One accident in the past 7 days)

Covariate = [0] (no) if Item 32 = [6, 7, -, ^] ([6] = No accidents; uses device such as a ostomy, [7] = No accidents, [-] = No response available, [^] = Valid skip)

3. Have peripheral vascular disease or peripheral arterial disease or diabetes:

Covariate = [1] (yes) if any of the following are true:

a. I0900 = [1] (checked)

b. I2900 = [1] (checked) Covariate = [0] (no) if I0900 = [0, -] AND I2900A = [0, -] Indicator of Low Body Mass Index, based on Height (25A) and Weight (26A) on the assessment:

Covariate = [1] (yes) if BMI \geq [12.0] AND \leq [19.0]

Covariate = [0] (no) if BMI > [19.0]

Covariate = [0] (no) if 25A = [-] OR 26A = [-] OR BMI < [12.0] ([-] = No response available)

Where: BMI = (weight * 703 / height²) = ((26A) * 703) / (25A)² and the resulting value is rounded to one decimal.

2.2.7 Quality Measure Calculation Algorithm

The following steps are used to calculate the measure:

A. Calculate the facility observed score (steps 1 through 3)

Step 1. Calculate the denominator count:

In the SNF setting, calculate the total number of short-stay residents with a selected target MDS 3.0 assessment in the measure time window, who do not meet the exclusion criteria.

In the LTCH setting, calculate the total number of stays with both an admission and discharge LTCH CARE Data Set assessment in the measure time window, who do not meet the exclusion criteria.

In the IRF setting, calculate the total number of stays with an IRF-PAI assessment in the measure time window, who do not meet the exclusion criteria.

Step 2. Calculate the numerator count:

In the SNF setting, calculate the total number short-stay residents in the denominator with selected target or look-back assessment that indicates one or more new or worsened pressure ulcers.

In the LTCH setting, calculate the total number of patient stays whose discharge assessment indicates one or more new or worsened pressure ulcers compared to the admission assessment.

In the IRF setting, calculate the total number of patient stays whose IRF-PAI assessment indicates one or more new or worsened pressure ulcers at discharge compared to admission.

Step 3. Calculate the facility's observed score:

Divide the facility's numerator count by its denominator count to obtain the facility's observed score; that is, divide the result of step 2 by the result of step 1.

B. Calculate the expected score for each patient/resident (steps 4 and 5)

Step 4. Determine presence or absence of the pressure ulcer covariates for each patient/resident:

Assign covariate values, either '0' for covariate condition not present or '1' for covariate condition present, for each patient/resident for each of the four covariates as reported on the initial assessment for the SNF setting or the admission assessment for the LTCH and IRF settings, as described in the section above.

Step 5. Calculate the expected score for each patient/resident with the following formula:

$$\text{Patient/resident-level expected QM score} = 1 / [1 + e^{-X}] \quad (1)$$

Where e is the base of natural logarithms and X is a linear combination of the constant and the logistic regression coefficients times the covariate scores (from Formula [2], below).

$$\text{QM triggered (yes=1, no=0)} = B0 + B1*COVA + B2*COVB + \dots BN*COVN \quad (2)$$

Where B0 is the logistic regression constant, B1 is the logistic regression coefficient for the first covariate (where applicable), COVA is the patient-/resident-level score for the first covariate, B2 is the logistic regression coefficient for the second covariate, and COVB is the patient/resident level score for the second covariate

(where applicable), etc. The regression constant and regression coefficients* are numbers obtained through statistical logistic regression analysis.

* Regression coefficients and constants are calculated separately for each facility type (SNF, LTCH, and IRF) and are updated each reporting period.

C. Calculate the facility expected score (step 6)

Step 6. Once an expected QM score has been calculated for all residents for the SNF setting or all patient stays for the LTCH and IRF settings, calculate the mean facility-level expected QM score by averaging all resident/patient-level expected scores.

D. Calculate national mean QM score (steps 7 through 9)

Step 7. Calculate the denominator count:

Calculate the total number of patient stays/resident retained after exclusions and sum to derive denominator count.

Step 8. Calculate the numerator count:

Calculate the total number of patient stays/residents that triggered the QM and sum to derive numerator count.

Step 9. Calculate national mean observed QM score:

Divide the numerator count by its denominator count to obtain the national mean observed score; that is, divide the result of step 8 by the result of step 7.

E. Calculate the facility-level adjusted score (step 10)

Step 10. Calculate the facility-level adjusted score based on the:

facility-level observed QM score (step 3),

facility-level average expected QM score (step 6), and

*national mean observed QM score (step 9).

**The national mean observed QM score is updated separately for each facility type (SNF, LTCH, and IRF) for each reporting period.*

The calculation of the adjusted score uses the following equation:

$$Adj = 1/[1 + e^y] \quad (3)$$

where

Adj is the facility-level adjusted QM score, and

$$y = (\text{Ln}(\text{Obs}/(1-\text{Obs})) - \text{Ln}(\text{Exp}/(1-\text{Exp})) + \text{Ln}(\text{Nat}/(1-\text{Nat})))$$

Obs is the facility-level observed QM rate,

Exp is the facility-level expected QM rate,

Nat is the national observed QM rate,

Ln indicates a natural logarithm, and

e is the base of natural logarithm.

2.3 Cross-Setting Falls with Major Injury Measure: Application of Percent of Residents Experiencing One or More Falls with Major Injury (NQF #0674)

2.3.1 Quality Measure Description

The quality measure addressing the incidence of major falls is an Application of the NQF-endorsed Percent of Residents Experiencing One or More Falls with Major Injury (Long Stay) (NQF #0674).

This quality measure reports the percentage of patients/residents who experience one or more falls with major injury (defined as bone fractures, joint dislocations, closed head injuries with altered consciousness, or subdural hematoma) during the SNF, LTCH, or IRF stay.

The data for the measure will be submitted via the MDS 3.0 for SNF residents, the LTCH CARE Data Set for LTCH patients, and the IRF-PAI for IRF patients.

This quality measure is based on data reported for two items. The first item (J1800) is a gateway item that asks whether the patient/resident has experienced any falls since admission/entry (or reentry or prior assessment). Because the LTCH and IRF measure is based on patient-level data for these items reported at discharge, the item (J1800) for the LTCH CARE Data Set and IRF-PAI asks whether patient has experienced any falls since admission. If the answer to J1800 is no, the next item (J1900) is skipped. If the answer to J1800 is yes, the next item (J1900) asks for the number of falls with a) no injury, b) injury (except major), and c) major injury. The measure is calculated using data reported for J1900C (number of falls with major injury).

2.3.2 Purpose/Rationale for Quality Measure

This quality measure is intended for use as a cross-setting quality measure to meet the requirements of the IMPACT Act of 2014 addressing the domain of major falls. The Department of Health and Human Services included injury prevention, which incorporates falls prevention, as one of the 10 leading health indicators in the Healthy People 2020 initiative.³⁶ Falls represent a significant cost burden to the entire health care system, with injurious falls accounting for 6% of medical expenses among adults aged 65 and older.³⁷ Research indicates that fall-related injuries are the most common cause of accidental death in older people, responsible for approximately 41% of accidental deaths annually.³⁸ Rates increase to 70% of accidental deaths among individuals aged 75 and older.³⁹ In addition to death, falls can lead to fracture, soft tissue or head injury, fear of falling, anxiety, and depression.⁴⁰

³⁶ DHHS. Healthy People 2020 Leading Health Indicators: Injury and Violence. March 2015. Available at <http://www.healthypeople.gov/2020/leading-health-indicators/2020-lhi-topics/Injury-and-Violence/>

³⁷ Tinetti ME, Williams CS. The effect of falls and fall injuries on functioning in community-dwelling older persons. *J Gerontol A Biol Sci Med Sci*. 1998 Mar;53(2):M112-9.

³⁸ Currie LM. Fall and injury prevention. *Annu Rev Nurs Res*. 2006;24:39-74.

³⁹ Fuller GF. Falls in the elderly. *Am Fam Physician*. Apr 1 2000;61(7):2159-2168, 2173-2154.

⁴⁰ Love, K, Allen, J. Falls: Why they matter and what you can do. *Geriatr Nurs*, 2011;32(3):206-208.

Approximately 75% of nursing facility residents fall at least once a year, twice the rate of their counterparts in the community.⁴¹ Further, it is estimated that 10 to 25% of nursing facility resident falls result in fractures and/or hospitalization.⁴²

A study of 5,062 IRF patients found that 367 patients (7%) had 438 falls. Among these 438 falls, 129 (29.5% of the falls) resulted in an injury, of which 25 (5.7% of all falls and 19% of all falls with injury) were serious.⁴³ A separate study of 754 stroke patients in an IRF reported 117 patients (16%) experienced 159 falls. Among these 159 falls, 13 (8%) resulted in a minor injury and 3 (2%) resulted in a serious injury.⁴⁴

2.3.3 Denominator

Specific denominator definitions for each setting are provided below.

SNF Denominator: The denominator is the number of stays in the selected time window for SNF residents with a SNF PPS Part A Discharge Assessment (A0310H = 1) during the selected time window, except those who meet the exclusion criteria. A stay is defined as the time period from resident admission or reentry to the facility (identified by a 5-day PPS assessment) to discharge, which may be an OBRA discharge or a SNF PPS Part A Discharge.

LTCH Denominator: The denominator is the number of patient stays with a discharge or expired assessment (A0250=10, 11, 12) during the selected time window, except those who meet the exclusion criteria.

IRF Denominator: The denominator is the number of Medicare patient stays* (Part A or Part C) during the selected time window, except those who meet the exclusion criteria.

*IRF-PAI data are submitted only for Medicare patients (Part A and Part C).

Denominator Exclusions

A patient/resident stay is excluded from the denominator if missing data precludes calculation of the measure. Specific denominator exclusions for each setting are provided below.

SNF Denominator Exclusions: Resident stay is excluded if none of the assessments that are included in the look-back scan has a usable response for items indicating the presence of a fall with major injury during the selected time window (i.e., information on falls with major injury is missing [J1900C = (-)] on all assessments used during a resident's stay during the selected time window).

⁴¹ Rubenstein LZ, Josephson KR, Robbins AS. Falls in the nursing home. *Ann Intern Med.* 1994 Sep 15; 121(6):442-51.

⁴² Vu MQ, Weintraub N, Rubenstein LZ. Falls in the nursing home: are they preventable? *J Am Med Dir Assoc.* 2004 Nov-Dec; 5(6):401-6.

⁴³ Frisina PG, Guellnitz R, Alverzo J. A time series analysis of falls and injury in the inpatient rehabilitation setting. *Rehab Nurs.* 2010; 35(4):141-146.

⁴⁴ Rabadi MH, Rabadi FM, Peterson M. An analysis of falls occurring in patients with stroke on an acute rehabilitation unit. *Rehab Nurs.* 2008; 33(3):104-109.

LTCH Denominator Exclusions: Patient stay is excluded if falls with major injury data is missing (J1900C = [-]) on the unplanned or planned discharge or expired assessment during the selected time window.

IRF Denominator Exclusions: Patient stay is excluded if falls with major injury data is missing (J1900C = [-]) on the IRF-PAI during the selected time window.

2.3.4 Numerator

The numerator for this quality measure is the number of patients/residents who experienced one or more falls that resulted in major injury during the stay. Specific numerator definitions for each setting are provided below.

SNF Numerator: The numerator is the number of Medicare Part A covered resident stays where the resident experienced one or more falls that resulted in major injury. A stay is defined as the time period from resident admission or reentry to the facility (identified by a 5-day PPS assessment) to discharge, which may be an OBRA discharge or a SNF PPS Part A Discharge. Assessments eligible for inclusion in the look-back scan include OBRA discharge, PPS 5-, 14-, 30-, 60-, 90-day, SNF PPS Part A Discharge Assessment or OBRA admission, quarterly, annual or significant change assessments.

LTCH Numerator: The numerator is the number of patient stays with planned or unplanned discharge or expired assessment during the selected time window who experienced one or more falls that resulted in major injury.

IRF Numerator: The numerator is the number of Medicare (Part A or Part C) patient stays during the selected time window who experienced one or more falls that resulted in major injury.

2.3.5 Items Included in the Quality Measure

The items used for this measure collect data that indicates whether or not a fall took place (J1800), and if so, the number of falls in each of the following categories (J1900):

- **Injury Related to Fall:** Any documented injury that occurred as a result of, or was recognized within a short period of time (e.g., hours to a few days) after, the fall and attributed to the fall.
- **Injury (Except Major):** Includes skin tears, abrasions, lacerations, superficial bruises, hematomas, and sprains; or any fall-related injury that causes the patient to complain of pain.
- **Major Injury:** Defined as a bone fracture, joint dislocation, closed-head injury with altered consciousness, or subdural hematoma.

Only the data on number of falls resulting in major injury are included to calculate this measure. Details on the item needed to calculate the quality measure are described separately below for each setting.

SNF: For SNFs, the item (J1900C) is collected on the MDS 3.0 assessments, which may be OBRA discharge, PPS 5-, 14-, 30-, 60-, 90-day, SNF PPS Part A Discharge Assessment, or OBRA admission, quarterly, annual or significant change assessments, included in a SNF resident's stay. Because the SNF measure includes assessments occurring between admission to the facility and discharge, the MDS 3.0 items ask providers to identify falls since admission/entry or reentry or prior assessment, whichever is more recent.

LTCH: For LTCHs, the item (J1900C) is collected on the LTCH CARE Data Set unplanned or planned discharge or expired assessment and assesses whether patient had one or more falls that resulted in major injury since the time of admission to the LTCH.

IRF: For IRFs, the item (J1900C) is collected on the IRF-PAI assessment and assesses whether patient had one or more falls that resulted in major injury since the time of admission to the IRF.

2.3.6 Risk Adjustment

This measure is not risk-adjusted or stratified.

2.3.7 Quality Measure Calculation Algorithm

The following steps are used to calculate the measure. Since this measure is not risk-adjusted or stratified, only the facility observed score is computed.

Calculate the facility observed score (steps 1 through 3)

Step 1. Calculate the denominator count:

- In the SNF setting, identify SNF residents with a PPS Part A Discharge (A0310H=1). Count the number of SNF stays (resident admission or reentry to the facility to discharge, which may be an OBRA discharge or a SNF PPS Part A Discharge) among these residents, except those that meet the exclusion criteria.
- In the LTCH setting, calculate the number of patient stays with a discharge or expired assessment (A0250=10, 11, 12), except those who meet the exclusion criteria.
- In the IRF setting, calculate the number of Medicare (Part A or Part C) patient stays, except those who meet the exclusion criteria.

Step 2. Calculate the numerator count:

- In the SNF setting, starting with the set of resident stays identified in Step 1, calculate the number of Medicare Part A covered resident stays where the resident experienced one or more falls that resulted in major injury during the stay. Assessments may be OBRA discharge, PPS 5-, 14-, 30-, 60-, 90-day, SNF PPS Part A Discharge Assessment or OBRA admission, quarterly, annual or significant change assessments.

- In the LTCH setting, calculate the number of patient stays with an LTCH CARE Data Set planned or unplanned discharge or expired assessment during the selected time window who experienced one or more falls that resulted in major injury during the stay.
- In the IRF setting, calculate the number of patient stays during the selected time window who experienced one or more falls that resulted in major injury during the stay.

Step 3. Calculate the facility's observed score:

Divide the facility's numerator count by its denominator count to obtain the facility's observed score; that is, divide the result of step 2 by the result of step 1.

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**APPENDIX A:
SELF-CARE AND MOBILITY ITEMS INCLUDED IN SECTION GG OF THE IRF-PAI,
MDS 3.0, LTCH CARE DATA SET**

Table 1 lists the function items included in Section GG of the IRF-PAI version 1.4 (effective October 1, 2016), MDS 3.0 (effective Oct 1, 2016), LTCH CARE Data Set version 3.00 (effective April 1, 2016). The items included in the cross-setting function quality measure, an *Application* of Percent of Long-Term Care Hospital Patients with an Admission and Discharge Functional Assessment and a Care Plan that Addresses Function (NQF #2631) are highlighted in yellow. The additional function items (white rows) that are checked for selected settings are required for other function quality measures. For example, the additional items “shower/bathe self”, “upper body dressing”, “lower body dressing”, “putting on/taking off footwear”, and “roll left and right” are included on the IRF-PAI and are required to calculate the quality measures Inpatient Rehabilitation Facility Functional Outcome Measure: Change in Self-Care Score for Medical Rehabilitation Patients (NQF #2633; under NQF review) and Inpatient Rehabilitation Facility Functional Outcome Measure: Discharge Self-Care Score for Medical Rehabilitation Patients (NQF #2635).

**Table 1
Self-Care and Mobility Items Included in Section GG of the IRF-PAI, MDS 3.0, LTCH
CARE Data Set**

Item	Item Description	Inpatient Rehabilitation Facility Patient Assessment Instrument (IRF-PAI) v1.4	Minimum Data Set (MDS) 3.0	Long-Term Care Hospital CARE Data Set v3.00
SELF-CARE GG0130				
A	Eating	✓	✓	✓
B	Oral hygiene	✓	✓	✓
C	Toileting hygiene	✓	✓	✓
D	Wash upper body	—	—	✓
E	Shower/bathe self	✓	—	—
F	Upper body dressing	✓	—	—
G	Lower body dressing	✓	—	—
H	Putting on/taking off footwear	✓	—	—

(continued)

Table 1 (continued)
Self-Care and Mobility Items Included in Section GG of the IRF-PAI, MDS 3.0, LTCH
CARE Data Set

Item	Item Description	Inpatient Rehabilitation Facility Patient Assessment Instrument (IRF-PAI) v1.4	Minimum Data Set (MDS) 3.0	Long-Term Care Hospital CARE Data Set v3.00
MOBILITY GG0170				
A	Roll left and right	✓	—	✓
B	Sit to lying	✓	✓	✓
C	Lying to sitting on side of bed	✓	✓	✓
D	Sit to stand	✓	✓	✓
E	Chair/bed-to-chair transfer	✓	✓	✓
F	Toilet transfer	✓	✓	✓
G	Car transfer	✓	—	—
I	Walk 10 feet	✓	—	✓
J	Walk 50 feet with two turns	✓	✓	✓
K	Walk 150 feet	✓	✓	✓
L	Walking 10 feet on uneven surface	✓	—	—
M	1 step (curb)	✓	—	—
N	4 steps	✓	—	—
O	12 steps	✓	—	—
P	Picking up object	✓	—	—
R	Wheel 50 feet with two turns	✓	✓	✓
S	Wheel 150 feet	✓	✓	✓

NOTES:

✓ = Item is included in the assessment instrument.

— = Item is not included in the assessment instrument

**APPENDIX B:
FUNCTION ITEMS INCLUDED IN THE PROCESS FUNCTION QUALITY MEASURE
FOR IRF, SNF, AND LTCH QUALITY REPORTING PROGRAMS**

Table 2 shows the items included in the function quality measures that are process measures. For the IRF, SNF and LTCH settings, the cross-setting measure, an *Application of Percent of Long-Term Care Hospital Patients with an Admission and Discharge Functional Assessment and a Care Plan that Addresses Function (NQF #2631)*, is listed. The LTCH setting also includes the measure, *Percent of Long-Term Care Hospital Patients with an Admission and Discharge Functional Assessment and a Care Plan that Addresses Function (NQF #2631)*, which includes additional function items, such as the CAM© items.

**Table 2
Function Items Included in the Process Function Quality Measures for IRF, SNF, and
LTCH QRPs**

Item Identifier	Item Name	IRF QRP	SNF QRP	LTCH QRP	
		Application of percent of long-term care hospital patients with an admission and discharge functional assessment and a care plan that addresses function (NQF #2631)	Application of percent of long-term care hospital patients with an admission and discharge functional assessment and a care plan that addresses function (NQF #2631)	Application of percent of long-term care hospital patients with an admission and discharge functional assessment and a care plan that addresses function (NQF #2631)	Percent of long-term care hospital patients with an admission and discharge functional assessment and a care plan that addresses function (NQF #2631)*
SELF-CARE GG0130					
A	Eating	✓	✓	✓	✓
B	Oral hygiene	✓	✓	✓	✓
C	Toileting hygiene	✓	✓	✓	✓
D	Wash upper body	—	—	—	✓
E	Shower/bathe self	—	—	—	—
F	Upper body dressing	—	—	—	—

(continued)

Table 2 (continued)
Function Items Included in the Process Function Quality Measures for IRF, SNF, and
LTCH QRPs

Item Identifier	Item Name	IRF QRP	SNF QRP	LTCH QRP	
		Application of percent of long-term care hospital patients with an admission and discharge functional assessment and a care plan that addresses function (NQF #2631)	Application of percent of long-term care hospital patients with an admission and discharge functional assessment and a care plan that addresses function (NQF #2631)	Application of percent of long-term care hospital patients with an admission and discharge functional assessment and a care plan that addresses function (NQF #2631)	Percent of long-term care hospital patients with an admission and discharge functional assessment and a care plan that addresses function (NQF #2631)*
G	Lower body dressing	—	—	—	—
H	Putting on/taking off footwear	—	—	—	—
MOBILITY GG0170					
A	Roll left and right	—	—	—	✓
B	Sit to lying	✓	✓	✓	✓
C	Lying to sitting on side of bed	✓	✓	✓	✓
D	Sit to stand	✓	✓	✓	✓
E	Chair/bed-to-chair transfer	✓	✓	✓	✓
F	Toilet transfer	✓	✓	✓	✓
G	Car transfer	—	—	—	—
H	<i>Does the patient walk?</i>	✓	✓	✓	✓
I	Walk 10 feet	—	—	—	✓
J	Walk 50 feet with two turns	✓	✓	✓	✓
K	Walk 150 feet	✓	✓	✓	✓

(continued)

Table 2 (continued)
Function Items Included in the Process Function Quality Measures for IRF, SNF, and
LTCH QRP

Item Identifier	Item Name	IRF QRP	SNF QRP	LTCH QRP	
		Application of percent of long-term care hospital patients with an admission and discharge functional assessment and a care plan that addresses function (NQF #2631)	Application of percent of long-term care hospital patients with an admission and discharge functional assessment and a care plan that addresses function (NQF #2631)	Application of percent of long-term care hospital patients with an admission and discharge functional assessment and a care plan that addresses function (NQF #2631)	Percent of long-term care hospital patients with an admission and discharge functional assessment and a care plan that addresses function (NQF #2631)*
L	Walking 10 feet on uneven surface	—	—	—	—
M	1 step (curb)	—	—	—	—
N	4 steps	—	—	—	—
O	12 steps	—	—	—	—
P	Picking up object	—	—	—	—
Q	<i>Does the patient use a wheelchair/scooter?</i>	✓	✓	✓	✓
R	Wheel 50 feet with two turns	✓	✓	✓	✓
RR	Type of wheelchair/scooter used	✓	✓	✓	✓
S	Wheel 150 feet	✓	✓	✓	✓
SS	Type of wheelchair/scooter used	✓	✓	✓	✓
COMMUNICATION (Section B)					
BB0700	Expression of Ideas and Wants	—	—	—	✓
BB0800	Understanding Verbal Content	—	—	—	✓

(continued)

Table 2 (continued)
Function Items Included in the Process Function Quality Measures for IRF, SNF, and LTCH QRPs

Item Identifier	Item Name	IRF QRP	SNF QRP	LTCH QRP	
		Application of percent of long-term care hospital patients with an admission and discharge functional assessment and a care plan that addresses function (NQF #2631)	Application of percent of long-term care hospital patients with an admission and discharge functional assessment and a care plan that addresses function (NQF #2631)	Application of percent of long-term care hospital patients with an admission and discharge functional assessment and a care plan that addresses function (NQF #2631)	Percent of long-term care hospital patients with an admission and discharge functional assessment and a care plan that addresses function (NQF #2631)*
CAM© (Section C)					
C1610A-B	CAM: Acute Onset and Fluctuating Course	—	—	—	✓
C1610C	CAM: Inattention	—	—	—	✓
C1610D	CAM: Disorganized Thinking	—	—	—	✓
C1610E	CAM: Altered Level of Consciousness	—	—	—	✓
BLADDER (Section H)					
H0350	Bladder Continence	—	—	—	✓

NOTES:

✓ = Item is included in the quality measure.

— = Item is not included in the quality measure.

* This process measure was adopted for the LTCH QRP through the FY 2015 IPPS/LTCH PPS final rule (79 FR 50298 through 50301).

CAM © Adapted with permission from: Inouye SK et al, Clarifying confusion: The Confusion Assessment Method. A new method for detection of delirium. *Annals of Internal Medicine*. 1990; 113: 941-948. Confusion Assessment Method: Training Manual and Coding Guide, Copyright 2003, Hospital Elder Life Program, LLC. Not to be reproduced without permission.

APPENDIX C: RELIABILITY AND VALIDITY TESTING

C.1 Overview of Reliability and Validity Testing

The functional assessment items used in the two Long-Term Care Hospitals (LTCHs) functional status quality measures are from the Continuity Assessment Record and Evaluation (CARE) Item Set. The CARE Item Set was designed to standardize assessment of patients' status across acute and post-acute settings, including Inpatient Rehabilitation Facilities (IRFs), LTCHs, Skilled Nursing Facilities (SNFs), and Home Health Agencies (HHAs). The functional status items on the CARE Item Set are daily activities that clinicians assess at the time of admission and/or at discharge to determine patients' needs, evaluate progress, and prepare for a transition home or another setting.

The goal of reliability testing is to ensure that items on an assessment obtain consistent results when administered or used by different clinicians. Validity testing examines whether an item or scale measures what it is intended to measure. The CARE functional status items underwent reliability testing at the item- and scale-level in multiple types of providers in conjunction with the Post-Acute Care Payment Reform Demonstration. Item-level testing included inter-rater reliability testing within facilities and the use of videotaped standardized patients for inter-rater reliability testing across facilities/care settings. Additional testing focused on the items and scales and included internal consistency, factor analysis, and Rasch analysis. A brief summary of this testing is provided below; full reports describing the testing are available at <http://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/Post-Acute-Care-Quality-Initiatives/CARE-Item-Set-and-B-CARE.html>.

C.2 Traditional Inter-rater Reliability Study

The reliability of the functional items was tested in a subset of 34 providers from each of the five levels of care (acute hospitals, HHAs, IRFs, LTCHs, and SNFs) distributed across 11 geographic areas. Each provider completed a duplicate CARE Item Set (admission or discharge assessment) on 15–20 patients included in the Post-Acute Care Payment Reform Demonstration (10–15 patients in the home health setting), in accordance with the guidelines and protocols.

Providers were asked to enroll a convenience sample of a set number of Medicare patients each month, representing a range of function and acuity. The overall patient sample size for each of the functional items was 450 for self-care items and 449 for mobility items (448 for transfers). After exclusions for missing data (unknown/not attempted/inapplicable), the effective sample sizes for the reliability testing were as follows:

- Eating: 401
- Oral hygiene: 414
- Toilet hygiene: 416
- Upper body dressing: 420
- Lower body dressing: 413
- Lying to sitting on the side of the bed: 412

- Sitting to standing: 387
- Chair/bed to chair transfer: 392
- Toilet transfer: 361
- Walk 150 feet: 68
- Walk once standing: 52
- Wheel in room: 46

The inter-rater reliability study included patients who were assessed by two different clinicians (raters), and the agreement of the clinicians' rating was calculated. Clinicians were instructed to have pairs of raters complete both patient assessments at the same time. Responses to items were obtained by direct observation of the patient by the clinician, and occasionally, supplemented by one or more of the following predetermined, matched methods: patient interviews (with each team member taking turns conducting and observing patient interviews); interviews with relatives/caregivers of the patient for certain items; and/or interviews with staff caring for the patient and/or chart review. Rater pairs were instructed to determine in advance which methods would be used to score the particular CARE items and to have both raters use the same methods. Raters were encouraged to divide hands-on assistance to the patient as evenly as possible for items that required hands-on assistance. Raters were instructed not to discuss item scoring during the assessment, nor to share item scores until the data were entered into the study database and finalized. Providers submitted data via the online CARE application for both assessments in each pair.

For categorical items, kappa statistics (kappa) indicate the level of agreement between raters using ordinal data, taking into account the role of chance agreement. The ranges commonly used to judge reliability based on kappa are as follows: ≤ 0 = poor; 0.01–0.20 = slight; 0.21–0.40 = fair; 0.41–0.60 = moderate; 0.61–0.80 = substantial; and 0.81–1.00 = almost perfect.

For categorical items with only two responses available, RTI International calculated only unweighted kappas. For items with more than two responses, RTI calculated both weighted and unweighted kappas. Unweighted kappa assumes the same "distance" between every one-unit difference in response across an ordinal scale. RTI used Fleiss-Cohen weights, or quadratic weights, which approximate the intra-class correlation coefficient and are commonly used for calculating weighted kappas. This choice of weighting is consistent with prior analyses of assessment reliability, where the method for developing weights was specified.^{45,46} Fleiss-Cohen weights put lower emphasis on disagreements between responses that fall near each other on an item scale. It should also be noted that the value of kappa can be influenced by the prevalence of the outcome or characteristic being measured. If the outcome or characteristic is rare, the kappa will be low because kappa attributes the majority of agreement among raters to chance. Kappa is also influenced by bias, and if the effective sample size is small, variation may play a role in the

⁴⁵ Hirdes JP, Smith TF, Rabinowitz T, et al. The Resident Assessment Instrument-Mental Health (RAI-MH): inter-rater reliability and convergent validity. *J Behav Health Serv Res.* 29(4):419-432, 2002

⁴⁶ Streiner DL, Norman GR. Health measurement scales: a practical guide to their development and use. *Oxford University Press*, 1995.

results. Hence, we report both weighted and unweighted kappas to give the range of agreement found under the two sets of assumptions.

Additionally, RTI calculated a separate set of kappa statistics (unweighted and weighted, where applicable) for items where additional responses outside of an ordinal scale were available (letter codes) and were set to missing.

For the traditional reliability study, kappa statistics indicated substantial agreement among raters. The weighted kappa values for the self-care items range between 0.798 for eating to 0.869 for upper-body dressing. Unweighted kappas ranged from 0.598 for oral hygiene to 0.634 for upper-body dressing. Provider-specific analyses of core self-care items show similar agreement to the overall estimates. The lower-body dressing item had the highest overall weighted kappa (0.855), whereas the eating item had the lowest (0.798). Unweighted overall kappas ranged from 0.636 (toileting) to 0.598 (oral hygiene). Acute hospitals had the highest weighted kappas across all self-care items.

The weighted kappa values for the mobility items ranged between 0.558 for walk 150 feet to 0.901 for sitting to standing and chair/bed to chair transfer. Unweighted kappas ranged from 0.667 for walk once standing to 0.762 for sit to stand. Provider-specific analyses of core mobility items show similar agreement to the overall estimates. The sit-to-stand and chair transfer items both had a weighted kappa of 0.901, whereas the lying to sitting item had a weighted kappa of 0.855. Unweighted overall kappas ranged from 0.693 (lying to sitting) to 0.762 (sitting to standing).

C.3 Videotaped Standardized Patients Reliability Study

For the video reliability study, which was designed to examine the level of clinician agreement across care settings, clinicians in each setting were asked to assess “standardized” patients presented through a videotape of a patient assessment. This ensured that the same information was presented to each clinician and allowed examination of differences in scoring effects among different clinicians examining the “same” patient.

The patient “case studies” in each of the videos varied in terms of medical complexity, functional abilities, and cognitive impairments. The nine videos included patients classified as high, medium, or low ability/complexity for each of these three areas. Each facility or agency received three videos, one of which demonstrated one of the following elements: cognitive impairments, skin integrity problems, a wheelchair-dependent patient, and a variety of mid-level functional activities. The mid-level functional activities were considered to be the most challenging for clinicians to score and are thus of particular interest in establishing reliability. Each clinician involved in the video study watched three videos and assessed the patients according to the study guidelines and protocols. Each video was approximately 20 minutes long and had a corresponding item set arranged in the sequence in which the items appeared in the video.

The sample included 28 providers (550 assessments), which included 3 acute hospitals (15 assessments [3%]); 9 HHAs (118 assessments [22%]); 8 IRFs (237 assessments [43%]); 3 LTCHs (114 assessments [21%]); and 5 SNFs (66 assessments [12%]). Participating providers included case managers (6% of assessments), occupational therapists (14% of assessments),

physical therapists (21% of assessments), registered nurses (47% of assessments), speech therapists (5% of assessments), and others, mostly licensed practical nurses (LPNs; 8% of assessments).

Two main analytic approaches were used for assessing the video reliability of the CARE items, adhering closely to the methods used by Fricke et al.⁴⁷ in their video reliability study of the FIM[®]⁴⁸ instrument. First, percent agreement with the mode response was calculated for each CARE item included in at least one of the nine videos. Unlike the approach used by Fricke et al., RTI did not consider agreement at one response level above and below the mode, and instead used a stricter approach looking at direct modal agreement only. In the second approach, percent agreement with the internal clinical team's consensus response was also calculated. This second measure not only gives an indication of item reliability, but also reflects training consistency for the providers.

The video reliability study indicated substantial agreement with the mode and clinical team among all items, typically upwards of 70%. The notable exception to this trend exists among the clinicians in the "Other" category (mostly LPNs); they consistently had the lowest levels of agreement among all core self-care items, ranging from 50 to 72%. For the toileting and dressing items, the agreement with the clinical team was lower than with the mode. This occurred because the clinical team response differed from the mode for these three items in either one or two videos. Nonetheless, because the clinical team response and mode were identical on most of the videos, agreement was still quite high for these items. In general, study clinicians had responses on average that agreed with the expert clinical team or were slightly lower.

The video reliability study indicated substantial agreement with the mode and clinical team for the lying-to-sitting, sit-to-stand, chair/bed to chair transfer, and toilet transfer items (greater than 76%). Although rates of agreement with the mode and clinical team response were generally identical, for the toilet transfer item, the clinical team agreement is slightly lower. The items for walking and wheeling distances showed more variable levels of agreement across disciplines, with overall agreement generally in the moderate range (50–78%). For the Walk In Room item, there was a notable decrease in the agreement with the clinical team compared to agreement with the mode. This occurred because in two of the four videos where this item was assessed, the clinical team response differed from the mode.

C.4 Scale-level Reliability Results: Internal Consistency

In addition to item-level reliability testing, we examined internal consistency, which provides a general assessment of how well the items interrelate within a domain or subscale. Internal consistency is 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 assessed when instrument or scale psychometrics are published. 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

⁴⁷ Fricke J, Unsworth C, Worrell D. Reliability of the Functional Independence Measure with Occupational Therapists. *Australian Occupational Therapy Journal* 40(1):7-15, 1993.

⁴⁸ FIM[®] is a trademark of Uniform Data System for Medical Rehabilitation, a division of UB Foundation Activities, Inc.

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.⁴⁹

Assessments of individual self-care and mobility subscales at both admission and discharge tend to show good reliability statistics (Cronbach’s Alpha of at least 0.80) within their specified subscales. Reliability estimates by provider type show that the functional status items maintain a very high internal consistency. In addition, no one provider type appears to have reliability estimates higher or lower than the rest, indicating similarity of CARE usage with respect to internal consistency.

The following table shows the findings from the Cronbach’s alpha internal consistency evaluation mentioned above.

Table A-1
CARE functional status internal consistency reliability summary by provider type

CARE analytic set	Overall alpha	HHA alpha	SNF alpha	IRF alpha	LTCH alpha
Self-Care	0.96	0.94	0.95	0.95	0.96
Mobility	0.96	0.94	0.95	0.96	0.97

C.5 Scale-level Reliability and Validity Testing: Rasch Analysis

Because we are measuring a latent trait—a concept that is not measured directly, but that relies on activities that can be directly observed—we used the one-parameter Rasch model to gain a better understanding of the functional status activities. More specifically, we examined the order of functional status items (from least challenging to most challenging) that characterize the concepts of the self-care and mobility.

Rasch analysis uses the scores from the functional assessment items to create the equivalent of a functional status “ruler” (i.e., scale). Rasch analysis uses the available data to estimate a person’s location along the “ruler;” therefore, analyses can be conducted if some data are missing. Rasch analysis can also inform the optimal selection of key items in order to construct functional status scales that sufficiently span an entire range of patient functioning, so that both the least able and most able (lowest- and highest-functioning) patients are adequately measured. In addition, Rasch analysis can indicate where items overlap or are redundant in terms of the level of function they capture.

⁴⁹ Aron A, Aron EN *Statistics for Psychology*. 2nd ed. Upper Saddle River, NJ: Prentice Hall, 1999.

Rasch analysis has been used to examine the FIM[®] instrument,^{50,51,52,53} the Minimum Data Set (MDS),⁵⁴ and the Outcome and Assessment Information Set (OASIS).⁵⁵ Rasch analysis has also been used to examine the extent to which existing functional assessment instruments (e.g., the FIM[®] instrument, MDS 2.0) capture the same construct.⁵⁶

Rasch measurement is based on a probabilistic model that describes the association between a person's underlying ability level and probability of a particular item response, and summarizes a patient's position along a "ruler" that represents a latent trait or concept (e.g., self-care or mobility).⁵⁷ In essence, the Rasch analysis creates a ruler based on the domain measured (e.g., mobility) that can be used to assess the abilities of the patients. The analysis also provides information on the hierarchy of item difficulty (from easy to hard) that can be used to evaluate the construct validity of a set of items. In addition, the Rasch analysis provides information about the level of challenge associated with each item rating scale ("dependent" through "independent"). For example, an item with a low difficulty estimate (e.g., eating) would be more likely to be completed with little or no help by patient's items that are more challenging (e.g., 12 steps), where most patients would find completing this activity challenging. Finally, the Rasch analysis can provide information on items that do not fit into the single theorized concept through "item misfit" statistics, which may indicate that the item needs further evaluation before it is included on future administrations of the subscale. The infit mean square is an indicator of the degree to which patient responses are similar to what would be expected (i.e., predicted) by the measurement model. The acceptable range is generally 0.6 to 1.4. If the item values are above this range, it reflects that person response patterns are erratic, generally suggesting that the item is not measuring the same construct as other items. Infit mean squares above 1.4 are considered to be unacceptably unexpected⁵⁸ and indicate that the item most likely does not reflect the same construct as the other items included in the scale; for example, a need for assistance with self-care.

⁵⁰ Granger CV, Hamilton BB, Linacre JM, et al. Performance profiles of the functional independence measure. *Am J Phys Med Rehabil.* 72(2):84-89, 1993.

⁵¹ Linacre JM, Heinemann AW, Wright BD, et al. The structure and stability of the Functional Independence Measure. *Archives of Physical Medicine & Rehabilitation.* 75(2):127-132, 1994

⁵² Wright BD, Linacre JM, Smith RM, et al. FIM measurement properties and Rasch model details. *Scandinavian Journal of Rehabilitation Medicine,* 29(4):267-272, Dec. 1997.

⁵³ Heinemann AW, Linacre JM, Wright BD, et al. Relationships between impairment and physical disability as measured by the functional independence measure. *Arch Phys Med Rehabil.* 74(6):566-573, 1993.

⁵⁴ Wang YC, Byers KL, Velozo CA. Rasch analysis of Minimum Data Set mandated in skilled nursing facilities. *J Rehabil Res Dev.* 45(9):1385-1399, 2008.

⁵⁵ Fortinsky RH, Garcia RI, Joseph Sheehan T, et al. Measuring disability in Medicare home care patients: application of Rasch modeling to the outcome and assessment information set. *Med Care.* 41(5):601-615, 2001.

⁵⁶ Velozo CA, Byers KL, Wang YC, et al. Translating measures across the continuum of care: using Rasch analysis to create a crosswalk between the Functional Independence Measure and the Minimum Data Set. *J Rehabil Res Dev.* 44(3):467-478, 2007.

⁵⁷ Wright BD, Stone MH. *Best Test Design.* Rasch Measurement. 1979.

⁵⁸ Wright BD, Linacre JM, Gustafson J, et al. Reasonable mean-square fit values. *Rasch Measurement Transactions.* 8(3):370, 1994.

RTI used Rasch analysis to examine the extent to which the items worked together to define a coherent concept. This was conducted separately for the self-care and mobility items. Item fit statistics were examined as an indication of how well all items work together to describe the overall construct (self-care or mobility). The Rasch analysis provides insight into how the items work together as a subscale, including the hierarchy of item difficulty (ordering from easy to difficult) and item fit to the model.

Examinations of these Rasch analysis results reveal that the mobility and self-care item hierarchies make sense clinically and that the operational definitions of the constructs maintain general stability from admission to discharge. Some items have fit statistics outside the acceptable range (e.g., pick up object from floor), but members of the Technical Expert Panel noted that this is an important assessment given the risk of falls.

RTI examined how well the items selected measure the persons in the data set for both self-care and mobility items. RTI examined the extent to which person response patterns fit the assumptions of the measurement model using the same range of infit statistics identified above. RTI examined the extent to which persons are effectively measured (ceiling and floor effects) in each setting overall and for admission and discharge time points. The mobility and self-care items were found to be well targeted to the range of patient ability sampled within this post-acute care population.

RTI established that the six steps of the CARE rating scale are operating as intended, both overall and for individual items on the self-care and mobility subscales. The probability that a person will be scored on a particular rating scale step varies depending on the functional ability of the person. That is, very able people will be more likely to be scored as “5” and “6” than as “1” and “2.” Looking empirically at these distributions, one should see the transitions from one step to the next (called thresholds) proceed monotonically and distinctly across the range of person abilities. In other words, there should always be some point along the range at which each rating-scale step is more probable than another step. When a rating-scale step is not more probable at any point, it suggests that raters are not able to use that step to consistently distinguish patient ability at that level.

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**APPENDIX D:
SUPPLEMENTAL INFORMATION TO THE ASSESSMENT ITEMS USED
TO CALCULATE THE ADOPTED FUNCTION QUALITY MEASURE**

Standardized functional assessment items are included in the new *Section GG* of the Minimum Data Set (MDS) 3.0 adopted for implementation starting October 1, 2016. These standardized items are used to collect data to calculate the adopted cross-setting quality measure intended to meet the IMPACT Act requirement for measure domain: functional status, cognitive function, and changes in function and cognitive function. The quality measure (an application of Percent of LTCH Residents with an Admission and Discharge Functional Assessment and a Care Plan That Addresses Function (NQF #2631) relies on the collection of data using specific standardized items derived from the Continuity Assessment Record and Evaluation (CARE) Item Set.

The standardized items included within the MDS do not duplicate existing items on the MDS currently in use for data collection on functional assessment. While many of the standardized items have labels that are similar to existing items on the MDS, there are several key differences between the two sets that may result in variation in the resident assessment results. Key differences include: (1) the data collection and associated data collection instructions; (2) the rating scales used to score a resident's level of independence; and (3) the item definitions.

Supplemental information discussing the standardized items used to calculate the adopted function quality measures is listed below.

1. Data Collection and Data Collection Instructions for the Standardized Function Items:
 - For the standardized items, the assessment period is three (3) calendar days.
 - When resident functioning varies, the resident's *usual* performance would need to be reported on these standardized items. When resident functioning varies, the resident's usual performance over a three day period would need to be reported on these standardized items in contrast to the assessment and reporting of the resident's most dependent level of performance that occurs three or more times according to the "rule of 3" (and the definition and coding exceptions) during a seven day period as is required in the MDS 3.0 Section G.
 - The standardized function items reflect best practice clinical assessment of daily activities that occur as part of the admission and/or discharge assessment workflow.
 - Activities assessed at admission occur in order to set discharge goals and activities are assessed at discharge in order to optimize a safe transition to home or the next care setting.

- Examples include: “Sit to stand” and “Lying to sitting on side of bed” are bed mobility activities that are often assessed on admission. “Toilet transfer,” “Toileting hygiene” are activities that are often assessed at discharge.

2. Rating Scales Used to Assess Functional Activities:

- The standardized items include 3 self-care activities and 9 mobility activities that are rated on a 6-level rating scale ranging from “6” meaning “Independent” to “1” that refers to dependent (**Figure 1**).
 - A higher score on the rating scale means greater independence.

Figure 1.
Rating Scale for Standardized Functional Assessment Items

Code the resident's usual performance at the start of the SNF PPS stay for each activity using the 6-point scale. If activity was not attempted at the start of the SNF PPS stay, code the reason. Code the patient's end of SNF PPS stay goal(s) using the 6-point scale.	
<p>Coding:</p> <p>Safety and Quality of Performance - If helper assistance is required because resident's performance is unsafe or of poor quality, score according to amount of assistance provided. <i>Activities may be completed with or without assistive devices.</i></p> <p>06. Independent - Resident completes the activity by him/herself with no assistance from a helper.</p> <p>05. Setup or clean-up assistance - Helper SETS UP or CLEANS UP; resident completes activity. Helper assists only prior to or following the activity.</p> <p>04. Supervision or touching assistance - Helper provides VERBAL CUES or TOUCHING/STEADYING assistance as resident completes activity. Assistance may be provided throughout the activity or intermittently.</p> <p>03. Partial/moderate assistance - Helper does LESS THAN HALF the effort. Helper lifts, holds, or supports trunk or limbs, but provides less than half the effort.</p> <p>02. Substantial/maximal assistance - Helper does MORE THAN HALF the effort. Helper lifts or holds trunk or limbs and provides more than half the effort.</p> <p>01. Dependent - Helper does ALL of the effort. Resident does none of the effort to complete the activity. Or the assistance of 2 or more helpers is required for the resident to complete the activity.</p>	<p>If activity was not attempted, code reason:</p> <p>07. Resident refused.</p> <p>09. Not applicable.</p> <p>88. Not attempted due to medical condition or safety concerns.</p>

- Three special codes are available to report that a resident did not attempt an activity and to identify the rationale for why a resident did not attempt an activity (e.g., safety concerns, resident refused), which is important when examining resident outcomes.
- Supervision and touching assistance with *no lifting* assistance is coded at a level 4 on the rating scale. The decision to code supervision assistance at a level of “4” is to reflect staffing supervision that is needed during the entire time that was needed to complete an activity.
- The level titled “Substantial/maximal assistance” is coded when the helper performs more than half of the effort. For example, the helper lifts or holds the resident’s trunk or limbs and provides more than half of the effort.

3. Definitions for the Standardized Items:

- The standardized items include assessment and scoring methods to allow for variation. For example, a score is reported for two walking items with different distances (50 and 150 feet) and two wheelchair items, if applicable.
- The standardized items have specified definitions. For example, the standardized function item for assessing “Eating” does not include tube feeding administration. If an individual is solely receiving nutrition by tube feeding and the staff administers his tube feedings and he does not eat by mouth, the standardized “Eating” item would be coded that the “Activity was not attempted due to medical condition or safety concerns” (code = 88).
- For the assessment of personal hygiene, the standardized items focus on a single activity, such as oral hygiene, which is not intermixed with other grooming activities. This enables the ability to identify activity-specific limitations, areas requiring clinical focus, and set activity-specific goals.

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**APPENDIX E:
MDS 3.0 ITEMS**

Nursing Home and Swing Bed PPS Part A End of Stay (NPE/SPE) Item Set
Section A

A0050	Type of Record
A0100A	Facility National Provider Identifier (NPI)
A0100B	Facility CMS Certification Number (CCN)
A0100C	State provider number
A0200	Type of provider
A0310A	Type of assessment: OBRA
A0310B	Type of assessment: PPS
A0310C	Type of assessment: OMRA
A0310D	Swing bed clinical change assessment
A0310E	First assessment since most recent entry
A0310F	Entry/discharge reporting
A0310G	Planned/unplanned discharge
A0310H	SNF PPS Part A Discharge (End of Stay) Assessment
A0410	Submission requirement
A0500A	Resident first name
A0500B	Resident middle initial
A0500C	Resident last name
A0500D	Resident name suffix
A0600A	Social Security Number
A0600B	Resident Medicare/railroad insurance number
A0700	Resident Medicaid number
A0800	Gender
A0900	Birthdate
A1000A	Ethnicity: American Indian or Alaska Native
A1000B	Ethnicity: Asian
A1000C	Ethnicity: Black or African American
A1000D	Ethnicity: Hispanic or Latino
A1000E	Ethnicity: Native Hawaiian/Pacific Islander
A1000F	Ethnicity: White
A1100A	Does the resident need or want an interpreter
A1100B	Preferred language
A1200	Marital status
A1300A	Medical record number
A1300B	Room number
A1300C	Name by which resident prefers to be addressed
A1300D	Lifetime occupation(s)
A1600	Entry date (date of admission/reentry in facility)
A1700	Type of entry

Section A

A1800	Entered from
A1900	Admission date
A2000	Discharge date
A2100	Discharge status
A2300	Assessment reference date
A2400A	Has resident had Medicare-covered stay
A2400B	Start date of most recent Medicare stay
A2400C	End date of most recent Medicare stay

Section GG

GG0130A	Eating
GG0130B	Oral hygiene
GG0130C	Toileting hygiene
GG0170B	Sit to lying
GG0170C	Lying to sitting on side of bed
GG0170D	Sit to stand
GG0170E	Chair/bed-to-chair transfer
GG0170F	Toilet transfer
GG0170H3	Does the resident walk?
GG0170J	Walk 50 feet with two turns
GG0170K	Walk 150 feet
GG0170Q3	Does resident use wheelchair/scooter? (Gateway)
GG0170R	Wheel 50 feet with two turns
GG0170RR3	Indicate the type of wheelchair/scooter used
GG0170S	Wheel 150 feet
GG0170SS3	Indicate the type of wheelchair/scooter used

Section J

J1800	Falls since admit/prior asmt: any falls
J1900A	Falls since admit/prior asmt: no injury
J1900B	Falls since admit/prior asmt: injury (not major)
J1900C	Falls since admit/prior asmt: major injury

Section M

M0210	Resident has Stage 1 or higher pressure ulcers
M0300B1	Stage 2 pressure ulcers: number present
M0300B2	Stage 2 pressure ulcers: number at admit/reentry
M0300C1	Stage 3 pressure ulcers: number present
M0300C2	Stage 3 pressure ulcers: number at admit/reentry
M0300D1	Stage 4 pressure ulcers: number present
M0300D2	Stage 4 pressure ulcers: number at admit/reentry
M0300E1	Unstaged due to dressing: number present
M0300E2	Unstaged due to dressing: number at admit/reentry
M0300F1	Unstaged slough/eschar: number present

Section M

M0300F2	Unstaged slough/eschar: number at admit/reentry
M0300G1	Unstageable - deep tissue: number present
M0300G2	Unstageable - deep tissue: number at admit/reentry
M0800A	Worsened since prior asmt: Stage 2 pressure ulcers
M0800B	Worsened since prior asmt: Stage 3 pressure ulcers
M0800C	Worsened since prior asmt: Stage 4 pressure ulcers

Section X

X0150	Correction: type of provider
X0200A	Correction: resident first name
X0200C	Correction: resident last name
X0300	Correction: resident gender
X0400	Correction: resident birth date
X0500	Correction: resident social security number
X0600A	Correction: OBRA reason for assessment
X0600B	Correction: PPS reason for assessment
X0600C	Correction: OMRA assessment
X0600D	Correction: Swing bed clinical change asmt
X0600F	Correction: entry/discharge reporting
X0600H	Correction: SNF PPS Part A Discharge (End of Stay) Assessment
X0700A	Correction: assessment reference date
X0700B	Correction: discharge date
X0700C	Correction: entry date
X0800	Correction: correction number
X0900A	Correction: modif reasons - transcription error
X0900B	Correction: modif reasons - data entry error
X0900C	Correction: modif reasons - software error
X0900D	Correction: modif reasons - item coding error
X0900E	Correction: Modif reasons - resume therapy
X0900Z	Correction: modif reasons - other error
X1050A	Correction: inact reasons - event did not occur
X1050Z	Correction: inact reasons - other reason
X1100A	Correction: attestor first name
X1100B	Correction: attestor last name
X1100C	Correction: attestor title
X1100D	Correction: attestor signature
X1100E	Correction: attestation date

Section Z

Z0400A	Attestation signature, title, sections, date
Z0400B	Attestation signature, title, sections, date
Z0400C	Attestation signature, title, sections, date
Z0400D	Attestation signature, title, sections, date
Z0400E	Attestation signature, title, sections, date

Section Z

Z0400F	Attestation signature, title, sections, date
Z0400G	Attestation signature, title, sections, date
Z0400H	Attestation signature, title, sections, date
Z0400I	Attestation signature, title, sections, date
Z0400J	Attestation signature, title, sections, date
Z0400K	Attestation signature, title, sections, date
Z0400L	Attestation signature, title, sections, date
Z0500A	Attestation signature, title, sections, date
Z0500B	Date RN Assessment Coordinator signed assessment as complete

PPS 5-Day Assessment (A0310B = 01)**Section A**

A0310H	SNF PPS Part A Discharge (End of Stay) Assessment
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Section GG

GG0130A	Eating
GG0130B	Oral hygiene
GG0130C	Toileting hygiene
GG0170B	Sit to lying
GG0170C	Lying to sitting on side of bed
GG0170D	Sit to stand
GG0170E	Chair/bed-to-chair transfer
GG0170F	Toilet transfer
GG0170H1	Does the resident walk?
GG0170J	Walk 50 feet with two turns
GG0170K	Walk 150 feet
GG0170Q1	Does resident use wheelchair/scooter? (Gateway)
GG0170R	Wheel 50 feet with two turns
GG0170RR1	Indicate the type of wheelchair/scooter used
GG0170S	Wheel 150 feet
GG0170SS1	Indicate the type of wheelchair/scooter used

All Assessments**Section A**

A0310H	SNF PPS Part A Discharge (End of Stay) Assessment
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All Discharge Item Sets (including swing bed)**Section M**

M0300B2	Stage 2 pressure ulcers: number at admit/reentry
M0300C2	Stage 3 pressure ulcers: number at admit/reentry
M0300D2	Stage 4 pressure ulcers: number at admit/reentry
M0300E2	Unstaged due to dressing: number at admit/reentry
M0300F2	Unstaged slough/eschar: number at admit/reentry
M0300G2	Unstageable - deep tissue: number at admit/reentry