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Technical Expert Panel Summary Report: Development of Functional Outcome Quality Measures for Skilled Nursing Facilities (SNFs)

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RTI INTERNATIONAL

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CONTENTS

Appendices

List of Tables

List of Figures

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SECTION 1
INTRODUCTION AND OVERVIEW

1.1 Introduction

RTI International, on behalf of the Centers for Medicare & Medicaid Services (CMS), convened a Technical Expert Panel (TEP) to seek expert input on the development of Functional Outcome Quality Measures for skilled nursing facilities (SNFs). This all-day, in-person TEP meeting was held on May 5, 2016, in Baltimore, MD.

This report provides a summary of the TEP proceedings, detailing key issues related to measure development and TEP discussion around those issues. In this section of the report, we provide a summary of the background, the process for the TEP meetings, and the organization of the TEP report.

1.2 Background

CMS has contracted with RTI to develop Functional Outcome Quality Measures for SNFs. The contract name is Development and Maintenance of Symptom Management Measures (contract number HHSM-500-2013-13015I). As part of its measure development process, CMS asks measure developers to convene groups of stakeholders and experts who contribute direction and thoughtful input to the measure contractor during quality measure development and maintenance.

The purpose of the contract, Development and Maintenance of Symptom Management Measures, is to develop quality measures reflective of quality of care for post-acute care (PAC) settings, which could be used to support CMS quality missions. Care settings included in this measure development project are SNFs, inpatient rehabilitation facilities (IRFs), and long-term care hospitals (LTCHs). Quality measures developed are consistent with the three broad aims and six priorities of the National Quality Strategy, available at http://www.ahrq.gov/workingforquality/nqs/nqs2011annlrpt.pdf, and the CMS Quality Strategy, available at https://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/QualityInitiativesGenInfo/Downloads/CMS-Quality-Strategy.pdf.

The objectives of the TEP meeting were:

- To obtain input on functional status quality measures that may be used in SNFs.
- To examine the following potential measures:
  - An Application of the Inpatient Rehabilitation Facility (IRF) Functional Outcome Measure: Change in Self-Care Score for Medical Rehabilitation Patients (National Quality Forum [NQF] #2633)
  - An Application of the Inpatient Rehabilitation Facility (IRF) Functional Outcome Measure: Change in Mobility Score for Medical Rehabilitation Patients (NQF #2634)

  - An Application of the Inpatient Rehabilitation Facility (IRF) Functional Outcome Measure: Discharge Self-Care Score for Medical Rehabilitation Patients (NQF #2635)

  - An Application of the Inpatient Rehabilitation Facility (IRF) Functional Outcome Measure: Discharge Mobility Score for Medical Rehabilitation Patients (NQF #2636)

- To specify the target population(s), including the inclusion and exclusion criteria

- To identify the case-mix adjustment variables and the approach for case-mix adjustment

1.3 Process of TEP Meeting

1.3.1 TEP Nomination Process

On March 10, 2016, a "Call for TEP Members" and a "TEP Nomination Form" were posted on the CMS Measures Management System website (https://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/MMS/TechnicalExpertPanels.html) to recruit TEP members. The TEP nomination opportunity period was 20 days (March 10, 2016, to March 30, 2016). Information about the opportunity to participate as a TEP member was also disseminated to national provider and professional associations, measure development experts, patient advocacy groups, potential consumer/patient representatives, and other stakeholder organizations.

After the nomination period, RTI finalized the TEP composition by selecting 10 nominees (out of 23) who offered a variety of clinical, research, and administrative expertise in SNF settings, and knowledge of functional outcomes. The selected TEP members offered a variety of perspectives related to quality improvement, patient outcomes, research methodology, data collection and implementation, and health care disparities. Two TEP members were chosen to provide consumer perspectives. **Table 1** lists the TEP members.

Table 1.
Members of the TEP on the Development of Functional Outcome Quality Measures for SNFs

Name	Professional Role	Location
Daniel Ciolek, PT, MS, PMP	Associate Vice President, Therapy Advocacy American Health Care Association (AHCA)	Washington, DC
Bill Goulding, MS/CCC-SLP	National Director of Outcomes and Reimbursement Aegis Therapies	Greendale, WI

(continued)

Table 1. (continued)
Members of the TEP on the Development of Functional Outcome Quality Measures for SNFs

Name	Professional Role	Location
Robyn Grant, MSW	Consumer Advocate, Director of Public Policy and Advocacy National Consumer Voice for Quality Long-Term Care	Washington, DC
Scott Guevin, PT, DPT, NHA, MBA, FACHE	CEO Penn State Hershey Rehabilitation Hospital	Lancaster, PA
John James, PhD	Consumer perspective	Houston, TX
Natalie Leland, PhD, OTR/L, BCG, FAOTA	Assistant Professor University of Southern California	Los Angeles, CA
Susan Levy, MD, CMD, AGSF	Medical Director, American Medical Director's Association (AMDA) President The Society for Post-Acute and Long Term Care Medicine	Frankford, DE
Craig Miller, PT	Senior PT Michigan Health and Rehabilitation	Macomb, MI
Anne Ruggiero, BSN, RN, CRRN	Case Manager Memorial Care Center	Swansea, IL
Azlan Tariq, DO	Director of Physician Development and Rehabilitation Consultant Integrated Rehab Consultants	Chicago, IL

1.3.2 TEP Meeting

The all-day, in-person TEP meeting took place in Baltimore, Maryland, on May 5, 2016 (see ***Appendix A*** for meeting agenda). The ten selected TEP members attended the meeting, in addition to CMS staff, RTI staff, and Medicare Payment Advisory Commission (MedPAC) observers. In response to stakeholder requests, there was an open phone line available to the public in listen-only mode. Discussion was facilitated by the RTI quality measure lead, Anne Deutsch; Lauren Palmer; Tracy Kline; and Mel Ingber. The following key topics were covered: (1) environmental scan findings, (2) self-care and mobility Continuity Assessment Record and Evaluation (CARE) function items, (3) Rasch analysis of self-care and mobility items, (4) proposed inclusion and exclusion criteria, (5) risk adjustment methodology, (6) risk adjustment variables, and (7) additional topics. Throughout the meeting, there was active discussion related to the conceptualization of the quality measures and specifications of the quality measures. The meeting was audio recorded for the purpose of summarizing TEP proceedings in this report.

1.4 Organization of the Report

The following sections of the report discuss the conceptualization of measures and specifications proposed to the TEP and summarize the feedback obtained from TEP members during the TEP session. ***Section 2*** summarizes the environmental scan findings, ***Section 3*** reports the discussion regarding the self-care and mobility CARE function items, ***Section 4*** summarizes discussion regarding Rasch analysis of self-care and mobility items, ***Section 5*** summarizes the discussions regarding proposed inclusion and exclusion criteria, ***Section 6*** focuses on risk adjustment methodology, ***Section 7*** reports on the discussion about proposed risk adjustment variables, and ***Section 8*** summarizes discussion regarding additional topics related to the development of the functional outcome quality measures in the SNF setting.

SECTION 2
ENVIRONMENTAL SCAN

2.1 Introduction

This section describes the background and rationale for developing four cross-setting functional outcome quality measures for SNF residents. These measures build on previous work, including the Development and Testing of CARE,[1,2,3] the PAC Payment Reform Demonstration (PAC PRD),[4,5,6,7] and the Analysis of Crosscutting Medicare Functional Status Quality Metrics Using CARE.[8] The environmental scan was developed from a review of scientific medical literature, gray literature, and current assessment practices, as well as a review of existing quality measures related to functional ability. The measure developer presented a summary of the environmental scan to the TEP and asked for feedback and additional resources.

2.1.1 Environmental Scan and TEP Discussion

The measure developer began the TEP discussion by presenting background on the importance of functional status. This included noting a statement from the National Committee on Vital and Health Statistics, Subcommittee on Health:[9]

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1 Gage, B., Constantine, R., Aggarwal, J., Morley, M., Kurlantzick, V. G., Bernard, S., . . . Barch, D. (2012). The Development and Testing of the Continuity Assessment Record and Evaluation (CARE) Item Set: Final Report on the Development of the CARE Item Set Volume 1 of 3 (Vol. Volume 1 of 3): RTI International.

2 Gage, B., Smith, L., Ross, J., Coots, L., Kline, T., Shamsuddin, K., . . . Gage-Croll, Z. (2012). The Development and Testing of the Continuity Assessment Record and Evaluation (CARE) Item Set: Final Report on Reliability Testing Volume 2 of 3 (Vol. Volume 2 of 3): RTI International.

3 Gage, B., Deutsch, A., Smith, L., Schwartz, C., Ross, J., Coots, L., . . . Silver, B. (2012). 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 (Vol. Volume 3 of 3): RTI International.

4 Gage, B., Morley, M., Smith, L., Ingber, M. J., Deutsch, A., Tracy Kline, P., . . . Mallinson, T. (2012). Post-Acute Care Payment Reform Demonstration: Final Report Volume1of 4 (Vol. Volume1of 4): RTI International.

5 Gage, B., Morley, M., Smith, L., Ingber, M. J., Deutsch, A., Tracy Kline, P., . . . Mallinson, T. (2012). Post-Acute Care Payment Reform Demonstration: Final Report Volume 2 of 4 (Vol. Volume 2 of 4): RTI International.

6 Gage, B., Morley, M., Smith, L., Ingber, M. J., Deutsch, A., Tracy Kline, P., . . . Mallinson, T. (2012). Post-Acute Care Payment Reform Demonstration: Final Report Volume 3 of 4 (Vol. Volume 3 of 4): RTI International.

7 Gage, B., Morley, M., Smith, L., Ingber, M. J., Deutsch, A., Tracy Kline, P., . . . Mallinson, T. (2012). Post-Acute Care Payment Reform Demonstration: Final Report Volume 4 of 4 (Vol. Volume 4 of 4): RTI International.

8 Deutsch, A., Kline, C. T., Kelleher, C., Lines, L. M., Coots, L., ... & Gage, B. (2012). Analysis of Crosscutting Medicare Functional Status Quality Metrics Using the Continuity and Assessment Record and Evaluation (CARE) Item Set.

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

> "Information 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, in other words, their functional status."

RTI also highlighted research led by Dr. Patrick Kortebein focused on the hazards of immobility. The study examined the effects of bedrest among healthy older adults. Following 10 days of bedrest, study participants had substantial loss of lower extremity strength, power, and aerobic capacity as well as a reduction in physical activity at the conclusion of the study. Dr. Kortebein concluded that interventions to maintain muscle function in older adults during a hospital stay should be a high priority.[10] The TEP members agreed with this conclusion, and one member suggested that RTI review literature related to NASA's bedrest models that aim to simulate what happens to astronauts' bodies in space.

SNFs provide skilled services, such as skilled nursing or therapy services. Residents receiving care in SNFs include those whose illness, injury, or condition has resulted in a loss of function, and for whom rehabilitative care is expected to help regain that function. Treatment goals may include fostering residents' ability to manage their daily activities so that they can complete self-care and mobility activities as independently as possible, and, if feasible, return to a safe, active, and productive life in a community-based setting. Given that the primary goal of many SNF stays is improvement in function, SNF clinicians assess and document residents' functional status at admission and at discharge to evaluate not only the effectiveness of the rehabilitation care provided to individual residents but also the effectiveness of the SNF.

Examination of SNF data shows that SNF care practices directly influence resident outcomes. For example, the number of hours of therapy services provided to SNF residents (i.e., therapy intensity) has been found to be positively correlated with the functional improvement that SNF residents achieve (i.e., functional outcomes).[11] Several studies found that a higher intensity of physical and occupational therapy was associated with significantly greater odds of improving mobility and self-care functional independence,[11,12] shorter length of stay,[11,13] and a

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[10] Kortebein, P., Symons, T. B., Ferrando, A., Paddon-Jones, D., Ronsen, O., Protas, E., ... & Evans, W. J. (2008). Functional impact of 10 days of bed rest in healthy older adults. *The Journals of Gerontology Series A: Biological Sciences and Medical Sciences*, *63*(10), 1076-1081.

[11] Jette, D. U., R. L. Warren, & C. Wirtalla. (2005). The relation between therapy intensity and outcomes of rehabilitation in skilled nursing facilities. Archives of Physical Medicine and Rehabilitation, 86 (3), 373-9.

[12] Lenze, E. J., Host, H. H., Hildebrand, M. W., Morrow-Howell, N., Carpenter, B., Freedland, K. E., ... & Binder, E. F. (2012). Enhanced medical rehabilitation increases therapy intensity and engagement and improves functional outcomes in post acute rehabilitation of older adults: a randomized-controlled trial. *Journal of the American Medical Directors Association*, *13*(8), 708-712.

[13] Medicare Payment Advisory Commission (US). (2016). Report to the Congress: Medicare payment policy. Medicare Payment Advisory Commission.

greater likelihood of discharge to community.[11,14] Furthermore, Jung et al.[15] found that an additional hour of therapy per week was associated with approximately a 3.1 percentage-point increase in the likelihood of returning to the community among residents with hip fracture. Achieving these targeted resident outcomes, including improved self-care and mobility functional independence, reduced length of stay, and increased discharges to the community, is a core goal of SNFs.

Among SNF residents receiving rehabilitation services, the amount of therapy received can vary widely. For example, the amount of therapy provided varies by type (i.e., for-profit versus not-for-profit) and location (i.e., urban versus rural) of facility.[16,17] Measuring residents' functional improvement across all SNFs on an ongoing basis would permit identification of SNF characteristics, such as ownership types or locations, associated with better or worse resident outcomes and thus help SNFs optimally target quality improvement efforts.

Recent research provides empirical support for the risk adjustment variables for these quality measures. In a study of resident functional improvement in SNFs, Wysocki et al.[18] found that several resident conditions were significantly related to resident functional improvement, including cognitive impairment, delirium, dementia, heart failure, and stroke. Also, Cary et al. found that several resident characteristics were significantly related to resident functional improvement, including age, cognitive function, self-care function at admission, and comorbidities.[14]

TEP members were asked if they had comments regarding the environmental scan. One TEP member wondered whether literature existed on the possibility of too much therapy. Two TEP members provided additional references, one pointing to work by Lenze on the need for patient-centered goals to drive measures for improvement, and the other sharing literature by Buurman on the possibility of functional gains plateauing for certain populations.[12,19] Several TEP members suggested that RTI review literature on additional topics related to functional improvement. These topics included resident engagement in the development of functional goals,

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[14] Cary, M. P., Pan, W., Sloane, R., Bettger, J. P., Hoenig, H., Merwin, E. I., & Anderson, R. A. (2016). Self-Care and Mobility Following Postacute Rehabilitation for Older Adults With Hip Fracture: A Multilevel Analysis. *Archives of Physical Medicine and Rehabilitation*. http://doi.org/10.1016/j.apmr.2016.01.012

[15] Jung, H. Y., Trivedi, A. N., Grabowski, D. C., & Mor, V. (2016). Does More Therapy in Skilled Nursing Facilities Lead to Better Outcomes in Patients With Hip Fracture? *Physical therapy*, *96*(1), 81-89.

[16] Grabowski, D. C., Feng, Z., Hirth, R., Rahman, M., & Mor, V. (2013). Effect of nursing home ownership on the quality of post-acute care: An instrumental variables approach. *Journal of Health Economics*, *32*(1), 12-21.

[17] Medicare Payment Advisory Commission (US). (2016). Report to the Congress: Medicare payment policy. Medicare Payment Advisory Commission.

[18] Wysocki, A., Thomas, K. S., & Mor, V. (2015). Functional Improvement Among Short-Stay Nursing Home Residents in the MDS 3.0. *Journal of the American Medical Directors Association*, *16*(6), 470–474. http://doi.org/10.1016/j.jamda.2014.11.018.

[19] Buurman, B. M., Han, L., Murphy, T. E., Gahbauer, E. A., Leo-Summers, L., Allore, H. G., & Gill, T. M. (2016). Trajectories of Disability Among Older Persons Before and After a Hospitalization Leading to a Skilled Nursing Facility Admission. *Journal of the American Medical Directors Association*, *17*(3), 225-231.

and the influence of cognitive disorders and pain levels on residents' functional activities and improvement.

2.1.2 Review of Related and Competing NQF-Endorsed Quality Measures

The environmental scan included reviewing NQF-endorsed function measures for the SNF setting.

As part of the Person- and Family-Centered Care (2014–2016) project (http://www.qualityforum.org/projects/person_family_centered_care/), NQF reviewed quality measures submitted for endorsement that focused on person- and family-centered care and the outcomes of particular interest to residents. Quality measures addressing function reviewed in phase 2 and following measures for SNF setting were endorsed by NQF:

Related and Competing Quality Measures—Self-Care Function:

- CARE: Improvement in Self-Care (NQF #2613)—Steward: AHCA

  For more information, visit www.qualityforum.org/QPS/2613, and for detailed measure specifications, visit http://www.qualityforum.org/ProjectTemplateDownload.aspx?SubmissionID=2613.

- Functional Change: Change in Self-Care Score (NQF #2286)—Steward: Uniform Data System for Medical Rehabilitation,

  For more information, visit www.qualityforum.org/QPS/2286, and for detailed measure specifications, visit: http://www.qualityforum.org/ProjectTemplateDownload.aspx?SubmissionID=2286 Note: The Phase 2 NQF Person- and Family-Centered Care Panel reviewed for IRF setting only.

- Functional Status Change for Patients with Shoulder Impairments (NQF #0426)—Steward: Focus on Therapeutic Outcomes, Inc. (FOTO); one of several condition-specific quality measures; outpatient therapy data

  For more information, visit www.qualityforum.org/QPS/0426, and for detailed measure specifications, visit http://www.qualityforum.org/ProjectTemplateDownload.aspx?SubmissionID=516

- Functional status change for patients with elbow, wrist and hand impairments (NQF #0427)—Steward: FOTO; outpatient therapy data

  For more information, visit www.qualityforum.org/QPS/0427, and for detailed measure specifications, visit http://www.qualityforum.org/ProjectTemplateDownload.aspx?SubmissionID=517

- Functional status change for patients with General orthopedic impairments (NQF #0428)—Steward: FOTO; outpatient therapy data

For more information, visit www.qualityforum.org/QPS/0428, and for detailed measure specifications, visit http://www.qualityforum.org/ProjectTemplateDownload.aspx?SubmissionID=548

Related and Competing Quality Measures—Mobility Function:

- CARE: Improvement in Mobility (NQF #2612)—Steward: AHCA

  For more information, visit www.qualityforum.org/QPS/2612, and for detailed measure specifications, visit http://www.qualityforum.org/ProjectTemplateDownload.aspx?SubmissionID=2612

- Functional Change: Change in Mobility Score (NQF #2321)—Steward: Uniform Data System for Medical Rehabilitation; Note: NQF Person- and Family-Centered Care Panel reviewed for IRF setting only

  For more information, visit www.qualityforum.org/QPS/2321, and for detailed measure specifications, visit http://www.qualityforum.org/ProjectTemplateDownload.aspx?SubmissionID=2321

- Functional Status Change for Patients with Knee Impairments (NQF #0422)—Steward: FOTO; one of several condition-specific quality measures; outpatient therapy data

  For more information, visit www.qualityforum.org/QPS/0422, and for detailed measure specifications, visit http://www.qualityforum.org/ProjectTemplateDownload.aspx?SubmissionID=546

- Functional Status Change for Patients with Hip Impairments (NQF #0423)—Steward: FOTO; outpatient therapy data

  For more information, visit www.qualityforum.org/QPS/0423, and for detailed measure specifications, visit http://www.qualityforum.org/ProjectTemplateDownload.aspx?SubmissionID=514

- Functional Status Change for Patients with Foot and Ankle Impairments (NQF #0424)—Steward: FOTO; outpatient therapy data

  For more information, visit www.qualityforum.org/QPS/0424, and for detailed measure specifications, visit http://www.qualityforum.org/ProjectTemplateDownload.aspx?SubmissionID=547

- Functional Status Change for Patients with Lumbar Impairments (NQF #0425)—Steward: FOTO; outpatient therapy data

For more information, visit www.qualityforum.org/QPS/0425, and for detailed measure specifications, visit, http://www.qualityforum.org/ProjectTemplateDownload.aspx?SubmissionID=515

The Person and Family Centered Care Final Report—Phase 2 can be accessed at http://www.qualityforum.org/Publications/2016/01/Person_and_Family_Centered_Care_Final_Report_-_Phase_2.aspx

The potential SNF functional outcome measures reviewed by the TEP included two self-care measures and two mobility measures. The two self-care measures were (1) an Application of Inpatient Rehabilitation Facility (IRF) Functional Outcome Measure: Change in Self-Care Score for Medical Rehabilitation Patients (NQF #2633), and (2) an Application of Inpatient Rehabilitation Facility (IRF) Functional Outcome Measure: Discharge Self-Care Score for Medical Rehabilitation Patients (NQF #2635). The two mobility measures were (1) an Application of Inpatient Rehabilitation Facility (IRF) Functional Outcome Measure: Change in Mobility Score for Medical Rehabilitation Patients (NQF #2634), and (2) an Application of Inpatient Rehabilitation Facility (IRF) Functional Outcome Measure: Discharge Mobility Score for Medical Rehabilitation Patients (NQF #2636). These measures require the collection of admission and discharge functional status data by trained clinicians using standardized data elements that assess specific functional self-care activities such as eating, oral hygiene, and toileting hygiene, and mobility activities such as lying to sitting on the side of the bed, toilet transfers, and walking or wheelchair mobility. These items are activities that clinicians typically assess at the time of admission discharge, or both to determine residents' needs, evaluate patient progress, and prepare residents and families for a transition to home or to another provider.

The functional assessment data elements included in the potential quality measure, the Application of the Change in Self-Care Score for Medical Rehabilitation Patients (NQF #2633), were originally developed and tested as part of the CARE Item Set,[20] which was designed to standardize assessment of patients' status across acute and post-acute providers, including IRFs, SNFs, home health agencies (HHAs), and LTCHs.

The use of standardized mobility and self-care data elements would standardize the collection of functional status data, which could improve communication when patients are transferred between providers. Most SNF residents receive care in an acute care hospital prior to the SNF stay, and many SNF residents receive care from another provider after the SNF stay. Use of standardized clinical data to describe a resident's status across providers could facilitate communication across providers.

[20] Gage, B., Constantine, R., Aggarwal, J., Morley, M., Kurlantzick, V. G., Bernard, S., . . . Barch, D. (2012). The Development and Testing of the Continuity Assessment Record and Evaluation (CARE) Item Set: Final Report on the Development of the CARE Item Set Volume 1 of 3 (Vol. Volume 1 of 3): RTI International.

This quality measure could inform SNF providers about opportunities to improve care in the area of function and strengthen incentives for quality improvement related to resident function.

The quality measures described in this document focus on self-care and mobility activities. We recognize that SNFs can focus on recovery across many areas of function related to body structure and function, activities, and participation; however, additional research is warranted to develop quality measures for other areas of functioning.

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SECTION 3
SELF-CARE AND MOBILITY: CARE FUNCTION ITEMS

3.1 History of the IRF Functional Outcome Measures

A major focus of the SNF Function TEP meeting was to examine the following potential measures for use in the SNF setting:

- An Application of the Inpatient Rehabilitation Facility (IRF) Functional Outcome Measure: Change in Self-Care Score for Medical Rehabilitation Patients (NQF #2633)

- An Application of the Inpatient Rehabilitation Facility (IRF) Functional Outcome Measure: Change in Mobility Score for Medical Rehabilitation Patients (NQF #2634)

- An Application of the Inpatient Rehabilitation Facility (IRF) Functional Outcome Measure: Discharge Self-Care Score for Medical Rehabilitation Patients (NQF #2635)

- An Application of the Inpatient Rehabilitation Facility (IRF) Functional Outcome Measure: Discharge Mobility Score for Medical Rehabilitation Patients (NQF #2636)

The functional assessment data elements (i.e., items) used to calculate the four IRF function quality measures are from the CARE Item Set. The CARE Item Set was developed and tested as part of the PAC PRD. The CARE Item Set was designed to standardize assessment of patients and residents' status across acute and post-acute settings, including IRFs, LTCHs, SNFs, and HHAs.

The functional status items on the CARE Item Set include daily activities that clinicians typically assess at the time of admission and/or at discharge to determine patient and resident needs, evaluate resident progress, and prepare patients, residents, and their families for a transition to home or another setting.

The development of the CARE Item Set and a description and rationale for each item is described in a report titled *The Development and Testing of the Continuity Assessment Record and Evaluation (CARE) Item Set: Final Report on the Development of the CARE Item Set: Volume 1 of 3.* Results of the reliability and validity testing conducted as part of the PAC PRD found the functional status items to have acceptable reliability and validity in the acute and post-acute patient and resident populations. A description of the testing methodology and results is available in several reports, including the following:

- Volume 2: Final Report On Reliability Testing

- Volume 3: Final Report on CARE Item Set and Current Assessment Comparisons

These reports 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.

The goal of reliability testing was to examine whether consistent results are obtained when administered or used by different clinicians. Validity testing examines whether the items or scales measure what they are 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 PAC PRD. 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.

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. The inter-rater reliability study included patients who were assessed by two different clinicians (raters), and the agreement of the clinicians' rating was calculated. Kappa statistics indicated substantial agreement among raters for both the self-care and mobility items. 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. Unweighted kappa values for the self-care items ranged from 0.598 for oral hygiene to 0.634 for upper-body dressing. For the mobility items, unweighted kappas ranged from 0.667 for walk once standing to 0.762 for sit to stand.

A limitation of the inter-rater reliability study was that the two clinicians assessing a patient were from the same facility, and therefore not examining differences across facilities. To address this issue, the team conducted the video reliability study, which was designed to examine the level of clinician agreement across disciplines, centers, and PAC settings. Clinicians in each facility were asked to assess "standardized" patients presented through a videotape of a patient. The video reliability study indicated substantial agreement with the mode and clinical team among all self-care items, typically upwards of 70 percent, and substantial agreement for the lying-to-sitting, sit-to-stand, chair/bed-to-chair transfer, and toilet transfer items (greater than 76%).

In addition to item-level reliability testing, RTI 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. The Cronbach's alpha reliability estimate ranges from zero to one, and the 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 one indicate a good scale.

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 (**Table 2**). 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.

Table 2.
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

Details about the Rasch analysis are discussed in detail below in Section 4. 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.

The measure development contractor noted that CMS has adopted selected function items from the CARE Item Set and used these items in the function quality measures adopted in the IRF, LTCH and SNF Quality Reporting Programs. For example, the LTCH Quality Reporting Program has adopted one cross-setting process quality measure, one LTCH-specific process quality measure, and one outcome quality measure. The IRF Quality Reporting Program has adopted one cross-setting process quality measure and four outcome quality measures. The SNF Quality Reporting Program has adopted one cross-setting process quality measure. The specific quality measures adopted are as follows:

LTCH Quality Reporting Program:

- An Application of the Percent of Long-Term Care Hospital Patients with an Admission and Discharge Functional Assessment and a Care Plan That Addresses Function
- Percent of Long-Term Care Hospital Patients with an Admission and Discharge Functional Assessment and a Care Plan That Addresses Function
- Long-Term Care Hospital Functional Outcome Measure: Change in Mobility Among Patients Requiring Ventilator Support

IRF Quality Reporting Program:

- An Application of the Percent of Long-Term Care Hospital Patients with an Admission and Discharge Functional Assessment and a Care Plan That Addresses Function
- Inpatient Rehabilitation Facility (IRF) Functional Outcome Measure: Change in Self-Care Score for Medical Rehabilitation Patients (NQF #2633)
- Inpatient Rehabilitation Facility (IRF) Functional Outcome Measure: Change in Mobility Score for Medical Rehabilitation Patients (NQF #2634)

- Inpatient Rehabilitation Facility (IRF) Functional Outcome Measure: Discharge Self-Care Score for Medical Rehabilitation Patients (NQF #2635)

- Inpatient Rehabilitation Facility (IRF) Functional Outcome Measure: Discharge Mobility Score for Medical Rehabilitation Patients (NQF #2636)

SNF Quality Reporting Program:

- An Application of the Percent of Long-Term Care Hospital Patients with an Admission and Discharge Functional Assessment and a Care Plan That Addresses Function

The measure developer reviewed **Table 3a,** which lists the function items included in Section GG of the IRF Patient Assessment Instrument (IRF-PAI) version 1.4 (effective October 1, 2016), Minimum Data Set (MDS) 3.0 (effective Oct 1, 2016), and 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 marked with an asterisk. This cross-setting function quality measure, adopted into the IRF, SNF and LTCH QRPs was also developed to meet the Improving Medicare Post-Acute Care Transformation (IMPACT) Act of 2014. The additional function items that are checked for selected settings are required for other function quality measures used in each quality reporting program. 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 (IRF) Functional Outcome Measure: Change in Self-Care Score for Medical Rehabilitation Patients (NQF #2633) and Inpatient Rehabilitation Facility (IRF) Functional Outcome Measure: Discharge Self-Care Score for Medical Rehabilitation Patients (NQF #2635).

Table 3a.
Self-Care and Mobility Items Included in Section GG of the IRF-PAI, MDS 3.0, LTCH CARE Data Set

Item	Item Description	IRF-PAI v1.4	MDS 3.0	LTCH 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 3a. (continued)
Self-Care and Mobility Items Included in Section GG of the IRF-PAI, MDS 3.0, LTCH CARE Data Set

Item	Item Description	IRF-PAI v1.4	MDS 3.0	LTCH 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 surfaces	✓	—	—
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

* Items included in cross-setting 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)

Table 3b 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 Confusion Assessment Method (CAM)© items.

Table 3b.
Function Items Included in the Process Function Quality Measures for IRF, SNF, and LTCH Quality Reporting Programs (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, endorsed)	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, endorsed)	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, endorsed)	Percent of Long-Term Care Hospital Patients with an Admission and Discharge Functional Assessment and a Care Plan That Addresses Function (NQF #2631, endorsed)*
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 3b. (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 Percent of Long-Term Care Hospital Patients with an Admission and Discharge Functional Assessment and a Care Plan That Addresses Function (NQF #2631)*
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	*Does the patient walk?*	✓	✓	✓	✓
I	Walk 10 feet	—	—	—	✓
J	Walk 50 feet with two turns	✓	✓	✓	✓
K	Walk 150 feet	✓	✓	✓	✓
L	Walking 10 feet on uneven surface	—	—	—	—

(continued)

Table 3b. (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)*
M	1 step (curb)	—	—	—	—
N	4 steps	—	—	—	—
O	12 steps	—	—	—	—
P	Picking up object	—	—	—	—
Q	*Does the patient use a wheelchair/scooter?*	✓	✓	✓	✓
R	Wheel 50 feet with two turns	✓	✓	✓	✓
RR	Type of wheelchair/ scooter	✓	✓	✓	✓
S	Wheel 150 feet	✓	✓	✓	✓
SS	Type of wheelchair/ scooter	✓	✓	✓	✓
Communication (Section B)					
BB0700	Expression of ideas and wants	—	—	—	✓
BB0800	Understanding verbal content	—	—	—	✓

(continued)

Table 3b. (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 Fiscal Year 2015 Inpatient Prospective Payment System (IPPS)/LTCH Prospective Payment System (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.

3.2 Self-Care and Mobility Items Included in the Quality Measures

RTI staff reviewed tables with TEP members that compared the functional assessment items (activities) included in four NQF-endorsed quality measures for self-care activities **(Table 4a and 4c)** and four NQF-endorsed quality measures for mobility activities **(Table 4b and 4c)**. The team also highlighted differences in the functional assessment items included in the quality measures, specifically:

- Bowel management, expression, and memory
- Walk and wheelchair
- Tub/shower transfer

Table 4a.
Functional Assessment Items Included in Selected Self-Care Quality Measures

Item	Inpatient Rehabilitation Facility (IRF) Functional Outcome Measure: Change in Self-Care Score for Medical Rehabilitation Patients (NQF #2633)	CARE: Improvement in Self-Care (NQF #2613)	Functional Change: Change in Self-Care Score (NQF #2286)	Functional Status Change for Patients with Shoulder Impairments (NQF #0426)
Eating/feeding	✓	✓	✓	✓
Oral hygiene/grooming	✓	✓	✓	-
Toileting hygiene	✓	✓	✓	✓
Wash upper body	—	✓	—	—
Shower/bathe self	✓	✓	—	✓*
Upper body dressing	✓	✓	✓	✓*
Lower body dressing	✓	✓	✓	✓*
Putting on/taking off footwear	✓	✓	—	—
Bowel management	—	—	✓	—
Expression	—	—	✓	—
Memory	—	—	✓	—
				See Table 4c

* Bathing or dressing

NOTE: Based on RTI's review of NQF measure submission documents on 4/22/2016.

Table 4b.
Functional Assessment Items Included in Selected Mobility Quality Measures

Item	Inpatient Rehabilitation Facility (IRF) Functional Outcome Measure: Change in Mobility Score for Medical Rehabilitation Patients (NQF #2634)	CARE: Improvement in Mobility (NQF #2612)	Functional Change: Change in Mobility Score (NQF #2321)	Functional Status Change for Patients with Hip Impairments (NQF #0423)
Roll left and right	✓	✓	—	—
Sit to lying	✓	✓	—	—
Lying to sitting on bed	✓	✓	—	—
Sit to stand	✓	✓	—	✓*
Chair/bed-to-chair transfer	✓	✓	✓	✓*
Toilet transfer	✓	✓	✓	—
Car transfer	✓	✓	—	—
Walk 10 feet	✓	Walk/Wheel Chair (WC)	Walk/WC	—
Walk 50 feet with two turns	✓	Walk/WC	Walk/WC	Walking between rooms
Walk 150 feet	✓	Walk/WC	Walk/WC	—
Walking 10 feet on uneven surfaces	✓	✓	—	—
1 step (curb)	✓	✓	—	—
4 steps	✓	✓	—	—
12 steps	✓	✓	✓	✓
Picking up object	✓	✓	—	Bending or stooping
Walking or wheelchair mobility	—	✓	✓	✓
Lifting an object (e.g., bag of groceries) from floor	—	—	—	✓
Squatting	—	—	—	✓
Walking two blocks	—	—	—	✓
Standing for 1 hour	—	—	—	✓
				See Table 4c

* Getting in and out of your chair

NOTE: Based on RTI's review of NQF measure submission documents on 4/22/2016.

Table 4c.
Additional Functional Assessment Items: FOTO Quality Measures

Additional Function Items for FOTO measures (0422, 0423, 0424, 0425, 0426, 0427, 0428)	
▪ Any of your usual work, housework, or school activities ▪ Your usual hobbies, recreational, or sporting activities ▪ Getting into or out of the bath ▪ Performing light activities around your home ▪ Performing heavy activities around your home ▪ Standing for 1 hour ▪ Running on uneven ground ▪ Hopping ▪ Vigorous activities, such as running, lifting heavy objects, participating in strenuous sports ▪ Participating in recreational sport? ▪ Moderate activities, such as moving a table, pushing a vacuum cleaner, bowling or playing golf ▪ Lifting or carrying groceries ▪ Attending social or cultural events ▪ Getting in and out of your chair ▪ Comb or brush your hair using your affected arm ▪ Use your affected arm to place a can of soup (1lb) on a shelf at shoulder height ▪ Use your affected arm to pick up and drink out of a full water glass ▪ Use your affected arm to reach a shelf that is shoulder height ▪ Use your affected arm to reach an overhead shelf ▪ Push yourself out of a chair using both arms ▪ While sitting, reach across to the middle of a table with your affected arm to get a salt shaker	▪ Get a scarf or necktie over your head and around your neck, using both hands ▪ Put deodorant under the arm opposite your affected shoulder using your affected arm ▪ Pull a chair out from a table, using your affected arm ▪ Are you having any difficulty putting on a pullover sweater? ▪ Are you having any difficulty turning a key? ▪ Are you having any difficulty carrying a small suitcase? ▪ Are you having any difficulty washing your back? ▪ Are you having any difficulty carrying a shopping bag or briefcase? ▪ Are you having any difficulty doing heavy household chores (e.g., washing windows or floors)? ▪ Are you having any difficulty laundering clothes (e.g., washing, ironing, folding)? ▪ Are you having any difficulty doing up buttons? ▪ Are you having any difficulty opening a tight or new jar? ▪ Are you having any difficulty opening doors? ▪ Lifting overhead to a cabinet? ▪ Gripping or opening a can? ▪ Handling of small items such as a pen or coins?

3.2.1 Scale-Level Reliability and Validity Testing: Rasch Analysis

Because functional status is a latent trait—a concept that is not measured directly, but that relies on reporting on activities that can be directly observed—we used the one-parameter Rasch model to gain a better understanding of functional status. 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.

Rasch analysis has been used to examine the FIM® instrument,[21,22,23,24] the MDS,[25] and the Outcome and Assessment Information Set (OASIS).[26] 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.[27]

Rasch measurement is based on a probabilistic model that describes the association between a person's underlying ability level and the 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).[28] 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. As mentioned previously, 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 than 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

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21 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.

22 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

23 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.

24 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.

25 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.

26 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.

27 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.

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

square is an indicator of how similar patient responses are to what would be expected (i.e., predicted) by the measurement model. The acceptable range is generally 0.6 to 1.4. Infit mean squares above 1.4 are considered to be unacceptably unexpected[29] 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.

RTI used Rasch analysis to examine the extent to which the items worked together to define a coherent concept. Examinations of 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 TEP noted that this is an important activity given the risk of falls. RTI also examined the extent to which people 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 PAC population.

Finally, 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 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.

3.3 TEP Discussion

Following the presentation of the history of the CARE function items, the TEP members asked questions and offered several observations. Specifically, TEP members inquired about the rationale for not having grooming, drinking, and tub/shower items on the data set. The measure developer stated that items such as grooming combined multiple activities, and that this increased the complexity of coding when assessing a patient's function. Data suggested that there was confusion on how to code these items, particularly if a patient's ability differed with each activity or if the patient did not perform each activity. Therefore, oral hygiene was included in the CARE Item Set as a single item that focused on one aspect of hygiene that is feasible to collect in the acute and PAC settings. RTI noted that TEP members could suggest additional grooming items for future measure development.

The tub/shower item was not included in the CARE Item Set because of variation in the bathroom setup at different facilities. Some institutional PAC settings have bathtubs, whereas

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

others only have showers, which would affect coding. The TEP members agreed that there are institutional variations across SNFs.

TEP members also wondered why bladder management was not included. RTI agreed that this was an important area of functional ability and indicated that it was important enough to be its own quality measure. RTI noted research examining function data that showed bladder and bowel function were distinct constructs from self-care and mobility. One TEP member agreed, and further stated that cognition should also be measured separately. RTI agreed with this TEP member.

One TEP member also asked whether items related to washing the whole body (versus washing upper body only) were going to be used in the SNF measures. If the plan of care is related to washing the upper body, for example, because the patient is staying in long-term care and not returning home, then this item might be appropriate. The TEP asked that RTI look into this further for use in the SNF setting. TEP members also stressed that it is important to move toward standardization across the settings, since currently washing the upper body is used in the LTCH setting and bathing/showering oneself is used in IRFs.

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SECTION 4
RASCH ANALYSIS OF SELF-CARE AND MOBILITY ITEMS

4.1 CARE Function Items: Rasch Background

Previous psychometric analysis showed that functional areas of self-care and mobility are being measured as intended with the CARE function items (see Section 3). We conducted additional analyses to examine the item scoring across PAC settings, including SNFs and IRFs. The current approach uses Rasch measurement methodology, specifically displacement and differential item functioning (DIF) information.

Rasch measurement is briefly summarized below. Rasch measurement takes theoretical constructs and provides tools to measure them in a more concrete way. Generally, Rasch analysis uses item-level response or observation data to determine how well items in a set function together to help measure a construct. As part of the analysis, Rasch methodology places persons and the items of interest on a virtual ruler so individual item difficulty can be understood in comparison to the other items in the set. Once a virtual ruler is specified, it can be used to measure different groups of individuals—in this case, patients in the IRF and SNF settings.

4.2 Cross-Setting Examination—Self-Care

4.2.1 Data

The sample used for the cross-setting CARE item consistency analysis are derived from the PAC PRD as described in Section 3. The current analysis uses a cross-setting approach and includes SNF, IRF, LTCH, and HHA data in the overall analysis. We focus on the SNF and IRF settings specifically in the results and discussion. **Table 5** shows the sample for the IRF and SNF settings at admission and discharge, constituting the analytic sample for the current endeavor. The sample below is the result of data cleaning and case validation (i.e., met inclusion criteria), but missing data at the item level could further reduce these numbers on an analysis-by-analysis basis.

Table 5.
Functional Assessment Sample in SNF, IRF, LTCH, and HHA Providers

Setting	Assessment	Frequency
HHA	Admission	3,716
HHA	Discharge	3,716
SNF	Admission	2,971
SNF	Discharge	2,971
IRF	Admission	4,800
IRF	Discharge	4,800
LTCH	Admission	2,035
LTCH	Discharge	2,035

4.2.2 Analysis Approach

The purpose of the current analysis is to determine if the selected CARE items, and the derived self-care and mobility rulers, can be effectively used across PAC settings. To that end, Rasch measurement anchoring methodology was employed to determine if item difficulties, gleaned from across admission and discharge [30] and across settings,[31] accurately represent item difficulty levels when data are specified to each setting and at admission and at discharge.

Rasch analysis was used to evaluate the fitness of a single set of self-care and mobility items for use across settings. That is, a single ruler was created for the items by determining the item difficulty estimates for an overall analysis (all settings together and combined admission and discharge) and constraining or "anchoring" those values in individual setting analyses. Therefore, the original item estimates (anchors) were compared to what would be estimated independently in each setting, or the setting-specific item difficulty estimates.

To determine if a single self-care ruler could be used to measure patient ability at various settings, analyses were conducted in three parts. First, the full data (cross-assessment and cross-setting) were used in a single analysis to establish the item difficulty estimates to which all setting-level and assessment-level estimates were compared. Next, anchoring methodology was used to assign the item difficulty estimates in each setting-level and assessment-level analysis. Finally, displacement statistics (or the degree to which the anchored item difficulty estimates differ from what would be independently estimated) were evaluated to determine how much setting-specific estimates of item difficulty deviate from the original, anchored values.

Finally, DIF was evaluated independently across assessments to confirm that the displacement analysis was providing sufficient information. DIF assesses the interaction between an item and a grouping of interest. If a substantial difference in measurement exists, it indicates the need for further investigation of the item(s) in question.

4.2.3 Results:

The results of displacement analysis indicates that with very few exceptions, the overall difficulty estimates are similar across IRF and SNF settings. Tables 6 through 8 show the progression of analyses as each level of specification is tested (assessment period and setting). First, the comparison of the overall analysis (cross-setting and cross-assessment period) to the IRF and SNF setting, but collapsed across assessment periods. In other words, admission and discharge are combined into a single analysis (see **Table 6**).

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[30] Admission and discharge data is combined into a single analysis to provide the greatest range of patient ability; in general, lower scores on admission and higher scores at the time of discharge.

[31] All settings (HHA, IRF, SNF, and LTCH) are collapsed, or combined into a single analysis.

Table 6.
Self-Care Cross-Setting and Cross-Assessment Anchored Item Estimates Specified on Setting

Measure	Standard Error	Displace	Item
SNF			
-2.29	0.02	0.04	Eating
1.25	0.02	-0.14	Putting on/taking off footwear
1.12	0.02	-0.01	Shower/bathe self
-1.33	0.02	0.18	Oral hygiene
-0.17	0.02	0.02	Upper body dressing
0.37	0.02	0.00	Toileting hygiene
1.05	0.02	-0.04	Lower body dressing
IRF			
-2.29	0.02	0.12	Eating
1.12	0.02	-0.28	Shower/bathe self
1.25	0.01	0.03	Putting on/taking off footwear
0.37	0.01	0.26	Toileting hygiene
-1.33	0.01	-0.02	Oral hygiene
-0.17	0.01	-0.19	Upper body dressing
1.05	0.01	0.05	Lower body dressing

Next, in **Table 7**, the comparison of the overall analysis to the admission assessments is provided. Finally, the overall analysis is compared to the discharge assessments **(Table 8)**.

The result show anchored item difficulty estimates and displacement statistics, which are the quantity that would need to be added to the anchored item difficulty value to make it approximate (with error) the freely estimated item difficulty. The far left column in Tables 6 through 8 show the item difficulty values, followed by the standard error of those estimates from the anchored run. These estimates are from the cross-setting and cross-assessment analysis; that is, they include all the data. The next column contains displacement values. Displacement values higher than 0.5 and lower than -0.5 could have an impact on measurement. For the self-care items, the overall, admission, and discharge anchored item difficulty estimates for IRF and SNF do not differ substantially from the cross-setting estimate.

Table 7.
Self-Care Cross-Setting and Cross-Assessment Anchored Item Estimates Specified on Setting at Admission

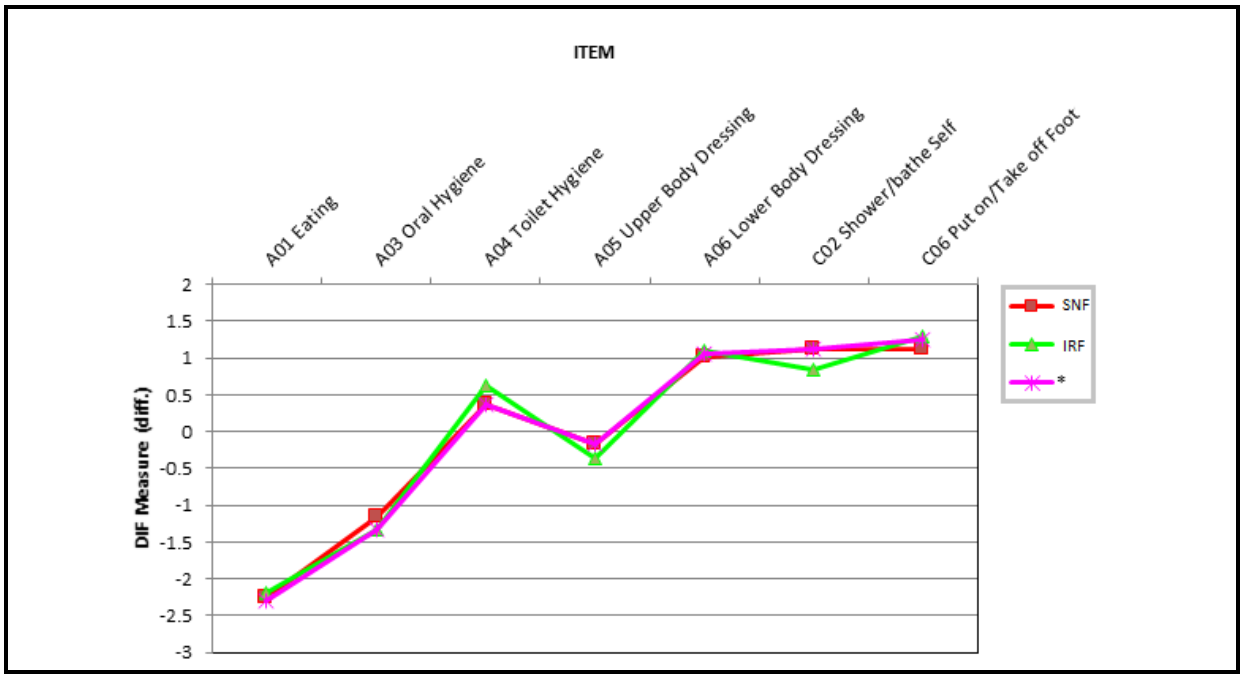
Measure	Standard Error	Displace	Item
Cross-Setting			
1.25	0.01	0.17	Putting on/taking off footwear
-2.29	0.01	-0.14	Eating
1.12	0.01	-0.12	Shower/bathe self
0.37	0.01	0.00	Toileting hygiene
-1.33	0.01	-0.09	Oral hygiene
-0.17	0.01	-0.02	Upper body dressing
1.05	0.01	0.11	Lower body dressing
SNF			
1.25	0.02	0.07	Putting on/taking off footwear
-2.29	0.03	-0.14	Eating
-1.33	0.02	0.06	Oral hygiene
1.12	0.03	-0.16	Shower/bathe self
-0.17	0.02	-0.02	Upper body dressing
0.37	0.02	0.06	Toileting hygiene
1.05	0.02	0.04	Lower body dressing
IRF			
1.25	0.02	0.26	Putting on/taking off footwear
-2.29	0.02	-0.03	Eating
1.12	0.02	-0.45	Shower/bathe self
0.37	0.02	0.29	Toileting hygiene
-1.33	0.02	-0.12	Oral hygiene
-0.17	0.02	-0.25	Upper body dressing
1.05	0.02	0.19	Lower body dressing

Table 8.
Self-Care Cross-Setting and Cross-Assessment Anchored Item Estimates Specified on Setting at Discharge

Measure	Standard Error	Displace	Item
Cross-Setting			
-2.29	0.02	0.26	Eating
1.12	0.01	0.15	Shower/bathe self
1.25	0.01	-0.24	Putting on/taking off footwear
-1.33	0.02	0.15	Oral hygiene
0.37	0.01	0.00	Toileting hygiene
-0.17	0.01	0.03	Upper body dressing
1.05	0.01	-0.15	Lower body dressing
SNF			
-2.29	0.04	0.39	Eating
1.25	0.03	-0.45	Putting on/taking off footwear
1.12	0.03	0.19	Shower/bathe self
-1.33	0.03	0.40	Oral hygiene
0.37	0.03	-0.10	Toileting hygiene
-0.17	0.03	0.09	Upper body dressing
1.05	0.03	-0.17	Lower body dressing
IRF			
-2.29	0.03	0.41	Eating
1.12	0.02	-0.07	Shower/bathe self
-1.33	0.03	0.17	Oral hygiene
0.37	0.02	0.22	Toileting hygiene
1.25	0.02	-0.25	Putting on/taking off footwear
-0.17	0.02	-0.08	Upper body dressing
1.05	0.02	-0.14	Lower body dressing

Cross-assessment DIF analyses echo the self-care displacement findings, where the item estimates for IRF and SNF are very similar (see **Figure 1**).

Figure 1.
Functional Assessment Self-Care Items Differential Item Functioning (DIF)



4.3 Cross-Setting Examination—Mobility

4.3.1. Data and Analysis Approach

The assessment of mobility CARE Items across settings used the same sample and analytic approach as the self-care items. Please see Table 5 for the sample size.

4.3.2. Results

The evaluation of displacement statistics indicates that with very few exceptions, the overall difficulty estimates can be used effectively across IRFs and SNFs. **Tables 9** through **11** show the progression of analysis as each level of specification is tested (assessment period and setting), just as was presented with the self-care items. First, **Table 9** provides cross-setting and cross-assessment period to each setting individually. In **Table 10**, comparisons between the overall and admission-specific setting assessments are provided. Finally, **Table 11** compares the overall estimates to the discharge setting-specific assessments. The tables below present anchored difficulty estimates and displacement statistics. The far left column shows the item difficulty values followed by the standard error of those estimates from the anchored run. The estimates are from the cross-setting and cross-assessment analysis. The third column reports the displacement values. Displacement values higher than 0.5 and lower than -0.5 could affect measurement.

Table 9.
Mobility Cross-Setting and Cross-Assessment Anchored Item Estimates Specified by Setting

Measure	Standard Error	Displace	Item
SNF			
1.13	0.02	-0.14	Picking up object
-1.69	0.02	0.11	Roll left and right
-0.56	0.06	-0.13	Walk in room
-1.10	0.02	0.10	Sit to lying
0.76	0.03	-0.16	Car transfer
0.06	0.03	-0.13	Walk 150 feet
0.79	0.03	-0.13	1 step (curb)
0.93	0.04	-0.11	Walking 10 feet on uneven surfaces
1.17	0.04	-0.18	12 steps—interior
-0.16	0.03	-0.07	Walk 50 feet with two turns
1.00	0.04	-0.01	4 steps—exterior
-0.97	0.02	0.13	Lying to sitting on side of bed
-0.37	0.02	0.02	Toilet transfer
-0.56	0.02	0.02	Sit to stand
-0.45	0.02	0.00	Chair/bed-to-chair transfer
IRF			
1.13	0.02	-0.36	Picking up object
1.17	0.03	-0.31	12 steps—interior
-1.69	0.02	0.16	Roll left and right
0.93	0.03	-0.33	Walking 10 feet on uneven surfaces
-0.56	0.04	-0.08	Walk in room
0.79	0.02	0.01	1 step (curb)
1.00	0.03	-0.26	4 steps—exterior
0.76	0.02	-0.23	Car transfer
-0.37	0.02	0.13	Toilet transfer
-1.10	0.01	0.15	Sit to lying
0.06	0.02	-0.16	Walk 150 feet
-0.97	0.01	0.08	Lying to sitting on side of bed
-0.16	0.02	-0.05	Walk 50 feet with two turns
-0.56	0.01	0.05	Sit to stand
-0.45	0.01	0.05	Chair/bed-to-chair transfer

Table 10.
Mobility Cross-Setting and Cross-Assessment Anchored Item Estimates Specified by Setting at Admission

Measure	Standard Error	Displace	Item
Cross-Setting			
1.13	0.02	0.19	Picking up object
1.17	0.04	-0.14	12 steps—interior
0.06	0.03	0.03	Walk 150 feet
0.93	0.03	-0.16	Walking 10 feet on uneven surfaces
0.76	0.03	-0.04	Car transfer
1.00	0.03	-0.27	4 steps—exterior
-0.56	0.03	-0.04	Walk in room
0.79	0.03	-0.37	1 step (curb)
-1.69	0.01	-0.01	Roll left and right
-0.16	0.02	-0.04	Walk 50 feet with two turns
-1.10	0.01	0.06	Sit to lying
-0.97	0.01	0.08	Lying to sitting on side of bed
-0.37	0.01	-0.03	Toilet transfer
-0.56	0.01	0.01	Sit to stand
-0.45	0.01	< 0.00	Chair/bed-to-chair transfer
SNF			
1.13	0.04	-0.12	Picking up object
1.17	0.11	-0.58*	12 steps—interior
0.79	0.07	-0.71*	1 step (curb)
-1.69	0.03	0.10	Roll left and right
0.76	0.06	-0.53*	Car transfer
0.93	0.09	-0.53*	Walking 10 feet on uneven surfaces
-0.56	0.06	-0.19	Walk in room
1.00	0.09	-0.51*	4 steps
0.06	0.07	-0.19	Walk 150 feet
-0.16	0.04	-0.23	Walk 50 feet with two turns
-1.10	0.03	0.17	Sit to lying
-0.97	0.02	0.20	Lying to sitting on side of bed
-0.37	0.03	0.02	Toilet transfer
-0.56	0.03	0.03	Sit to stand
-0.45	0.03	-0.01	Chair/bed-to-chair transfer

(continued)

Table 10. (continued)
Mobility Cross-Setting and Cross-Assessment Anchored Item Estimates Specified on Setting at Admission

Measure	Standard Error	Displace	Item
IRF			
1.13	0.04	-0.18	Picking up object
1.17	0.08	-1.06*	12 steps
0.93	0.08	-1.19*	Walking 10 feet on uneven surfaces
1.00	0.05	-0.98*	4 steps—exterior
0.79	0.05	-0.76*	1 step (curb)
0.76	0.06	-0.71*	Car transfer
-1.69	0.02	0.12	Roll left and right
-0.56	0.05	-0.12	Walk in room
-0.37	0.02	0.10	Toilet transfer
-1.10	0.02	0.25	Sit to lying
-0.97	0.02	0.18	Lying to sitting on side of bed
0.06	0.05	-0.29	Walk 150 feet
-0.16	0.03	-0.18	Walk 50 feet with two turns
-0.56	0.02	0.04	Sit to stand
-0.45	0.02	0.06	Chair/bed-to-chair transfer

* = Displacement values higher than 0.5 and lower than -0.5 could affect measurement.

Table 11.
Mobility Cross-Setting and Cross-Assessment Anchored Item Estimates Specified on Setting at Discharge

Measure	Standard Error	Displace	Item
Cross-Setting			
1.13	0.02	-0.15	Picking up object
-0.56	0.06	0.17	Walk in room
0.06	0.02	-0.01	Walk 150 feet
-1.69	0.02	0.00	Roll left and right
1.17	0.02	0.06	12 steps—interior
0.76	0.02	0.02	Car transfer
0.93	0.02	0.07	Walking 10 feet on uneven surfaces
0.79	0.02	0.17	1 step (curb)

(continued)

Table 11. (continued)
Mobility Cross-Setting and Cross-Assessment Anchored Item Estimates Specified on Setting at Discharge

Measure	Standard Error	Displace	Item
Cross-Setting (continued)			
-1.10	0.02	-0.09	Sit to lying
1.00	0.02	0.13	4 steps—exterior
-0.37	0.01	0.03	Toilet transfer
-0.16	0.02	0.03	Walk 50 feet with two turns
-0.97	0.01	-0.11	Lying to sitting on side of bed
-0.56	0.01	-0.01	Sit to stand
-0.45	0.01	-0.01	Chair/bed-to-chair transfer
SNF			
1.13	0.03	-0.15	Picking up object
-1.69	0.04	0.12	Roll left and right
-0.56	0.18	0.46	Walk in room
-1.10	0.03	0.00	Sit to lying
0.06	0.04	-0.12	Walk 150 feet
0.76	0.03	-0.06	Car transfer
0.79	0.03	0.03	1 step (curb)
0.93	0.04	0.00	Walking 10 feet on uneven surfaces
-0.16	0.03	0.03	Walk 50 feet with two turns
-0.97	0.03	0.03	Lying to sitting on side of bed
1.00	0.04	0.11	4 steps—exterior
1.17	0.05	-0.08	12 steps—interior
-0.37	0.03	0.02	Toileting transfer
-0.56	0.03	0.01	Sit to stand
-0.45	0.03	0.01	Chair/bed-to-chair transfer
IRF			
1.13	0.03	-0.47	Picking up object
-1.69	0.02	0.21	Roll left and right
-0.56	0.12	0.18	Walk in room
1.17	0.03	-0.16	12 steps—interior
-0.37	0.02	0.15	Toilet transfer
0.79	0.02	0.26	1 step (curb)

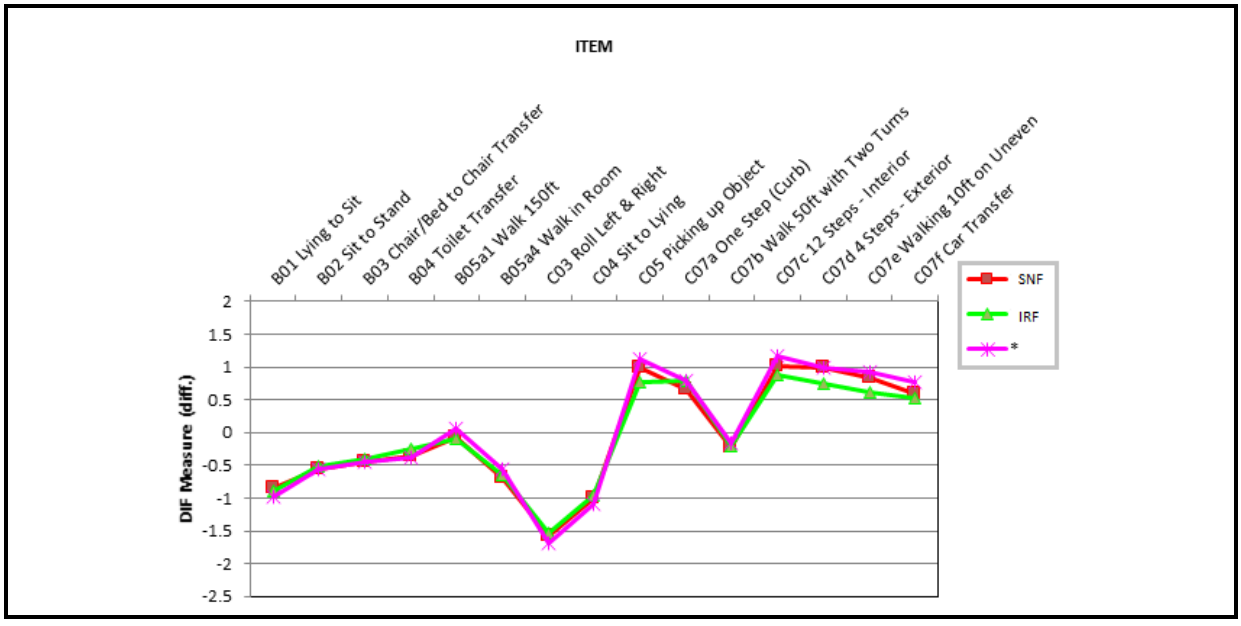
(continued)

Table 11. (continued)
Mobility Cross-Setting and Cross-Assessment Anchored Item Estimates Specified on Setting at Discharge

Measure	Standard Error	Displace	Item
IRF (continued)			
0.76	0.02	-0.14	Car transfer
0.93	0.03	-0.15	Walking 10 feet on uneven surfaces
1.00	0.03	0.01	4 steps—exterior
-1.10	0.02	0.02	Sit to lying
-0.97	0.02	-0.05	Lying to sitting on side of bed
0.06	0.03	-0.13	Walk 150 feet
-0.56	0.02	0.06	Sit to stand
-0.16	0.02	0.02	Walk 50 feet with two turns
-0.45	0.02	0.04	Chair/bed-to-chair transfer

Overall, no displacement estimates differ by more than 5 units. At admission, the more difficult items in the IRF and SNF settings show some displacement, meaning that the anchored item difficulty estimates differ from what would be freely estimated. However, these items (at admission) have relatively small sample sizes in some response categories compared with other items, which may be contributing to the displacement. Cross-assessment DIF analyses echo the overall mobility displacement findings in that the SNF and IRF settings show very similar measurement (**Figure 2**).

Figure 2.
Functional Assessment Mobility Items Differential Item Functioning (DIF)



To further investigate the impact in situations where displacement was found in the IRF and SNF settings (at admission), graphs were compiled to compare person measurement. **Figures 3** and **4** below show person measurement (ability estimates) for the anchored analysis and then a free (unanchored) analysis in the IRF and SNF setting at admission. These graphs show a roughly linear relationship between the two sets of function estimates. Therefore, it appears that the mobility item displacement seen in SNF and IRF have a negligible impact on person measurement.

Figure 3.
Functional Assessment Mobility Person Estimate for Overall and SNF Admission

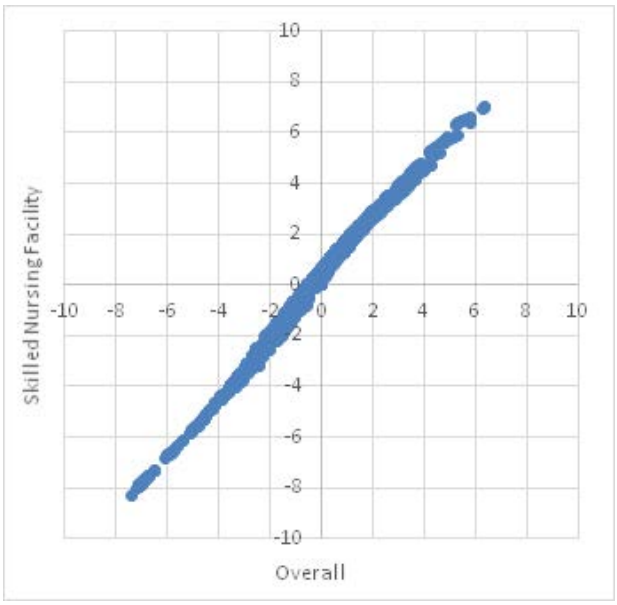
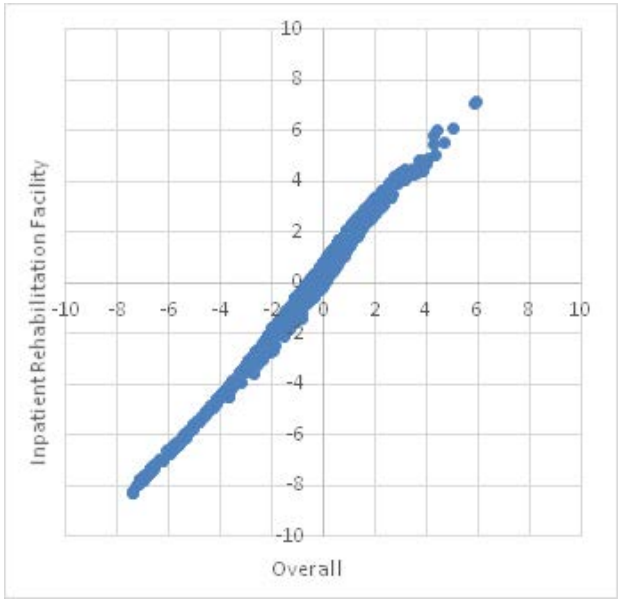


Figure 4.
Functional Assessment Mobility Person Estimate for Overall and IRF Admission



SECTION 5
INCLUSION/EXCLUSION CRITERIA

5.1 Overview of Exclusion Criteria for Selected Quality Measures

During the meeting, TEP members examined the inclusion and exclusion criteria of existing NQF-endorsed IRF self-care and mobility functional outcome measures and provided input on their applicability in the SNF setting. TEP members reviewed the criteria currently used for several self-care quality measures (**Table 12a**) and mobility quality measures (**Table 12b**). The tables were developed based on publicly available NQF documents and measure specifications.

For the four IRF Functional Outcome Measures, the inclusion and exclusion criteria for the IRF setting were based on environmental scans, input from previous TEPs, and clinical expertise.

Table 12a.
Comparison of Exclusion Criteria for Selected Self-Care Quality Measures Based on NQF Documents*

Exclusion Criteria	Functional Change: Change in Self-Care Score (NQF #2286)	CARE: Improvement in Self-Care (NQF #2613)	Functional Status Change for Patients with Shoulder Impairments (NQF #0426)	Inpatient Rehabilitation Facility (IRF) Functional Outcome Measure: Change in Self-Care Score for Medical Rehabilitation Patients (NQF #2633)	Inpatient Rehabilitation Facility (IRF) Functional Outcome Measure: Discharge Self-Care Score for Medical Rehabilitation Patients (NQF #2635)
Younger patients/residents	✓ < 18 years old	✓ < 18 years old	✓ < 14 years old[2]	✓ < 21 years old	✓ < 21 years old
Non-Medicare patients/residents	—	—	—	✓	✓
Patients/residents who are independent with all self-care activities	—	—	—	✓	—
Patients/residents not getting Occupational/Physical Therapy	—	✓	—	—	—
Patients/residents in a coma/persistent vegetative state	—	✓	—	✓	✓
Patients/residents with complete tetraplegia (quadriplegia)	—	✓	—	✓	✓
Patients/residents with locked-in syndrome	—	—	—	✓	✓
Patients/residents with severe anoxic brain damage, cerebral edema, or compression of brain	—	—	—	✓	✓
Patients/residents on ventilator or respirator	—	✓	—	—	—
Patient/resident not being treated for shoulder impairment	—	—	✓	—	—

(continued)

Table 12a. (continued)
Comparison of Exclusion Criteria for Selected Self-Care Quality Measures Based on NQF Documents*

Exclusion Criteria	Functional Change: Change in Self-Care Score (NQF #2286)	CARE: Improvement in Self-Care (NQF #2613)	Functional Status Change for Patients with Shoulder Impairments (NQF #0426)	Inpatient Rehabilitation Facility (IRF) Functional Outcome Measure: Change in Self-Care Score for Medical Rehabilitation Patients (NQF #2633)	Inpatient Rehabilitation Facility (IRF) Functional Outcome Measure: Discharge Self-Care Score for Medical Rehabilitation Patients (NQF #2635)
Admitted from the community (home, assisted living, etc.), a psychiatric hospital, intellectual and developmental disabilities (ID/DD) facility, or hospice[3]	—	✓	—	—	—
Unexpectedly discharged to an acute care setting[4]	—	✓	✓	✓	✓
Leave facility against medical advice/treatment interrupted or discontinued by patient	—	-	✓	✓	✓
Hospice	—	✓ patient/resident is currently under hospice care	—	✓ discharged to hospice	✓ discharged to hospice
Discharged to another IRF	—	—	—	✓	✓
Length of stay <3 days	—	—	—	✓	✓
Intervention was interrupted or discontinued by physician, provider, or payer	—	—	✓	—	—
Patients/residents who died	✓	✓	unclear[1]	✓	✓

(continued)

Table 12a. (continued)
Comparison of Exclusion Criteria for Selected Self-Care Quality Measures Based on NQF Documents*

Exclusion Criteria	Functional Change: Change in Self-Care Score (NQF #2286)	CARE: Improvement in Self-Care (NQF #2613)	Functional Status Change for Patients with Shoulder Impairments (NQF #0426)	Inpatient Rehabilitation Facility (IRF) Functional Outcome Measure: Change in Self-Care Score for Medical Rehabilitation Patients (NQF #2633)	Inpatient Rehabilitation Facility (IRF) Functional Outcome Measure: Discharge Self-Care Score for Medical Rehabilitation Patients (NQF #2635)
Patient/residents who cannot complete function questions due to blindness, illiteracy, severe mental incapacity, or language incompatibility	—	—	✓	—	—
Patients/residents who refuse to participate	—	—	✓	—	—
Patients/residents with missing data	—	✓	✓	—	—

* Data reported in this table is based on our review of documents on the National Quality Forum website. We welcome any corrections.

[1] Unclear = publicly available documentation and measure specifications do not explicitly address this exclusion criteria

[2] NQF website states ages <14 are excluded, but additional documentation suggests that the age exclusion is <18 years old. The measure was developed for ages 18 and older, but was changed to ages 14 and older in recent years. It is unclear if this was changed back to <18 years old.

[3] Measure only includes residents admitted to the SNF from "02. Another NH [nursing home] or swing bed," "03 Acute Hospital," "05 IRF," or "09 LTCH."

[4] Medical emergency, and patient is discharged to a Short-Stay Acute Hospital, Critical Access Hospital, Inpatient Psychiatric Facility, or LTCH. For NQF # 0426, stays are excluded from the measure unless they are defined as a "treatment episode," and without interruption of care (e.g., hospitalization).

Table 12b.
Comparison of Exclusion Criteria for Selected Mobility Quality Measures Based on NQF Documents*

Exclusion Criteria	Functional Change: Change in Mobility Score (NQF #2321)	CARE: Improvement in Mobility (NQF #2612)	Functional Status Change for Patients with Hip Impairments (NQF #0423)	Long-Term Care Hospital (LTCH) Functional Outcome Measure: Change in Mobility Among Patients Requiring Ventilator Support (NQF #2632)	Inpatient Rehabilitation Facility (IRF) Functional Outcome Measure: Change in Mobility Score for Medical Rehabilitation Patients (NQF #2634)	Inpatient Rehabilitation Facility (IRF) Functional Outcome Measure: Discharge Mobility Score for Medical Rehabilitation Patients (NQF #2636)
Younger patients/residents	✓ < 18 years old	✓ < 18 years old	✓ < 14 years old[2]	✓ < 21 years old	✓ < 21 years old	✓ < 21 years old
Non-Medicare patients/residents	—	—	—	—	✓	✓
Patients/residents who are independent with all mobility activities	—	—	—	✓	✓	—
Patients/residents not getting Occupational/ Physical Therapy	—	✓	—	—	—	—
Patients/residents in a coma/ persistent vegetative state	—	✓	—	✓	✓	✓
Patients/residents with complete tetraplegia (quadriplegia)	—	✓	—	✓	✓	✓
Patients/residents with locked-in syndrome	—	—	—	✓	✓	✓
Patients/residents with severe anoxic brain damage, cerebral edema, or compression of brain	—	—	—	—	✓	✓

(continued)

Table 12b. (continued)
Comparison of Exclusion Criteria for Selected Mobility Quality Measures Based on NQF Documents*

Exclusion Criteria	Functional Change: Change in Mobility Score (NQF #2321)	CARE: Improvement in Mobility (NQF #2612)	Functional Status Change for Patients with Hip Impairments (NQF #0423)	Long-Term Care Hospital (LTCH) Functional Outcome Measure: Change in Mobility Among Patients Requiring Ventilator Support (NQF #2632)	Inpatient Rehabilitation Facility (IRF) Functional Outcome Measure: Change in Mobility Score for Medical Rehabilitation Patients (NQF #2634)	Inpatient Rehabilitation Facility (IRF) Functional Outcome Measure: Discharge Mobility Score for Medical Rehabilitation Patients (NQF #2636)
Patients/residents on ventilator or respirator	—	✓	—	—	—	—
Patients/residents NOT on ventilator upon admission	—	—	—	✓	—	—
Patient/resident not being treated for hip impairment	—	—	✓	—	—	—
Patients/residents with progressive neurological conditions (e.g., amyotrophic lateral sclerosis)	—	—	—	✓	—	—
Admitted from the community, a psychiatric hospital, intellectual and developmental disabilities (ID/DD) facility, or hospice[3]	—	✓	—	—	—	—
Unexpectedly discharged to an acute care setting[4]	—	✓	✓	✓	✓	✓
Leave facility against medical advice	—	—	✓ treatment interrupted or discontinued by patient	✓	✓	✓

(continued)

Table 12b. (continued)
Comparison of Exclusion Criteria for Selected Mobility Quality Measures Based on NQF Documents*

Exclusion Criteria	Functional Change: Change in Mobility Score (NQF #2321)	CARE: Improvement in Mobility (NQF #2612)	Functional Status Change for Patients with Hip Impairments (NQF #0423)	Long-Term Care Hospital (LTCH) Functional Outcome Measure: Change in Mobility Among Patients Requiring Ventilator Support (NQF #2632)	Inpatient Rehabilitation Facility (IRF) Functional Outcome Measure: Change in Mobility Score for Medical Rehabilitation Patients (NQF #2634)	Inpatient Rehabilitation Facility (IRF) Functional Outcome Measure: Discharge Mobility Score for Medical Rehabilitation Patients (NQF #2636)
Discharged to another IRF	—	—	—	—	✓	✓
Transferred to another LTCH	—	—	—	✓	—	—
Hospice	—	✓ patient/resident is currently under hospice care	—	✓ discharged to hospice	✓ discharged to hospice	✓ discharged to hospice
Length of stay <3 days	—	—	—	✓	✓	✓
Intervention was interrupted or discontinued by physician, provider, or payer	—	—	✓	—	—	—
Patients/residents who died	✓	✓	unclear[1]	✓	✓	✓
Patients/residents who refuse to participate	—	—	✓	—	—	—
Patient/residents who cannot complete function questions due to blindness, illiteracy, severe mental incapacity, or language incompatibility	—	—	✓	—	—	—

(continued)

Table 12b.
Comparison of Exclusion Criteria for Selected Mobility Quality Measures Based on NQF Documents* (continued)

Exclusion Criteria	Functional Change: Change in Mobility Score (NQF #2321)	CARE: Improvement in Mobility (NQF #2612)	Functional Status Change for Patients with Hip Impairments (NQF #0423)	Long-Term Care Hospital (LTCH) Functional Outcome Measure: Change in Mobility Among Patients Requiring Ventilator Support (NQF #2632)	Inpatient Rehabilitation Facility (IRF) Functional Outcome Measure: Change in Mobility Score for Medical Rehabilitation Patients (NQF #2634)	Inpatient Rehabilitation Facility (IRF) Functional Outcome Measure: Discharge Mobility Score for Medical Rehabilitation Patients (NQF #2636)
Patients/residents with missing data	—	✓	✓	—	—	—

* Data reported in this table is based on our review of documents on the National Quality Forum website. We welcome any corrections.

[1] Unclear = publicly available documentation and measure specifications do not explicitly address this exclusion criteria

[2] NQF website states ages <14 are excluded, but additional documentation suggests that the age exclusion is <18 years old. The measure was developed for ages 18 and older, but was changed to ages 14 and older in recent years.

[3] Measure only includes residents admitted to the SNF from "02. Another NH or swing bed," "03 Acute Hospital," "05 IRF," or "09 LTCH."

[4] Medical emergency, and patient is discharged to a Short-Stay Acute Hospital, Critical Access Hospital, Inpatient Psychiatric Facility, or LTCH. For NQF # 0423, stays are excluded from the measure unless they are defined as a "treatment episode," and without interruption of care (e.g., hospitalization).

5.2 TEP Discussion

TEP members generally supported the inclusion and exclusion criteria of the existing IRF functional outcome measures for application of these quality measures in the SNF setting. TEP members encouraged the measure developer to continue striving for alignment across settings. The TEP expressed the importance of moving toward the vision of the IMPACT Act to standardize quality information across PAC providers.

Some TEP members recommended including Medicare Advantage residents in the measure population, and pointed out that not collecting information for Medicare Advantage residents would be a limitation.

Several TEP members did express their concern about adding additional items to the MDS and the associated burden that this would place on providers However, taking burden into consideration, the consensus was that including new items for these measures was important. Sections 5.2.1 through 5.2.4 summarize TEP member discussions related to the measure inclusions and exclusions that were proposed for possible use in the SNF setting.

5.2.1 Inclusion/Exclusion Criteria—Receiving Therapy

One of the TEP members mentioned that the AHCA quality measures **(Tables 12a and 12b**) excluded patients who were not receiving physical or occupational therapy, and asked whether this exclusion is appropriate for the SNF setting. This TEP member stated that approximately 10 percent of SNF residents are not receiving therapy, and that excluding these residents may make the measures more comparable to the IRF measures. This comment led to a discussion about SNF residents who are unable to tolerate therapy upon admission, and also about the possibility of starting and stopping therapy during a resident's stay.

RTI confirmed that patients with certain conditions, such as those with complete tetraplegia or those who are comatose, are excluded from the IRF measure because their functional recovery courses can be unpredictable. The TEP supported these exclusions. Several TEP members also brought up the issue of discontinuing therapy during the SNF stay. SNF residents can end therapy but are not discharged from the facility until a later date. The TEP discussed several clinical examples of this situation, and in the end agreed that an end to therapy during the patient/resident stay is not a reason for exclusion.

Several TEP members stressed that these residents may not have improvement goals, but that providers do not want to see a decline in functional ability during their stays. This tied back to the conversation regarding using physical or occupational therapy orders on admission as a marker for inclusion. It was stated that the entire stay, regardless of whether therapy is discontinued, should be included in the measure.

5.2.2 Inclusion/Exclusion Criteria—Maintenance or Improvement

Patients in IRF settings receive care focused on functional improvement, so the measures developed do not address patients with different functional goals. This was an important point of discussion at the SNF TEP meeting, which was identified several times by the TEP members, including during the conversation about inclusion and exclusion criteria. In general, TEP

members were concerned about whether the measure calculations should be different for patients and residents with different functional goals, that is, functional improvement or maintaining function. Part of the discussion was that the measure might affect quality measure scores of facilities that see many residents with a goal of maintenance of function. One TEP member stressed that there is now a clear distinction in SNFs among restorative and maintenance programs, and documentation exists on the MDS and in the medical record.

RTI acknowledged the TEP members' concerns. RTI noted that standardized data could be collected, and that separate quality measures could differ based on the goals of care.

5.2.3 Inclusion/Exclusion Criteria—Unexpected Discharges

The TEP members had several discussions related to different types of discharge locations and possible need for exclusions. RTI's inclusion and exclusion tables showed that, for some existing measures, patients and residents are excluded if they are discharged to hospice. TEP members stated that there are times when residents may not go directly to hospice although they have discharge planning related to hospice. It is not uncommon for a SNF resident to stay in the facility rather than going home or to a hospice facility to receive hospice care. RTI agreed this was a valid difference among settings, and planned to investigate further.

One TEP member was concerned about residents who are discharged against medical advice, and how the measure would address this type of discharge. RTI stated that these individuals are currently excluded from the measures because this type of discharge is considered an incomplete stay. The measure development team also stated that discharge to an acute care facility is considered an unexpected discharge and is excluded from these measures. The TEP agreed with this approach.

5.2.4 Inclusion/Exclusion Criteria—Other Exclusions and Comments

One TEP member asked whether residents who are depressed at admission should be included or excluded from the measure, since the resident may not want therapy or may actively refrain from participating in therapy activities. Another TEP member disagreed with excluding these residents and stated that when this happens providers try to keep them engaged in therapy as much as possible while actively trying to treat their depressive symptoms. Thus, the TEP suggested that if residents have therapy orders, they should not be excluded based on a diagnosis of depression.

Several TEP members asked RTI to review the length of stay exclusion criteria, in part to understand its relationship to alternative payment models. They suggested that payments can influence how and when residents are assessed, so it is important that both the length of stay exclusion and the timeframe for completing the admission assessment are clearly defined. RTI agreed to do further testing on length of stay.

SECTION 6
RISK ADJUSTMENT METHODOLOGY

6.1 Risk-Adjustment Methodology

In order to compare functional outcomes across different SNFs, we adjust for differences in the mix of residents or *case mixes* within those SNFs. Similar to our risk adjustment approach in the IRF setting, we would adjust for facility-level case mixes by calculating risk adjustment scores to measure how facilities are performing relative to how they would be expected to perform given their case mix. The model controls for patient/resident risk factors for function discharge scores and functional change, such as demographic and clinical characteristics. Using the risk adjustors for the IRF functional outcome measures and guidance from the TEP, we would specify the SNF model by using an ordinary-least squares regression, and evaluate the direction and magnitude of the coefficient, statistical significance, and expected clinical relationship with the self-care or mobility outcome. This process would estimate the relationship between patient/resident factors and the outcome, and retain risk adjusters if they were statistically significant, or were clinically important to function improvement. Our final model would use a generalized estimating equation (GEE) to account for clustering at the SNF level.

After RTI staff discussed the above strategy for developing a risk-adjustment model for use in the SNF setting, they presented two different approaches that are used in risk adjustment in quality measures and asked for the TEP's feedback.

6.1.1. Ratio Approach

To compare outcomes across facilities, we compare the summation of the observed function values (i.e., discharge score and function change) to the summation of the expected value, as calculated using GEE coefficients. RTI specified the IRF function quality measures use a ratio of observed and expected scores (O/E) at the IRF level. The O/E methodology for comparing quality outcomes is a commonly used approach for NQF-endorsed measures, and in the literature.[32,33] The individual expected and observed values are summed at the facility level to create a ratio of facility level observed over expected, and are then multiplied by the national average:

$$Q^{Ratio} = Avg^{National} * \left(\frac{Observed}{Expected}\right)$$

Although the ratio approach is commonly used in epidemiological studies, there are some limitations, and particularly when it is being used to measure a change. Change scores may not be systematically positive, and may be close to zero. When the expected value is small, the ratio

[32] Shahian, D. M., & Normand, S. L. T. (2008). Comparison of "risk-adjusted" hospital outcomes. *Circulation*, *117*(15), 1955-1963.

[33] Shahian, D. M., He, X., Jacobs, J. P., Rankin, J. S., Peterson, E. D., Welke, K. F., ... & O'Brien, S. M. (2013). Issues in quality measurement: target population, risk adjustment, and ratings. *The Annals of thoracic surgery*, *96*(2), 718-726.

is more volatile with small changes in the observed values (Ash et al, 2003).[34] As the denominator approaches zero, the ratio can increase greatly in magnitude, as the observed values become greater than the expected values. Also, if the average expected value is 0, then the ratio cannot be calculated. Additionally, the absolute difference between the observed and expected value can lead to outcomes that vary in magnitude, depending on the direction of the difference. That is, when the observed values are less than the expected values, the ratio will be condensed between 0.00 and 0.99. On the other hand, when the observed value is greater than the expected value, the ratio can vary between 1.00 and ∞. As such, an observed value that is greater than the expected value (e.g., 5 points greater) produces a greater change in the adjusted rate, compared to an observed value that is 5 points less than the expected value. Finally, if an average observed score is negative, it is feasible for a negative adjusted rate. This would occur when the expected or observed value is negative; one can envision this potentially occurring for a facility that serves only a small number of very sick residents.

6.1.2. Difference Approach

Another approach to risk adjustment is to calculate the observed minus expected outcomes (O – E). This "difference" based approach is used for measuring risk-adjusted quality outcomes for NQF measures and CMS programs, such as Health Home Compare. This method also relies on a regression-adjusted approach to calculating the expected individual outcome, by taking the difference between the observed values and the expected values (O – E), and further standardizing it by adding the difference to a national average:

$$(Q^{\text{difference}} = \text{Avg}^{\text{National}} + (O^{\text{Observed}} - E^{\text{Expected}})).$$

An advantage of this approach is that there is less volatility with small expected values, and differences between observed and expected values rarely result in exceedingly large rates. Additionally, the difference approach avoids the concern of average expected values equaling zero. Unlike the O/E approach, however, taking the difference between the observed and expected values can result in a loss of scale. For example, if the difference is +2 points, it is unclear what the magnitude of this change is and would depend on whether the expected value is large or small. An observed minus expected difference of 2 can have a different meaning depending on whether the expected value is 10 or 20 (a 20% change vs. a 10% change).

6.1.3. Comparison of the Two Approaches

There is not one O to E comparison approach that is better than the other.[23] Indeed, which approach is used should depend on the suspected underlying relationship between patient/resident risk and quality of care (i.e., additive or multiplicative). A ratio approach assumes that there is a multiplicative relationship between patient/resident risk factors and the outcome. By contrast, a difference approach assumes an additive relationship between

[34] Ash, A. S., Shwartz, M., Pekoz, E. A., & Iezzoni, L. I. (2003). Comparing outcomes across providers. *Risk adjustment for measuring health care outcomes, 3*, 297-333.

patient/resident-level risk factors and function outcomes. Muckemal et al.[35] argue that the choice between the two approaches can make a difference in ordering by rank the top 5% highest and lowest performers. The authors state that this difference can result because of the variance of individual patient risk across facilities. Essentially, the authors argue that it is important to understand the relationship (i.e., additive or multiplicative) between patient risk factors and the outcome. Functional form testing can help determine this relationship (e.g., statistical tests on squared terms, interactions, etc.). Additionally, comparing the rank order of facilities using the two different approaches in our sample is another way to ensure that the risk adjustment methodology is appropriate.

Using a subset of IRF facilities, **Table 13** illustrates both approaches and the variation in results of each approach. The first set of facilities perform at around the 50th percentile of performance in the IRF sample. Despite differences in the approach, what is clear in both approaches that a facility that has an observed outcome that is higher (in the case of a 'change' measure) than the expected outcome, is identified as 'better.' A lower-than-expected outcome always will translate into poorer performance, regardless of the method used. However, it appears that when comparing performance among high-performing facilities, the rankings change slightly. Facility C performs better than Facility D under the ratio approach. Under the difference approach, Facility D performs better than Facility C, but generally, the ranks appear similar.

Table 13.
Observed and Expected Scores for IRFs and Ratio and Difference Approach for Risk Adjustment

Facility	Observed	Expected	National Mean	Ratio Approach	Difference Approach
A	9.1	9.2	9.9	9.8	9.8
B	9.3	9.4	9.9	9.8	9.8
C	9.7	9.8	9.9	9.8	9.8
D	10.3	10.7	9.9	9.5	9.5
E	10.2	10.7	9.9	9.4	9.4
Scores for the Top 5 Performing Facilities					
A	16.8	11.2	9.9	14.9	15.5
B	13.3	10.1	9.9	13.0	13.1
C	10.6	8.3	9.9	12.6	12.2
D	12.3	9.8	9.9	12.4	12.4
E	9.9	8.3	9.9	11.8	11.5

[35] Mukamel, D. B., Dick, A., & Spector, W. D. (2000). Specification issues in measurement of quality of medical care using risk adjusted outcomes.*Journal of Economic and Social Measurement*, *26*(3, 4), 267-281.

6.2 TEP Discussion

After presenting these approaches to the TEP, RTI asked TEP members for reactions. TEP members did not indicate a clear preference for either approach. There was some interest around presenting a method that is understandable to the general public. It was also mentioned that hierarchical modeling might be an alternative regression method used to risk-adjust in order to compare outcomes across settings.[36]

To inform this decision, RTI plans to conduct testing of the risk-adjustment approaches and to construct a table similar to **Table 13** comparing the two approaches once regression analyses are completed on the SNF dataset.

[36] Ash, A. S., Shwartz, M., Pekoz, E. A., & Iezzoni, L. I. (2003). Comparing outcomes across providers. *Risk adjustment for measuring health care outcomes, 3*, 297-333.

SECTION 7
RISK ADJUSTMENT VARIABLES

After discussing the risk adjustment methodology, RTI presented results of analyses using the PAC PRD data relevant to risk adjustment.

Specifically, **Table 14** shows the average self-care function score at admission and discharge, and the average change in the score by potential risk factors. Key descriptive characteristics of the sample at admission to the SNF were as follows:

- Most beneficiaries were between the ages of 75 to 84 (40.4 percent).
- 17.3 and 24.9 percent of beneficiaries reported that they required "some help" in prior functioning for indoor ambulation and self-help, respectively.
- 19.2 and 13.6 percent of beneficiaries had moderately to severely impaired cognitive abilities.
- Approximately 20.9 percent of beneficiaries had bladder incontinence less than daily, daily, or always prior to admission.
- Approximately 45.7 percent of beneficiaries used a walker to help with mobility at admission.
- 15 percent of beneficiaries were wheelchair bound at admission.
- Overall, the average change in self-care function from admission to discharge was 8.04 points.
- The mean admission, discharge, and change in self-care scores varied by resident characteristic, as expected.

Table 15 illustrates sample characteristics for the mobility function measures. This sample is similar to **Table 14**, with some key differences:

- "Not applicable" was the code reported for prior functioning stair climbing for 22.5 percent of beneficiaries, possibly due to inability to obtain this information.
- 42.3 percent had a history of falls.
- Overall, the average change in mobility function from admission to discharge was 21 points.
- The mean admission, discharge, and change in self-care scores varied by resident characteristic, as expected.

RTI staff also reviewed the sample distribution across select HCCs for the self-care function measure:

- Beneficiaries with mononeuropathy or other neurological conditions/injuries and those with intestinal obstruction/perforation had the largest unadjusted change in self-care (8.7 and 8.3, respectively).

- Beneficiaries on dialysis and those with dementia with complications had the smallest unadjusted change in self-care (3.4 and 4.8 points, respectively).

- The mean admission, discharge, and change in mobility score varied by resident characteristic, as expected.

RTI staff reviewed the sample distribution across select hierarchical condition categories (HCC) for the mobility function measure. We selected these categories based on our previous analysis of functional self-care and mobility among beneficiaries discharged to IRFs. Key characteristics include the following:

- Among this select group of HCC scores, the most frequent disease category was coronary atherosclerosis or other chronic ischemic heart disease (21.6%), followed by diabetes without complication (21.2%)

- Only 0.7% of beneficiaries had lower limb/amputation complications, and 0.8% had hypertensive heart disease.

- Beneficiaries with HCC of hypertensive heart disease and mononeuropathy or other neurological conditions/injuries had the greatest unadjusted change in mobility at 23.8 and 23.5, respectively.

- Beneficiaries with dialysis and complications with lower limb amputations had the least unadjusted change in mobility score at 4.8 and 12.7 points, respectively.

- The mean admission, discharge, and change in mobility score varied by resident characteristic, as expected.

Table 14.
Mean Admission, Discharge, and Change in Self-Care by Skilled Nursing Facility Resident Characteristics: Fee-for-Service Medicare Beneficiaries, Post-Acute Care Payment Reform Demonstration (N = 2,922)

	Self-Care at Admission Mean	Self-Care at Discharge Mean	Change in Self-Care Mean	n	%
Total Average	24.51	32.55	8.04	2,922	—
Age					
<35	—	—	—	—	—
35-44	—	—	—	—	—
45-54	25.72	34.09	8.37	47	1.61
55-64	25.87	33.47	7.60	137	4.69
65-74	25.76	34.43	8.67	629	21.53
75-84	24.81	33.08	8.27	1179	40.35
85-90	23.12	31.03	7.91	649	22.21
90+	22.45	28.56	6.11	265	9.07
Surgical Diagnosis					
No	23.63	30.46	6.83	1491	51.03
Yes	25.42	34.73	9.31	1431	48.97
Prior Functioning: Indoor Ambulation					
Independent	25.72	34.54	8.82	2256	77.21
Dependent, Some Help	20.82	26.30	5.48	506	17.32
Not Applicable	17.47	22.14	4.67	70	2.4
Unknown/Missing	20.40	25.97	5.57	90	3.08
Prior Functioning: Self-Care					
Independent	26.06	35.08	9.02	2020	69.13
Some Help	21.92	28.19	6.27	727	24.88
Dependent	14.73	18.27	3.54	101	3.46
Unknown/Missing	21.04	26.08	5.04	73	—
Presence of Severe Pressure Ulcer					
No	24.60	32.71	8.11	2873	98.32
Yes	19.12	23.29	4.17	49	1.68
Stage 2 Pressure Ulcer					
No	24.75	32.8	8.05	2745	93.94
Yes	20.81	28.67	7.86	177	6.06

(continued)

Table 14. (continued)
Mean Admission, Discharge, and Change in Self-Care by Skilled Nursing Facility Resident Characteristics: Fee-for-Service Medicare Beneficiaries, Post-Acute Care Payment Reform Demonstration (N = 2,922)

	Self-Care at Admission Mean	Self-Care at Discharge Mean	Change in Self-Care Mean	n	%
Cognitive Abilities: BIMS score					
Intact or Borderline	26.01	34.77	8.76	1938	66.32
Moderately Impaired	23.84	31.50	7.66	562	19.23
Severely Impaired	18.63	23.88	5.25	397	13.59
Not Assessed	16.84	21.92	5.08	25	0.86
Moderate to Severe Communication Impairment					
No	25.22	33.56	8.34	2682	91.79
Yes	16.53	21.32	4.79	240	8.21
Bladder Incontinence					
Always Continent, Stress Incontinent, No Urine Output	26.27	34.87	8.60	2145	73.41
Less Than Daily, Daily, Always	19.64	25.87	6.23	612	20.94
Not applicable (NA)	19.75	27.15	7.40	165	5.65
Bowel Incontinent					
Always Continent, No bowel movement, or NA	25.71	34.31	8.60	2485	85.04
Always Incontinent	13.99	17.56	3.57	145	4.96
Less Than Daily or Daily	19.50	25.06	5.56	292	9.99
Prior Mobility Device/Aid: Walker					
No	25.32	33.61	8.29	1586	54.28
Yes	23.55	31.30	7.75	1336	45.72
Prior Mobility Device/Aid: Prosthetics					
No	24.52	32.55	8.03	2904	99.38
Yes	23.61	32.22	8.61	18	0.62
Prior Mobility Device/Aid: Wheelchair					
No	25.08	33.5	8.42	2484	85.01
Yes	21.25	27.19	5.94	438	14.99
Prior Mobility Device/Aid: Mechanical Lift					
No	24.60	32.68	8.08	2898	99.18
Yes	13.92	16.88	2.96	24	0.82

(continued)

Table 14. (continued)
Mean Admission, Discharge, and Change in Self-Care by Skilled Nursing Facility Resident Characteristics: Fee-for-Service Medicare Beneficiaries, Post-Acute Care Payment Reform Demonstration (N = 2,922)

	Self-Care at Admission Mean	Self-Care at Discharge Mean	Change in Self-Care Mean	n	%
Swallowing Ability: Modified Food					
No	24.76	32.86	8.10	2766	94.66
Yes	20.03	27.14	7.11	156	5.34
Swallowing Ability: Tube Feeding					
No	24.59	32.67	8.08	2898	99.18
Yes	14.25	18.29	4.04	24	0.82

Table 15.
Mean Admission, Discharge, and Change in Mobility Score by Skilled Nursing Facility Resident Characteristics (N = 2,938)

	Mobility at Admission Mean	Mobility at Discharge Mean	Change in Mobility Mean	n	%
Total Average	34.19	55.18	21	2938	—
Age					
<35	—	—	—	—	—
35-44	—	—	—	—	—
45-54	33.94	54.77	20.83	48	1.63
55-64	37.04	54.32	17.28	141	4.80
65-74	35.64	59.24	23.60	633	21.55
75-84	34.51	56.47	21.96	1185	40.33
85-90	32.64	52.27	19.63	649	22.09
90+	31.55	47.68	16.13	266	9.05
Surgical Diagnosis					
No	34.05	51.05	17.00	1499	51.02
Yes	34.33	59.49	25.16	1439	48.98

(continued)

Table 15. (continued)
Mean Admission, Discharge, and Change in Mobility Score by Skilled Nursing Facility Resident Characteristics (N = 2,938)

	Mobility at Admission Mean	Mobility at Discharge Mean	Change in Mobility Mean	n	%
Prior Functioning: Indoor Ambulation					
Independent	35.41	59.02	23.61	2272	77.33
Some Help	31.77	44.38	12.61	439	14.94
Dependent	26.09	39.07	12.98	68	2.31
Not Applicable	23.00	30.30	7.30	70	2.38
Unknown/Missing	29.73	42.38	12.65	89	3.03
Prior Functioning: Stairs					
Independent	36.30	61.95	25.66	1623	55.24
Some Help	34.01	50.42	16.41	384	13.07
Dependent	29.18	44.31	15.13	55	1.87
Not Applicable	30.59	45.96	15.37	660	22.46
Unknown/Missing	30.90	43.75	12.85	216	7.35
Prior Functioning: Functional Cognition					
Independent	35.75	59.89	24.14	1979	67.36
Some Help	31.36	46.36	15.00	606	20.63
Dependent	27.91	39.76	11.85	192	6.54
Not Applicable	37.57	50.77	13.20	47	1.60
Unknown/Missing	31.30	48.15	16.85	114	3.88
Presence of Severe Pressure Ulcer					
No	34.32	55.52	21.20	2888	98.30
Yes	26.54	35.60	9.06	50	1.70
Stage 2 Pressure Ulcer					
No	34.53	55.69	21.16	2761	93.98
Yes	28.84	47.27	18.43	177	6.02
Cognitive Abilities: BIMS score					
Intact or Borderline	35.67	59.02	23.35	1954	66.51
Moderately Impaired	33.47	52.57	19.1	564	19.20
Severely Impaired	28.46	41	12.54	396	13.48
Not Assessed	24.88	38.71	13.83	24	0.82

(continued)

Table 15. (continued)
Mean Admission, Discharge, and Change in Mobility Score by Skilled Nursing Facility Resident Characteristics (N = 2,938)

	Mobility at Admission Mean	Mobility at Discharge Mean	Change in Mobility Mean	n	%
Communication Impairment					
No Impairment	35.31	58.28	22.97	2319	78.93
Mild	32.52	47.98	15.46	377	12.83
Moderate to Severe	25.81	36.53	10.72	230	7.83
Unable to Assess	30.45	37.64	7.19	11	0.37
Bladder Incontinence					
Always Continent, Stress Incontinent, No Urine Output, or NA	35.70	58.44	22.74	2328	79.24
Less Than Daily, Daily, Always	28.40	42.77	14.37	610	20.76
Bowel Incontinent					
Always Continent, No bowel movement, or NA	35.60	58.40	22.80	2503	85.19
Always Incontinent	22.60	28.72	6.12	144	4.9
Less Than Daily or Daily	27.79	40.58	12.79	291	9.9
History of Falls					
No	35.80	57.44	21.64	1695	57.69
Yes	31.98	52.1	20.12	1243	42.31
Prior Mobility Device/Aid: Walker					
No	35.46	57.78	22.32	1599	54.42
Yes	32.67	52.08	19.41	1339	45.58
Prior Mobility Device/Aid: Prosthetics					
No	34.21	55.20	20.99	2920	99.39
Yes	30.39	53.33	22.94	18	0.61
Prior Mobility Device/Aid: Wheelchair					
No	35.08	57.41	22.33	2501	85.13
Yes	29.08	42.43	13.35	437	14.87
Prior Mobility Device/Aid: Mechanical Lift					
No	34.29	55.41	21.12	2914	99.18
Yes	21.29	27.46	6.17	24	0.82

(continued)

Table 15. (continued)
Mean Admission, Discharge, and Change in Mobility Score by Skilled Nursing Facility Resident Characteristics (N = 2,938)

	Mobility at Admission Mean	Mobility at Discharge Mean	Change in Mobility Mean	n	%
Usual Swallowing Ability: Tube Feeding					
No	34.25	55.34	21.09	2914	99.18
Yes	26.67	36.58	9.91	24	0.82
Major Treatments During Assessment Period: Total Parenteral Nutrition Recode					
No	34.19	55.19	21.00	2933	99.83
Yes	—	—	—	—	—

TEP members reviewed the risk adjustment variables that were applied to the existing NQF-endorsed self-care quality measures (**Table 16**) and mobility quality measures (**Table 17**). As with the exclusion criteria tables above, these tables were developed based on publicly available NQF documentation and measure specifications.

The TEP reviewed the tables and emphasized several additional factors that may influence functional ability in the SNF setting for which risk adjustment may be important. The measure developer appreciated their feedback and agreed to do additional testing on risk adjustment.

7.1 Summary of Recommended Additional Potential Risk Factors

- Residents with a maintenance plan of care
- Depression on admission
- Vision (legally blind is currently the only risk adjustor)
- Medications (pain killers, or medications that make residents drowsy, were given as an example)
- Additional cognitive function items other than the Brief Interview for Mental Status (BIMS) (executive function)
- Behavioral symptoms of psychosis (e.g., hallucinations, delusions) *to include in self-care*
- Prior hospital claims through the All-payer Diagnosis-related Group (to identify level 4)

- Counting the number of different body systems
- Prior intensive care unit (ICU) stays
- Post-trauma residents
- Treatments residents receive (e.g., continuous oxygen, central lines, dialysis)—consider that some of these are possibly better predictors than some diagnoses (treatment-oriented approach)
- Admitted from nursing facility, IRF, LTCH, home care, etc. ("where they are in their course")
- Multiple acute hospital stays before their SNF stay
- Expectation of being discharged to the community
- Device use/cane
- Pain levels (at admission and discharge)

Table 16.
Comparison of Risk Adjustment for Selected Self-Care Quality Measures Based on NQF Documents*

Risk Adjustment Model/Variables	Functional Change: Change in Self-Care Score (NQF #2286)[1]	CARE: Improvement in Self-Care (NQF #2613)	Functional Status Change for Patients with Shoulder Impairments (NQF #0426)	Inpatient Rehabilitation Facility (IRF) Functional Outcome Measure: Change in Self-Care Score for Medical Rehabilitation Patients (NQF #2633)	Inpatient Rehabilitation Facility (IRF) Functional Outcome Measure: Discharge Self-Care Score for Medical Rehabilitation Patients (NQF #2635)
Statistical Risk Model	The change score uses indirect standardization which weights national case-mix group (CMG)-specific values by facility-specific CMG proportions. CMG-adjustment derives the expected value based on the case mix and severity mix of each facility.	The change score was risk adjusted based on the following formula: Risk Adjusted Score for individual = (National Average Change Score – Predicted Change Score) + Actual Change Score. The Predicted Change Score is calculated based on logistic regression that applies the risk adjustors.	The change in functional status assessed using FOTO (shoulder) Patient Reported Outcome Measure (PROM) is risk adjusted using a multivariate linear regression model that includes the independent variables listed below.	The final selection of risk adjustors was determined using ordinary least squares multiple linear regression. Then a generalized linear model was used to GEE as the estimation method to account for clustering of data within each IRF.	The final selection of risk adjustors was determined using ordinary least squares multiple linear regression. Then a generalized linear model was used to GEE as the estimation method to account for clustering of data within each IRF.
Risk Adjustment Variables					
Age Categories	—	✓ ≥85	✓ Continuous	✓ <35, 35-44, 45-54, 55-64, 75-84 , 85-90, >90	✓ <35, 35-44, 45-54, 55-64, 75-84, 85-90, >90

(continued)

Table 16. (continued)
Comparison of Risk Adjustment for Selected Self-Care Quality Measures Based on NQF Documents*

Risk Adjustment Model/Variables	Functional Change: Change in Self-Care Score (NQF #2286)[1]	CARE: Improvement in Self-Care (NQF #2613)	Functional Status Change for Patients with Shoulder Impairments (NQF #0426)	Inpatient Rehabilitation Facility (IRF) Functional Outcome Measure: Change in Self-Care Score for Medical Rehabilitation Patients (NQF #2633)	Inpatient Rehabilitation Facility (IRF) Functional Outcome Measure: Discharge Self-Care Score for Medical Rehabilitation Patients (NQF #2635)
Sex			✓		
Payer Source	—		✓	—	—
Admitted From a SNF	—	✓	—	—	—
Admitted From a Psychiatric Hospital	—	✓	—	—	—
Functional Status Risk Adjustors					
Prior Function	—	—	—	✓ Indoor ambulation and self-care	✓ Indoor ambulation and self-care
Prior Mobility Devices	—	—	—	✓ Wheelchair/scooter, mechanical lift, orthotics/prosthetics, walker	✓ Wheelchair/scooter, mechanical lift, orthotics/prosthetics, walker
Admission Self-Care Score	—	—	✓ Intake functional status (onset)	✓ Continuous and squared forms	✓ Continuous and squared forms
Interaction of Admission Self-Care Score and Primary Diagnosis Group	—	—	—	✓	✓

(continued)

Table 16. (continued)
Comparison of Risk Adjustment for Selected Self-Care Quality Measures Based on NQF Documents*

Risk Adjustment Model/Variables	Functional Change: Change in Self-Care Score (NQF #2286)[1]	CARE: Improvement in Self-Care (NQF #2613)	Functional Status Change for Patients with Shoulder Impairments (NQF #0426)	Inpatient Rehabilitation Facility (IRF) Functional Outcome Measure: Change in Self-Care Score for Medical Rehabilitation Patients (NQF #2633)	Inpatient Rehabilitation Facility (IRF) Functional Outcome Measure: Discharge Self-Care Score for Medical Rehabilitation Patients (NQF #2635)
Behavioral, Mood, and Cognitive Risk Adjustors					
Behavioral Symptoms of Psychosis (e.g., hallucinations, delusions)	—	✓	—	—	—
Patient/Resident Mood (e.g., Resident Mood Interview or Staff Assessment of Resident Mood ≥10)	—	✓	—	—	—
Communication Impairment	—	—	—	✓ Expression and comprehension: moderate and severe impairment	✓ Expression and comprehension: moderate and severe impairment
Cognitive Impairment	—	✓ >12 on BIMS score[2] or impaired decision making	—	✓ >12 on BIMS score[2] or Staff Assessment for Mental Status	✓ >12 on BIMS score[2] or Staff Assessment for Mental Status
Fear-Avoidance Beliefs of Physical Activities	—	—	✓	—	—

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Table 16. (continued)
Comparison of Risk Adjustment for Selected Self-Care Quality Measures Based on NQF Documents*

Risk Adjustment Model/Variables	Functional Change: Change in Self-Care Score (NQF #2286)[1]	CARE: Improvement in Self-Care (NQF #2613)	Functional Status Change for Patients with Shoulder Impairments (NQF #0426)	Inpatient Rehabilitation Facility (IRF) Functional Outcome Measure: Change in Self-Care Score for Medical Rehabilitation Patients (NQF #2633)	Inpatient Rehabilitation Facility (IRF) Functional Outcome Measure: Discharge Self-Care Score for Medical Rehabilitation Patients (NQF #2635)
Primary Conditions and Comorbidities					
Number of Functional Comorbidities	—	—	✓	—	—
Non-Traumatic Brain Dysfunction	—	—	—	✓	✓
Traumatic Brain Dysfunction	—	—	—	✓	✓
Non-Traumatic Spinal Cord Dysfunction	—	—	—	✓	✓
Traumatic Spinal Cord Dysfunction	—	—	—	✓	✓
Progressive Neurological Condition	—	—	—	✓	✓
Other Neurological Conditions	—	—	—	✓	✓
Fractures and Other Multiple Trauma	—	—	—	✓	✓
Debility, Cardiorespiratory Conditions	—	—	—	✓	✓
Medically Complex Conditions	—	—	—	✓	✓
Hip and Knee Replacements	—	—	—	✓	✓
Other Orthopedic Conditions	—	—	—	✓	✓

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Table 16. (continued)
Comparison of Risk Adjustment for Selected Self-Care Quality Measures Based on NQF Documents*

Risk Adjustment Model/Variables	Functional Change: Change in Self-Care Score (NQF #2286)[1]	CARE: Improvement in Self-Care (NQF #2613)	Functional Status Change for Patients with Shoulder Impairments (NQF #0426)	Inpatient Rehabilitation Facility (IRF) Functional Outcome Measure: Change in Self-Care Score for Medical Rehabilitation Patients (NQF #2633)	Inpatient Rehabilitation Facility (IRF) Functional Outcome Measure: Discharge Self-Care Score for Medical Rehabilitation Patients (NQF #2635)
Primary Conditions and Comorbidities (continued)					
Metastatic Cancer and Acute Leukemia	—	—	—	✓	✓
Chronic Ulcer of the Skin (not including pressure ulcer)	—	—	—	✓	✓
Presence of Pressure Ulcer	—	✓ Unhealed at Stage 1 or higher	—	✓ At Stage 2 or higher; includes unstageable	✓ At Stage 2 or higher; includes unstageable
Infection of the Foot, Open Lesions on Foot, or Diabetic Foot Ulcers	—	✓	—	—	—
Central Nervous System (CNS) Infections: Bacterial, Fungal, and Parasitic; Viral and Late Effects CNS Infections	—	—	—	✓	✓
Septicemia, Sepsis, and Systematic Inflammatory Response Syndrome Shock	—	—	—	✓	✓
Diabetes[3]	—	—	—	✓	✓
Other Significant Endocrine and Metabolic Disorders	—	—	—	✓	✓

(continued)

Table 16. (continued)
Comparison of Risk Adjustment for Selected Self-Care Quality Measures Based on NQF Documents*

Risk Adjustment Model/Variables	Functional Change: Change in Self-Care Score (NQF #2286)[1]	CARE: Improvement in Self-Care (NQF #2613)	Functional Status Change for Patients with Shoulder Impairments (NQF #0426)	Inpatient Rehabilitation Facility (IRF) Functional Outcome Measure: Change in Self-Care Score for Medical Rehabilitation Patients (NQF #2633)	Inpatient Rehabilitation Facility (IRF) Functional Outcome Measure: Discharge Self-Care Score for Medical Rehabilitation Patients (NQF #2635)
Primary Conditions and Comorbidities (continued)					
Amputations[4]	—	—	—	✓	✓
Stroke	—	—	—	✓	✓
Dementia, With and Without Complications	—	—	—	✓	✓
Delirium and Encephalopathy	—	—	—	✓	✓
Hemiplegia/Other Late Effects of Cerebrovascular Accident; Hemiplegia/Hemiparesis	—	—	—	✓	✓
Paraplegia	—	—	—	✓	✓
Tetraplegia (excluding complete tetraplegia)	—	—	—	✓	✓
Multiple Sclerosis	—	—	—	✓	✓
Mononeuropathy, Other Neurological Conditions/Injuries	—	—	—	✓	✓
Parkinson's and Huntington's Disease	—	—	—	✓	✓
Bladder Incontinence	—	—	—	✓	✓
Bowel Incontinence	—	—	—	✓	✓

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Table 16. (continued)
Comparison of Risk Adjustment for Selected Self-Care Quality Measures Based on NQF Documents*

Risk Adjustment Model/Variables	Functional Change: Change in Self-Care Score (NQF #2286)[1]	CARE: Improvement in Self-Care (NQF #2613)	Functional Status Change for Patients with Shoulder Impairments (NQF #0426)	Inpatient Rehabilitation Facility (IRF) Functional Outcome Measure: Change in Self-Care Score for Medical Rehabilitation Patients (NQF #2633)	Inpatient Rehabilitation Facility (IRF) Functional Outcome Measure: Discharge Self-Care Score for Medical Rehabilitation Patients (NQF #2635)
Primary Conditions and Comorbidities (continued)					
Intestinal Obstruction/Perforation	—	—	—	✓	✓
Urinary Obstruction and Retention	—	—	—	✓	✓
Angina Pectoris	—	—	—	✓	✓
Coronary Atherosclerosis/Other Chronic Ischemic Heart Disease	—	—	—	✓	✓
Hypertensive Heart Disease	—	—	—	✓	✓
Kidney Transplant Status	—	—	—	✓	✓
Special Treatments and Procedures Risk Adjustors					
Dialysis and Chronic Kidney Disease	—	✓ Dialysis while a resident only	—	✓ Stage 5	✓ Stage 5
Catheterization/Ostomy	—	✓	—	—	—
Receiving Oxygen Therapy	—	✓	—	—	—

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Table 16. (continued)
Comparison of Risk Adjustment for Selected Self-Care Quality Measures Based on NQF Documents*

Risk Adjustment Model/Variables	Functional Change: Change in Self-Care Score (NQF #2286)[1]	CARE: Improvement in Self-Care (NQF #2613)	Functional Status Change for Patients with Shoulder Impairments (NQF #0426)	Inpatient Rehabilitation Facility (IRF) Functional Outcome Measure: Change in Self-Care Score for Medical Rehabilitation Patients (NQF #2633)	Inpatient Rehabilitation Facility (IRF) Functional Outcome Measure: Discharge Self-Care Score for Medical Rehabilitation Patients (NQF #2635)
Special Treatments and Procedures Risk Adjustors (continued)					
Parenteral/IV Feeding or Feeding Tube	—	✓	—	✓	✓
Modified Food Consistency	—	—	—	✓	✓
Tracheostomy Care or Suctioning	—	✓	—	—	—
Prior Medical Condition Risk Adjustors					
Prior Surgery/Surgical History	—	—	✓ Surgical shoulder history	✓ Surgical: prior acute or LTCH diagnosis	✓ Surgical: prior acute or LTCH diagnosis

* Data reported in this table is based on our review of documents on the National Quality Forum website. We welcome any corrections.

[1] NQF #2286 risk adjustment is based on CMGs as used by the IRF prospective payment system. A CMG is assigned based on admission motor FIM® scores, the rehabilitation impairment category. FIM® cognitive scores and age are used to assign patients into some, but not all CMGs. Five additional CMGs are used to assign patients with special cases: those who died or had a length of stay >3 days.

[2] BIMS Scores of >12 are indicative of a moderate to severe cognitive impairment.

[3] Diabetes includes Diabetes with Chronic Complications; Diabetes without Complications; and Type I Diabetes Mellitus unless specified.

[4] Amputations includes Traumatic Amputations and Complications; Amputation Status, Lower Limb/Amputation Complications; Amputation Status, Upper Limb.

Table 17.
Comparison of Risk Adjustment for Selected Mobility Quality Measures Based on NQF Documents*

Risk Adjustment Model/Variables	Functional Change: Change in Mobility Score (NQF #2321)[1]	CARE: Improvement in Mobility (NQF #2612)	Functional Status Change for Patients with Hip Impairments (NQF #0423)	Long-Term Care Hospital (LTCH) Functional Outcome Measure: Change in Mobility Among Patients Requiring Ventilator Support (NQF #2632)	Inpatient Rehabilitation Facility (IRF) Functional Outcome Measure: Change in Mobility Score for Medical Rehabilitation Patients (NQF #2634)	Inpatient Rehabilitation Facility (IRF) Functional Outcome Measure: Discharge Mobility Score for Medical Rehabilitation Patients (NQF #2636)
Statistical Risk Model	The change score uses indirect standardization which weights national CMG-specific values by facility-specific CMG proportions. CMG-adjustment derives the expected value based on the case mix and severity mix of each facility.	The change score was risk adjusted based on the following formula: Risk Adjusted Score for individual = (National Average Change Score – Predicted Change Score) + Actual Change Score. The Predicted Change Score is calculated based on logistic regression that applies the risk adjustors.	The change in functional status assessed using FOTO (hip) PROM is risk adjusted using a multivariate linear regression model that includes the independent variables listed below.	Ordinary least squares multiple linear regression was used to determine the risk adjustors, and then we ran a generalized linear model using GEE as the estimation method to account for clustering of data within each LTCH.	The final selection of risk adjustors was determined using ordinary least squares multiple linear regression. Then a generalized linear model was used to GEE as the estimation method to account for clustering of data within each IRF.	The final selection of risk adjustors was determined using ordinary least squares multiple linear regression. Then a generalized linear model was used to GEE as the estimation method to account for clustering of data within each IRF.

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Table 17. (continued)
Comparison of Risk Adjustment for Selected Mobility Quality Measures Based on NQF Documents*

Risk Adjustment Model/Variables	Functional Change: Change in Mobility Score (NQF #2321)[1]	CARE: Improvement in Mobility (NQF #2612)	0423: Functional Status Change for Patients with Hip Impairments (NQF #0423)	Long-Term Care Hospital (LTCH) Functional Outcome Measure: Change in Mobility Among Patients Requiring Ventilator Support (NQF #2632)	Inpatient Rehabilitation Facility (IRF) Functional Outcome Measure: Change in Mobility Score for Medical Rehabilitation Patients (NQF #2634)	Inpatient Rehabilitation Facility (IRF) Functional Outcome Measure: Discharge Mobility Score for Medical Rehabilitation Patients (NQF #2636)
Risk Adjustment Variables						
Age Categories	—	✓ ≥85	✓ continuous	✓ <55, 55-64, 75-84, ≥85	✓ <35, 35-44, 45-54, 55-64, 65-74, 75-84, 85-90, >90	✓ <35, 35-44, 45-54, 55-64, 65-74, 75-84, 85-90, >90
Sex	—	—	✓	—	—	—
Legally Blind	—	—		—	✓	✓
Payer Source	—	—	✓	—	—	—
Admitted From a SNF	—	✓	—	—	—	—
Admitted From a Psychiatric Hospital	—	✓	—	—	—	—
Risk Adjustors						
Prior Function	—	—	—	✓ Indoor ambulation	✓ Indoor ambulation, stairs, and functional cognition	✓ Indoor ambulation, stairs, and functional cognition

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Table 17. (continued)
Comparison of Risk Adjustment for Selected Mobility Quality Measures Based on NQF Documents*

Risk Adjustment Model/Variables	Functional Change: Change in Mobility Score (NQF #2321)[1]	CARE: Improvement in Mobility (NQF #2612)	0423: Functional Status Change for Patients with Hip Impairments (NQF #0423)	Long-Term Care Hospital (LTCH) Functional Outcome Measure: Change in Mobility Among Patients Requiring Ventilator Support (NQF #2632)	Inpatient Rehabilitation Facility (IRF) Functional Outcome Measure: Change in Mobility Score for Medical Rehabilitation Patients (NQF #2634)	Inpatient Rehabilitation Facility (IRF) Functional Outcome Measure: Discharge Mobility Score for Medical Rehabilitation Patients (NQF #2636)
Risk Adjustors (continued)						
Prior Mobility Devices	—	—	—	✓ Wheelchair/scooter, mechanical lift	✓ Wheelchair/scooter, mechanical lift, orthotics/ prosthetics, walker	✓ Wheelchair/scooter, mechanical lift, orthotics/ prosthetics, walker
Admission Mobility Score	—	—	✓ Intake functional status (onset)	—	✓ Continuous and squared forms	✓ Continuous and squared forms
Interaction of Admission Mobility Score and Primary Diagnosis Group	—	—	—	—	✓	✓
Symptom Acuity			✓			
Behavioral, Mood, and Cognitive Risk Adjustors						
Behavioral Symptoms of Psychosis (e.g., hallucinations, delusions)	—	✓	—	—	✓ Reactive and unspecified psychosis	✓ Reactive and unspecified psychosis

(continued)

Table 17. (continued)
Comparison of Risk Adjustment for Selected Mobility Quality Measures Based on NQF Documents*

Risk Adjustment Model/Variables	Functional Change: Change in Mobility Score (NQF #2321)[1]	CARE: Improvement in Mobility (NQF #2612)	0423: Functional Status Change for Patients with Hip Impairments (NQF #0423)	Long-Term Care Hospital (LTCH) Functional Outcome Measure: Change in Mobility Among Patients Requiring Ventilator Support (NQF #2632)	Inpatient Rehabilitation Facility (IRF) Functional Outcome Measure: Change in Mobility Score for Medical Rehabilitation Patients (NQF #2634)	Inpatient Rehabilitation Facility (IRF) Functional Outcome Measure: Discharge Mobility Score for Medical Rehabilitation Patients (NQF #2636)
Behavioral, Mood, and Cognitive Risk Adjustors						
Patient/Resident Mood (e.g., Resident Mood Interview or Staff Assessment of Resident Mood ≥10)	—	✓	—	—	—	—
Communication Impairment	—	—	—	✓ Expression and comprehension: moderate and severe impairment	✓ Expression and comprehension: mild, moderate, and severe impairment	✓ Expression and comprehension: mild, moderate, and severe impairment
Cognitive Impairment	—	✓ >12 on BIMS score[2] or impaired decision making	—	—	✓ >12 on BIMS score[2] or Staff Assessment for Mental Status	✓ >12 on BIMS score[2] or Staff Assessment for Mental Status
Fear-Avoidance Beliefs of Physical Activity	—	—	✓	—	—	—

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Table 17. (continued)
Comparison of Risk Adjustment for Selected Mobility Quality Measures Based on NQF Documents*

Risk Adjustment Model/Variables	Functional Change: Change in Mobility Score (NQF #2321)[1]	CARE: Improvement in Mobility (NQF #2612)	0423: Functional Status Change for Patients with Hip Impairments (NQF #0423)	Long-Term Care Hospital (LTCH) Functional Outcome Measure: Change in Mobility Among Patients Requiring Ventilator Support (NQF #2632)	Inpatient Rehabilitation Facility (IRF) Functional Outcome Measure: Change in Mobility Score for Medical Rehabilitation Patients (NQF #2634)	Inpatient Rehabilitation Facility (IRF) Functional Outcome Measure: Discharge Mobility Score for Medical Rehabilitation Patients (NQF #2636)
/Behavioral, Mood, and Cognitive Risk Adjustors (continued)						
Mental Health Disorders	—	—		—	✓ Schizophrenia, Major Depressive Disorder, Bipolar Disorder, Paranoid Disorders, Personality Disorders	✓ Schizophrenia, Major Depressive Disorder, Bipolar Disorder, Paranoid Disorders, Personality Disorders
Primary Conditions and Comorbidities						
Number of Functional Comorbidities	—	—	—	—	—	—
Chronic Respiratory Condition: Chronic Obstructive Pulmonary Disease and Fibrosis of Lung and Other Lung Disorders	—	—	—	✓	—	—
Acute and Chronic Respiratory Conditions[3]	—	—	—	✓		
Angina Pectoris	—	—	—	—	✓	✓

(continued)

Table 17. (continued)
Comparison of Risk Adjustment for Selected Mobility Quality Measures Based on NQF Documents*

Risk Adjustment Model/Variables	Functional Change: Change in Mobility Score (NQF #2321)[1]	CARE: Improvement in Mobility (NQF #2612)	0423: Functional Status Change for Patients with Hip Impairments (NQF #0423)	Long-Term Care Hospital (LTCH) Functional Outcome Measure: Change in Mobility Among Patients Requiring Ventilator Support (NQF #2632)	Inpatient Rehabilitation Facility (IRF) Functional Outcome Measure: Change in Mobility Score for Medical Rehabilitation Patients (NQF #2634)	Inpatient Rehabilitation Facility (IRF) Functional Outcome Measure: Discharge Mobility Score for Medical Rehabilitation Patients (NQF #2636)
Primary Conditions and Comorbidities (continued)						
Hypertensive Heart Disease	—	—	—	—	✓	✓
Coronary Atherosclerosis/Other Chronic Ischemic Heart Disease	—	—	—	—	✓	✓
Congestive Heart Failure/Chronic Cardiac Condition	—	—	—	✓	—	—
Aspiration, Bacterial, or Other Pneumonias	—	—	—	—	✓	✓
Non-Traumatic Brain Dysfunction	—	—	—	—	✓	✓
Traumatic Brain Dysfunction	—	—	—	—	✓	✓
Non-Traumatic Spinal Cord Dysfunction	—	—	—	—	✓	✓
Traumatic Spinal Cord Dysfunction	—	—	—	—	✓	✓

(continued)

Table 17. (continued)
Comparison of Risk Adjustment for Selected Mobility Quality Measures Based on NQF Documents*

Risk Adjustment Model/Variables	Functional Change: Change in Mobility Score (NQF #2321)[1]	CARE: Improvement in Mobility (NQF #2612)	0423: Functional Status Change for Patients with Hip Impairments (NQF #0423)	Long-Term Care Hospital (LTCH) Functional Outcome Measure: Change in Mobility Among Patients Requiring Ventilator Support (NQF #2632)	Inpatient Rehabilitation Facility (IRF) Functional Outcome Measure: Change in Mobility Score for Medical Rehabilitation Patients (NQF #2634)	Inpatient Rehabilitation Facility (IRF) Functional Outcome Measure: Discharge Mobility Score for Medical Rehabilitation Patients (NQF #2636)
Primary Conditions and Comorbidities (continued)						
Progressive Neurological Condition	—	—	—	—	✓	✓
Other Neurological Conditions	—	—	—	—	✓	✓
Metastatic Cancer and Acute Leukemia	—	—	—	✓	✓	✓
Lung and Other Severe Cancers	—	—	—	✓	✓	✓
Lymphoma and Other Cancers	—	—	—	✓	✓	✓
Other Major Cancers: Colorectal, Bladder, and Other Cancers	—	—	—	✓	✓	✓
Other Respiratory and Heart Neoplasms, Other Digestive and Urinary Neoplasms, Other Neoplasms	—	—	—	—	✓	✓

(continued)

Table 17. (continued)
Comparison of Risk Adjustment for Selected Mobility Quality Measures Based on NQF Documents*

Risk Adjustment Model/Variables	Functional Change: Change in Mobility Score (NQF #2321)[1]	CARE: Improvement in Mobility (NQF #2612)	0423: Functional Status Change for Patients with Hip Impairments (NQF #0423)	Long-Term Care Hospital (LTCH) Functional Outcome Measure: Change in Mobility Among Patients Requiring Ventilator Support (NQF #2632)	Inpatient Rehabilitation Facility (IRF) Functional Outcome Measure: Change in Mobility Score for Medical Rehabilitation Patients (NQF #2634)	Inpatient Rehabilitation Facility (IRF) Functional Outcome Measure: Discharge Mobility Score for Medical Rehabilitation Patients (NQF #2636)
Primary Conditions and Comorbidities (continued)						
Chronic Ulcer of the Skin (not including pressure ulcers)	—	—	—	—	✓	✓
Atherosclerosis of the Extremities With Ulceration or Gangrene	—	—	—	—	✓	✓
Presence of Pressure Ulcer	—	✓ Unhealed at Stage 1 or higher	—	✓ At Stage 3 or higher; includes unstageable	✓ At Stage 2 or higher; includes unstageable	✓ At Stage 2 or higher; includes unstageable
Infection of the Foot, Open Lesions on Foot, or Diabetic Foot Ulcers	—	✓	—	—	—	—
Acute Renal Failure	—	—	—	✓	—	—
Central Nervous System Infections: Bacterial, Fungal, and Parasitic, and Viral and Late Effects CNS Infections	—	—	—	✓	✓	✓

(continued)

Table 17. (continued)
Comparison of Risk Adjustment for Selected Mobility Quality Measures Based on NQF Documents*

Risk Adjustment Model/Variables	Functional Change: Change in Mobility Score (NQF #2321)[1]	CARE: Improvement in Mobility (NQF #2612)	0423: Functional Status Change for Patients with Hip Impairments (NQF #0423)	Long-Term Care Hospital (LTCH) Functional Outcome Measure: Change in Mobility Among Patients Requiring Ventilator Support (NQF #2632)	Inpatient Rehabilitation Facility (IRF) Functional Outcome Measure: Change in Mobility Score for Medical Rehabilitation Patients (NQF #2634)	Inpatient Rehabilitation Facility (IRF) Functional Outcome Measure: Discharge Mobility Score for Medical Rehabilitation Patients (NQF #2636)
Primary Conditions and Comorbidities (continued)						
Septicemia, Sepsis, and Systematic Inflammatory Response Syndrome Shock	—	—	—	✓	✓	✓
Bone/Joint/Muscle Infections/Necrosis				✓	—	—
Other Infectious Diseases	—	—	—	—	✓	✓
Diabetes With Chronic Complications, Diabetes Without Complications	—	?	—	✓	✓ Includes Type I Diabetes Mellitus	✓ Includes Type I Diabetes Mellitus
Amputation[4]	—	—	—	✓	✓	✓
Stroke[5]	—	—	—	✓	✓	✓
Dementia, With and Without Complications	—	—	—	✓	✓	✓
Delirium and Encephalopathy	—	—	—	—	✓	✓
Severe Hematological Disorders	—	—	—	—	✓	✓

(continued)

Table 17. (continued)
Comparison of Risk Adjustment for Selected Mobility Quality Measures Based on NQF Documents*

Risk Adjustment Model/Variables	Functional Change: Change in Mobility Score (NQF #2321)[1]	CARE: Improvement in Mobility (NQF #2612)	0423: Functional Status Change for Patients with Hip Impairments (NQF #0423)	Long-Term Care Hospital (LTCH) Functional Outcome Measure: Change in Mobility Among Patients Requiring Ventilator Support (NQF #2632)	Inpatient Rehabilitation Facility (IRF) Functional Outcome Measure: Change in Mobility Score for Medical Rehabilitation Patients (NQF #2634)	Inpatient Rehabilitation Facility (IRF) Functional Outcome Measure: Discharge Mobility Score for Medical Rehabilitation Patients (NQF #2636)
Primary Conditions and Comorbidities (continued)						
Hemiplegia/Other Late Effects of Cerebrovascular Accident, Hemiplegia/Hemiparesis	—	—	—	—	✓	✓
Paraplegia	—	—	—	✓	✓	✓
Tetraplegia (excluding complete tetraplegia)	—	—	—	✓	✓	✓
Other Spinal Cord Disorder/Injury, Including Quadriplegia	—	—	—	✓	—	—
Multiple Sclerosis	—	—	—	—	✓	✓
Mononeuropathy, Other Neurological Conditions/Injuries	—	—	—	—	✓	✓
Protein-Calorie Malnutrition	—	—	—	✓	—	—
Total Parenteral Nutrition	—	—	—	✓	✓	✓
Hip Fracture/Dislocation	—	—	—	—	✓	✓

(continued)

Table 17. (continued)
Comparison of Risk Adjustment for Selected Mobility Quality Measures Based on NQF Documents*

Risk Adjustment Model/Variables	Functional Change: Change in Mobility Score (NQF #2321)[1]	CARE: Improvement in Mobility (NQF #2612)	0423: Functional Status Change for Patients with Hip Impairments (NQF #0423)	Long-Term Care Hospital (LTCH) Functional Outcome Measure: Change in Mobility Among Patients Requiring Ventilator Support (NQF #2632)	Inpatient Rehabilitation Facility (IRF) Functional Outcome Measure: Change in Mobility Score for Medical Rehabilitation Patients (NQF #2634)	Inpatient Rehabilitation Facility (IRF) Functional Outcome Measure: Discharge Mobility Score for Medical Rehabilitation Patients (NQF #2636)
Primary Conditions and Comorbidities (continued)						
Major Fracture (excluding skull, vertebrae, or hip)	—	—	—	—	✓	✓
Bladder Incontinence	—	—	—	—	✓	✓
Bowel Incontinence	—	—	—	—	✓	✓
Fractures and Other Multiple Trauma	—	—	—	—	✓	✓
Debility, Cardiorespiratory Conditions	—	—	—	—	✓	✓
Medically Complex Conditions	—	—	—	—	✓	✓
Hip and Knee Replacements	—	—	—	—	✓	✓
Other Orthopedic Conditions	—	—	—	—	✓	✓
Transplant Status (e.g., kidney transplant, major organ transplant or replacement, other organ transplant status)	—	—	—	—	✓	✓

(continued)

Table 17. (continued)
Comparison of Risk Adjustment for Selected Mobility Quality Measures Based on NQF Documents*

Risk Adjustment Model/Variables	Functional Change: Change in Mobility Score (NQF #2321)[1]	CARE: Improvement in Mobility (NQF #2612)	0423: Functional Status Change for Patients with Hip Impairments (NQF #0423)	Long-Term Care Hospital (LTCH) Functional Outcome Measure: Change in Mobility Among Patients Requiring Ventilator Support (NQF #2632)	Inpatient Rehabilitation Facility (IRF) Functional Outcome Measure: Change in Mobility Score for Medical Rehabilitation Patients (NQF #2634)	Inpatient Rehabilitation Facility (IRF) Functional Outcome Measure: Discharge Mobility Score for Medical Rehabilitation Patients (NQF #2636)
Special Treatments and Procedures						
Dialysis and Chronic Kidney Disease	—	✓ Dialysis while a resident only	—	✓ Stage 5	✓ Stage 5	✓ Stage 5
Chronic Kidney Disease: Stages 1—4 Unspecified	—		—	—	✓	✓
Catheterization/Ostomy	—	✓	—	—	—	—
Receiving Oxygen Therapy	—	✓	—	—	—	—
Parenteral/IV Feeding or Feeding Tube	—	✓	—	—	✓	✓
Tracheostomy Care or Suctioning	—	✓	—	—	—	—

(continued)

Table 17. (continued)
Comparison of Risk Adjustment for Selected Mobility Quality Measures Based on NQF Documents*

Risk Adjustment Model/Variables	Functional Change: Change in Mobility Score (NQF #2321)[1]	CARE: Improvement in Mobility (NQF #2612)	0423: Functional Status Change for Patients with Hip Impairments (NQF #0423)	Long-Term Care Hospital (LTCH) Functional Outcome Measure: Change in Mobility Among Patients Requiring Ventilator Support (NQF #2632)	Inpatient Rehabilitation Facility (IRF) Functional Outcome Measure: Change in Mobility Score for Medical Rehabilitation Patients (NQF #2634)	Inpatient Rehabilitation Facility (IRF) Functional Outcome Measure: Discharge Mobility Score for Medical Rehabilitation Patients (NQF #2636)
Prior Medical Condition						
History of Falls in the Past Year	—	—	—	—	✓	✓
Prior Surgery/Surgical History	—	—	✓ Surgical hip history	—	✓ Surgical: prior acute or LTCH diagnosis	✓ Surgical prior acute or LTCH diagnosis

* Data reported in this table is based on our review of documents on the National Quality Forum website. We welcome any corrections.

[1] NQF #2321 risk adjustment is based on CMGs as used by the IRF prospective payment system. A CMG is assigned based on admission motor FIM® scores, the rehabilitation impairment category. FIM® cognitive scores and age are used to assign patients into some, but not all CMGs. Five additional CMGs are used to assign patients with special cases: those who died or had a length of stay >3 days.

[2] BIMS Scores of >12 are indicative of a moderate to severe cognitive impairment.

[3] Aspiration and Specified Bacterial Pneumonias, Pneumococcal Pneumonia, Empyema, Lung Abscess, Viral and Unspecified Pneumonia, Pleurisy, Pleural Effusion/Pneumothorax, Chronic Obstructive Pulmonary Disease, Fibrosis of Lung and Other Chronic Lung Disorders.

[4] Amputations includes Traumatic Amputations and Complications; Amputation Status, Lower Limb/Amputation Complications; Amputation Status, Upper Limb.

[5] For NQF #2632, stroke includes Cerebral Hemorrhage, Ischemic or Unspecified Stroke, Hemiplegia/Hemiparesis, Late Effects of Cerebrovascular Disease, Except Paralysis.

SECTION 8
ADDITIONAL TOPICS

RTI requested feedback on current practices in SNFs for collecting data on the following data elements: car transfers, walking on uneven surfaces, and wheelchair use.

8.1 Wheelchair Mobility

RTI explained that the purpose of the wheelchair items is to assess a resident's ability to use a wheelchair for mobilization. It is important that residents are given the opportunity to mobilize themselves in the wheelchair if they are going to be using a wheelchair after discharge. The wheelchair mobility items are not to be coded based on use of a wheelchair while being pushed by staff for transport purposes. One TEP member indicated that this may need to be addressed thoroughly in training. The TEP agreed that thorough training will be needed for SNF staff, and one TEP member pointed out that IRF clinicians have prior experience with this kind of assessment. It was suggested that many provider types (e.g., physical therapists, occupational therapists, nursing staff) might be involved in scoring SNF residents, so training will be critical for consistency.

One TEP member was concerned that residents may enter the facility at the wheelchair level, but may be ambulatory at discharge, and that coding the wheelchair items on admission may make it appear as if the resident declined in functional status (due to missing data at discharge). RTI noted that both walking ability and wheelchair mobility skills could be reported at the time of admission and discharge. Walking scores on admission and discharge can be compared, and wheelchair scores on admission and discharge can be compared.

Another TEP member confirmed that the resident population would need to be very clear, because some therapy is done in the wheelchair to accommodate residents with low endurance even though wheelchair mobility is not a long-term goal. RTI agreed that the population needs to be clearly defined, and asked the TEP if the wheelchair items could be used as the mobility metric for residents with a goal of improvement based on wheelchair mobility.

RTI asked if improvement in wheelchair mobility could be used instead of the walking items when the resident is non-ambulatory. The TEP believed that this was a patient-centered approach, and puts the resident's values and goals first. Two TEP members suggested adding community variables or variables related to "distance" in their home situation because they thought it was important to understand how much the resident needs to wheel around to do what he/she needed to do both in the home and out in the community. One TEP member asked if Rasch analysis could be used to examine both the wheelchair and walking items at discharge, and then use the item with the highest score to measure the difference between admission and discharge function. More testing is needed to understand how to substitute the wheelchair mobility items in place of walking items, but the TEP supported this approach.

8.2 Other Mobility Items

RTI asked where SNFs are assessing residents' abilities to pick up an object from the floor. The TEP confirmed that SNFs are assessing this, and during the assessment they examine

whether or not residents need adaptive devices to assist with this task. The TEP agreed that this is a real issue residents face when at home. One TEP member mentioned the importance of being able to get up from the floor. Other TEP members agreed this was important, and that the fear of falling can have a large impact on function and can decrease a person's function because they are anxious to move around.

RTI also asked about the curb and stair mobility items, and whether the TEP considers these important. One TEP member said that some residents may not go out into their communities or use steps in the home, and prior activities and function influences the conversation around this issue. However, this TEP member said that he does see this as important regardless of the resident's home environment. Other TEP members agreed that community-level mobility measures are important, but that we need to balance this with missing data if too many residents are unable to perform these activities. One TEP member wanted to consider different assessment questions and goals if the resident is planning to go home versus entering into long-term care.

The TEP then discussed testing car transfers, and RTI asked whether the TEP thought that this was important. One TEP member said that at his facility, they do home assessments including car transfers, and that they are typically done with the resident's own car.

8.3 Process Measure, Title Change, and Other Issues

Other discussion points at the TEP included their initial thoughts on the cross-setting function process measure, An Application of Percent of LTCH Patients with an Admission and Discharge Functional Assessment and a Care Plan that Addressed Function (NQF #2631). The TEP members agreed that therapists are expected to create and report on goals. They also reiterated that residents should be involved in setting these goals.

RTI then asked the TEP what they thought of the measure titles, and if they were appropriate. The measures were titled, "change in mobility" and "change in self-care" because mathematically that is how the measures are calculated. Some people have interpreted this to mean a decline in function, so RTI asked the TEP their opinion on using the word "improvement." One TEP member said that positive language is better, but another TEP member brought the conversation back to the maintenance issue and said that this would be the only area of concern. RTI agreed that residents with a goal of maintenance would not be included in the measures focused on "improvement."

Final comments of TEP members included a concern about the state-by-state variation in SNF provider teams. Some facilities have the minimum numbers of doctors and see residents monthly, and this is very different from the IRF and LTCH settings, which can influence the standardization of these measures.

APPENDIX A
TEP IN-PERSON MEETING AGENDA

Development of Functional Outcome Quality Measures for Skilled Nursing Facilities (SNFs) Technical Expert Panel Meeting Agenda

May 5, 2016
8:30am–4:30pm EDT
Sheraton Baltimore Washington Airport Hotel—BWI
1100 Old Elkridge Landing Road Linthicum Heights, Maryland 21090

Dial-in Information:
AT&T line: 888-706-0584
Access code: 2026356

Time	Agenda Item
8:30am - 9:00am	**Welcome and Introductions** Review of agenda and goals of TEP Vote to ratify TEP charter
9:00am - 9:20am	**Environmental Scan** Presentation and Discussion
9:20am - 10:00am	**Self-Care and Mobility: CARE Function Items** Presentation and Discussion
10:00am - 10:15am	**Break**
10:15am - 10:45am	**Rasch Analysis of Self-Care and Mobility Items** Presentation and Discussion
10:45am - 12:00pm	**Inclusion/Exclusion Criteria** Presentation and Discussion
12:00am - 1:00pm	**Lunch**
1:00pm - 1:30pm	**Risk Adjustment Methodology** Presentation and Discussion
1:30pm - 2:45pm	**Risk Adjustment Variables** Presentation and Discussion
2:45pm - 3:00pm	**Break**
3:00pm - 4:15pm	**Additional Topics** Presentation and Discussion
4:15pm - 4:30pm	**Concluding Remarks & Meeting Summary**

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APPENDIX B
Development of Functional Outcome Quality Measures for Skilled Nursing Facilities (SNFs)

Technical Expert Panel Presentation
May 5, 2016

Development of Functional Outcome Quality Measures for Skilled Nursing Facilities (SNFs)

Technical Expert Panel

May 5, 2016
Baltimore, MD

RTI International

Welcome & Introductions: TEP Members

- Daniel Ciolek, PT, MS, PMP
- Bill Goulding, MS/CCC-SLP
- Robyn Grant, MSW
- Scott Guevin, PT, DPT, NHA, MBA, FACHE
- John James, PhD
- Natalie Leland, PhD, OTR/L, BCG, FAOTA
- Susan Levy, MD, CMD, AGSF
- Craig Miller, PT
- Anne Ruggiero, BSN, RN, CRRN
- Azlan Tariq, DO

Welcome & Introductions: CMS and RTI teams

CMS
- Tara McMullen
- Mary Pratt
- Sharon Lash
- John Kane
- Christine Teague
- Sara Brice Payne

RTI International
- Anne Deutsch
- Lauren Palmer
- Melvin Ingber
- Magdalena Ignaczak
- Tracy Kline (via phone)

Housekeeping Issues

- Agenda
- Lunch (on our own)
- Restrooms
- Audio recording of meeting for notetaking
- Phone line open to the public
- Wifi: FR787

Agenda Overview

- Review of TEP Charter
- Environmental Scan
- Self-Care and Mobility: CARE Function Items
- Rasch Analysis of Self-Care and Mobility Data
- Inclusion/Exclusion Criteria
- Risk Adjustment Methodology
- Risk Adjustment Variables
- Additional Topics
- Concluding Reports and Meeting Summary

TEP Charter

- The TEP Charter orients members to their roles and responsibilities.
- The TEP is the second part of the measure conceptualization process.
- A TEP is a group of stakeholders and experts who contribute direction and thoughtful input to the measure developer.

Project Objectives

To develop, maintain, re-evaluate, and implement measures reflective of quality care for post-acute settings

- Measures must support CMS quality missions, including:
  - Long-Term Care Hospital Quality Reporting Program (LTCH QRP),
  - Inpatient Rehabilitation Facility Quality Reporting Program (IRF QRP), and
  - Skilled Nursing Facility Quality Reporting Program (SNF QRP)/ Nursing Home Quality Initiative (NHQI).
- Measures must address the domains required by the IMPACT Act, which mandates specification of cross-setting quality, resource use, and other measures for post-acute care providers.

TEP Objectives

- To obtain input on functional status quality measures that may be used in skilled nursing facilities (SNFs).
- To examine the following potential measures:
  - *An Application* of the Inpatient Rehabilitation Facility (IRF) Functional Outcome Measure: Change in Self-Care Score for Medical Rehabilitation Patients (NQF #2633)
  - *An Application* of the Inpatient Rehabilitation Facility (IRF) Functional Outcome Measure: Change in Mobility Score for Medical Rehabilitation Patients (NQF #2634)
  - *An Application* of the Inpatient Rehabilitation Facility (IRF) Functional Outcome Measure: Discharge Self-Care Score for Medical Rehabilitation Patients (NQF #2635)
  - *An Application* of the Inpatient Rehabilitation Facility (IRF) Functional Outcome Measure: Discharge Mobility Score for Medical Rehabilitation Patients (NQF #2636)

TEP Objectives (continued)

- To specify the target population(s), including the inclusion and exclusion criteria.
- To identify the case-mix adjustment variables and the approach for case-mix adjustment.

Environmental Scan

Environmental Scan: Components

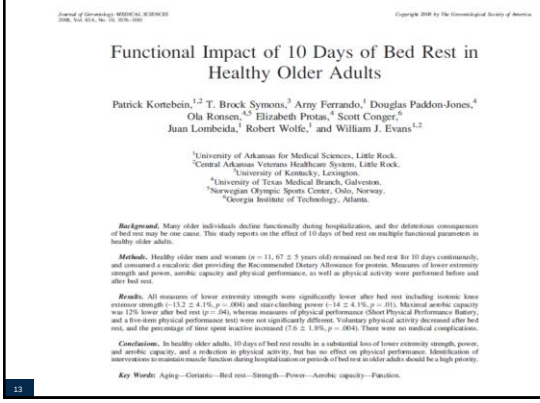
- Scientific and Medical Literature
- Grey Literature
- Current Assessment Practices
- Existing Quality Measures

Importance of Functional Status

In describing the importance of functional status, the National Committee on Vital and Health Statistics, Subcommittee on Health, noted:

> "Information 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, in other words, their functional status."

Kortebein et al., 2008



Journal of Gerontology: MEDICAL SCIENCES
2008, Vol. 63A, No. 10, 1076–1081

Functional Impact of 10 Days of Bed Rest in Healthy Older Adults

Patrick Kortebein,[1,2] T. Brock Symons,[3] Arny Ferrando,[1] Douglas Paddon-Jones,[4] Ola Ronsen,[4,5] Elizabeth Protas,[4] Scott Conger,[6] Juan Lombeida,[1] Robert Wolfe,[1] and William J. Evans[1,2]

[1]University of Arkansas for Medical Sciences, Little Rock.
[2]Central Arkansas Veterans Healthcare System, Little Rock.
[3]University of Kentucky, Lexington.
[4]University of Texas Medical Branch, Galveston.
[5]Norwegian Olympic Sports Center, Oslo, Norway.
[6]Georgia Institute of Technology, Atlanta.

Background. Many older individuals decline functionally during hospitalization, and the deleterious consequences of bed rest may be one cause. This study reports on the effect of 10 days of bed rest on multiple functional parameters in healthy older adults.

Methods. Healthy older men and women ($n = 11$, 67 ± 5 years old) remained on bed rest for 10 days continuously, and consumed a eucaloric diet providing the Recommended Dietary Allowance for protein. Measures of lower extremity strength and power, aerobic capacity and physical performance, as well as physical activity were performed before and after bed rest.

Results. All measures of lower extremity strength were significantly lower after bed rest including isotonic knee extensor strength ($-13.2 \pm 4.1\%$, $p = .004$) and stair-climbing power ($-14 \pm 4.1\%$, $p = .01$). Maximal aerobic capacity was 12% lower after bed rest ($p = .04$), whereas measures of physical performance (Short Physical Performance Battery, and a five-item physical performance test) were not significantly different. Voluntary physical activity decreased after bed rest, and the percentage of time spent inactive increased ($7.6 \pm 1.8\%$, $p = .004$). There were no medical complications.

Conclusions. In healthy older adults, 10 days of bed rest results in a substantial loss of lower extremity strength, power, and aerobic capacity, and a reduction in physical activity, but has no effect on physical performance. Identification of interventions to maintain muscle function during hospitalization or periods of bed rest in older adults should be a high priority.

Key Words: Aging—Geriatric—Bed rest—Strength—Power—Aerobic capacity—Function.

Environmental Scan

- Skilled nursing facilities (SNFs) provide skilled services, such as skilled nursing or therapy services.
- Some residents receiving care in SNFs include those whose illness, injury, or condition has resulted in a loss of function, and for whom rehabilitative care is expected to help regain that function.
- During a SNF stay, treatment goals may include fostering the resident's ability to manage his or her daily activities so that the resident can complete activities as independently as possible, and, if feasible, return to a safe, active, and productive life in a community-based setting.

Environmental Scan

- Given that the primary goal of some SNF residents is improvement in function, SNF clinicians assess and document residents' functional status at admission and at discharge in order to evaluate the effectiveness of the rehabilitation care.
- Examination of SNF data shows that care provided in SNFs, such as the dose of therapy, directly influence resident outcomes.
- SNF data also show variations in functional outcomes by facility characteristics.

Environmental Scan

- Jette et al.: Higher intensity of physical and occupational therapy was associated with significantly greater odds of improving mobility and self-care independence among residents with all clinical conditions (e.g., stroke, orthopedic, cardiovascular, and pulmonary conditions).
- Lenze et al.: A randomized control trial comparing higher intensity of rehabilitation therapy to the standard-of-care for SNF residents found greater improvement in mobility activities (gait speed, walking distance) and an improvement trend in self-care activities.

Environmental Scan

- Jung et al.: Another study found higher intensity therapy led to greater gains in functional independence with a shorter length of stay, and a greater likelihood of discharge to community.
- MedPAC noted that while there was an overall increase in the share of intensive therapy days between 2002 and 2012, for-profit and urban facilities had higher shares of intensive therapy than not-for-profit facilities and those located in rural areas.

Environmental Scan

- Grabowski et al.: Among SNF residents receiving rehabilitation services, the amount of therapy received can vary widely.

Selected References

- Grabowski, D. C., Feng, Z., Hirth, R., Rahman, M., & Mor, V. (2013). Effect of nursing home ownership on the quality of post-acute care: An instrumental variables approach. *Journal of Health Economics*, *32*(1), 12-21.
- Jette, D. U., Warren, R. L., & Wirtalla, C. (2005). The relation between therapy intensity and outcomes of rehabilitation in skilled nursing facilities. *Archives of physical medicine and rehabilitation*, *86*(3), 373-379.
- Jung, H. Y., Trivedi, A. N., Grabowski, D. C., & Mor, V. (2016). Does More Therapy in Skilled Nursing Facilities Lead to Better Outcomes in Patients With Hip Fracture?. *Physical therapy*, *96*(1), 81-89.
- Lenze, E. J., Host, H. H., Hildebrand, M. W., Morrow-Howell, N., Carpenter, B., Freedland, K. E., ... & Binder, E. F. (2012). Enhanced medical rehabilitation increases therapy intensity and engagement and improves functional outcomes in postacute rehabilitation of older adults: a randomized-controlled trial. *Journal of the American Medical Directors Association*, *13*(8), 708-712.

NQF-Endorsed SNF Function Quality Measures

CARE: Improvement in Mobility (NQF #2612)

- Steward: American Health Care Association

Functional Change: Change in Mobility Score (NQF #2321)

- Steward: Uniform Data System for Medical Rehabilitation
- NQF Person- and Family-Centered Care Panel reviewed for IRF setting only

Functional Status Change for Patients with Hip Impairments (NQF #0423)

- One of several similar condition-specific quality measures
- Steward: FOTO
- Outpatient therapy data

Environmental Scan: Discussion

- Any comments or reactions to our environmental scan?
- Do you have any additional references (e.g., published literature or reports) that we should review to supplement our environmental scan?
- Do you know of other function quality measures that we should review?

CARE Function Items

Presentation and Discussion

Quality Measures

- To examine the following potential measures:
  - *An Application* of the Inpatient Rehabilitation Facility (IRF) Functional Outcome Measure: Change in Self-Care Score for Medical Rehabilitation Patients (NQF #2633)
  - *An Application* of the Inpatient Rehabilitation Facility (IRF) Functional Outcome Measure: Change in Mobility Score for Medical Rehabilitation Patients (NQF #2634)
  - *An Application* of the Inpatient Rehabilitation Facility (IRF) Functional Outcome Measure: Discharge Self-Care Score for Medical Rehabilitation Patients (NQF #2635)
  - *An Application* of the Inpatient Rehabilitation Facility (IRF) Functional Outcome Measure: Discharge Mobility Score for Medical Rehabilitation Patients (NQF #2636)

CARE Function Items

- The functional assessment items used to calculate the four function quality measures are from the CARE Item Set.
- The CARE Item Set was designed to standardize assessment of patients and residents' status across acute and post-acute settings, including IRFs, long-term care hospitals (LTCHs), skilled nursing facilities (SNFs), and home health agencies (HHAs).

CARE Function Items (continued)

- The CARE Item Set was developed and tested as part of the Post-Acute Care Payment Reform Demonstration (PAC PRD).
- The functional status items on the CARE Item Set include daily activities that clinicians typically assess at the time of admission and/or at discharge to determine patient and resident needs, evaluate resident progress, and prepare patients and residents and families for a transition to home or another setting.

CARE Function Items (continued)

- The development of the CARE Item Set and a description and rationale for each item is described in a report titled *The Development and Testing of the Continuity Assessment Record and Evaluation (CARE) Item Set: Final Report on the Development of the CARE Item Set: Volume 1 of 3.*
- Results of the reliability and validity testing conducted as part of the PAC PRD found the functional status items to have acceptable reliability and validity in the acute and post-acute patient and resident populations.

CARE Function Items (continued)

- A description of the testing methodology and results are available in several reports, including:
  - Volume 2: *Final Report On Reliability Testing*
  - Volume 3: *Final Report on CARE Item Set and Current Assessment Comparisons*.
- These reports 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.

Reliability and Validity Testing

Reliability and validity testing of the CARE items was conducted, including:

- Inter-rater reliability with paired clinicians
- Video reliability (“standardized” patients videotape)
- Internal consistency (Cronbach alpha)
- Rasch analysis
- Exploratory factor analysis
- Comparisons of CARE function scores and current setting-specific assessment data (IRF-PAI, MDS, OASIS)

November 2012

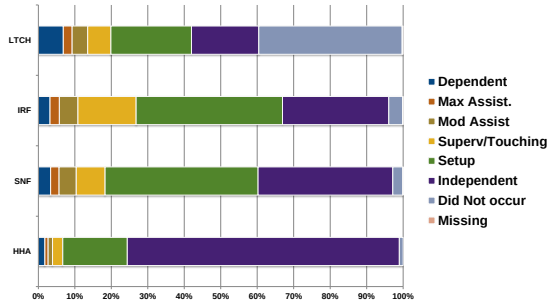
Analysis of Crosscutting Medicare Functional Status Quality Metrics Using the Continuity and Assessment Record and Evaluation (CARE) Item Set

Final Report

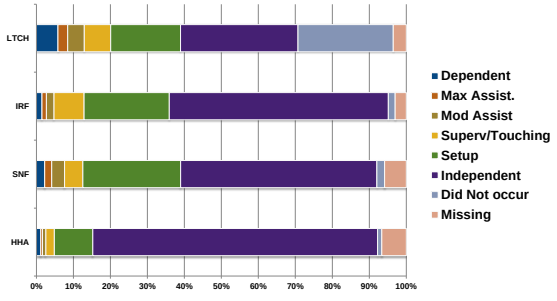
Project funded by the Assistant Secretary for Planning and Evaluation, US Department of Health and Human Services and conducted by RTI International

https://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/Post-Acute-Care-Quality-Initiatives/Functional-Measures-.html

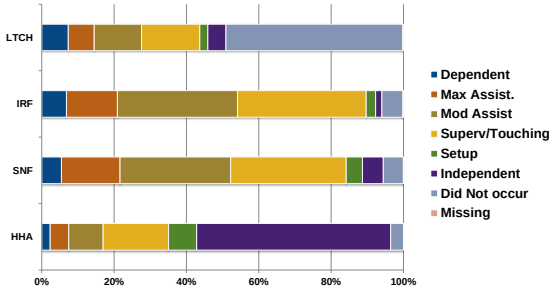
Eating Codes at Admission



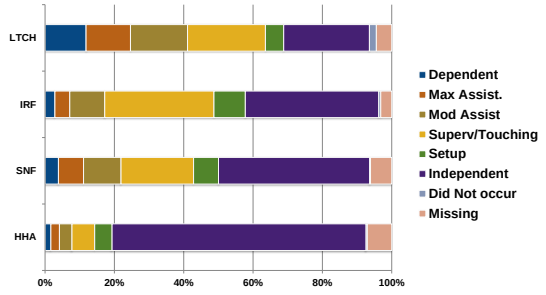
Eating Codes at Discharge



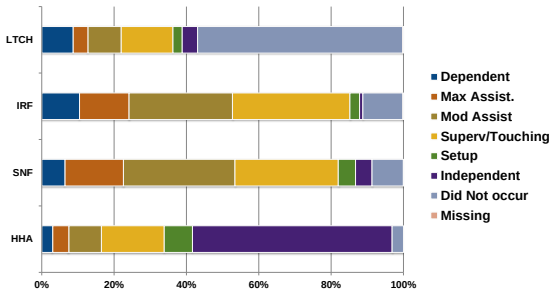
Sit to Stand Codes at Admission



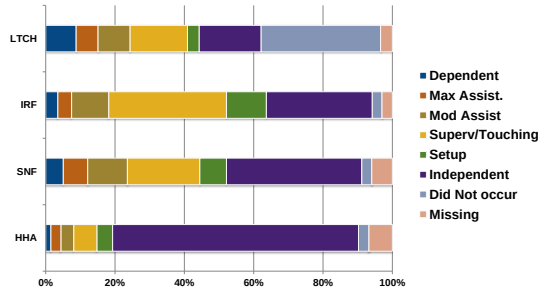
Sit to Stand Codes at Discharge



Toilet Transfer Codes at Admission



Toilet Transfer Codes at Discharge



Quality Reporting Programs

CMS has adopted CARE-based function quality measures into 3 Quality Reporting Programs:

- **Long-Term Care Hospital Quality Reporting Program**
  - 1 cross-setting process quality measure
  - 1 LTCH-specific process quality measure
  - 1 outcome quality measure
- **Inpatient Rehabilitation Facility Quality Reporting Program**
  - 1 cross-setting process quality measure
  - 4 outcome quality measures
- **SNF Quality Reporting Program**
  - 1 cross-setting process quality measure

Function Measures: LTCH QRP

LTCH Quality Reporting Program:

- *An Application of the* Percent of Long-Term Care Hospital (LTCH) Patients With an Admission and Discharge Functional Assessment and a Care Plan That Addresses Function (NQF #2631)
- Percent of Long-Term Care Hospital (LTCH) Patients With an Admission and Discharge Functional Assessment and a Care Plan That Addresses Function (NQF #2631)
- Long-Term Care Hospital (LTCH) Functional Outcome Measure: Change in Mobility Among Patients Requiring Ventilator Support (NQF #2632)

Function Measures: IRF QRP

IRF Quality Reporting Program:

- *An Application of the* Percent of Long-Term Care Hospital (LTCH) Patients With an Admission and Discharge Functional Assessment and a Care Plan That Addresses Function (NQF #2631)
- Inpatient Rehabilitation Facility (IRF) Functional Outcome Measure: Change in Self-Care Score for Medical Rehabilitation Patients (NQF #2633)
- Inpatient Rehabilitation Facility (IRF) Functional Outcome Measure: Change in Mobility Score for Medical Rehabilitation Patients (NQF #2634)
- Inpatient Rehabilitation Facility (IRF) Functional Outcome Measure: Discharge Self-Care Score for Medical Rehabilitation Patients (NQF #2635)
- Inpatient Rehabilitation Facility (IRF) Functional Outcome Measure: Discharge Mobility Score for Medical Rehabilitation Patients (NQF #2636)

Function Measures: SNF QRP

SNF Quality Reporting Program:

- *An Application of the* Percent of Long-Term Care Hospital (LTCH) Patients With an Admission and Discharge Functional Assessment and a Care Plan That Addresses Function (NQF #2631)

CARE Function Items: Self-Care

Table 3a. 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	✓	—	—

CARE Function Items: Mobility

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	✓	✓	✓

Function Items: Discussion

- We compared the activities (items) included in the selected NQF-endorsed Functional Outcome Measures – see printout of Tables 2a and 2b
- Items for Discussion:
  - Wash Upper Body and Shower/Bathe Self
  - Bowel Management, Expression and Memory
  - Walk and Wheelchair
  - Tub/Shower Transfer
- Discuss other activities (items)?

Rasch Analysis Results

Presentation and Discussion

CARE Function Items: Cross-Setting Evaluation

- Previous psychometric analysis examined whether functional domains are being measured as intended.
- The current effort is to assess the items across healthcare settings.
  - SNF and IRF
- Approach uses Rasch measurement displacement and differential item functioning (DIF) information.
- These are interim findings: the CARE data analysis is ongoing.

Rasch Background

Direct Measures and Indirect Measures

- Some health care data are measured (somewhat) directly:
  - Height (centimeters or inches) or Weight (lb. or kg.)
- Some constructs are not measured directly (e.g., self-care function, mobility function, mood disorders)
  - Domain assessment instrument responses can represent varying amounts of the domain we are trying to measure
  - We can create a "ruler" to represent this domain

Rasch Key Points

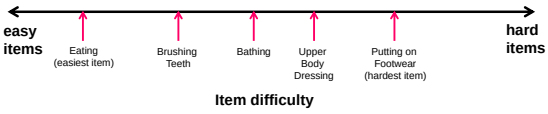
- The order of the items (hierarchy) becomes the operational definition of the domain
  - The item hierarchy is a way to assess construct validity
- Unidimensional (items measure a single construct)
- Response ordering (concept increases along the response scale)

Creating a Ruler

We can use a line to represent the domain (i.e., "self-care") as a ruler

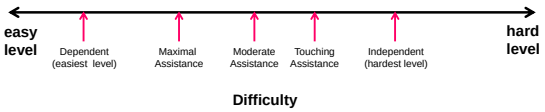
Defining a Construct: Multiple Self-Care Items

Each item will be placed on the concept ruler, with "easier" items on the left and "harder" items on the right



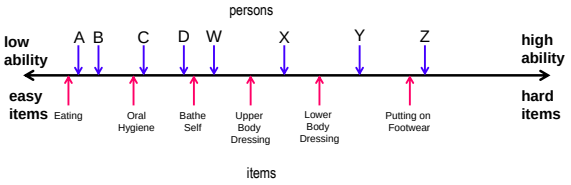
Defining a Construct: Rating Scale

For an item with a rating scale, each rating scale level will be placed on the concept ruler, with the "easier" level on the left and "harder" level on the right



Person Ability: Self-Care

We can use a line to represent the construct (i.e., "self-care") as a ruler



Rasch Analysis and Functional Status

- Rasch analysis is frequently used in instrument development
- In addition to the CARE item set Rasch analysis has been used to better understand other functional status items
  - The FIM® instrument
  - Minimum Data Set (MDS)
  - Outcome and Assessment Information Set (OASIS)

Rasch Analysis

- Anchored Rasch analysis results provide:
  - Displacement statistics
    - Degree to which the specified item difficulty estimates differ from what would be freely estimated at each setting.
    - Values outside the -0.5 to 0.5 range could have an impact on measurement.
- DIF Analysis confirms displacement statistics
- Person ability estimate graphs determine displacement & DIF impact on person measurement

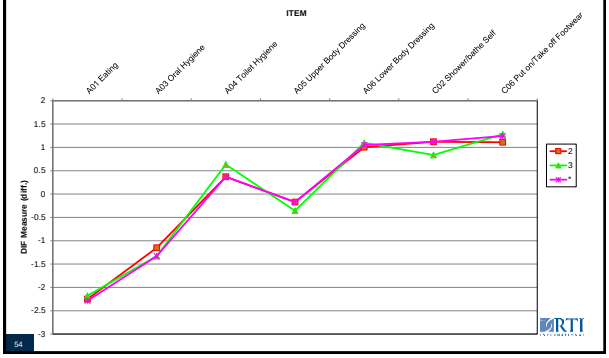
Admission and Discharge Self-Care: IRF & SNF

- Table 7. Self-Care Cross-Assessment Anchored Item Estimates Specified on Setting at Discharge

MEASURE	S.E.	DISPLACE	ITEM
SNF			
-2.29	0.02	0.04	A01 Eating
1.25	0.02	-0.14	C06 Put on/Take off Footwear
1.12	0.02	-0.01	C02 Shower/bathe Self
-1.33	0.02	0.18	A03 Oral Hygiene
-0.17	0.02	0.02	A05 Upper Body Dressing
0.37	0.02	0.00	A04 Toilet Hygiene
1.05	0.02	-0.04	A06 Lower Body Dressing
IRF			
-2.29	0.02	0.12	A01 Eating
1.12	0.02	-0.28	C02 Shower/bathe Self
1.25	0.01	0.03	C06 Put on/Take off Footwear
0.37	0.01	0.26	A04 Toilet Hygiene
-1.33	0.01	-0.02	A03 Oral Hygiene
-0.17	0.01	-0.19	A05 Upper Body Dressing
1.05	0.01	0.05	A06 Lower Body Dressing

Self-Care

Figure 1.
Functional Assessment Self-Care Items Differential Item Functioning (DIF)



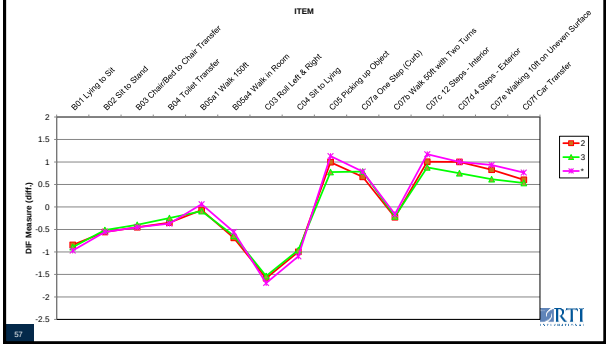
Admission and Discharge Mobility: IRF and SNF

Table 8. Mobility Cross-Assessment Anchored Item Estimates Specified on Setting

MEASURE	S.E.	DISPLACE	ITEM
SNF			
1.13	0.02	-0.14	C05 Picking up Object
-1.69	0.02	0.11	C03 Roll Left & Right
-0.56	0.06	-0.13	B05a4 Walk in Room
-1.10	0.02	0.10	C04 Sit to Lying
0.76	0.03	-0.16	C07f Car Transfer
0.06	0.03	-0.13	B05a1 Walk 150ft
0.79	0.03	-0.13	C07a One Step (Curb)
0.93	0.04	-0.11	C07e Walking 10ft on Uneven Surface
1.17	0.04	-0.18	C07c 12 Steps - Interior
-0.16	0.03	-0.07	C07b Walk 50ft with Two Turns
1.00	0.04	-0.01	C07d 4 Steps - Exterior
-0.97	0.02	0.13	B01 Lying to Sitting on Side of Bed
-0.37	0.02	0.02	B04 Toilet Transfer
-0.56	0.02	0.02	B02 Sit to Stand
-0.45	0.02	0.00	B03 Chair/Bed to Chair Transfer
IRF			
1.13	0.02	-0.36	C05 Picking up Object
1.17	0.03	-0.31	C07c 12 Steps - Interior
-1.69	0.02	0.16	C03 Roll Left & Right
0.93	0.03	-0.33	C07e Walking 10ft on Uneven Surface
-0.56	0.04	-0.08	B05a4 Walk in Room
0.79	0.02	0.01	C07a One Step (Curb)
1.00	0.03	-0.26	C07d 4 Steps - Exterior
0.76	0.02	-0.23	C07f Car Transfer
-0.37	0.02	0.13	B04 Toilet Transfer
-1.10	0.01	0.15	C04 Sit to Lying
0.06	0.02	-0.16	B05a1 Walk 150ft
-0.97	0.01	0.08	B01 Lying to Sitting on Side of Bed
-0.16	0.02	-0.05	C07b Walk 50ft with Two Turns
-0.56	0.01	0.05	B02 Sit to Stand
-0.45	0.01	0.05	B03 Chair/Bed to Chair Transfer

Mobility

Figure 2.
Functional Assessment Mobility Items Differential Item Functioning (DIF)



Mobility

Figure 3. Functional Assessment Mobility Person Estimate for Overall and SNF Admission

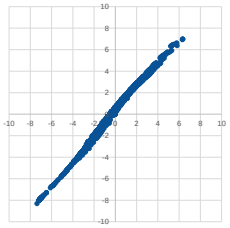
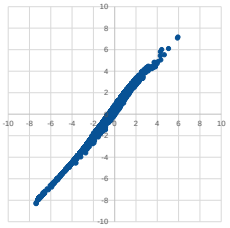


Figure 4. Functional Assessment Mobility Person Estimate for Overall and IRF Admission



Questions?

Inclusion/Exclusion Criteria

Presentation and Discussion

Inclusion/Exclusion Criteria

- The inclusion and exclusion criteria for the IRF functional outcome measures were selected based on our environmental scan and input from previous expert panel members.
- We have reviewed the inclusion/exclusion criteria for other NQF-endorsed measures.
- See printout of Table 11a and Table 11b

Inclusion/Exclusion Criteria: Discussion

- How can residents who do not have a goal of functional improvement be identified?
- Should additional exclusion criteria be considered?

Risk Adjustment Methodology

Presentation and Discussion

Risk Adjustment Methodology

- Risk adjustment is an important issue when developing quality measures that are outcome measures.
- Many patient factors such as age, primary medical condition, comorbidities, prior functioning, etc. may affect functional outcomes.

Risk Adjustment Methodology

Our review of the NQF-endorsed measures showed variations in the risk adjustment methods:

- Ratio of observed and expected outcome (e.g., 20/20 = 1.0)
- Difference of observed minus expected added to the national average (25 + [20-20] = 25)
- Ratio of observed over expected times the national average ([20/20]*25 = 25)

Risk Adjustment Methodology

- A facility that has a higher (better) observed change compared to the expected change, will be identified as "better" using all of these approaches.
- The different approaches will results in different risk-adjusted values.

Risk Adjustment Methodology: Examples

Observed	Expected	National Mean	Ratio Approach	Difference Approach
20	40	25	12.5	5
20	30	25	16.7	15
30	30	25	25	25
30	20	25	37.5	35
40	20	25	50	45

Risk Adjustment Methodology: Discussion

- Does one approach seem better?
- Would negative or zero values be expected as observed or expected values?

Risk Adjustment Variables

Presentation and Discussion

Risk Adjustment Variables

Table 13. Mean Admission, Discharge and Change in Self-Care by Skilled Nursing Facility Resident Characteristics: Fee-for-Service Medicare Beneficiaries, Post-Acute Care Payment Reform Demonstration (N = 2,922)

	Self-Care at Admission	Self-Care at Discharge	Change in Self-Care		
	mean	mean	mean	n	%
Total Average	24.51	32.55	8.04	2,922	
Age					
45-54	25.72	34.09	8.37	47	1.61
55-64	25.87	33.47	7.6	137	4.69
65-74	25.76	34.43	8.67	629	21.53
75-84	24.81	33.08	8.27	1179	40.35
85-90	23.12	31.03	7.91	649	22.21
90+	22.45	28.56	6.11	265	9.07
Surgical Diagnosis					
No	23.63	30.46	6.83	1491	51.03
Yes	25.42	34.73	9.31	1431	48.97

Risk Adjustment Variables

	Self-Care at Admission	Self-Care at Discharge	Change in Self-Care		
	mean	mean	mean	n	%
Prior Functioning: Indoor Ambulation					
Independent	25.72	34.54	8.82	2256	77.21
Dependent, Some Help	20.82	26.3	5.48	506	17.32
Not Applicable	17.47	22.14	4.67	70	2.4
Unknown/Missing	20.4	25.97	5.57	90	3.08
Prior Functioning: Self-Care					
Independent	26.06	35.08	9.02	2020	69.13
Some Help	21.92	28.19	6.27	727	24.88
Dependent	14.73	18.27	3.54	101	3.46
Unknown/Missing	21.04	26.08	5.04	73	

Risk Adjustment Variables

	Self-Care at Admission	Self-Care at Discharge	Change in Self-Care		
	mean	mean	mean	n	%
Presence of Severe Pressure Ulcer					
No	24.6	32.71	8.11	2873	98.32
Yes	19.12	23.29	4.17	49	1.68
Stage 2 Pressure Ulcer					
No	24.75	32.8	8.05	2745	93.94
Yes	20.81	28.67	7.86	177	6.06
Cognitive Abilities: BIM score					
Intact or Borderline	26.01	34.77	8.76	1938	66.32
Moderately Impaired	23.84	31.5	7.66	562	19.23
Severely Impaired	18.63	23.88	5.25	397	13.59
Not Assessed	16.84	21.92	5.08	25	0.86
Moderate to Severe Communication Impairment					
No	25.22	33.56	8.34	2682	91.79
Yes	16.53	21.32	4.79	240	8.21

Risk Adjustment Variables

	Self-Care at Admission	Self-Care at Discharge	Change in Self-Care		
	mean	mean	mean	n	%
Bladder Incontinence					
Always continent, Stress incont., no urine output	26.27	34.87	8.6	2145	73.41
Less than daily, Daily, Always	19.64	25.87	6.23	612	20.94
NA	19.75	27.15	7.4	165	5.65
Bowell Incontinent					
Always continent, Stress incont., no urine output or NA	25.71	34.31	8.6	2485	85.04
Always incontinent	13.99	17.56	3.57	145	4.96
Less than daily or daily	19.5	25.06	5.56	292	9.99

Risk Adjustment Variables

	Self-Care at Admission	Self-Care at Discharge	Change in Self-Care		
	mean	mean	mean	n	%
Prior Mobility Device/Aid: Walker					
No	25.32	33.61	8.29	1586	54.28
Yes	23.55	31.3	7.75	1336	45.72
Prior Mobility Device/Aid: Prosthetics					
No	24.52	32.55	8.03	2904	99.38
Yes	23.61	32.22	8.61	18	0.62
Prior Mobility Device/Aid: Wheelchair					
No	25.08	33.5	8.42	2484	85.01
Yes	21.25	27.19	5.94	438	14.99
Prior Mobility Device/Aid: Mechanical Lift					
No	24.6	32.68	8.08	2898	99.18
Yes	13.92	16.88	2.96	24	0.82
Swallowing Ability: Modified Food					
No	24.76	32.86	8.1	2766	94.66
Yes	20.03	27.14	7.11	156	5.34
Swallowing Ability: Tube Feeding					
No	24.59	32.67	8.08	2898	99.18
Yes	14.25	18.29	4.04	24	0.82

Risk Adjustment Variables

Table 14. Mean Admission, Discharge and Change in Mobility Score by Skilled Nursing Facility Resident Characteristics (N = 2,938)

	Mobility at Admission	Mobility at Discharge	Change in Mobility		
	mean	mean	mean	n	%
Total Average	34.19	55.18	21	2938	
Age					
45-54	33.94	54.77	20.83	48	1.63
55-64	37.04	54.32	17.28	141	4.8
65-74	35.64	59.24	23.6	633	21.55
75-84	34.51	56.47	21.96	1185	40.33
85-90	32.64	52.27	19.63	649	22.09
90+	31.55	47.68	16.13	266	9.05
Surgical Diagnosis					
No	34.05	51.05	17	1499	51.02
Yes	34.33	59.49	25.16	1439	48.98

Risk Adjustment Variables

	Mobility at Admission	Mobility at Discharge	Change in Mobility		
	mean	mean	mean	n	%
Prior Functioning: Indoor Ambulation[1]					
Independent	35.41	59.02	23.61	2272	77.33
Some Help	31.77	44.38	12.61	439	14.94
Dependent	26.09	39.07	12.98	68	2.31
Not Applicable	23	30.3	7.3	70	2.38
Unknown/Missing	29.73	42.38	12.65	89	3.03
Prior Functioning: Stairs[2]					
Independent	36.3	61.95	25.66	1623	55.24
Some Help	34.01	50.42	16.41	384	13.07
Dependent	29.18	44.31	15.13	55	1.87
Not Applicable	30.59	45.96	15.37	660	22.46
Unknown/Missing	30.9	43.75	12.85	216	7.35
Prior Functioning: Functional Cognition[3]					
Independent	35.75	59.89	24.14	1979	67.36
Some Help	31.36	46.36	15	606	20.63
Dependent	27.91	39.76	11.85	192	6.54
Not Applicable	37.57	50.77	13.2	47	1.6
Unknown/Missing	31.3	48.15	16.85	114	3.88

Risk Adjustment Variables

	Mobility at Admission	Mobility at Discharge	Change in Mobility		
	mean	mean	mean	n	%
Presence of Severe Pressure Ulcer					
No	34.32	55.52	21.2	2888	98.3
Yes	26.54	35.6	9.06	50	1.7
Stage 2 Pressure Ulcer					
No	34.53	55.69	21.16	2761	93.98
Yes	28.84	47.27	18.43	177	6.02
Cognitive Abilities: BIM score					
Intact or Borderline	35.67	59.02	23.35	1954	66.51
Moderately Impaired	33.47	52.57	19.1	564	19.2
Severely Impaired	28.46	41	12.54	396	13.48
Not Assessed	24.88	38.71	13.83	24	0.82
Communication Impairment					
No Impairment	35.31	58.28	22.97	2319	78.93
Mild	32.52	47.98	15.46	377	12.83
Moderate to Severe	25.81	36.53	10.72	230	7.83
Unable to assess	30.45	37.64	7.19	11	0.37

Risk Adjustment Variables

	Mobility at Admission	Mobility at Discharge	Change in Mobility		
	mean	mean	mean	n	%
Bladder Incontinence					
Always continent, Stress incont., no urine output or NA	35.7	58.44	22.74	2328	79.24
Less than daily, Daily, Always	28.4	42.77	14.37	610	20.76
Bowell Incontinent					
Always continent, Stress incont., no urine output or NA	35.6	58.4	22.8	2503	85.19
Always incontinent	22.6	28.72	6.12	144	4.9
Less than daily or daily	27.79	40.58	12.79	291	9.9
History of Falls					
No	35.8	57.44	21.64	1695	57.69
Yes	31.98	52.1	20.12	1243	42.31
Prior Mobility Device/Aid: Walker					
No	35.46	57.78	22.32	1599	54.42
Yes	32.67	52.08	19.41	1339	45.58

Risk Adjustment Variables

	Mobility at Admission	Mobility at Discharge	Change in Mobility		
	mean	mean	mean	n	%
Prior Mobility Device/Aid: Prosthetics					
No	34.21	55.2	20.99	2920	99.39
Yes	30.39	53.33	22.94	18	0.61
Prior Mobility Device/Aid: Wheelchair					
No	35.08	57.41	22.33	2501	85.13
Yes	29.08	42.43	13.35	437	14.87
Prior Mobility Device/Aid: Mechanical Lift					
No	34.29	55.41	21.12	2914	99.18
Yes	21.29	27.46	6.17	24	0.82
Usual Swallowing Ability: Tube Feeding					
No	34.25	55.34	21.09	2914	99.18
Yes	26.67	36.58	9.91	24	0.82

Risk Adjustment Variables

	Mobility at Admission	Mobility at Discharge	Change in Mobility		
	mean	mean	mean	n	%
Septicemia, Sepsis, Systemic Inflammatory Response Syndrome/Shock					
No	34.36	55.53	21.17	2746	95.35
Yes	32.17	49.16	16.99	134	4.65
Other Infectious Diseases					
No	34.43	55.81	21.38	2435	84.55
Yes	33.34	52.1	18.76	445	15.45
Metastatic Cancer and Acute Leukemia					
No	34.2	55.29	21.09	2821	97.95
Yes	37	52.39	15.39	59	2.05
Diabetes with Chronic Complications					
No	34.28	55.32	21.04	2723	94.55
Yes	33.83	54.93	21.1	157	5.45
Diabetes without Complication					
No	34.24	55.32	21.08	2269	78.78
Yes	34.35	54.93	20.58	611	21.22
Type I Diabetes Mellitus					
No	34.23	55.27	21.04	2852	99.03
Yes	36.89	51.82	14.93	28	0.97

Additional Topics

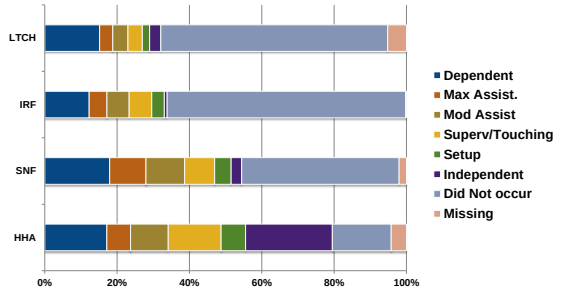
Presentation and Discussion

Additional Topics:

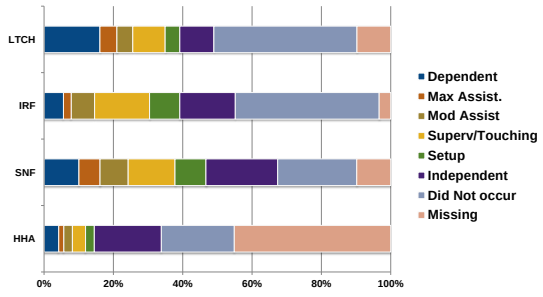
Current assessment practices regarding more challenging mobility skills

- Car transfers
- Walking on uneven surfaces
- Wheelchair skills testing

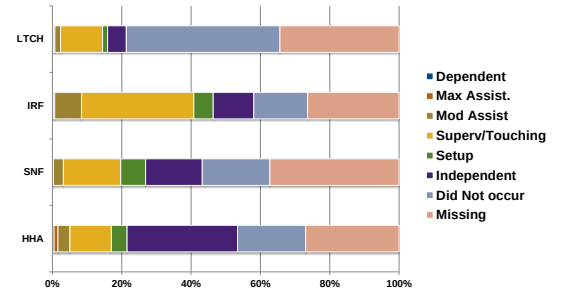
Pick Up Object from Floor Codes at Admission



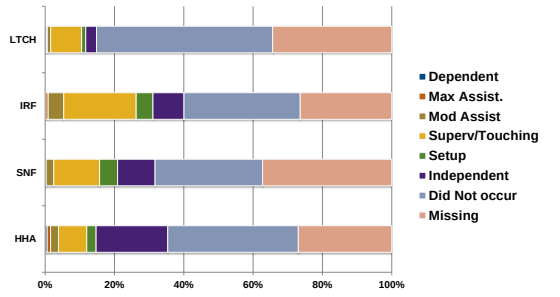
Pick Up Object from Floor Codes at Discharge



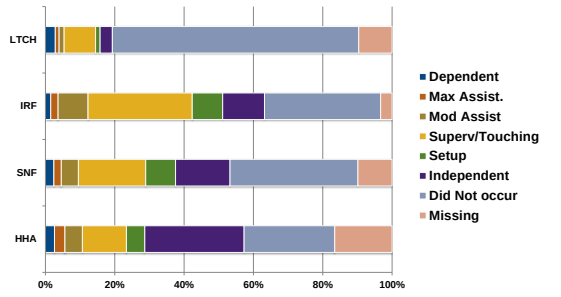
1 Step Curb Codes at Discharge



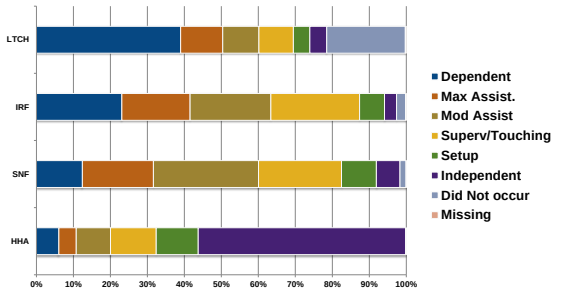
4 Steps Codes at Discharge



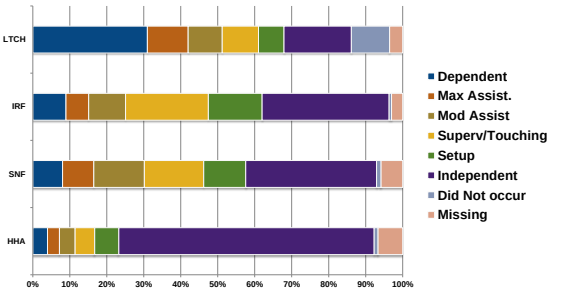
Car Transfer Codes at Discharge



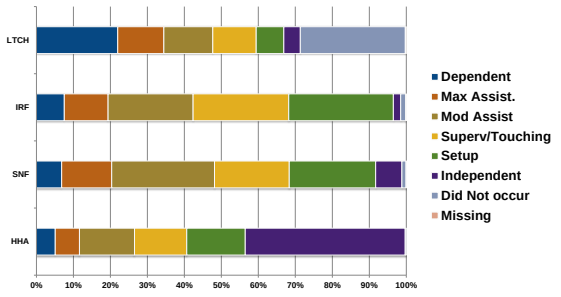
Toileting Hygiene Codes at Admission



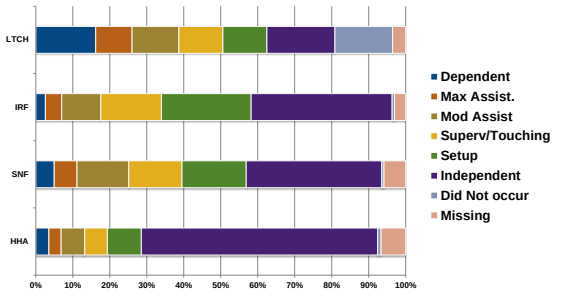
Toileting Hygiene Codes at Discharge



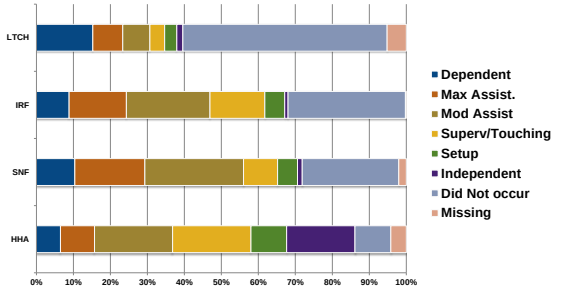
Dressing Upper Body Codes at Admission



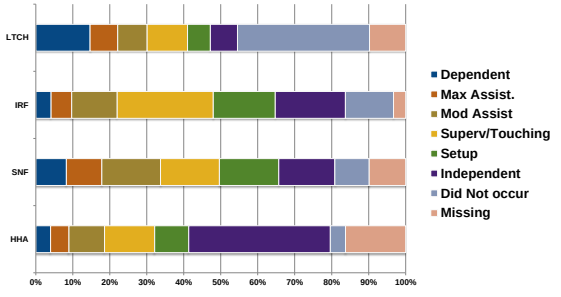
Dressing Upper Body Codes at Discharge



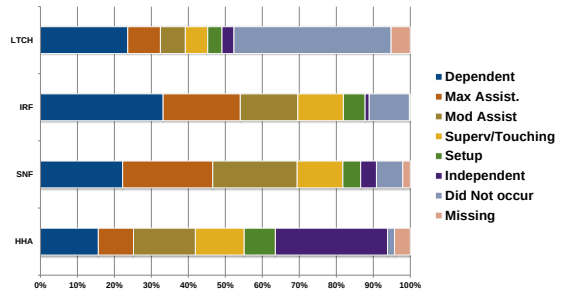
Shower/Bathe Self Codes at Admission



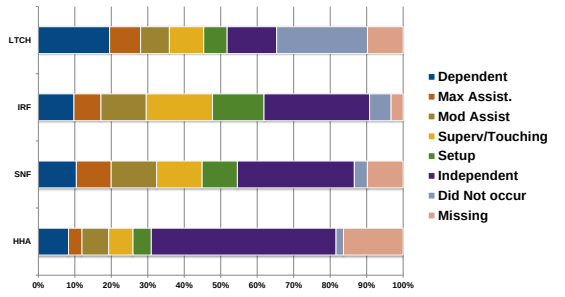
Shower/Bathe Self Codes at Discharge



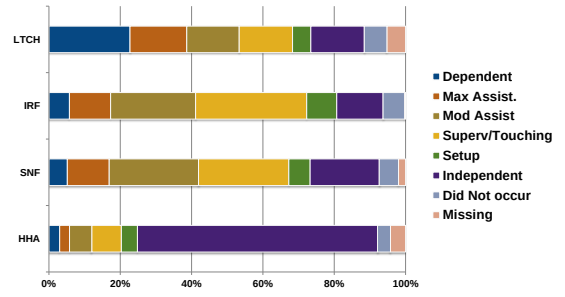
Put On/Take Off Footwear Codes at Admission



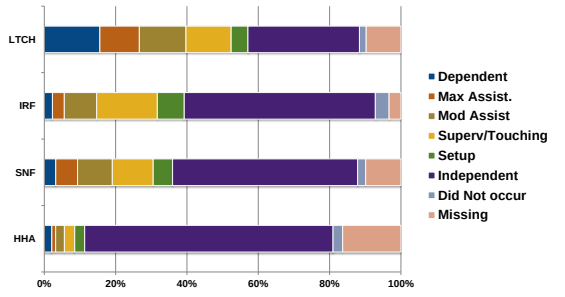
Put On/Take Off Footwear Codes at Discharge



Roll Left to Right Codes at Admission



Roll Left to Right Codes at Discharge



Additional Topics:

- What are current practices regarding setting self-care and mobility goals?
- Discharge and longer-term goals?
- Title of the measure: “Improvement in self-care” or “change in self-care”?

Concluding Remarks & Meeting Summary

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- Any final comments or recommendations to guide development of the functional outcome quality measures for SNFs?
- Next steps

THANK YOU!