



**Technical Expert Panel (TEP) for Cross-Setting Function
Measure Development
January 26-27, 2022**

Summary Report

April 2022

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1 INTRODUCTION

The Patient Protection and Affordable Care Act (ACA) of 2010 and Improving Medicare Post-Acute Care Transformation Act (IMPACT) of 2014 require public reporting of quality measures through Post-Acute Care (PAC) Quality Reporting Programs (QRPs). The Centers for Medicare & Medicaid Services (CMS) has contracted with Acumen, LLC, and Abt Associates (hereafter referred to as the PAC QRP Support team) to develop and maintain measures for each PAC QRP, which includes Long-Term Care Hospitals (LTCHs), Skilled Nursing Facilities (SNFs), Home Health Agencies (HHAs), and Inpatient Rehabilitation Facilities (IRFs). Acumen, LLC operates under the *Quality Measure & Assessment Instrument Development & Maintenance & QRP Support for the Long Term Care Hospital, Inpatient Rehabilitation Facility, Skilled Nursing Facility, Quality Reporting Programs, & Nursing Home Compare* contract (75FCMC18D0015/Task Order 75FCMC19F0003). Abt Associates operates under the *Home Health and Hospice Quality Reporting Program Quality Measures and Assessment Instruments Development, Modification and Maintenance, & Quality Reporting Program Oversight Support* contract (75FCMC18D0014/Task Order 75FCMC19F0001).

This report provides a summary of the feedback shared by panelists during the January 26 and 27, 2022, Technical Expert Panel (TEP) meetings, which focused on the development of a cross-setting functional outcome measure. The remainder of this section briefly introduces the PAC QRP project. Section 2 outlines the structure, materials, and composition of the TEP. Section 3 presents a summary of the presentation, panelist discussion, and key findings for each session. Finally, Section 4 outlines the next steps for this project that take into account the feedback obtained from the TEP.

1.1 Project Context

Under this project, the PAC QRP Support team supports CMS in the development and maintenance of quality measures for use in the IRF, LTCH, SNF, and HH QRPs and the Nursing Home Quality Initiative (NHQI). These measures are designed to improve care quality and to enable Medicare beneficiaries to make informed choices when selecting a healthcare provider. The suite of PAC QRP measures covers several domains relevant to care quality, including function – a dimension of care that is especially salient to each of the PAC settings. Over the last decade, CMS has introduced several measures addressing function. To ensure these and any newly developed function measures meet CMS program requirements and goals while maintaining high levels of scientific acceptability, the PAC QRP Support team convened a Technical Expert Panel (TEP). The PAC QRP Support team sought guidance on specifications for a cross-setting functional outcome measure to implement across PAC QRPs. The TEP meetings focused on finalizing the GG items to use for measure construction, discussing the

method to use to address Activities Not Attempted (ANAs), considering how social risk factors impact patient outcomes, and reviewing risk adjustment strategies. This TEP built upon a previous TEP, held in July 2021, where initial expert feedback was gathered on the relevance of individual GG items across PAC settings, the functional outcome measures to prioritize for cross-setting development, the appropriateness of the current approach to handling ANAs, and the identification of measurement gaps in the function domain.

1.2 TEP Panelists

The PAC QRP Functions TEP comprised 15 stakeholders with diverse perspectives and areas of expertise, as listed in Table 1. The panelists included expert stakeholders representing clinical, policy and program, measures development, and technical expertise.

Table 1. Function Measure TEP Composition

Name, Credentials, Professional Role	Organizational Affiliation, City, State	PAC Area(s) of Expertise	Consumer Perspective	Clinical Content	Performance Measurement	Coding and Informatics	Conflict of Interest Disclosure
Amy Leisenberger, MS, PT Physical Therapist and Senior Director of Outcomes Integrity	naviHealth, Couer d'Alene, ID	IRF, LTCH, SNF/NH, HH, Acute Care	-	X	X	-	N
Amy Mayer-Barger, RN, BS, COS-C, Manager of Outcomes Achievement, and Quality Assurance	Advocate Aurora Health, Continuing Health, Oak Brook, IL	HH	X	X	X	-	N
Amy J. Stewart, MSN, RAC-MT, RAC-MTA, DNS-MT, QCP-MT, Vice President of Post-Acute Care Nursing	American Association of Post-Acute Care Nursing, Denver, CO	SNF/NH	X	X	-	-	N
Anthony D'Alonzo, PT, DPT, MBA, Division Director and Vice President of Clinical Strategy and Innovation	BAYADA Home Health Care, Pennsauken, NJ	HH, Hospice Care Hospital	X	X	X	X	N
Chloe Slocum, MD, MPH Associate Director of Quality, Physical Medicine and Rehabilitation Physician	Mass General Brigham Spaulding Rehabilitation Hospital and Harvard Medical School, Charlestown, MA	LTCH, IRF, SNF/NH, HH	X	X	-	-	N
Cindy Krafft, PT, MS, HCS-O, Physical Therapist and Business Owner - Home Health Education and Consulting Firm	Kornetti & Krafft Health Care Solutions, Fernandina Beach, FL	HH	-	X	X	-	N
Debra Valkenberg, RN, RAC-CT, DNS-CT, GERO-BC Chief Nursing Officer	Ascension Living, Lake Villa, IL	LTCH, SNF/NH, HH, rural health	-	X	-	-	N

Name, Credentials, Professional Role	Organizational Affiliation, City, State	PAC Area(s) of Expertise	Consumer Perspective	Clinical Content	Performance Measurement	Coding and Informatics	Conflict of Interest Disclosure
Jennifer Stevens-Lapsley, PT, PhD, Professor of Physical Therapy and Clinical Researcher	University of Colorado, Aurora, CO	SNF/NH, Acute Care Hospital, HH	-	X	X	-	N
Kathleen Weissberg, MS, OTD, OTR/L, MCDCP, CDP, National Director of Education	Select Rehabilitation, Glenview, IL	SNF/NH, HH	-	X	X	X	N
Natalie Leland, PhD, OTR/L, BCG, FAOTA, FGSA Occupational Therapist and Researcher	Department of Occupational Therapy, School of Health and Rehabilitation Sciences, University of Pittsburgh Pittsburgh, PA	SNF/NH	-	X	-	-	N
Pamela Roberts, PhD, OTR/L, SCFES, FAOTA, CPHQ, FNAP, FACRM, Executive Director and Professor	Cedars-Sinai, Los Angeles, CA	IRF, Acute Care Hospital	-	X	X	-	N
Renee Kinder, MS, CCC-SLP, RAC-CT Executive Vice President for Clinical Services, Speech Pathologist	American Speech-Language-Hearing Association, Lexington, KY	IRF	-	X	-	-	N
Robert Rosati, PhD, Vice President of Research and Quality	VNA Health Group, Holmdel, NJ	-	-	-	-	-	N
Susan M. Battaglia, GERO-BC, RAC-CT, Director of Case Mix Management & Clinical Services	Tara Cares, Orchard Park, NY	SNF/NH	-	X	X	X	N
Timothy Peng, PhD Chief Data & Analytics Officer	Visiting Nurse Service of New York, New York, NY	HH	X	X	X	X	N

2 MEETING OVERVIEW

This section provides an overview of the TEP orientation and the TEP meetings. The PAC QRP Support team convened an hour-long webinar for TEP orientation on January 20, 2022. The TEP met via two 4-hour webinars on January 26 and 27, 2022.

2.1 Structure

The TEP orientation was a brief introduction to the current state of function measurement in the PAC QRP. The TEP meetings included four topic-driven sessions across the two days. Table 2 below provides the agenda for the TEP orientation and each day of the TEP meetings. The orientation established an understanding of the project goals and reviewed the status of measure development efforts. During the TEP meetings, the PAC QRP Support team sought input on options for specifications for cross-setting function measure, including GG items to use for measure scores, options for addressing Activities Not Attempted (ANAs), strategies for addressing social risk factors, and risk adjustment.

Table 2. TEP Orientation and Meeting Agenda

Session	Topic	Section
	Orientation	
1-A	Introductions and Project Overview	3.1
1-B	Overview of Function Measurement in Post-Acute Care	3.1
1-C	Meeting Structure and Materials	2
	Day 1	
2-A	GG Items for the Cross-Setting Measure	3.2
2-B	Options for Addressing Activity Not Attempted (ANA)	3.3
	Day 2	
3-A	Strategies for Addressing Social Risk Factors	3.4
3-B	Cross-Setting Risk Adjustment	3.5

The PAC QRP Support team presented targeted questions to facilitate the discussion and to solicit feedback to inform next steps for refining the PAC QRP cross-setting function measure specifications. The questions posed to panelists are included in italics at the beginning of each Panelist Discussion subsection. Bulleted key findings from those discussions are presented at the end of each section in this report.

2.2 Meeting Materials

Prior to the TEP, the *Technical Expert Panel: Charter*, outlining the purpose of the TEP and level of commitment expected, was reviewed by panelists. The PAC QRP team also provided panelists with a meeting agenda, background materials on assessment items and function measures, and a memo summarizing alternative approaches to handling ANA codes for the cross-setting functional outcome measure. The background materials included:

- IMPACT Act webpage¹
- Assessment instrument manuals (Table C1 in Appendix C)
- QRP websites (Table C2)
- Quality measure informational pages (Table C3)
- Quality measure specifications (Table C4)

¹ Center of Medicare & Medicaid Services, Post-Acute Care Quality Initiatives, 2021, <https://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/Post-Acute-Care-Quality-Initiatives/IMPACT-Act-of-2014/IMPACT-Act-of-2014-Data-Standardization-and-Cross-Setting-Measures>

3 SUMMARY OF THE TEP PRESENTATION AND DISCUSSION

This section summarizes feedback shared by TEP panelists and is organized into five subsections. Section 3.1 reviews background information provided during orientation, and Sections 3.2 through 3.5 describe the discussions from the January 26-27, 2022, meetings. Each subsection summarizes the material presented to the TEP, the discussion among TEP panelists in response to the material, and the key findings extracted from that discussion.

3.1 Session 1-B: Overview of Cross-Setting Function Measure Development

During this orientation session, the PAC QRP Support team reviewed the list of section GG items under consideration for the cross-setting measure, the current PAC QRP function measure portfolio, and the Discharge Function Score computation for existing IRF/SNF measures.

3.1.1 Function Assessment Items

Section GG of each PAC assessment instrument includes standardized patient assessment data elements that measure functional status. The functional status data elements (hereafter referred to as “items”) used to calculate the PAC QRP function measures capture a patient’s capacity to perform daily activities related to self-care (GG0130) and mobility (GG0170) at admission/start of care (SOC)/resumption of care (ROC)² and discharge. Table 3 reports the GG items currently available across all PAC settings (see Appendix B for full list of GG items).

Table 3. GG Items Available Across PAC Settings

Functional Domain	Item	Description
Self-Care	GG0130A	Eating
	GG0130B	Oral Hygiene
	GG0130C	Toileting Hygiene
Mobility – Bed Mobility	GG0170A	Roll Left and Right
	GG0170B	Sit to Lying
	GG0170C	Lying to Sitting on Side
Mobility – Transfers	GG0170D	Sit to Stand
	GG0170E	Chair/Bed-to-Chair Transfer
	GG0170F	Toilet Transfer
Mobility – Walking	GG0170I	Walk 10 Feet
	GG0170J	Walk 50 Feet with 2 Turns
	GG0170K	Walk 150 Feet
Mobility – Wheeling	GG0170R	Wheel 50 Feet with 2 Turns
	GG0170S	Wheel 150 Feet

² GG items are collected at SOC/ROC in HH and at admission in LTCH, IRF, and SNF

PAC clinicians score patients on their level of independence in completing the activities reflected in each item using a scale of 6 (completely independent) to 1 (completely dependent). If clinicians are unable to determine the performance code for an activity, they record the reason using one of the Activity Not Attempted (ANA) codes. Table 4 presents the meaning of each item score and ANA code.

Table 4. Item Scores and ANA Codes Available for Self-Care and Mobility GG Items

Category	Code	Description
Item Scores	1	Dependent
	2	Substantial/maximal assistance
	3	Partial/moderate assistance
	4	Supervision or touching assistance
	5	Setup or clean-up assistance
	6	Independent
ANA Codes	7	Patient refused
	9	Not applicable - Not attempted and the patient did not perform this activity prior to the current illness, exacerbation, or injury.
	10	Not attempted due to environmental limitations (e.g., lack of equipment, weather constraints)
	88	Not attempted due to medical condition or safety concerns
	^	Skip
	-	Dash

3.1.2 Cross-Setting Function Measure Development

There are currently six function measures across the PAC QRPs based on section GG items, including one process measure and five functional outcome measures (Table 5). The process measure evaluates whether PAC providers assess all available Self-Care (GG0130) and Mobility (GG0170) items on admission/SOC/ROC, set a discharge goal for at least one of the items, and assess the corresponding Self-Care (GG0130) and Mobility (GG0170) items at discharge. This measure is currently used to meet the cross-setting mandate from the IMPACT Act. This measure is topped out across all settings, so the PAC QRP Support team is seeking an alternate cross-setting measure that captures more relevant differences between providers' performance. The five risk-adjusted outcome measures calculate the gap between observed function and risk-adjusted expected function. The two Discharge Function Score measures use the function score at discharge as the outcome, whereas the three Change in Function Score measures use the difference in function scores between admission and discharge as the outcome.

Based on feedback from the July 2021 TEP, the PAC QRP Support team used the Discharge Mobility Score measure as the starting point for cross-setting measure development.

For both Self-Care and Mobility, the Discharge and Change in Function measures were highly correlated and did not appear to be measuring unique concepts. Panelists from the July 2021 TEP favored Discharge Function Score measures over Change in Function Score measures and recommended moving forward with Discharge Function Score for the cross-setting measure. Additionally, only 3 Self-Care items are available across all PAC settings, compared to 11 Mobility items. Thus, the PAC QRP Support team focused on the Discharge Mobility Score measure as a starting point for cross-setting development, but also tested the effect of including the 3 Self-Care items on provider scores.

Table 5. PAC QRP Function Measures

Measure*	Data Collection Start			
	LTCH	IRF	SNF	HH
Application of Percent of LTCH Patients with an Admission and Discharge Functional Assessment and a Care Plan that Addresses Function Measure (NQF #2631)	2016	2016	2016	2019
Functional Outcome Measure: Discharge Self-Care Score (NQF #2635)	-	2016	2018	-
Functional Outcome Measure: Discharge Mobility Score (NQF #2636)	-	2016	2018	-
Functional Outcome Measure: Change in Self-Care Score (NQF #2633)	-	2016	2018	-
Functional Outcome Measure: Change in Mobility Score (NQF #2634)	-	2016	2018	-
Change in Mobility among Patients Requiring Ventilator Support (NQF #2632)	2015	-	-	-

* See Table C4 in Appendix C for the QM manuals with specifications for each function measure

3.1.3 Discharge Function Score Computation

The PAC QRP Support team reviewed the steps involved in calculating the IRF Discharge Mobility Score measure as a framework to be adapted to the cross-setting measure score computation (see Table C4 for QM manual with full specification details):

- Exclude non-qualifying stays (e.g., incomplete stays, patients with severe neurological conditions)
- Determine observed admission and discharge scores
- Impute scores for items scored with an Activity Not Attempted (ANAs) code by recoding all ANAs to 1 (dependent) (see Section 3.3 for alternative ANA methods).
- Sum individual GG items. Patients may walk and/or use a wheelchair. Wheeling items are only used when Walk 10 Feet (GG0170I) is scored with ANA codes (7, 9, 10, 88) at both admission and discharge.

- Calculate expected Discharge Function Mobility Score for each eligible stay using risk adjustment coefficients, including demographics, health characteristics, and admission function score (see Section 3.5 for list of risk adjustors).
- Calculate provider score as the percentage of stays where observed discharge function met or exceeded expected discharge function over total qualifying stays.

3.2 Session 2-A: GG Item Set Options for the Measure Computation

During this session, the PAC QRP Support team provided an overview of the available GG items under consideration for inclusion in the cross-setting measure. Importantly, this discussion pertained only to the item set for the proposed cross-setting discharge function measure. Any GG items not included in the measure would still be collected through the PAC assessment instruments.

3.2.1 Summary of Presentation

The PAC QRP Support Team presented analyses comparing options for item sets for the cross-setting discharge mobility measure.

Item Set Recommendations from July 2021 TEP Panelists

For the July 2021 TEP, the PAC QRP Support team tested whether the set of mobility items currently available across PAC settings, or the “uniform mobility item set”, is sufficient to measure function in a cross-setting measure. The full mobility item set is available in IRF, SNF, and HH but are not currently available in LTCH. To inform whether these additional items were necessary for the cross-setting measure, the PAC QRP Support team compared measure scores and risk adjustment model results when using the uniform mobility item set (Table 6) compared to the full list of mobility items (Appendix C). Providers tended to be ranked similarly between these two item sets, with the highest correlation in IRF (0.91), then HH (0.84), then SNF (0.81), and the risk adjustment models produced similar results.

Table 6. Uniform Mobility Item Set

Item	Description
GG0170A	Roll left and right
GG0170B	Sit to lying
GG0170C	Lying to sitting on side of bed
GG0170D	Sit to stand
GG0170E	Bed-to-chair transfer
GG0170F	Toilet transfer
GG0170I	Walk 10 feet
GG0170J	Walk 50 feet with two turns
GG0170K	Walk 150 feet
GG0170R	Wheel 50 feet with two turns

Item	Description
GG0170S	Wheel 150 feet

The July 2021 TEP panelists agreed that the uniform mobility item set was sufficient for this cross-setting measure but prompted the PAC QRP Support team to consider modifications to the item set. One modification was to consider removing redundant mobility items to prevent overrepresentation of a particular functional mobility area and eliminate items with a high rate of Activity Not Attempted (ANA) responses. In particular, Sit-to-Lying (GG0170B) is highly correlated with the other bed mobility items: Roll Left/Right (GG1017A) and Lying to Sitting on the Side of Bed (GG0170C). In addition, Walk 150 Feet (GG010K) correlates highly with Walk 10 Feet (GG0170I) and Walk 50 Feet with 2 Turns (GG0170R), and Wheel 150 Feet (GG0170S) is highly correlated with Wheel 50 Feet with 2 Turns (GG0170R). The Walk/Wheel 150 Feet items also have some of the highest ANA rates of items in the uniform mobility item set, and removing these items would lessen the ANA response rate.

The other modification suggested by July 2021 TEP panelists was to incorporate self-care into the cross-setting measure by using Eating (GG0130A), Oral Hygiene (GG0130B), and Toileting Hygiene (GG0130C) for measure scores.

Comparison of Item Set Options

In response to recommendations from the July 2021 TEP, the PAC QRP Support team compared the following four alternative item set options against the uniform mobility item set (UMIS) to assess the impact on measure scores (Table 7):

- (1) UMIS without Walk/Wheel 150 Feet
- (2) UMIS without Walk/Wheel 150 Feet and the Sit to Lying
- (3) UMIS with Self-Care items (Eating, Oral Hygiene, Toileting Hygiene)
- (4) Reduced item set (i.e., item set 2 above) with the additional Self-Care items

The PAC QRP Support team measured differences in provider scores and model performance in each alternative item set compared to the UMIS. For all settings and alternative item sets, the rank correlation with the UMIS was fairly high and ranged from 0.92 to 0.99. Across settings, the percent of providers that performed in the same quintile for the UMIS and alternative item sets varied by item set (71-90%). The item sets with Self-Care items tended to differ the most from the UMIS. Consistently across item sets, the most impact to scores was in HH. Mean provider scores and risk adjustment model fit (adjusted R²) were similar across item sets for each setting.

Table 7. Item Set Alternatives to the Uniform Mobility Item Set (UMIS)

Item	Description	Uniform Mobility Item Set (UMIS)	UMIS Alternatives			
			1) No W/W 150'	2) No W/W 150', Sit to Lying	3) UMIS + SC	4) No W/W 150', Sit to Lying, + SC
Self-Care						
GG0130A	Eating				✓	✓
GG0130B	Oral hygiene				✓	✓
GG0130C	Toilet hygiene				✓	✓
Mobility						
GG0170A	Roll left and right	✓	✓	✓	✓	✓
GG0170B	Sit to lying	✓	✓		✓	
GG0170C	Lying to sitting on side of bed	✓	✓	✓	✓	✓
GG0170D	Sit to stand	✓	✓	✓	✓	✓
GG0170E	Bed-to-chair transfer	✓	✓	✓	✓	✓
GG0170F	Toilet transfer	✓	✓	✓	✓	✓
GG0170I	Walk 10 feet	✓	✓	✓	✓	✓
GG0170J	Walk 50 feet with 2 turns	✓	✓	✓	✓	✓
GG0170K	Walk 150 feet	✓			✓	
GG0170R	Wheel 50 feet with 2 turns	✓	✓	✓	✓	✓
GG0170S	Wheel 150 feet	✓			✓	

3.2.2 Panelist Discussion

Should the cross-setting functional outcome measure include:

- (1) Walk 150 Feet (GG0170K)?
- (2) Wheel 150 Feet (GG0170S)?
- (3) Sit to Lying (GG0170B)?
- (4) Self-Care Items (GG0130A-C)?

TEP members expressed conflicting opinions about removing the Walk and Wheel 150 Feet items. Many panelists favored retaining Walk and Wheel 150 Feet. Panelists worried that these patients would tend to do well on the lower difficulty Walk/Wheel items but may perform worse on Walk/Wheel 150 Feet, such that eliminating those items would reduce our ability to differentiate ambulation status in settings with more mobile patients (e.g., HH).

In contrast, other panelists favored removing the Walk and Wheel 150 Feet items. TEP members cited that since these items are highly correlated with other Walk and Wheel items, this

dimension of function appears to be accounted for through other items. Also, due to the high ANA rates, removing these items would reduce the need for imputed values. Panelists commented on the variability in the HH setting. The PAC QRP Support team attributed this to the unique nature of HH care since HHAs tend to be smaller and more susceptible to variation. Some panelists mentioned that Walk/Wheel 150 Feet may be missing more in HH than the other Walk/Wheel items because there may not be adequate space in a patient's home to conduct the assessment.

The TEP members generally agreed that the self-care items would be a valuable addition to the measure. The TEP members noted that the self-care items impact scores, indicating their relevance and added value. The panelists mentioned that these items were clinically important, and some panelists further recommended the addition of more self-care items in the future (if available).

3.2.3 Key Findings

- Panelists did not express concerns about removing the Sit to Lying item.
- Panelists were divided on removing or keeping the Walk and Wheel 150' items.
- Most panelists favored adding self-care items.

3.3 Session 2-B: Options for Addressing Activities Not Attempted (ANA)

During this session, the PAC QRP Support team presented and solicited feedback on strategies to address Activity Not Attempted codes (ANAs) during measure calculation.

3.3.1 Summary of Presentation

The PAC QRP Support team described the approach to handling ANAs currently used in setting-specific PAC QRP functional outcome measures, presented two alternative methods, and reviewed results that compare ANA methods.

Current Recode Approach

For the functional outcome measures currently implemented in the LTCH, IRF, and SNF QRPs, all ANA codes are recoded to 1 (dependent) when calculating measure scores. This approach assumes that all ANAs equate to scenarios where patients are fully dependent for a particular activity. The PAC QRP Support team reviewed results presented in the July 2021 TEP suggesting that this assumption may not be universally true. In the subset of stays where patients had an ANA at admission but were assessed at discharge (i.e., given a score of 1-6), item scores at discharge tended to be higher in patients with ANAs at admission than those with a 1 (dependent) at admission. Panelists from the July 2021 TEP expressed that these results were sensible because, in their experience, ANAs do not always reflect dependence on a function activity. First, certain ANA codes (7 – patient refused; 10 – environmental limitations) do not

conceptually reflect patient dependence. Second, there is variability in how ANA codes are applied across providers. For instance, different types of clinicians may apply ANA codes more or less, depending on their degree of comfort assessing function.

Alternatives to the Current Recode

Based on feedback from the July 2021 TEP, the PAC QRP Support team explored alternate approaches to address ANAs during measure calculation. This section describes two alternatives to the current recode: (1) rescale and (2) statistical imputation.

Rescale

An alternative solution to the current recode method is to rescale the assessed items (i.e., non-ANAs) in a way that counterfactually creates a score as if it were based on the full set of items. As a simplified example, imagine a set of 3 mobility items where a beneficiary has the scores detailed below. Item 3 is ANA. The total mobility score would be the sum of the available item scores rescaled to reflect the full number of items: $(2+4) * 3/2 = 9$.

Table 8. Total Score for a Beneficiary Using Simple Rescale (Hypothetical)

Item	Score
Rescaled Total Score	9
1	2
2	4
3	ANA

To improve upon the validity of the rescaled total mobility score, the PAC QRP Support team incorporates two refinements to the simple rescale. First, to correct for varying difficulty across mobility items, each available item score is centered on the population-level mean for that item before determining a beneficiary’s rescaled total score. Second, to ensure information about the level of change in patient function between admission and discharge on individual items is maintained, only items where both admission and discharge scores are recorded (non-ANAs) are used to determine a beneficiary’s rescaled total score.

The advantages of the rescale method are that (1) it does not assume that all patients whose function is not assessed (ANAs) should have similar outcomes to patients who are evaluated as dependent (score of 1), and (2) it is simple to implement. However, a disadvantage is that the rescale method does not discourage ANA use. Rather, it may encourage providers to report ANAs at discharge, particularly on harder items such that their rescaled measure scores are based on easier items, or on any item on which a patient does not show improvement. An additional issue with rescale is that it may require additional exclusion rules to prevent scores from being based on a small number of items.

Statistical Imputation

Another approach to handle ANAs is to use the information collected through the assessments (e.g., patient demographics, such as age, and comorbid conditions) to impute the missing scores. In general, the idea of imputation is to replace missing or invalid values for a variable based on the values of other, non-missing variables in the data. When a missing value is encountered for an item on an assessment (the target item/assessment), an imputation method essentially looks to fill in the missing value by finding other assessments which (1) do not have a missing value for this item, and (2) are otherwise similar to the assessment with a missing value. This is achieved by building statistical models to impute missing values on each GG item. Two separate models are run for each GG item included in the measure score: one for admission score and another for discharge score. Models use scores on other function items and covariates from the risk adjustment model to predict what the missing item value should have been. Variables for other function items include the assessed value (1-6) when available and indicators for whether the item was skipped or had another type of ANA when the item was not assessed. To revisit the simplified example, statistical imputation would use model results to estimate the score on the missing third item in this hypothetical patient encounter (Table 9).

Table 9. Total Score for a Beneficiary Using Simple Rescale (Hypothetical)

Item	Observed	Imputed
1	2	2
2	4	4
3	ANA	3.3

A benefit of statistical imputation is that it produces an unbiased estimate of the score on each item with ANAs. In addition, statistical imputation should dis-incentivize strategic ANA use since it is more difficult for providers to know when ANA use would improve their measure scores, given the number of patient characteristics adjusted for. A disadvantage of statistical imputation is that it is more complex to implement and report.

Evaluating Alternatives to Current Recode

This section describes two analyses conducted to evaluate the merits of each alternative method: (1) a bootstrapping analysis to obtain bias/error estimates and (2) an incentive simulation analysis. All analyses were conducted with the UMIS.

Criteria for Evaluating ANA Methods

The PAC QRP Support team compared how each ANA method performed by measuring:

- Bias: on average, by how much (up or down) does the method distort the truth?
- Mean Squared Error (MSE): on average, how far away is the method from the truth?
- Incentive to Mis-Report ANA: on average, how much can a facility distort its score by mis-reporting ANAs?

Bias/MSE

The PAC QRP Support team devised a bootstrapping method to measure bias and MSE in each ANA method relative to a gold standard. The goal was to determine, for each method, how similar imputed values were to the true item score. This similarity could not be measured directly since the true value of the measure score was unknown in the case of the individuals for whom imputation was necessary (imputation was needed precisely because the missing values prevented calculating the measure score for these individuals). Therefore, the PAC QRP Support team assessed the accuracy of each imputation method through a bootstrapping strategy:

1. Identified observations from the original sample with no ANAs recorded across all items needed for measure calculation.
2. Generated a bootstrap sample that draws from the no-ANA observations until there were as many observations in the bootstrap sample as the original sample.
3. Created two copies of this sample.
 - a. One copy served as the gold standard source of truth.
 - b. With the other copy, imposed ANAs onto bootstrap observations by randomly drawing from the original sample and replicating its ANA pattern onto the bootstrap observation (e.g., if items 2 & 5 were ANA in the original observation, imposed ANAs on items 2 & 5 in the bootstrap observation).
4. In the second copy produced in step 3b, imputed values for the ANAs imposed onto the bootstrap sample using the current recode, statistical imputation, and rescale. Calculated measure scores using values imputed from each method.
5. Calculated bias and mean-squared error of each method by comparing to the measure scores produced from the gold standard copy (step 3a).
6. Repeated steps 2-3 many times. Reported average bias/mean-squared error across iterations for each method.

Across settings, both rescale and statistical imputation had substantially lower levels of bias and MSE than the current recode approach. The current recode produced considerable negative bias across settings, whereas rescale and statistical imputation showed a lower magnitude of positive bias, on average. The current recode also showed higher MSE across settings than the alternatives. In LTCH, IRF, and SNF, statistical imputation outperformed rescale in terms of bias and MSE. In HH, rescale had slightly lower bias and MSE than statistical imputation.

Incentive Simulation Analysis

For PAC quality measures based on risk-adjusted improvement in functional status, facilities have an incentive to reduce the functional status measure score on admission. Under the current recode, one avenue for reducing admission score would be to code more ANAs than are necessary since each ANA would be recoded to 1 (the lowest possible value). For instance, if a patient would score a 3 on an item, a strategic provider may instead record an ANA code in order to minimize the expectation for that patient's function at discharge and improve facility quality scores by exceeding that artificially lowered expectation. Imputation has the potential to reduce this issue. When an item is coded ANA, imputation methods replace that item's score not with 1 but with an imputed value which, often, will be greater than 1.

The PAC QRP Support team used a simulation method to assess how much the incentive to recode ANA is reduced by shifting to imputation. The purpose of the simulation method was to calculate the incentive to mis-assess ANA and how this varies among imputation methods. The team studied the relationship between number of mis-assessed ANAs imposed and average observed admission score across facilities (see Steps 1-3 below). The expectation was that methods more susceptible to gaming would exhibit lower average admission scores with more mis-assessed ANAs.

1. Started from validation samples produced in step 2 of Bias/MSE calculation. Calculated admission score for each facility (sum of individual item scores at admission). Generated the average admission score across facilities.
2. For each observation, imposed a mis-assessed ANA by randomly replacing an item score with an ANA. Used the current recode and statistical imputation to generate imputed item scores. Recalculated admission scores for each facility with imputed item scores. Generated the average admission score across facilities with one mis-assessed ANA per observation.
3. Repeated 4 times such that each iteration has one more mis-assessed ANA per observation than the previous iteration (up to 5 mis-assessed ANAs per observation).

Using the current recode as the ANA-handling method, the average observed admission score decreased with each ANA added. However, adding ANAs to stays did not result in substantive impact on observed admission score for statistical imputation.

Impact of Imputation on Measure Scores

The PAC QRP Support team also measured the impact on provider scores of using statistical imputation as the ANA method, relative to using the current recode. In LTCH, IRF, and SNF, providers tended to be ranked fairly similarly between statistical imputation and

current recode. Rank order correlation is 0.93, 0.98, and 0.95 in LTCH, IRF, and SNF, respectively, and providers fall in the same quintile 67%, 84%, and 71% of the time in LTCH, IRF, and SNF, respectively. In HH, provider scores are less correlated between statistical imputation and current recode – with a rank correlation of 0.77 and 58% of providers in the same quintile. Across all PAC settings, mean values for observed admission score, observed discharge score, and final score were higher using statistical imputation compared to the current recode.

The PAC QRP Support team evaluated whether using statistical imputation v. recode impacted final scores of certain provider types more than others. The team measured differences in provider performance between the methods by rurality, profit status, provider size, and proportion of dual-eligible patients and did not observe notable differences by these provider characteristics when using statistical imputation instead of the current recode.

3.3.2 Panelist Discussion

How do TEP members think ANAs should be handled in the cross-setting function measure?

- Current Recode
- Rescale
- Statistical Imputation
- Alternative Suggestion

Panelists asked clarifying questions about the ANA methods presented. One panelist wondered if patient characteristics were considered in the sampling method used to generate the gold standard for bias/MSE calculations. The PAC QRP Support team clarified that the gold standard was not a random sample. Instead, it was constructed by matching on function scores on assessed items. Propensity score stratification had also been tested. Another panelist mentioned changes in reimbursement occurring in 2019 and asked if ANA rates and related findings would be impacted by those changes. The PAC QRP Support team indicated that testing had been conducted in more recent data, and the findings were similar.

In response to which ANA method to use for the cross-setting measure, panelists tended to favor statistical imputation with continued refinement to improve cross-setting performance. Panelists agreed that the current recode could be improved upon and reiterated that not all ANAs reflect dependence on a function activity. One panelist mentioned that rescale has some limitations that imputation does not, citing the incentive problem. Panelists tended to consider statistical imputation the most accurate approach to estimating missing values since it uses more information about the patient to impute scores. A few panelists expressed concerns about how the imputation method appears to be performing in HH and expressed support for continued

refinement. Panelists emphasized the importance of clear plain language to describe the method to providers but thought clinicians would prefer a method that is more accurate over one that is simpler.

3.3.3 Key Findings

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

3.4 Session 3-A: Strategies for Addressing Social Risk Factors

During this session, the PAC QRP Support team facilitated a discussion about how social risk factors impact functional outcomes in each PAC setting.

3.4.1 Summary of Presentation

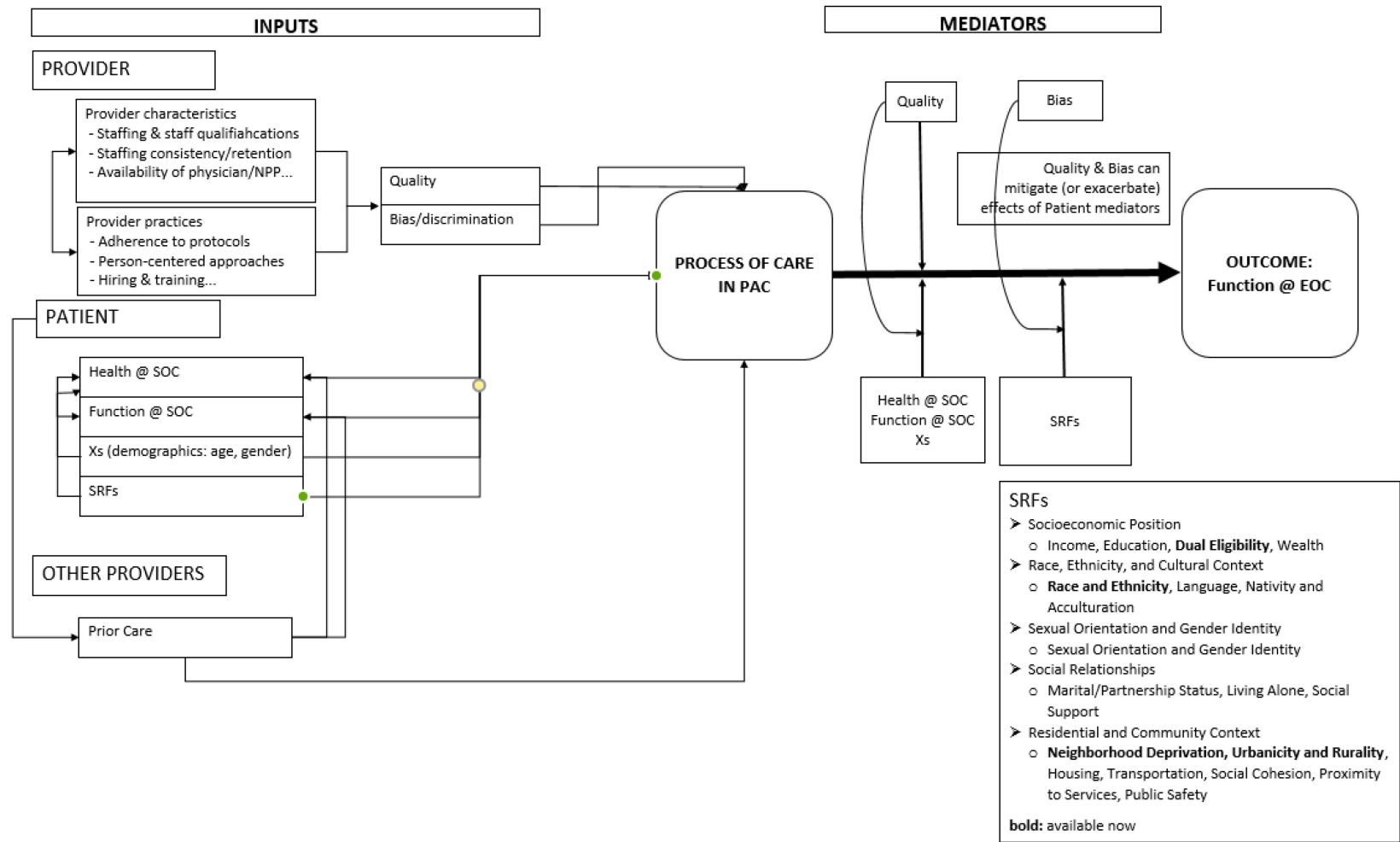
The PAC QRP Support team reviewed a conceptual model for how social risk factors (SRFs) influence functional outcomes in PAC patients. In technical guidance released in 2021,³ the National Quality Forum (NQF) encouraged incorporation of an explicit logic model of causal factors that lead to a measure outcome of interest during measure development. The PAC QRP Support team adapted this logic model to show the timeline of factors that impact functional outcomes throughout the process of post-acute care (Figure 1). This conceptual model outlined how the same process of care can result in different outcomes due to differences in patient or provider characteristics. The model displayed inputs into the process of care, including examples of provider characteristics (e.g., staffing levels and qualifications, staff consistency/retention), provider practices (e.g., adherence to protocols, person-centered approaches), and patient characteristics (e.g., health/functional status at start of care, SRFs). Provider characteristics and practices could be grouped into (1) characteristics that relate to provider quality and (2) ones that reflect provider bias and discrimination. The model showed how, throughout the process of care, provider mediators (quality and bias) could either mitigate or exacerbate patient mediators to influence functional outcomes at the end of care.

The PAC QRP Support team provided language fluency as an example of this interaction of patient and provider mediators. If patients are less able to communicate effectively with their provider, their functional outcomes may be worse. However, providers could mitigate this effect by offering translation services or having staff fluent in the patient's preferred language. Bias (e.g., xenophobia) could impact care directly (e.g., less time and attention given to the patient) and affect the provider's ability to mitigate the effect of the language barrier (e.g., patient

³ Developing and Testing Risk Adjustment Models for Social and Functional Status-Related Risk Within Healthcare Performance Measurement FINAL TECHNICAL GUIDANCE – VERSION 4 August 30, 2021

requests/complaints are not acted upon). This type of SRF, where the provider has control over its effect on functional outcomes, should not be included in risk adjustment.

Figure 1. Conceptual Model for Functional Outcomes in PAC



The PAC QRP Support team reviewed a common list of SRFs in the conceptual model for PAC that have the potential to, directly or indirectly, impact patient outcomes. Bolded items indicate currently available data and italicized items indicate data elements that will be available in the future.

- Socioeconomic Position
- Income, Education, **Dual Eligibility**, Wealth
- Race, Ethnicity, and Cultural Context
- **Race and Ethnicity**, *Language*, Nativity and Acculturation
- Sexual Orientation and Gender Identity
- Sexual Orientation and Gender Identity
- Social Relationships
- Marital/Partnership Status, Living Alone, Social Support
- Residential and Community Context
- **Neighborhood Deprivation, Urbanicity and Rurality**, Housing, *Transportation*, Social Cohesion, Proximity to Services, Public Safety

3.4.2 Panelist Discussion

- *Provide examples of SRFs that affect the relationship between care provided and functional outcomes in your setting.*
- *Provide examples of ways providers can mitigate these relationships.*
- *Highlight SRFs and/or mitigation strategies that are more relevant in some settings than in others*
- *Does the conceptual model represent the salient points about the relationship between SRFs, patient functional outcomes, and provider quality?*

One panelist asked about the rationale for discussing SRFs that are not currently measured. The PAC QRP Support team clarified that this discussion also serves to identify important gaps in data collection. Panelists offered examples of patient characteristics that influence outcomes: health literacy; access to healthcare services (including telemedicine); race/ethnicity/culture; whether patients had a primary care physician; prior hospitalization; prior intensive care unit admission; living site; unstable housing/homelessness; income status; food security; social isolation; transportation. Some panelists mentioned that the area deprivation index would capture regional disparities in wealth/access to healthcare. A few panelists

emphasized that addressing health literacy and cultural competence are inside the provider's control.

In terms of SRFs that are currently measurable, some panelists mentioned that dual eligibility for Medicare and Medicaid tends to be a fairly good proxy for income status, and the area deprivation index could serve to reflect access to care. Race/ethnicity are relevant to functional outcomes but are impacted by provider bias. One panelist offered that providers may be unaware of differences in outcomes by SRFs and suggested that educating providers about any differences could help address them.

3.4.3 Key Findings

- TEP members agreed that the conceptual model presented does represent the salient points about the relationship between SRFs, patient functional outcomes, and provider quality.
- TEP members provided examples of ways in which providers are able to, and should be expected to, mitigate the influence of SRFs on patient outcomes.
- TEP members supported further analysis to understand effect of measureable SRFs.

3.5 Session 3-B: Cross-Setting Risk Adjustment

During this session, the PAC QRP Support team presented an overview of the data availability in each PAC setting and aimed to solicit feedback on which covariates should be included in the cross-setting measure risk adjustment model.

3.5.1 Summary of Presentation

Because different data elements are collected across the assessment instruments for each PAC setting, the PAC QRP Support team aligned covariates across PAC settings as much as possible when constructing risk adjustment models (Table 10). In all four settings, risk adjustment models adjust for age, admission mobility score, prior function/device use, pressure ulcers, incontinence, and comorbid conditions. For other covariates, SNF and IRF are most aligned. The same primary medical condition categories (PMCC) are collected in SNF and IRF. In LTCH, PMCCs are used, but the conditions are different from SNF and IRF. In HH, the ICD codes indicating primary diagnosis are not rolled up into PMCCs. Additionally, certain covariates are unavailable in LTCH and HH. Data on cognitive function and falls are not collected in LTCH. Nutritional approaches are not collected in HH. Communication impairment is measured differently in the HH setting compared to the other three settings. LTCH and HH risk adjustment models also contain covariates not included in the SNF/IRF models. Ventilation status is only included in LTCH. The HH model has three unique risk-adjustors: availability of assistance, living arrangements, and entry pattern. These covariates are specifically important

for HH since patients are often referred without a preceding hospital stay and patient care occurs outside a facility setting.

Table 10. Risk Adjusters Available in Assessments from Each Setting

Risk Adjuster	LTCH	IRF	SNF	HH
Age	✓	✓	✓	✓
Admission Mobility Score	✓	✓	✓	✓
Primary Medical Condition Category (PMCC)	✓	✓	✓	
Interaction of Admission Mobility Score and PMCC	✓	✓	✓	
Prior Function/Device Use	✓	✓	✓	✓
Pressure Ulcers	✓	✓	✓	✓
Cognitive Function		✓	✓	✓
Communication Impairment	✓	✓	✓	
Incontinence	✓	✓	✓	✓
Falls		✓	✓	✓
Nutritional Approach	✓	✓	✓	
Comorbidities	✓	✓	✓	✓
Ventilation Status	✓			
Availability of Assistance				✓
Living Arrangements				✓
Entry Pattern				✓

3.5.2 Panelist Discussion

The PAC QRP Support team requested general feedback on the risk adjustment models and other covariates for risk adjustment to consider.

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

3.5.3 Key Findings

- The panelists supported setting-specific parameters for risk adjustment.
- Panelists offered additional dimensions to consider adding to the risk adjustment model for the cross-setting measure using data elements that are currently available or will be available in the future.

4 NEXT STEPS

The input provided by this TEP will provide guidance to the PAC QRP Support team throughout the cross-setting functional outcome measure development effort. This section will discuss how we plan to address and incorporate the feedback received from this TEP meeting.

4.1 Item Set for a Cross-Setting Function Measure

The panelists agreed with removing the Sit-to-Lying item (GG0170B) from the cross-setting measure specification and adding Self-Care items (GG0130A-C). The TEP members were conflicted about removing the Walk and Wheel 150' items. The PAC QRP Support team will conduct further analysis to inform this decision.

4.2 Imputation Methodology for Addressing ANAs

The panelists arrived at a consensus that the current recode can be improved upon and that statistical imputation should be the method to use instead. The PAC QRP Support team will continue to refine the imputation methodology to improve performance across settings.

4.3 Impact of SRFs on Measure Scores

The panelists expressed support of both the conceptual model presented and for further analysis. The PAC QRP Support team will conduct further analysis to understand the effects of measureable SRFs.

4.4 Testing Additional Risk Adjustment Variables

The panelists expressed support for setting-specific risk adjustment models. The PAC QRP Support team will test incorporating additional clinically advisable and feasible risk adjustment covariates.

5 APPENDIX A: PAC QRP FUNCTION MEASURE DEVELOPMENT TEAM

The PAC QRP Support team is multidisciplinary and includes individuals with knowledge and expertise in the areas of measure development, clinician payment policy, health economics, clinical practice, public reporting, pay-for-performance, and value-based purchasing and quality improvement. The following individuals from the project team attended the TEP:

Abt Associates and OASIS Answers, Inc.

- Alrick Edwards, Health Research Monitoring and Evaluation Associate
- Derek Hoodin, Health Economics Senior Analyst
- Linda Krulish, Clinical Subject Matter Expert
- Margot Schwartz, Health Research Monitoring and Evaluation Associate
- Marian Essey, Clinical Subject Matter Expert
- Morris Hamilton, Health Economics Associate

Acumen, LLC

- Adrian Yuen, Senior Data & Policy Analyst
- Ellen Strunk, Clinical Lead
- Eugene Lin, Moderator
- Mikhail Pyatigorsky, Associate Research Manager
- Sharoni Bandyopadhyay, Data & Policy Analyst
- Stephen McKean, Research Manager
- William Vogt, Senior Research Director
- Zebulin Kessler, Policy Lead
- Zhizhi Min, Data & Policy Analyst

6 APPENDIX B: PAC QRP FUNCTION ASSESSMENT ITEMS

The following tables report when data collection for each self-care (Table B1) and each mobility (Table B2) GG item started.

Table B1. Self-Care Assessment Item Data Collection Start Dates

Item	Description	IRF	LTCH	SNF	HH
GG0130A	Eating	2016	2016	2016	2019
GG0130B	Oral Hygiene	2016	2016	2016	2019
GG0130C	Toileting Hygiene	2016	2016	2016	2019
GG0130D	Wash Upper Body	-	2016	-	-
GG0130E	Shower/Bathe Self	2016	-	2018	2019
GG0130F	Upper Body Dressing	2016	-	2018	2019
GG0130G	Lower Body Dressing	2016	-	2018	2019
GG0130H	On/Off Footwear	2016	-	2018	2019

Table B2. Mobility Assessment Item Data Collection Start Dates

Item	Description	IRF	LTCH	SNF	HH
GG0170A	Roll Left and Right	2016	2016	2018	2019
GG0170B	Sit to Lying	2016	2016	2016	2019
GG0170C	Lying to Sitting on Side	2016	2016	2016	2017
GG0170D	Sit to Stand	2016	2016	2016	2019
GG0170E	Chair/Bed-to-Chair Transfer	2016	2016	2016	2019
GG0170F	Toilet Transfer	2016	2016	2016	2019
GG0170G	Car Transfer	2016	TBD	2016	2019
GG0170I	Walk 10 Feet	2016	2016	2018	2019
GG0170J	Walk 50 Feet with 2 Turns	2016	2016	2016	2019
GG0170K	Walk 150 Feet	2016	2016	2016	2019
GG0170L	Walk 10 Feet – Uneven Surface	2016	TBD	2018	2019
GG0170M	1 Step (Curb)	2016	TBD	2018	2019
GG0170N	4 Steps	2016	TBD	2018	2019
GG0170O	12 Steps	2016	TBD	2018	2019
GG0170P	Picking Up an Object	2016	TBD	2018	2019
GG0170R	Wheel 50 Feet with 2 Turns	2016	2016	2016	2019
GG0170S	Wheel 150 Feet	2016	2016	2016	2019

7 APPENDIX C: BACKGROUND MATERIALS

The following tables present the background materials provided to the TEP panelists for review prior to the TEP meeting.

Table C1. Assessment Instrument Manuals

Setting	Manual Version	URL
HH	OASIS-D	Home Health (HH) OASIS-D Instrument and Manuals
IRF	IRF-PAI v3.0	Inpatient Rehabilitation Facility Patient Assessment Instrument (IRF-PAI) and Manuals
LTCH	LCDS v4.0	Long-Term Care Hospital (LTCH) Continuity Assessment Record and Evaluation (CARE) Data Set (LCDS) Instrument and Manuals
SNF	MDS 3.0	Minimum Data Set (MDS) 3.0 Resident Assessment Instrument (RAI) and Manuals

Table C2. Quality Reporting Program Websites

Setting	URL
HH	Home Health (HH) Quality Reporting Program (QRP)
IRF	Inpatient Rehabilitation Facility (IRF) Quality Reporting Program (QRP)
LTCH	Long-Term Care Hospital (LTCH) Quality Reporting Program (QRP)
SNF	Skilled Nursing Facility (SNF) Quality Reporting Program (QRP)

Table C3. Quality Measure Informational Pages

Setting	URL
HH	Home Health (HH) Quality Reporting Program (QRP) Measures Informational Page
IRF	Inpatient Rehabilitation Facility (IRF) Quality Reporting Program (QRP) Measure Informational Page
LTCH	Long-Term Care Hospital (LTCH) Quality Reporting Program (QRP) Measures Informational Page
SNF	Skilled Nursing Facility (SNF) Quality Reporting Program (QRP) Measures and Technical Informational Page

Table C4. Quality Measure Specifications

Setting	QM Manual Version	URL
HH	v1.0	Home-Health-QRP-QM-Users-Manual-V1.0-August-2019.pdf
IRF	v3.1	IRF-Measure-Calculations-and-Reporting-Users-Manual-V3.1-508C.pdf
LTCH	v3.1	LTCH-Measure-Calculations-and-Reporting-Users-Manual-V3.1-508C.pdf
SNF	v3.0	SNF-Measure-Calculations-and-Reporting-Users-Manual-V3.0 -508C.pdf