Development and Evaluation of Candidate Standardized Patient Assessment Data Elements: Findings from the National Beta Test (Volume 7: Global Health, Care Preferences, and Medication Reconciliation)

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Preface

The Centers for Medicare & Medicaid Services (CMS) contracted with the RAND Corporation to identify and develop standardized patient assessment data elements (SPADEs) for use in the post-acute care (PAC) patient assessment instruments: the Outcome and Assessment Information Set, used in home health agencies; the Inpatient Rehabilitation Facility Patient Assessment Instrument (IRF-PAI), used in inpatient rehabilitation facilities; the Long-Term Care Hospital Continuity Assessment Record and Evaluation Data Set, used in long-term care hospitals; and the Minimum Data Set, used in nursing homes and skilled nursing facilities. RAND was tasked with developing and testing data elements within five areas of focus that fall under the clinical categories delineated in the Improving Medicare Post-Acute Care Transformation (IMPACT) Act of 2014: (1) cognitive function and mental status; (2) special services, treatments, and interventions; (3) medical conditions and comorbidities; (4) impairments; and (5) other categories.

This eight-volume report presents background information and results of the National Beta Test, which assessed a set of data elements within the five categories under the IMPACT Act. The National Beta Test was conducted between November 2017 and August 2018. Volume 1 is an executive summary of the material presented in the subsequent volumes. Volume 2 covers the data elements tested; the design; the sampling plan; information on training, recruitment, and retention; information on the data collection process, and the analytic plan. Volume 3 provides a sample description and reports analyses that evaluate the generalizability of results from the National Beta Test sample, both in terms of the representativeness of the facility/agency-level sample to the national population of PAC facilities/agencies, as well as the patients and residents who participated in the National Beta Test relative to the national population of patients and residents receiving PAC in the United States. Volumes 4–8 present the quantitative and qualitative data gathered during testing, as well as interpretations of the results for SPADEs in the following clinical categories: cognitive function (Volume 4), mental status and pain (Volume 5), impairments and special services, treatments, and interventions (Volume 6), and data elements that fall into other clinical categories (care preferences, medication reconciliation, and global health; Volume 7). Volume 8 describes the results and recommendations for SPADEs developed specifically for patients and residents who are unable to communicate (staff assessments of mental status, mood, and pain).

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Abbreviations

ADLs	activities of daily living
ANOVA	analysis of variance
BIMS	Brief Interview for Mental Status
CMS	Centers for Medicare & Medicaid Services
CY	calendar year
DIF	differential item functioning
ECV	explained common variance
EMR	electronic medical record
FY	fiscal year
HHA	home health agency
HRQOL	health-related quality of life
IMPACT	Improving Medicare Post-Acute Care Transformation
IRF	inpatient rehabilitation facility
IRF-PAI	Inpatient Rehabilitation Facility Patient Assessment Instrument
IRT	item response theory
LCDS	Long-Term Care Hospital CARE Data Set
LTCH	long-term care hospital
MDS	Minimum Data Set
MR	medication reconciliation
OASIS	Outcome and Assessment Information Set
PAC	post-acute care
PC	public comment
PHQ	Patient Health Questionnaire
PROMIS	Patient-Reported Outcome Measurement Information System
ROC	resumption of care
SD	standard deviation
SNF	skilled nursing facility
SOC	start of care
SPADE	standardized patient assessment data element
TEP	technical expert panel

1. Introduction

The Centers for Medicare & Medicaid Services (CMS) contracted with the RAND Corporation to evaluate candidate standardized patient assessment data elements (SPADEs) in a national field test titled the National Beta Test. The National Beta Test was conducted to evaluate the performance of candidate SPADEs in the clinical categories of (1) cognitive function and mental status; (2) special services, treatments, and interventions; (3) medical conditions and comorbidities; (4) impairments; and (5) other clinical categories, for use in four post-acute care (PAC) settings: home health agencies (HHAs), inpatient rehabilitation facilities (IRFs), long-term care hospitals (LTCHs), and skilled nursing facilities (SNFs).

This is Volume 7 of the final report on the National Beta Test, which includes the identification and testing of candidate SPADEs in the clinical category of *other clinical categories* (global health, care preferences, and medication reconciliation). This chapter offers a high-level orientation of the goals, scope, and methods of the National Beta Test. Additionally, this chapter lists the analyses that will be presented for the evaluation of candidate SPADEs in later chapters of this volume.

Candidate SPADEs were identified for this National Beta Test following a series of activities that took place from October 2015 to August 2017, including two Alpha feasibility tests held in select CMS regions,[1] two technical expert panels (TEPs),[2] two subregulatory calls for public comment,[3] and one notice of proposed rulemaking for the Fiscal Year (FY)/Calendar Year (CY) 2018 proposed rules.[4] The results of these activities informed the content and design of the National Beta Test.

The National Beta Test included data collection within 143 PAC facilities/agencies across 14 markets in the United States (listed in Volume 2 of the final report[5]), from November 2017 to August 2018. The overarching goal of the National Beta Test was to evaluate the feasibility, reliability, and validity of candidate SPADEs to identify a subset of data elements for standardization across PAC settings. Candidate SPADEs were considered if they met the requirements of being feasible, clinically useful, and having the potential to improve quality. Trained research nurses and/or staff at participating PAC facilities/agencies administered all National Beta Test assessment protocols. A subset of National Beta Test assessments was

[1] Edelen et al., 2017; Edelen et al., 2018.

[2] RAND Corporation, 2017a; RAND Corporation, 2017b.

[3] CMS, 2016; CMS, 2018.

[4] CMS, 2017a; CMS, 2017b; CMS, 2017c; CMS, 2017d.

[5] Edelen et al., 2019a.

completed by research nurse and facility/agency staff assessor pairs to allow for evaluation of interrater reliability. Other National Beta Test design features allowed for comparison of different look-back time frames for chart review data elements (i.e., on admission [Day 1], and on Days 3, 5, and 7; Discharge Day and Discharge Day minus 2), as well as an evaluation of the assessment of a subset of interview data elements on Days 3, 5, and 7.

To support evaluation of the validity of candidate SPADEs, data collectors documented demographic characteristics of the patient/resident sample (e.g., gender, age). National Beta Test assessment data were merged with CMS routine admission assessment data in the Outcome and Assessment Information Set (OASIS), Inpatient Rehabilitation Facility Patient Assessment Instrument (IRF-PAI), Long-Term Care Hospital CARE Data Set (LCDS), and Minimum Data Set (MDS). These assessment data were collected concurrently by the PAC facilities/agencies and submitted to CMS to fulfill PAC regulatory, prospective payment system, and quality reporting program requirements. From these data, a set of variables was selected that reflected the presence of clinical conditions (i.e., sepsis, heart failure, and stroke) and ability to perform two activities of daily living (ADLs) (toileting [hygiene] and the ability to transfer from lying to sitting [mobility]). These variables, defined in more detail in Volume 3,[6] were selected because they are prevalent, potentially debilitating illnesses or conditions with high relevance to patients/residents across all four PAC settings. In addition, and crucial for our ability to compare across PAC provider types, these variables were consistently defined across the four PAC settings, although toileting was not available for HHA patients at the time of this study.

Finally, to further support the feasibility and clinical utility of the candidate SPADES, we solicited the perspectives of research nurses and facility/agency staff assessors on the strengths and weaknesses of collecting the data elements in practice. This feedback was collected as part of the National Beta Test by means of an online survey and focus group discussions.

To evaluate the candidate SPADEs, this report provides the following results and significance tests.

Feasibility

- Basic descriptive statistics (e.g., frequencies, means, standard deviations [SDs]) for each component of each data element for all admission data, first combined across settings (overall), and then by setting.
- Statistical comparison of versions (standard language versus past three days) for the Patient-Reported Outcomes Measurement Information System (PROMIS) Global Health data elements.[7]

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[6] Edelen et al., 2019b.

[7] Dewitt et al., 2018. *PROMIS*, *Patient-Reported Outcomes Measurement Information System*, and the PROMIS logo are marks owned by the U.S. Department of Health and Human Services.

- Evaluation of differential item functioning (DIF) according to version, setting, gender, and age for PROMIS Global Health. DIF occurs when items do not assess the underlying construct equally well, or vary in meaning, between different subgroups of patients/residents.
- Extent of missing data for each data element overall. Missing data were minimal and did not vary by setting and so are only briefly summarized.
- Average time to complete the assessment of each data element, for each data element overall and by setting.

Reliability

- Interrater reliability for each data element overall and by setting. We examined interrater reliability using a variety of coefficients depending on the response scale of data elements: kappa (dichotomous), weighted kappa (ordinal), and raw percent agreement (all formats).
- For each data element, there are two tables: one reporting kappa and weighted kappa estimates and another reporting raw percent agreement. Interpretation of coefficients follows conventional criteria: 0.00–0.20 is slight/poor, 0.21–0.40 is fair, 0.41–0.60 is moderate, 0.61–0.80 is substantial/good, and 0.81–1.00 is excellent/almost perfect. Because of the impact of prevalence rates on the stability and interpretability of kappa estimates, kappa is not reported for data elements with prevalence rates out of range for stable kappa estimates, as determined by study power calculations. In these cases, kappas are replaced by (—) in the tabulated results.
- Item and scale reliability for the PROMIS Global Physical and Global Mental Health scales included average inter-item correlations, item-total correlations, and Cronbach's alpha. Item-total correlations of $r < 0.4$ suggest that items should be considered for deletion in a scale.

Validity

- Frequency tables delineating the association of patient/resident characteristics (i.e., gender, age, length of stay, disposition at discharge), clinical conditions (i.e., sepsis, heart failure, stroke), and two ADLs (i.e., toileting [hygiene] and ability to transfer from lying to sitting [mobility]) by responses to the data element (e.g., Brief Interview for Mental Status [BIMS] categorization). Evaluation of these associations provides a form of construct validity referred to as *known groups validity*, which is demonstrated when a data element can discriminate between two groups in expected ways. Because examination of all data elements by all patient characteristic variables would be prohibitive, we conducted these analyses using data elements representing total scores (e.g., BIMS categorization, Patient Health Questionnaire [PHQ]-9 score, ability to see), where available. When total scores were not available, we selected the data element in the set that was both representative and had sufficiently high endorsement rates for significant associations to be observed (e.g., Mechanically Altered Diet). Frequency tables for patients/residents overall are shown in the body of this volume, and setting-level frequencies are in the appendix.

- For PROMIS Global Health scales, explained common variance (ECV[8]) was calculated based on an exploratory bifactor model,[9] which estimates one general factor for all the items and allows for the presence of additional specific factors to capture unexplained residual associations among items. The ECV is the ratio of the common variance explained by the general factor compared with the specific factors and has a maximum value of 1.0. ECV values greater than or equal to 0.60 may indicate that items in a scale are sufficiently unidimensional, and are thus assessing a single construct. Although the dimensionality of PROMIS items has been established, the items have not been used in PAC settings, so these analyses were conducted to confirm unidimensionality for the population of PAC patients and residents.

Stability and Change over Time

- Comparison of admission and discharge frequency data for each data element overall and by setting.
- Degree of change in rates or scores depending on the day a patient/resident was assessed after admission (i.e., Day 1), within the Day 3, 5, and 7 repeat assessment design. These results are reported for all data elements in this volume overall and by setting.

Sensitivity to National Representativeness

- Sensitivity analyses for each data element to confirm that performance does not vary according to urbanicity as classified by rural-urban commuting area codes (metropolitan and micropolitan [urban] versus small town and rural [nonurban]),[10] geographic region as defined by the U.S. Census (Northeast, South, Midwest, West), facility ownership (for-profit versus nonprofit), and facility size (above versus below median size for the setting [size analyses not conducted for HHAs]). The results of these sensitivity analyses are included in the appendix for the data elements evaluated in this volume. For the most part, differences were not found, and those that were identified are discussed later in this volume within the specific data element chapter for which a difference emerged.

Statistical Tests

- Categorical associations were statistically evaluated using chi-square tests of independence and, in the case of ordinal data, Mantel-Haenszel chi-square.[11] Significant results from chi-square tests are reported in the following format: $\left(\chi^2_{(df)} = X.X, p < 0.05\right)$, where *df* is degrees of freedom and the *X*'s are numerical test statistic values. A significant chi-square value (i.e., $p < 0.05$, $p < 0.01$, $p < 0.001$) indicates a significant association between two variables (e.g., age group and BIMS categorization).

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[8] Rodriguez, Reise, and Haviland, 2016.

[9] Reise, 2012.

[10] U.S. Department of Agriculture, 2016.

[11] Mantel and Haenszel, 1959.

- Associations involving one continuous and one categorical variable were statistically evaluated using either an analysis of variance (ANOVA) or independent samples t-test to determine whether statistical differences emerged in the continuous variable (e.g., length of stay) as a function of a grouping variable (e.g., BIMS categorization). Significant results from ANOVA and t-test results are reported in the following formats: $\left(F_{(df)} = X.X, p < 0.001\right)$ or $\left(t_{(df)} = X.X, p < 0.001\right)$, where *df* is degrees of freedom and the *X*'s are numerical test statistic values. When a significant overall effect was found, follow-up independent samples t-tests were often conducted to statistically compare each group value (e.g., to evaluate setting-specific differences in time to complete assessments).
- Associations involving two continuous variables were statistically evaluated using a Pearson correlation (*r*) to determine whether a linear association emerged between one continuous variable (e.g., length of stay) and another continuous variable (e.g., PHQ-9 total score). Significant results are reported in the following format: Pearson correlation $r = 0.XX$, $p < 0.05$, where *X*'s are the numerical values corresponding to the magnitude of the linear association. Values can be positive (i.e., scores on both variables increase or decrease together) or negative (i.e., scores on one variable increase while scores on the other variable decrease).
- We used the chi-squared likelihood-ratio statistic as the DIF detection criteria (alpha less than 0.01) and the pseudo McFadden R^2 of magnitude (greater than or equal to 0.02) in model comparisons. The DIF detection approach is sensitive and often identifies DIF that is very small in magnitude. This 0.02 value for R^2 magnitude is conventionally used in the development of PROMIS instruments to identify statistically significant DIF that is large enough to warrant further examination.
- Effect sizes for many of the significant findings are reported using Cohen's *d*[12] to further characterize the importance of statistically significant findings. When reported, a Cohen's *d* value greater than 0.2 was used to indicate a potentially meaningful (i.e., medium to large) effect size.
- When multiple tests were performed (i.e., setting comparisons for time to complete assessments, pairwise comparisons between assessment days for repeat assessments, and comparisons between admission to discharge), the probability of finding significant differences by chance increases. To control for this, we calculated corrected significance levels using the Benjamini-Hochberg method,[13] where each significance test is evaluated against an adjusted critical value. We set our desired level of significance at 0.01 to minimize Type I error and increase confidence in significant effects.

[12] Cohen, 2013.

[13] Benjamini and Hochberg, 1995.

2. Standardized Assessment of Global Health, Care Preferences, and Medication Reconciliation in Post-Acute Care

As described in Chapter 1, candidate SPADEs were identified for inclusion in the National Beta Test through a series of activities, including information gathering, stakeholder outreach, and Alpha field testing. Through these activities, the research team found that systematically assessing the status of patients'/residents' global health, care preferences, and medication reconciliation could help providers develop individualized care plans and ease transitions between sites of care. This chapter provides background on the importance of standardized assessment in the three clinical categories addressed in this volume, the activities undertaken to identify candidate SPADEs for these categories during the project period, and the data elements tested in the National Beta Test. This chapter also gives an overview of the results presented in subsequent chapters of this volume.

Global Health

Information Gathering

Assessing health-related quality of life (HRQOL) through patient-reported outcomes has the potential to improve quality of care by improving clinicians' abilities to monitor symptoms and treatment effectiveness and by engaging patients/residents in their care through better patient-physician communication.[14] The PROMIS initiative is a National Institutes of Health–supported research collaborative that has developed item banks for patient-reported outcomes on a wide range of topics.[15] When items are drawn from different topics and combined to represent a patient's health in general or HRQOL, the groups of items are referred to as PROMIS profile assessments. One product of this work are groups of items that assess HRQOL drawn from the item banks on Depression, Anxiety, Physical Function, Pain Interference, Pain Intensity, Fatigue, Sleep Disturbance, and Ability to Participate in Social Roles and Activities.[16] These PROMIS items collectively assess Global Health, including physical and mental aspects of health, and have been shown to be predictive of important future events, such as health care utilization,[17] which is important to inform patient-centered care. PROMIS profile assessments, such as the

[14] Bevans, Ross, and Cella, 2014; Chen, Ou, and Hollis, 2013.

[15] Cella et al., 2010.

[16] Hays et al., 2009.

[17] Bjorner, Fayers, and Idler, 2005.

ten-item PROMIS Global Health profile assessment of global HRQOL,[18] have been used in a wide range of populations, including numerous clinical populations and older adults, suggesting the feasibility of its use in PAC settings, which could be useful for care planning and care transitions.

Stakeholder Feedback and Field Testing

During the second convening of the TEP (in January 2017), TEP members discussed the possibility of using a PROMIS profile assessment in PAC. Panelists were intrigued by the novelty of using a cross-cutting "profile" score as a standardized assessment. They expressed interest in further exploring the feasibility and value of implementing this type of HRQOL-focused assessment in PAC settings. The PROMIS Global Health instrument (version 1.2, a ten-item list) was officially brought into consideration after the TEP meeting and was included in the National Beta Test as a potential way to capture patient-reported HRQOL in PAC settings.

The ten-item PROMIS Global Health profile assessment was included in the second subregulatory public comment period, which occurred from April to June 2017. Several commenters mentioned the value of using the PROMIS Global Health data elements for assessment, noting their relevance across PAC settings. However, some commenters questioned the appropriateness of the PROMIS Global Health data elements for certain populations, such as those with cognitive or language impairments who are determined to be unable to self-report or may need the help of a proxy. Other commenters were skeptical that assessment of HRQOL via the PROMIS Global Health data elements would provide information with a high potential for improving quality.

The original version of the PROMIS Global Health data elements referred to "the past seven days" or "in general" for symptoms to be included in the assessment responses. Stakeholders commented that admission assessment generally occurred in the first three days of a PAC, so a reference period of seven days or "in general" would capture the patient's experience in the hospital or other prior care setting. In addition to the standard version of the Global 10, which uses a seven-day or "in general" reference period, we created a second version of these questions that referenced "the past three days" to align more closely with PAC assessment data elements that are currently in use.

Candidate SPADEs in the National Beta Test

The PROMIS Global Health data elements, which have the assessor ask the patient/resident questions about his or her overall health status, including physical, mental, and social health, were included in the National Beta Test. The administration of data elements was tested in two

[18] Revicki et al., 2009; Hays et al., 2016; Barile et al., 2013; Schalet et al., 2015.

ways: with a look-back period of seven days or "in general" for approximately half of patients/residents and a look-back period of three days for the other half of patients/residents.

Care Preferences

Although it is important for assessors to capture an overall picture of each patient's/resident's health through global health assessment, getting a sense of the patient's/resident's preferences for care in the PAC setting also gives providers valuable information. The assessment of patient/resident care preferences and goals for care is critical to ensuring patient-/resident-centered and preference-concordant care through the course of a PAC episode and beyond. Information about patient/resident preferences and goals, used together with clinical guidelines, can provide important direction for developing a care plan, selecting treatment options, and tailoring interventions.[19] Understanding patient/resident goals can also help to establish or reset both patient/resident and provider expectations in the context of the current clinical condition.[20]

Preferences for health care can address how much and what type of health care treatments a patient/resident (and his or her caregiver) prefers. For example, a patient/resident may prefer alternative approaches to pain management over prescription medications. Patients/residents receiving rehabilitation may also have specific preferences for their level of involvement in decisionmaking or for how they receive information about their health care treatment.[21] In PAC settings, preferences for care might also focus on a patient's/resident's daily routine and lifestyle, such as a preference for a private room or the ability to choose mealtimes. Goals of care, which are intertwined with preferences, reflect the outcomes of care and encompass the patient's/resident's (and caregiver's) aspirations for care, health, and functioning (e.g., returning home, regaining function of a limb, being able to travel).[22] Care that is aligned with the patient's expressed wishes and preferences is associated with lower costs and less aggressive care at the end of life.[23] In addition, eliciting patient preferences has been shown to increase patient satisfaction with the decisionmaking process and reduce patient decisional conflict.[24]

There are several challenges related to assessing and testing care preferences. Patients/residents might have trouble identifying and articulating their preferences in health care and other areas, particularly in the absence of similar prior experiences, and they may feel scared

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[19] Mulley, Trimble, and Elwyn, 2012.

[20] Mulley, Trimble, and Elwyn, 2012.

[21] Couzner et al., 2013.

[22] Mulley, Trimble, and Elwyn, 2012.

[23] Briggs et al., 2004; Detering et al., 2010; Kirchhoff et al., 2010; Kirchhoff et al., 2012; Mack et al., 2012; Schneiderman et al., 2003; Schwartz et al., 2002; Wright et al, 2008; Zhang et al., 2009.

[24] Garfield et al., 2007; Housen et al., 2008; Rockwood et al., 2003.

or reluctant to think about the possibility of a future decline in health.[25] In addition, thinking about care preferences in the context of future health status is a complex cognitive task, which could be especially challenging for patients/residents within the stressful context of PAC. Care planning can be complex when preferences (e.g., not wanting to exercise) are at odds with goals (e.g., improved ability to walk). Also, a patient's/resident's goals for care might differ from the goals set by that person's physician.

The ability to obtain patient's/resident's true preferences at any given point is highly dependent on who asks the question and how it is asked. The key challenge for assessing care preferences is thus to establish a robust yet feasible and standardized approach to assessing a broad range of relevant preferences and goals that can be used to inform care planning and care transitions and to facilitate care that is more patient/resident centered.

Information Gathering

The MDS is the only PAC assessment instrument that includes an item that assesses the patient's/resident's preferences for daily life and activities or, for persons unable to self-report, the staff member's assessment of the patient's/resident's daily life and activity preferences (Section F: Preferences for Customary Routine and Activities). One data element assesses preferences regarding family or close-relative involvement in discussions about care.

Data elements in the assessment instruments in all four PAC settings collect information on patient/resident discharge goals related to mobility and self-care. In addition, the MDS includes Section Q, which broadly assesses a patient's/resident's goals and expectations for his or her stay as well as his or her participation in this goal and expectation assessment.

None of the assessment instruments, however, address broader goals, such as living with manageable levels of pain, regaining functional independence, or being able to attend an important family event. Nor do they distinguish between provider- and patient-/resident-set goals or whether care received aligns with preferences or goals.

Other data elements related to care preferences have shown reliability in PAC settings and have potential for standardization but have not been incorporated into current PAC assessment instruments to date. Two data elements that capture the overall plan of care were developed by the project team in consultation with expert advisers for use in the Post-Acute Care Payment Reform Demonstration: (1) whether the clinical team has discussed treatment goals with the patient or his or her representative and (2) whether the patient has made and documented future treatment decisions.

Through the review process, the project team and advisers identified three categories of care preferences that would be salient and important to assess in PAC settings: (1) preferences for involvement in decisionmaking, (2) preferences for daily life activities and routine, and (3) goals of care. The work team and advisers developed final recommendations for specific data elements

[25] Schickedanz et al., 2009.

within the first two of these categories; however, no feasible data elements were identified for goal setting.

The project team, in consultation with expert advisers, identified 43 data elements pertaining to preference assessment. Key data elements under consideration included the Control Preferences Scale, the Autonomy Preference Index, the Patient Preferences on Information and Decisions questionnaire, the Preferences for Privacy in Daily Life questionnaire, Preferences for Everyday Living Inventory, Goal Attainment Scaling, and the goal-setting subscale of the Patient Assessment of Chronic Illness Care. The project team drew on these data elements to develop a set of data elements for further consideration.

Stakeholder Feedback and Field Testing

Nine preferred data elements were presented at the first convening of the of TEP in April 2016. Feedback from TEP members supported data elements asking patients/residents to rank a listing of preferences or for their broad preferences for how much information to receive or how to involve others in clinical decisionmaking. Using this information and feedback from other stakeholders, such as focus groups, the project team narrowed the potential data elements to five for testing in Alpha 1: Advance Directive (Health Care Agent [Proxy Decisionmaker]), Importance of Involvement of Family and Friends, Preferences for Involvement in Decisionmaking (Information), Preferences for Involvement in Decisionmaking (How to Make Decisions), and Goals of Care. The data elements generally tested well, though the Advance Directive data element produced substantially different results across some settings, and assessors noted that wording on some response choices was long, suggesting these data elements may require revisions.

At the second TEP meeting (January 2017), the care preferences discussion centered on the results of the Alpha 1 feasibility testing, a revised Advance Directive data element, and two new Goals of Care data elements. The project team proposed to assess documentation of relevant treatment limitations through Advance Directive (Physician Orders), in addition to assessing documentation through a health care proxy decisionmaker (Advance Directive [Health Care Agent]). The two new proposed Goals of Care data elements included one data element revising the existing Goals of Care data element to be more specific, and a second data element assessing patient/resident preferences for the extent of their involvement in decisions about their health care. The intent to document care preferences among patients in PAC settings was well received among the TEP, and the panel fully supported the idea of encouraging patients/residents and providers to have meaningful conversations about preferences for care. The TEP suggested the assessment might be used to prompt subsequent discussion by adding a question on whether patients/residents have discussed their preferences with providers. For the Goals of Care data elements, TEP members questioned how the data would be used, whether such assessments are a good time to raise such questions, and whether the wording of the data elements would present meaningful choices to all patients/residents.

Both versions of Advance Directive, Importance of Involvement of Family and Friends, and a variation of Goals of Care (Documentation) were put forth for the second public comment period. Commenters overall supported their potential to be feasible and to improve quality, utility for describing case mix, and validity, though some expressed concern about their effect on clinical treatment plans, whether the responses would reflect case-mix, and their relevance for certain PAC populations (such as pediatric patients).

Advance Directive (Physician Orders) and Goals of Care (Documentation) were tested in the Alpha 2 phase (April to July 2017), with a focus on using chart review to collect data. The main objectives in Alpha 2 testing were to determine interrater reliability and to assess feasibility. A limited sample size prevented clear conclusions about the interrater reliability for Advance Directive (Physician Orders) data elements, with the exception of the "do not resuscitate (DNR)" data element, which was reliable. Goals of Care Documentation data elements generally had poor reliability, likely as a consequence of small sample sizes.

Candidate SPADEs in the National Beta Test

Taking together findings from the literature, input from the TEP and other subject-matter experts, and considerations of feasibility and burden for implementation, three Care Preference data elements advanced to the National Beta Test: Importance of Involvement of Family/Friends (Interview), Preferences for Involvement in Decisionmaking (Interview), and Advance Directive (Health Care Agent). Results are described in Chapter 4.

Medication Reconciliation

Approximately half of all hospital-related medication errors and 20 percent of adverse drug events occur during transitions, admission, transfer, or discharge from a hospital.[26] Older adults and individuals with multiple comorbid conditions take multiple medications and have multiple prescribers.[27] They, as well as those with low health literacy, may be more likely to suffer a larger number of medication discrepancies and experience greater consequences to their health.

Medication reconciliation (MR), the process of obtaining a patient's/resident's multiple medication lists and reconciling any discrepancies, is a cost-effective way to promote patient/resident safety by reducing errors and resulting adverse drug events.[28] The Joint Commission adopted MR as a National Patient Safety Goal in 2005.[29] It defined MR as the

[26] Barnsteiner, 2005; Rozich and Resar, 2001; Gleason et al., 2004.

[27] Bao et al., 2012.

[28] Karnon, Campbell, and Czoski-Murray, 2009; Agency for Healthcare Research and Quality, 2012; Greenwald et al., 2010.

[29] Joint Commission, 2015.

process of comparing and merging patients' medication lists at any point of transition, with the goal of preventing medication errors. The five steps in the MR process are (1) develop a list of current medications, (2) develop a list of medications to be prescribed, (3) compare medications on the two lists, (4) make clinical decisions based on the comparisons, and (5) communicate the new list to the patient and appropriate caregivers.[30]

There are several challenges with conducting standardized assessments of MR. One issue is the fragmented health care system in the United States; individuals frequently see many health care providers, but data are not always shared between providers. In this environment, providers often lack information on which and how many medications a patient/resident is taking, which in turn may be contributing to an increasing number of medications used overall, especially by older adults.[31] Other challenges include the difficulty of producing an accurate (or "gold standard") medication list that has been confirmed by all possible sources. Furthermore, reconciling multiple lists is an important first step, but this activity may still fail to identify and resolve inappropriate medications or harmful drug-to-drug interactions, extensions of MR that are addressed directly in drug regimen review (a process of evaluating the reconciled medication list). However, a standardized set of data elements that assess MR with clear definitions of each step could provide a better, more detailed explanation of MR processes for providers to follow. By facilitating MR, these data elements could help improve care.

Information Gathering

At the time that we began information gathering to inform the development of MR data elements, only one PAC assessment included data elements related to MR: a drug regimen review–focused set of data elements in the OASIS for HHAs.[32] These data elements were related to medications but do not assess the comparison of medication lists among the patient's/resident's medical records, pharmacy (or pharmacies), or interview with the patient/resident or caregivers as the primary source of information at admission, transfer, and discharge. A search for additional potential MR data elements identified 17 toolkits and data elements, from which seven data elements emerged (OASIS, Medication Discrepancy Tool, IPRO Medication Discrepancy Tool, Medication Appropriateness Index, Unnecessary Drug Use Measure, Twinlist, and Pre-Admission Medication List Builder). Published data on validity and reliability were sparse for these seven data elements. In consultation with project advisers, the project team narrowed the potential data elements to two: the IPRO version of the Medication Discrepancy Tool and the Unnecessary Drug Use tool. The Medication Discrepancy Tool was

[30] Joint Commission, 2015; Boockvar et al., 2006.

[31] Maher, Hanlon, and Hajjar, 2014.

[32] As of 2019, the Drug Regimen Review data elements, which form the basis for a quality measure of the same name, are in use in the OASIS, MDS, IRF-PAI, and LCDS.

subsequently eliminated from consideration because it is copyrighted and therefore not eligible for modification.

Stakeholder Feedback and Field Testing

Fourteen data elements were identified and developed for stakeholder consideration, some of which were based on the Unnecessary Drug Use tool. These data elements asked about whether multiple medication lists were obtained, whether indications for medications were noted, whether the review of medications identified discrepancies or adverse drug events, and whether the patient/resident (or proxy caregiver) was involved in the resolution of or education regarding medication issues. The project team asked stakeholders to focus on "potential clinically significant medication issues," defined as discrepancies or adverse drug events involving medications listed in the Beer's criteria or medications that are anticoagulants, antidiabetics, opioids, antimicrobials, and antipsychotics.

Discussions with expert advisers and among focus groups revealed that definitions of MR can vary by setting; likewise, stakeholders differ on which sources of information they consider the most accurate, reliable, and timely. Experts at the first TEP meeting discussed the challenges of conducting MR in PAC settings, including health literacy among patients/residents, interpretation of provider instructions, self-administration of old medications, and access to multiple sources of medications. The TEP supported a focus on high-risk drugs and developing a common meaning of potential clinically significant medication issues to be used across settings.

Twelve data elements were developed with clinical advisers for Alpha 1 feasibility testing (August to October 2016), focusing on objective medical chart review; results from the test indicated challenges with both reliability and feasibility. Discussion of MR at the second convening of the TEP focused on how to clarify the intended process as well as the clinical utility of the data elements. Although TEP members agreed that MR was a worthy objective, they disagreed on whether standardized assessment would ultimately improve care quality or whether it would encourage assessors to indicate completion of the process without fully working through the steps intended.

A subset of data elements addressing the five Joint Commission steps was included in the second request for public comment. Commenters supported the notion of including MR as a potential way to improve care quality and reduce adverse events. They also raised concerns regarding burden, redundancy, validity and reliability, and whether the data elements' focus on drug classes would provide sufficient clinical utility.

In response to stakeholder feedback, the MR data elements were revised to focus on whether and how MR was conducted, and they were tested in the Alpha 2 feasibility test to assess cross-setting feasibility and interrater reliability. Testing on one data element was discontinued midway through the field period due to high burden and feedback from assessors that other data elements would capture the MR process. Although the MR data elements were considered complex and in need of further refinement (particularly the instructions for the data elements),

assessors indicated that time to administer the assessment improved substantially from Alpha 1, and that nurses' familiarity with medications provided better background than other facility staff would have for completing the data elements.

Candidate SPADEs in the National Beta Test

After thorough consideration of the results and activities described above, the MR data elements were further narrowed and clarified through improvements to the data element language and instructions, the number of drug classes considered, and the answer choices. The data elements finalized for inclusion in the National Beta Test cover six drug classes. Results are described in Chapter 5.

Candidate SPADEs in the National Beta Test

The data elements assessing Global Health, Care Preferences, and Medication Reconciliation (the Other Clinical Categories) evaluated in the National Beta Test are shown in Table 2.1. This table also lists the evaluative and input opportunities in which each data element has been included during the contract period, specific National Beta Test design features relevant to the data element, and an indication of its use in any of the four PAC assessments (OASIS, IRF-PAI, LCDS, and MDS).

Table 2.1. Global Health, Care Preferences, and Medication Reconciliation Data Elements Evaluated in the National Beta Test Communicative Sample

Data Element[a]	Input Opportunities	National Beta Test Inclusion Notes	Current Assessment Instrument Use
PROMIS Global Health	Public Comment (PC) 2	Two versions tested[b]	
Care Preferences: Decision Making Preferences; Designated Health Care Agent	Alpha 1, Alpha 2, PC2		Involvement in care decisions (MDS)
Medication Reconciliation	Alpha 1, Alpha 2, PC2		Medication classes taken (MDS) Drug Regimen Review (OASIS, IRF-PAI, LCDS, MDS)

[a] Assessment of these data elements in the National Beta Test was limited to communicative patients/residents (defined as those who could make themselves understood by any means; see Volume 2 for more detail).
[b] Two versions of the PROMIS Global Health were evaluated in different samples, one version using the "past three days" and another using either "in general" or "in the past seven days."

3. PROMIS Global Health

Data Element Description

The PROMIS Global Health profile assessment consists of ten data elements that address HRQOL, including functioning and well-being in physical, mental, and social domains of life. PROMIS Global Health is intended to globally reflect the patients'/residents' assessment of their health. It is important to assess global health among PAC patients/residents because it has been shown to be useful in screening for disability and improving communication between patients/residents who are communicative and their clinicians.[33]

These data elements are completed through patient/resident interviews and are not assessed in any of the current PAC assessment instruments. The PROMIS Global Health data elements were collected in two versions in the National Beta Test. One version, shown in Figure 3.1, was identical to the format in the PROMIS data element library, using a reference to "the past seven days" or "in general" for symptoms. The second version was identical except that it referenced "the past three days" to align more closely with PAC assessment data elements that are currently in use.

Figure 3.1. PROMIS Global Health Data Elements

SAY TO PATIENT/RESIDENT: "I am now going to ask you about your overall health status. All patients/residents are asked to answer these questions. Knowing the answers to these questions will help us provide you with a more individualized care plan."
C1a. ASK PATIENT/RESIDENT: **"**In general, would you say your health is:" ☐ 5 = Excellent ☐ 4 = Very good ☐ 3 = Good ☐ 2 = Fair ☐ 1 = Poor ☐ 7 = **Patient/resident declined to respond** ☐ 9 = **Unknown or unable to assess**

[33] Detmar et al., 2002; Velikova et al., 2004.

C1b. ASK PATIENT/RESIDENT:
"In general, would you say your quality of life is:"

- ☐ 5 = Excellent
- ☐ 4 = Very good
- ☐ 3 = Good
- ☐ 2 = Fair
- ☐ 1 = Poor
- ☐ 7 = **Patient/resident declined to respond**
- ☐ 9 = **Unknown or unable to assess**

C1c. ASK PATIENT/RESIDENT:
"In general, how would you rate your physical health?"

- ☐ 5 = Excellent
- ☐ 4 = Very good
- ☐ 3 = Good
- ☐ 2 = Fair
- ☐ 1 = Poor
- ☐ 7 = **Patient/resident declined to respond**
- ☐ 9 = **Unknown or unable to assess**

C1d. ASK PATIENT/RESIDENT:
"In general, how would you rate your mental health, including your mood and your ability to think?"

- ☐ 5 = Excellent
- ☐ 4 = Very good
- ☐ 3 = Good
- ☐ 2 = Fair
- ☐ 1 = Poor
- ☐ 7 = **Patient/resident declined to respond**
- ☐ 9 = **Unknown or unable to assess**

C1e. ASK PATIENT/RESIDENT:
"In general, how would you rate your satisfaction with your social activities and relationships?"

- ☐ 5 = Excellent
- ☐ 4 = Very good
- ☐ 3 = Good
- ☐ 2 = Fair
- ☐ 1 = Poor
- ☐ 7 = **Patient/resident declined to respond**
- ☐ 9 = **Unknown or unable to assess**

C1f. ASK PATIENT/RESIDENT:
"In general, please rate how well you carry out your usual social activities and roles. This includes activities at home, at work and in your community, and responsibilities as a parent, child, spouse, employee, friend, etc."

- ☐ 5 = Excellent
- ☐ 4 = Very good
- ☐ 3 = Good
- ☐ 2 = Fair
- ☐ 1 = Poor
- ☐ 7 = **Patient/resident declined to respond**
- ☐ 9 = **Unknown or unable to assess**

C1g. ASK PATIENT/RESIDENT:
"To what extent are you able to carry out your everyday physical activities such as walking, climbing stairs, carrying groceries, or moving a chair?"

- ☐ 5 = Completely
- ☐ 4 = Mostly
- ☐ 3 = Moderately
- ☐ 2 = A little
- ☐ 1 = Not at all
- ☐ 7 = **Patient/resident declined to respond**
- ☐ 9 = **Unknown or unable to assess**

C1h. ASK PATIENT/RESIDENT:
"In the past 7 days, how often have you been bothered by emotional problems such as feeling anxious, depressed or irritable?"

- ☐ 5 = Never
- ☐ 4 = Rarely
- ☐ 3 = Sometimes
- ☐ 2 = Often
- ☐ 1 = Always
- ☐ 7 = **Patient/resident declined to respond**
- ☐ 9 = **Unknown or unable to assess**

C1i. ASK PATIENT/RESIDENT:
"In the past 7 days, how would you rate your fatigue on average?"

- ☐ 5 = None
- ☐ 4 = Mild
- ☐ 3 = Moderate
- ☐ 2 = Severe
- ☐ 1 = Very severe
- ☐ 7 = **Patient/resident declined to respond**
- ☐ 9 = **Unknown or unable to assess**

C1j. ASK PATIENT/RESIDENT:
"In the past 7 days, how would you rate your pain on average, on a scale of 0 to 10? 0 being no pain, and 10 being the worst pain imaginable."

- ☐ 0 = No pain
- ☐ 1
- ☐ 2
- ☐ 3
- ☐ 4
- ☐ 5
- ☐ 6
- ☐ 7
- ☐ 8
- ☐ 9
- ☐ 10 = Worst pain imaginable
- ☐ 77 = **Patient/resident declined to respond**
- ☐ 99 = **Unknown or unable to assess**

Testing Objectives

As stated above, two versions of the PROMIS Global Health data elements were administered during the National Beta Test: a standard ("past seven days" or "in general") version, and a modified ("past three days") version. The seven-day/in general version was administered in Market Group A, and the three-day version was administered in Market Group B. For more details on Market Group A and B samples and characteristics, please refer to Volume 3. Evaluation of the PROMIS Global Health data elements included examination of each data element and the performance of two summary scores, which are calculated based on responses to the following PROMIS Global Health data elements: Physical Health (c1c: "How would you rate your physical health?"; c1g: "To what extent are you able to carry out your everyday physical activities such as walking, climbing stairs, carrying groceries, or moving a chair?"; c1i: "How would you rate your fatigue on average?"; c1j: "How would you rate your pain on average, on a scale of 0 to 10?") and Mental Health (c1b: "Would you say your quality of life is:"; c1d: "How would you rate your mental health, including your mood and your ability to think?"; c1e: "How would you rate your satisfaction with your social activities and relationships?"; c1h: "How often have you been bothered by emotional problems such as feeling anxious, depressed or irritable?"). The Physical Health and Mental Health scores are presented as both summed scores and T-scores. The T-score conversion puts scores on a metric with a mean of 50 and SD of 10.

Basic descriptive statistics (e.g., frequencies and scale scores) are first presented for admission data to characterize the responses to the PROMIS Global Health data elements according to version for patients/residents in each setting and for the overall sample. Next, we evaluated differences in versions by (1) conducting t-tests to compare data element and scale level means across the two versions (a Cohen's *d* value greater than 0.2 was used to indicate meaningful version differences) and (2) conducting DIF by version to determine whether data elements functioned differently within the scale according to version.

Because we saw evidence of performance differences according to version in our analyses of the National Beta Test data (described later in this chapter), the majority of results are presented separately for the two versions. However, there is a trade-off in maintaining the separate versions in analyses due to the 50-percent reduction in sample size. Because the power of some of our planned analyses would be compromised by this reduction, we elected to maximize our available sample size. In these cases, we decided that the potential influence of the performance differences on conclusions was minimal enough to be offset by the need for as many observations as possible and used the combined admission response data to (1) evaluate DIF according to setting, gender, and age, (2) examine PROMIS Global Health T-scores by patient/resident characteristics and clinical groups of interest (i.e., known groups validity), and (3) conduct sensitivity analyses for interrater reliability (kappa). Frequencies at admission and discharge were compared separately for the two versions to inform stability or possible change

over time. Finally, because this set of data elements comes from the item response theory (IRT)-calibrated PROMIS Global Health profile instrument, we provide summed score to T-score conversion tables for the Physical Health and Mental Health scales based on this profile instrument in the appendix. This allows for the calculation of T-scores with a mean of 50 and SD of 10 corresponding to the total score on each of the four data elements included in the two scales, allowing results to be directly compared with general population PROMIS Physical Health and Mental Health values.

Results

Feasibility

Frequencies/Missing

Tables 3.1 and 3.2 show the percentage of responses for each PROMIS Global Health data element, both overall and by setting. The tables are split into Market Group A (Table 3.1), which was administered version A (asking about experience either in general or in the past seven days), and Market Group B (Table 3.2), which was administered version B (asking about experience in the past three days). Version A was administered to 1,528 patients/residents: 230 in HHAs, 491 in IRFs, 260 in LTCHs, and 547 in SNFs. Version B was administered to 1,521 patients/residents: 415 in HHAs, 294 in IRFs, 229 in LTCHs, and 583 in SNFs. Overall, a little over 96 percent of the sample were administered one of the two versions. Among these, overall missing data at the item level ranged from 0.72 percent to 3.21 percent in version A and 0.72 percent to 4.21 percent in version B, with minimal setting differences.

Tables 3.1 and 3.2 present percentages of patients/residents endorsing frequencies of symptoms on a variety of five-point Likert response scales (*poor* to *excellent; not at all* to *completely; always* to *never; very severe* to *none*). As a reminder, the version used for Market Group A used *in general* or *to what extent* (data elements c1a–c1g) or referred to *the past seven days*. The version used in Market Group B referred to *the past three days* for all data elements. Across the two versions, there are some differences in response category endorsement according to version. For example, on the Quality of Life (c1b) data element, patients/residents in Market Group A were more likely than those in Market Group B to endorse the higher response categories, indicating higher quality of life ratings when the patient/resident is rating his or her quality of life *in general* as opposed to *in the past three days*. In fact, responses in Market Group A tend to reflect better health relative to Market Group B for all data elements that reference *in general* in that version. The data elements that reference *the past seven days* in Market Group A do not show this trend.

Tables 3.1 and 3.2 also show the mean of the Physical and Mental Health total scores (possible range from four to 20) and the T-scores (a standardized metric normed to the general population with a mean of 50 and SD of 10), overall and by setting across two different versions.

The same pattern is observed for the total and the T-scores as in individual data elements. That is, scores tend to be slightly higher for Market Group A, and this is more pronounced for the Mental Health score than for Physical Health. This is likely because three of four data elements used to calculate the Mental Health total score use the phrase *in general*, whereas only two of four data elements in the Physical Health total score use *in general*. Looking across the two versions, it is noteworthy that the Physical Health T-scores tend to be well below the population norm of 50. The Mental Health T-scores are also below the national average, but that trend is less pronounced. Finally, although there are few notable setting differences, LTCH patients tended to have somewhat lower Physical and Mental Health scores relative to patients/residents in other settings. Formal analyses to evaluate differences in versions are presented below.

Table 3.1. Overall and Setting-Specific Response Frequencies for PROMIS Global Health Data Elements: Market Group A (percent)

Data Element	HHA (*n* = 230)	IRF (*n* = 491)	LTCH (*n* = 260)	SNF (*n* = 547)	Overall (*n* = 1,528)
General health (c1a)[a]					
Poor	9	12	18	12	12
Fair	22	27	35	28	28
Good	41	33	28	35	35
Very good	21	21	14	19	19
Excellent	7	6	4	5	5
Quality of life (c1b)[a]					
Poor	6	5	14	8	8
Fair	16	16	28	22	20
Good	32	33	31	35	33
Very good	30	30	21	22	26
Excellent	16	16	6	13	13
Physical health (c1c)[a]					
Poor	12	17	26	16	18
Fair	25	28	35	31	30
Good	40	32	26	34	33
Very good	17	18	9	14	15
Excellent	5	4	4	4	4

Data Element	HHA (*n* = 230)	IRF (*n* = 491)	LTCH (*n* = 260)	SNF (*n* = 547)	Overall (*n* = 1,528)
Mental health (c1d)[a]					
Poor	3	3	7	5	4
Fair	14	11	18	15	14
Good	28	32	33	37	33
Very good	30	33	26	27	30
Excellent	25	20	16	15	18
Social satisfaction (c1e)[a]					
Poor	7	6	13	6	7
Fair	12	11	17	14	13
Good	38	32	30	37	34
Very good	27	31	26	27	28
Excellent	16	20	14	15	17
Ability to carry out social activities (c1f)[a]					
Poor	8	6	15	9	9
Fair	18	15	17	17	16
Good	34	34	32	37	35
Very good	27	31	27	24	27
Excellent	13	15	9	13	13
Extent able to carry out physical activities (c1g)					
Not at all	14	14	33	16	18
A little	25	29	27	32	29
Moderately	29	26	16	24	24
Mostly	22	16	14	17	17
Completely	10	14	10	11	12
How often bothered by emotional problems (c1h)					
Always	4	5	10	5	6
Often	10	17	20	12	15
Sometimes	30	33	33	36	34
Rarely	29	21	19	18	21
Never	26	23	18	29	25

Data Element	HHA (*n* = 230)	IRF (*n* = 491)	LTCH (*n* = 260)	SNF (*n* = 547)	Overall (*n* = 1,528)
Rate fatigue (c1i)					
Very severe	4	5	7	6	5
Severe	16	28	17	18	21
Moderate	43	44	44	44	44
Mild	28	20	20	25	23
None	9	3	12	7	7
Rate pain (0–10) (c1j) Mean (SD)	3.7 (2.9)	5.2 (3.0)	5.4 (3.2)	4.8 (3.3)	4.9 (3.1)
Physical Health total[b] Mean (SD)	12.4 (3.0)	11.3 (2.8)	10.8 (3.1)	11.5 (3.0)	11.5 (3.0)
Physical Health T-score Mean (SD)	40.4 (8.2)	38.2 (7.7)	36.5 (8.7)	38.7 (8.2)	38.4 (8.2)
Mental Health total[c] Mean (SD)	13.9 (3.5)	13.8 (3.1)	12.3 (3.6)	13.3 (3.2)	13.4 (3.3)
Mental Health T-score Mean (SD)	48.3 (9.3)	48.3 (8.3)	44.7 (9.5)	46.5 (8.3)	47.1 (8.8)

[a] These data elements use "in general" for Market Group A (c1a–c1f); data elements c1g–c1j reference "the past seven days" in Market Group A. All data elements reference "the past three days" in Market Group B.
[b] Physical Health score based on responses to c1c, c1g, c1i, c1j.
[c] Mental Health score based on responses to c1b, c1d, c1e, c1h.

Table 3.2. Overall and Setting-Specific Response Frequencies for PROMIS Global Health Data Elements: Market Group B (percent)

Data Element	HHA (*n* = 415)	IRF (*n* = 294)	LTCH (*n* = 229)	SNF (*n* = 583)	Overall (*n* = 1,521)
General health (c1a)					
Poor	14	18	23	18	18
Fair	25	28	35	33	30
Good	39	35	30	31	34
Very good	16	16	10	15	15
Excellent	5	2	3	3	3
Quality of life (c1b)					
Poor	10	15	14	16	14
Fair	23	26	33	26	26
Good	36	30	34	38	35
Very good	23	19	15	16	18
Excellent	8	10	4	4	6

Physical health (c1c)					
Poor	17	20	25	22	21
Fair	31	32	35	35	33
Good	36	32	29	31	33
Very good	11	11	8	10	10
Excellent	4	4	2	2	3
Mental health (c1d)					
Poor	5	7	8	8	7
Fair	18	22	24	19	20
Good	40	35	33	35	36
Very good	26	23	20	26	25
Excellent	12	13	14	12	12
Social satisfaction (c1e)					
Poor	11	8	18	12	12
Fair	22	15	18	21	20
Good	36	42	30	35	36
Very good	19	22	23	20	21
Excellent	11	13	11	11	12
Ability to carry out social activities (c1f)					
Poor	16	29	26	23	23
Fair	26	18	21	22	22
Good	34	30	30	32	32
Very good	18	16	15	17	17
Excellent	6	7	8	6	7
Extent able to carry out physical activities (c1g)					
Not at all	11	27	35	19	21
A little	33	32	31	39	35
Moderately	28	25	19	22	24
Mostly	18	11	11	16	15
Completely	10	5	4	4	6
How often bothered by emotional problems (c1h)					
Always	4	5	6	3	4
Often	11	15	20	15	14
Sometimes	30	33	36	34	33
Rarely	25	18	19	20	21
Never	30	28	20	29	28

Rate fatigue (c1i)					
Very severe	4	5	8	5	5
Severe	15	16	18	17	17
Moderate	47	50	47	46	47
Mild	25	24	18	22	23
None	10	6	8	9	9
Rate pain (0–10) (c1j) Mean (SD)	4.3 (2.9)	4.4 (3.0)	5.1 (3.2)	5.0 (3.1)	4.7 (3.1)
Physical Health total[b] Mean (SD)	11.9 (3.0)	11.1 (2.9)	10.4 (3.0)	11.0 (3.0)	11.2 (3.0)
Physical Health T-score Mean (SD)	39.3 (8.1)	37.3 (7.8)	35.6 (7.9)	37.1 (7.9)	37.5 (8.0)
Mental Health total[c] Mean (SD)	12.8 (3.3)	12.6 (3.3)	11.8 (3.4)	12.4 (3.2)	12.5 (3.3)
Mental Health T-score Mean (SD)	45.2 (8.4)	44.9 (8.7)	43.3 (9.0)	44.3 (8.4)	44.5 (8.6)

NOTE: All data elements reference "the past three days" in Market Group B.
[b] Physical Health score based on responses to c1c, c1g, c1i, c1j.
[c] Mental Health score based on responses to c1b, c1d, c1e, c1h.

Version Comparison and Differential Item Functioning

Results of the comparison of data element and scale means by version are shown in Table A.1 in the appendix. These comparisons were conducted to determine whether data element performance varied according to version and to inform the appropriateness of combining across versions for remaining analyses. Significant mean differences were observed according to version for nine out of ten of these data elements, and effect sizes were at or above the Cohen's *d* value of 0.2 for six of the data elements. Three of these were in the Mental Health scale, while one was in the Physical Health scale. The other two data elements reflecting general health are not included in either scale. In each of these six data elements where the magnitude of Cohen's *d* was greater than 0.2, the alternative three-day wording resulted in the reporting of poorer health (lower scores) relative to the standard wording. At the scale level, these differences were also significant, though only for Mental Health were these differences larger than our threshold (Cohen's $d = -0.3$).

As can be seen in Table A.2 in the appendix, the results of DIF according to version for the data elements in the Physical and Mental Health scales showed that all data elements had R^2 effect sizes well below the 0.02 cutoff for nontrivial DIF. This means that the data element properties function very similarly across the two versions in IRT models. Evaluation of DIF according to setting, gender, and age was conducted using data combined across versions (based on no DIF according to version). No meaningful DIF was found by setting, gender, and age for data elements in either scale. The R^2 values were well below 0.02 for combined DIF types (uniform and nonuniform). These DIF results support the feasibility of assessment of these data elements in PAC settings regardless of setting, gender, and age. However, it should be noted that

the *past three days* wording performed somewhat better psychometrically for the Physical Health data elements, while resulting in overall lower Physical and Mental Health scores relative to the *in general* or *past seven days* version.

Known Groups Validity

Comparing the performance of patients/residents on the PROMIS Global Health data elements with other patient/resident characteristics adds information about the validity of data elements. If known or logical associations between patients/resident characteristics and data elements are observed in data from the National Beta test, this contributes to the evidence that the data elements are valid, or assessing the construct that they are intended to capture.

Table 3.3 shows the Physical and Mental Health T-scores, calculated based on data from the two versions combined for the overall admission sample and stratified by patient/resident characteristics and clinical groups as described in Chapter 1: gender (male or female, as documented by National Beta Test assessor), age (as categorized into the following ranges: 18–44, 45–64, 65–74, 75–89, 90 and over), length of stay (in days), disposition at discharge (e.g., to another PAC setting, home, to hospital), sepsis, heart failure, stroke, and two ADLs (toileting [not available for HHA patients] and ability to transfer from lying to sitting). As a reminder, these clinical conditions were chosen based on their common occurrence across settings, their frequent relationship with many of the data elements tested in the National Beta Test, and their availability in all four standardized assessments (OASIS, IRF-PAI, LCDS, MDS). Setting-specific results for these individual characteristics are presented in Tables A.3–A.6 in the appendix.

Based on the research literature, we generated two hypotheses (or expectations) for associations between the data elements and the patient/resident characteristics. We expected Physical and Mental Health T-scores to be related to needing assistance with toileting and the ability to transfer from lying to sitting, such that patients/residents with worse physical and mental health would tend to have less independence in both ADLs.[34]

[34] Amstadter et al., 2010; Damián, Pastor-Barriuso, and Valderrama-Game, 2008.

Table 3.3. Overall PROMIS Physical Health and Mental Health T-Scores by Patient/Resident Characteristics and Clinical Groups

Patient/Resident Characteristics and Clinical Groups	Mean Physical Health T-Score (SD)	Mean Mental Health T-Score (SD)
Gender (*nph* = 2,941[a]; *nmh* = 2,933)		
Male (*nph* = 1,214; *nmh* = 1,211)	38.5 (8.3)	45.7 (8.8)
Female (*nph* = 1,727; *nmh* = 1,722)	37.7 (8.0)	45.8 (8.7)
Age (*nph* = 2,930[a]; *nmh* = 2,922[a])		
18–44 (*nph* = 42; *nmh* = 42)	35.3 (7.2)	46.0 (9.8)
45–64 (*nph* = 308; *nmh* = 308)	34.9 (7.5)	43.4 (8.8)
65–74 (*nph* = 918; *nmh* = 916)	37.2 (8.2)	45.6 (8.8)
75–89 (*nph* = 1,347; *nmh* = 1,341)	38.9 (8.0)	46.3 (8.8)
90 or older (*nph* = 315; *nmh* = 315)	39.9 (8.4)	46.3 (7.9)
Length of stay (*nph* = 2,593; *nmh* = 2,586[a])	Pearson $r = -0.04$	Pearson $r = -0.08$
Disposition at discharge (*nph* = 2,890[a]; *nmh* = 2,882[a])		
Home (*nph* = 1,349; *nmh* = 1,345)	39.0 (8.0)	46.5 (8.5)
Hospital (*nph* = 200; *nmh* = 199)	35.4 (8.1)	44.6 (8.8)
Hospice (*nph* = 40; *nmh* = 40)	36.5 (9.0)	45.4 (7.3)
SNF (*nph* = 286; *nmh* = 285)	36.5 (9.1)	44.2 (9.8)
IRF (*nph* = 51; *nmh* = 51)	33.6 (7.4)	42.6 (9.4)
HHA (*nph* = 625; *nmh* = 624)	37.9 (7.6)	46.3 (8.7)
LTCH (*nph* = 13; *nmh* = 13)	38.9 (8.6)	45.3 (4.7)
Other (*nph* = 326; *nmh* = 325)	37.4 (8.1)	44.4 (8.8)
Clinical conditions (*nph* = 2,267; *nmh* = 2,261)		
Sepsis		
Yes (*nph* = 154[a]; *nmh* = 153[a])	36.5 (9.0)	44.2 (9.3)
No (*nph* = 2,113; *nmh* = 2,108)	37.9 (8.1)	45.8 (8.8)
Heart failure		
Yes (*nph* = 387; *nmh* = 386)	37.3 (8.5)	45.4 (8.5)
No (*nph* = 1,880; *nmh* = 1,875)	37.9 (8.2)	45.7 (8.9)
Stroke		
Yes (*nph* = 200; *nmh* = 199[a])	38.0 (8.7)	43.6 (9.0)
No (*nph* = 2,067; *nmh* = 2,062)	37.8 (8.2)	45.9 (8.8)

Patient/Resident Characteristics and Clinical Groups	Mean Physical Health T-Score (SD)	Mean Mental Health T-Score (SD)
Hygiene—Toileting (*nph* = 1,534[a]; *nmh* = 1,528[a])[b]		
Independent (*nph* = 73; *nmh* = 73)	39.2 (9.3)	45.4 (8.1)
Setup or clean-up assistance (*nph* = 77; *nmh* = 77)	39.8 (8.3)	48.7 (7.8)
Supervision or touching assistance (*nph* = 322; *nmh* = 322)	39.7 (8.0)	47.4 (8.7)
Partial/moderate assistance (*nph* = 368; *nmh* = 367)	38.2 (8.0)	46.2 (8.8)
Substantial/maximal assistance (*nph* = 340; *nmh* = 338)	36.6 (8.0)	45.3 (8.8)
Dependent (*nph* = 354; *nmh* = 351)	34.7 (7.9)	43.7 (9.7)
Mobility—Transfer from lying to sitting (*nph* = 1,891[a]; *nmh* = 1,885[a])		
Independent (*nph* = 193; *nmh* = 193)	40.5 (9.0)	47.0 (8.8)
Setup or clean-up assistance (*nph* = 114; *nmh* = 114)	39.6 (8.1)	46.4 (8.8)
Supervision or touching assistance (*nph* = 530; *nmh* = 529)	39.2 (7.9)	46.6 (8.7)
Partial/moderate assistance (*nph* = 621; *nmh* = 619)	37.7 (8.1)	45.9 (8.9)
Substantial/maximal assistance (*nph* = 295; *nmh* = 294)	35.8 (7.8)	45.2 (9.0)
Dependent (*nph* = 138; *nmh* = 136)	34.1 (8.0)	43.4 (8.9)

[a] Significant ($p < 0.05$) associations with Physical Health T-score and Mental Health T-score as indicated by chi-square tests of independence. Because of differences in sample sizes for the data elements, we report sample sizes for each (*nph* = Physical Health T-score; *nmh* = Mental Health T-score).
[b] Toileting hygiene data not available for HHA patients.

Overall, the Physical Health T-scores are significantly associated with gender, age, disposition at discharge, sepsis, and the two ADLs. There are also significant associations of Physical Health with length of stay and stroke in one or more settings. The Mental Health T-scores overall are significantly associated with age, length of stay, disposition at discharge, sepsis, stroke, and the two ADLs. We review the specific associations in the bullets below. We found many unexpected associations that likely relate to underlying medical conditions between the different groups that use PAC settings.

Gender and Age

- Gender, overall, is significantly associated with Physical Health ($t_{(2549)} = 2.70$, $p < 0.01$), such that females score lower (mean [M] = 37.7, *SD* = 8.0) than males (M = 38.5, *SD* = 8.3). A similar trend is observed at the setting level in HHAs ($t_{(624)} = 3.04$, $p < 0.01$) and LTCHs ($t_{(465)} = 2.09$, $p < 0.05$) but not in IRFs or SNFs. There was no association of gender with Mental Health overall or at the setting level. *We had not expected any associations with gender, which are likely due to a gender-related factor, such as age or clinical conditions.*
- Age, overall, was significantly associated with Physical Health ($F_{(4,2925)} = 23.35$, $p < 0.01$), such that the two youngest age groups have lower scores (age 18–44: M = 35.3, SD = 7.2; age 45–64: M = 34.9, SD = 7.5) than the three older age groups, from age 65 to 90 and over (mean range: 37.2–39.9). Age was also significantly associated with Physical Health in each of the four settings. In HHAs ($F_{(4,617)} = 10.40$, $p < 0.001$), with the

exception of the patients under age 45 ($n = 4$) who had a relatively high Physical Health score (M = 39.4, SD = 3.3), Physical Health scores tended to be higher as age increased. This trend occurred also among IRF ($F_{(4,741)} = 3.44$, $p < 0.01$) and LTCH ($F_{(4,463)} = 3.34$, $p < 0.05$) patients and SNF residents ($F_{(4,1089)} = 4.99$, $p < 0.01$). Similar associations were observed between age and Mental Health, overall ($F_{(4,2917)} = 6.96$, $p < 0.01$) and in HHAs ($F_{(4,617)} = 6.35$, $p < 0.01$) and IRFs ($F_{(4,741)} = 2.42$, $p < 0.05$), with similar trends, where younger age groups in general have lower Mental Health scores that indicate worse Mental Health. Age is not associated with Mental Health scores in the LTCH or SNF settings. *These associations were not anticipated but likely related to the underlying conditions that cause patients/residents to require PAC services.*

Length of Stay, Disposition at Discharge

- Length of stay, overall, is not significantly associated with Physical Health (Pearson correlation $r = -0.04$, $p > 0.05$) but is significantly associated with Mental Health (Pearson correlation $r = -0.08$, $p < 0.05$). This small effect indicates a slight tendency for length of stay to be longer among those with lower Mental Health scores (worse mental health). At the setting level, length of stay is associated with Physical Health among HHA and LTCH patients (Pearson correlation $r = -0.10$ and -0.12, respectively, $p < 0.05$) and is also associated with Mental Health among IRF and LTCH patients and SNF residents (Pearson correlation $r = -0.10$, -0.12, and -0.06, respectively, $p < 0.05$). In all cases, effect sizes are small but indicate a tendency for lengths of stay to be longer for patients/residents with lower Physical and Mental Health scores. *This association was not anticipated, but the trend is logically consistent: Patients/residents with lower scores on these scales may require longer stays to stabilize or regain health. Alternatively, it is also possible that as length of stay increases, mental health declines.*
- Overall, disposition at discharge is significantly associated with Physical ($F_{(7,2882)} = 10.29$, $p < 0.001$) and Mental Health T-scores ($F_{(7,2874)} = 5.75$, $p < 0.001$). Relative to patients/residents discharged to all other placements, those discharged to home and LTCHs have the highest Physical Health T-scores (home: M = 39.0, SD = 8.0; LTCH: M = 38.9, SD = 8.6), indicating better Physical Health, and those discharged to home and HHAs tended to have better Mental Health, with the highest Mental Health T-scores (home: M = 46.5, SD = 8.5; HHA: M = 46.3, SD = 8.7). In contrast, those discharged to IRFs have the lowest Physical (M = 33.6, SD = 7.4) and Mental Health T-scores (M = 42.6, SD = 9.4). At the setting level, disposition at discharge is significantly associated with Physical Health at HHAs ($F_{(7,610)} = 3.84$, $p < 0.001$), LTCHs ($F_{(7,444)} = 3.72$, $p < 0.001$), and SNFs ($F_{(7,1068)} = 2.18$, $p < 0.001$). Among HHA patients, those discharged to SNFs (M = 28.2, SD = 10.8), LTCHs (one patient with a score of 34.2), and hospitals (M = 35.1, SD = 6.3) tended to have poorer Physical Health than those discharged to other placements (mean range: 37.4–41.7). Among LTCH patients, those discharged to HHAs (M = 38.5, SD = 8.3) and home (M = 38.1, SD = 8.0) tended to have better Physical Health relative to those discharged to all other placements (mean range: 26.7–35.7). Finally, among SNF residents, those discharged to hospices (M = 32.8, SD = 5.0) and hospitals (M = 35.8, SD = 8.4) tended to have poorer Physical Health than those discharged to all other placements (mean range: 37.5–48.2). There was also an association between disposition at discharge and PROMIS Mental Health among SNF residents ($F_{(7,1061)} = 3.72$, $p < 0.001$): Those discharged to SNFs (M = 41.2, SD = 9.0) and

hospices (M = 42.4, SD = 6.8) tended to have poorer Mental Health than those discharged to all other placements (mean range: 44.2–46.2, and one resident discharged to an IRF with a Mental Health score of 64.6). *These associations were not anticipated and somewhat difficult to interpret. The cases in which higher scores were associated with discharge to lower-intensity settings (e.g., HHA, home) are logically consistent, but the finding that patients/residents with higher Physical Health T-scores are discharged to LTCHs is inconsistent with this idea.*

Clinical Conditions

- Overall, patients/residents with sepsis had significantly poorer Physical Health (M = 36.5, SD = 9.0; $t_{(2265)} = 2.09$, $p < 0.05$) and Mental Health (M = 44.2, SD = 9.3; $t_{(2259)} = 2.11$, $p < 0.05$) relative to those without (Physical Health: M = 37.9, SD = 8.1; Mental Health: M = 45.8, SD = 8.8). This relationship was also observed for Physical Health at the setting level in HHAs only. However, the mean difference is reversed, such that those HHA patients with sepsis ($n = 9$) have a significantly higher mean (M = 45.8, SD = 6.9) than those without (M = 39.6, SD = 8.0; $t_{(419)} = 2.33$, $p < 0.05$). There are no associations of Mental Health T-scores with sepsis within any of the four settings. *We did not anticipate associations between these variables. However, the association with sepsis in the overall sample is consistent with the idea that serious medical conditions could harm quality of life.*
- We did not observe any associations of heart failure with either Physical or Mental Health overall or at the setting level. *We did not anticipate associations between these variables.*
- Stroke is significantly associated with Physical Health among IRF patients, where those with stroke have better Physical Health (M = 39.8, SD = 9.0) than those without (M = 37.6, SD = 7.8, $t_{(582)} = 2.52$, $p < 0.05$). Stroke is also significantly associated with Mental Health T-scores overall, such that those with stroke have poorer Mental Health (M = 43.6, SD = 9.0) than those without (M = 45.9, SD = 8.8, $t_{(2259)} = 3.53$, $p < 0.01$). This trend was also observed at the setting level among IRF patients ($t_{(582)} = 2.03$, $p < 0.05$) and SNF residents ($t_{(856)} = 2.71$, $p < 0.01$), where those with stroke tend to have poorer Mental Health than those without. *These associations were not anticipated, but they suggest that patients/residents with stroke rate their physical condition as better compared with other PAC patients/residents but rate their mental health as worse.*

ADLs: Toileting and Ability to Transfer from Lying to Sitting

- Level of independence in toileting hygiene is significantly associated with both PROMIS Physical Health T-scores ($F_{(5,1528)} = 16.54$, $p < 0.001$) and Mental Health T-scores ($F_{(5,1522)} = 8.03$, $p < 0.001$). Both Physical and Mental Health scores tend to be higher among those with increased independence. For example, those needing minimal assistance (i.e., setup or cleanup assistance) had higher Physical (M = 39.8, SD = 8.0) and Mental Health T-scores (M = 48.7, SD = 7.8) than those requiring substantial or maximal assistance (Physical: M = 36.6, SD = 8.0; Mental: M = 45.3, SD = 8.8) and those who are completely dependent (Physical: M = 34.7, SD= 7.9; Mental: M = 43.7, SD = 9.7). This trend was observed as significant at the setting level in all settings other than HHAs for both Physical Health (IRFs: $F_{(5,562)} = 6.73$, $p < 0.001$; LTCHs: $F_{(5,380)} = 6.26$, $p < 0.001$; and SNFs $F_{(5,574)} = 5.99$, $p < 0.001$) and Mental Health (IRFs: $F_{(5,562)} = 3.01$, $p < 0.05$;

LTCHs: $F_{(5,379)} = 3.33$, $p < 0.01$; and SNFs: $F_{(5,569)} = 3.13$, $p < 0.01$), such that those who need more assistance in general have lower scores. *This is consistent with our hypothesis and supports the validity of the PROMIS Physical and Mental Health data elements to capture the experience of PAC patients/residents.*

- Level of independence in transferring from lying to sitting is significantly associated overall with PROMIS Physical ($F_{(5,1885)} = 17.97$, $p < 0.001$) and Mental Health T-scores ($F_{(5,1879)} = 3.9$, $p < 0.01$). As with toileting, both Physical and Mental Health scores tend to be higher among those with increased independence. For example, patients/residents who are completely dependent have the lowest mean scores for Physical (M = 34.1, SD = 8.0) and Mental Health (M = 43.4, SD = 8.9) as compared with those who need less assistance. Similar trends were also observed for Physical Health in IRFs ($F_{(5,575)} = 8.31$, $p < 0.001$), LTCHs ($F_{(5,338)} = 5.55$, $p < 0.001$), and SNFs ($F_{(5,566)} = 5.30$, $p < 0.001$) and for Mental Health at LTCHs only ($F_{(5,337)} = 2.57$, $p < 0.05$). *This is consistent with our hypothesis and supports the validity of the PROMIS Physical and Mental Health data elements to capture the experience of PAC patients/residents.*

Time to Complete

Table 3.4 shows the average time to complete the PROMIS Global Health data elements overall and by setting for each version separately and combined across versions. On average, the time to complete for version A (past seven days, in general) was 3.7 minutes (SD = 1.6) and ranged from 3.5 minutes (SD = 2.3) in LTCHs to 3.8 minutes in both HHAs (SD = 1.4) and SNFs (SD = 1.6). For version B (past three days), time to complete on average was 3.5 minutes (SD = 1.5) and ranged from 2.8 minutes (SD = 1.2) in IRFs to 3.9 minutes (SD = 1.4) in LTCHs. There were no differences in time to complete at the setting level for version A. However, there were differences in time to complete for version B ($F_{(3,851)} = 19.68$, $p < 0.001$), which tended to be completed in significantly less time in IRFs than in HHAs ($t_{(851)} = 6.33$, $p < 0.001$), LTCHs ($t_{(851)} = 7.0$, $p < 0.001$), and SNFs ($t_{(851)} = 5.47$, $p < 0.001$).

Table 3.4. Time to Complete the PROMIS Global Health Data Elements (minutes)

Version	HHA (*n* = 432)	IRF (*n* = 530)	LTCH (*n* = 316)	SNF (*n* = 479)	Overall (*n* = 1,757)
A: In general or past 7 days; mean (SD)	3.8 (1.4)	3.7 (1.4)	3.5 (2.3)	3.8 (1.6)	3.7 (1.6)
B: Past 3 days; mean (SD)	3.7 (1.5)	2.8 (1.2)	3.9 (1.4)	3.6 (1.6)	3.5 (1.5)
Combined; mean (SD)	3.7 (1.5)	3.4 (1.4)	3.7 (1.9)	3.7 (1.6)	3.6 (1.6)

Time to complete was also evaluated using the data from the two versions combined according to urbanicity (urban versus nonurban), geographic region (Northeast, South, Midwest, West), facility ownership (for-profit versus nonprofit), and facility size (below or above setting-type median) to evaluate the generalizability of these performance results (see Tables A.7–A.10 in the appendix). The PROMIS Global Health data elements took significantly less time to complete in the Northeast region (3.5 minutes [*SD* = 1.6]) than in the South (3.7 minutes [*SD* =

1.5]), but the effect size was quite small (Cohen's $d = 0.13$). There were no significant differences in time to complete by urbanicity, ownership, and size.

Interrater Reliability

Tables 3.5 and 3.6 show kappa interrater reliability coefficients separately for the two versions overall and by setting. As described in more detail in Volume 3, paired assessment data for interrater reliability evaluation was collected on a subset of the National Beta Test admission sample of patients/residents according to setting-level target totals. For example, each participating LTCH was asked to conduct 20 paired assessments to contribute to interrater reliability. Inclusion in interrater reliability data collection depended on paired facility staff and research nurse assessors' ability to schedule assessments. For version A (Table 3.5), kappas were computed on 440 patients/residents who were assessed by research nurse and facility/agency staff assessor pairs: 56 in HHAs, 159 in IRFs, 112 in LTCHs, and 113 in SNFs. For version B (Table 3.6), kappas were computed on 521 patients/residents who were assessed by research nurse and facility/agency staff assessor pairs: 141 in HHAs, 97 in IRFs, 126 in LTCHs, and 157 in SNFs. Kappas for the PROMIS Global Health data elements were excellent for both versions, ranging from 0.89 to 1. At the setting level, kappas were also excellent, ranging from 0.94 to 1.00 in HHAs, 0.89 to 0.99 in IRFs, 0.91 to 1.00 in LTCHs, and 0.93 to 0.99 in SNFs. Generally speaking, kappas are all excellent and there is little variation among them at the setting level.

Interrater reliability (kappa) was also evaluated according to urbanicity (urban versus nonurban), geographic region (Northeast, South, Midwest and West), facility ownership (for-profit versus nonprofit), and facility size (below or above setting-type median) using data from the two versions combined to evaluate the generalizability of these performance results (see Tables A.11–A.14 in the appendix). No noteworthy differences were found for interrater reliability of the PROMIS Global Health data elements in these sensitivity analyses.

Table 3.5. Interrater Reliability Kappa or Weighted Kappa for PROMIS Global Health Data Elements: Market Group A

Data Element	HHA (*n* = 56)	IRF (*n* = 159)	LTCH (*n* = 112)	SNF (*n* = 113)	Overall (*n* = 440)
General health (c1a)	0.98	0.94	0.91	0.98	0.95
Quality of life (c1b)	1.00	0.98	0.99	0.98	0.99
Physical health (c1c)	0.98	0.97	0.96	0.98	0.98
Mental health (c1d)	1.00	0.98	0.98	0.93	0.97
Social satisfaction (c1e)	0.98	0.99	0.98	0.98	0.98
Ability to carry out social activities (c1f)	1.00	0.97	0.99	0.96	0.98
Able to carry out physical activities (c1g)	1.00	0.97	0.99	0.98	0.98
How often bothered by emotional problems (c1h)	0.98	0.99	0.98	0.99	0.99
Rate fatigue (c1i)	0.98	0.98	0.98	0.95	0.97
Rate pain (0–10) (c1j)[a]	1.00	0.99	1.00	0.98	0.99

NOTE: Interpretation of kappa or weighted kappa is as follows: 0.00–0.20 is slight/poor, 0.21–0.40 is fair, 0.41–0.60 is moderate, 0.61–0.80 is substantial/good, 0.81–1.00 is excellent/almost perfect.
[a] Pearson correlation for rating of average pain, which is on a 0–10 scale.

Table 3.6. Interrater Reliability Kappa or Weighted Kappa for PROMIS Global Health Data Elements: Market Group B

Data Element	HHA (*n* = 141)	IRF (*n* = 97)	LTCH (*n* = 126)	SNF (*n* = 157)	Overall (*n* = 521)
General health (c1a)	0.97	0.96	0.97	0.97	0.97
Quality of life (c1b)	0.97	0.92	0.99	0.97	0.97
Physical health (c1c)	1.00	0.94	0.99	0.97	0.98
Mental health (c1d)	0.94	0.97	1.00	0.95	0.96
Social satisfaction (c1e)	0.98	0.95	0.98	0.97	0.97
Ability to carry out social activities (c1f)	0.96	0.94	0.98	0.98	0.97
Able to carry out physical activities (c1g)	0.98	0.89	0.97	0.93	0.95
How often bothered by emotional problems (c1h)	0.99	0.93	0.99	0.98	0.98
Rate fatigue (c1i)	0.98	0.89	0.98	0.98	0.96
Rate pain (0–10) (c1j)[a]	0.99	0.97	1.00	0.99	0.99

NOTE: Interpretation of kappa or weighted kappa is as follows: 0.00–0.20 is slight/poor, 0.21–0.40 is fair, 0.41–0.60 is moderate, 0.61–0.80 is substantial/good, 0.81–1.00 is excellent/almost perfect.
[a] Pearson correlation for rating of average pain, which is on a 0–10 scale.

Tables 3.7 and 3.8 show the percent agreement for the PROMIS Global Health data elements overall and by setting for the two versions separately. Overall, percent agreement was high for all data elements, ranging from 93 percent to 100 percent with minimal setting or version differences.

Table 3.7. Interrater Reliability—Percent Agreement for PROMIS Global Health Data Elements: Market Group A

Data Element	HHA (n = 56)	IRF (n = 159)	LTCH (n = 112)	SNF (n = 113)	Overall (n = 440)
General health (c1a)	98	96	93	97	96
Quality of life (c1b)	100	98	99	97	98
Physical health (c1c)	98	97	97	98	98
Mental health (c1d)	100	98	99	94	97
Social satisfaction (c1e)	98	98	98	99	98
Ability to carry out social activities (c1f)	100	98	98	94	97
Able to carry out physical activities (c1g)	100	97	99	97	98
How often bothered by emotional problems (c1h)	98	99	98	99	99
Rate fatigue (c1i)	98	98	98	95	97

NOTE: The “rate pain (0–10)” data element (c1j) is a continuous measure. Therefore, it is not amenable to calculation of percent agreement and is omitted from Tables 3.7 and 3.8.

Table 3.8. Interrater Reliability—Percent Agreement for PROMIS Global Health Data Elements: Market Group B

Data Element	HHA (*n* = 141)	IRF (*n* = 97)	LTCH (*n* = 126)	SNF (*n* = 157)	Overall (*n* = 521)
General health (c1a)	97	97	98	97	97
Quality of life (c1b)	97	94	99	96	97
Physical health (c1c)	100	95	99	97	98
Mental health (c1d)	94	97	100	94	96
Social satisfaction (c1e)	98	95	98	97	97
Ability to carry out social activities (c1f)	97	94	98	97	96
Able to carry out physical activities (c1g)	99	91	97	95	95
How often bothered by emotional problems (c1h)	99	94	98	98	97
Rate fatigue (c1i)	98	93	98	98	97

NOTE: The “rate pain (0–10)” data element (c1j) is a continuous measure. Therefore, it is not amenable to calculation of percent agreement and is omitted from Tables 3.7 and 3.8.

Scale Reliability

Because the PROMIS Global Health data elements are typically interpreted at the Physical and Mental Health scale level, we conducted additional analyses to evaluate the unidimensionality and internal consistency reliability of the data element components of each of these scales.

The Mental Health scale showed a reasonable level of internal consistency (Cronbach's Alpha = 0.71), which did not differ between standard and alternative wording. None of the item-total correlations were below the PROMIS standard 0.4 cutoff. Physical Health, however, showed a lower Cronbach's Alpha (0.56), and one data element (pain) fell below the 0.4 cutoff in the standard wording. For the alternative three-day wording, however, Alpha increased to 0.62 and the pain data element increased from 0.30 to 0.41. Evaluation of unidimensionality was mixed for the Physical and Mental Health data elements. For Mental Health, the fit statistics suggested that the four–data element scale met unidimensionality assumptions and even suggested that standard wording might be preferred over alternative wording. In contrast, the fit statistics for Physical Health were met only for the alternative wording.

Admission to Discharge

Tables 3.9 and 3.10 summarize patterns of change from admission to discharge on the PROMIS Global Health data elements, as well as total and T-scores for data combined from both versions. Patterns are characterized as "no change" (scores stay the same at admission and discharge), "improve" (scores reflect improvement from admission to discharge), and "worsen" (scores indicate a decline from admission to discharge). As described in more detail in Volume 3, discharge data were collected on a subset of the National Beta Test admission sample of patients/residents. Availability of discharge data depended on advance notification of discharge and the ability to schedule assessments among the facility staff assessors in each participating site. Results for the PROMIS Global Health data elements are based on data from 790 patients/residents, 467 of whom received version A and 323 of whom received version B. Overall, responses demonstrated only a moderate degree of stability from admission to discharge, with an overall range of 31 percent to 52 percent experiencing no change, depending on the data element and version. At discharge (compared with admission), patients/residents were more likely to show improvement in symptoms than to worsen. For example, patients/residents reported higher ratings of general health using version A at discharge than at admission ($t_{(465)} = 6.57$, $p < 0.001$). Across all the data elements, the percentage of patients/residents with worsening health ranged from 7 percent to 46 percent, while the percentage showing improvement ranged from 7 percent to 62 percent. Furthermore, more than half of all patients/residents showed improvement from admission to discharge in Physical and Mental Health total score and T-score. There was little noticeable variation across settings.

The summed score to T-score conversion tables for the Physical and Mental Health scales are included as Table A.15 and A.16 in the appendix.

Table 3.9. Admission to Discharge Results for PROMIS Global Health Data Elements: Market Group A (percent)

Data Element	HHA (*n* = 54)	IRF (*n* = 226)	LTCH (*n* = 43)	SNF (*n* = 144)	Overall (*n* = 467)
General health (c1a)					
No change	50	47	51	48	48
Improve	41	38	33	37	37
Worsen	9	15	16	15	15
Quality of life (c1b)					
No change	48	47	45	52	48
Improve	37	29	36	31	31
Worsen	15	24	19	17	21
Physical health (c1c)					
No change	57	43	38	44	44
Improve	30	36	38	42	37
Worsen	13	21	24	14	18
Mental health (c1d)					
No change	50	53	49	53	52
Improve	26	25	35	30	27
Worsen	24	22	16	18	21
Social satisfaction (c1e)					
No change	39	51	42	47	47
Improve	41	26	30	30	29
Worsen	20	23	28	24	23
Ability to carry out social activities (c1f)					
No change	36	44	60	54	48
Improve	36	29	7	22	25
Worsen	28	27	33	25	27
Able to carry out physical activities (c1g)					
No change	43	39	47	47	42
Improve	41	40	23	34	37
Worsen	17	21	30	19	21
How often bothered by emotional problems (c1h)					
No change	44	45	40	43	44
Improve	37	44	51	43	43
Worsen	19	12	9	15	13

Data Element	HHA (*n* = 54)	IRF (*n* = 226)	LTCH (*n* = 43)	SNF (*n* = 144)	Overall (*n* = 467)
Rate fatigue (c1i)					
No change	37	41	38	45	41
Improve	46	47	45	50	48
Worsen	17	12	17	6	11
Rate pain (0–10) (c1j)					
No change	33	27	37	43	34
Improve	59	62	51	48	56
Worsen	7	11	12	9	10
Physical Health total score					
No change	17	17	12	14	15
Improve	67	62	53	69	64
Worsen	17	21	35	17	21
Physical Health T-score					
No change	6	6	0	5	5
Improve	68	65	59	74	67
Worsen	26	29	41	21	27
Mental Health total score					
No change	20	18	21	16	18
Improve	57	54	56	57	56
Worsen	22	28	23	27	26
Mental Health T-score					
No change	10	6	8	10	8
Improve	56	57	62	59	58
Worsen	34	38	31	31	34

Table 3.10. Admission to Discharge Results for PROMIS Global Health Data Elements: Market Group B (percent)

Data Element	HHA (*n* = 92)	IRF (*n* = 108)	LTCH (*n* = 42)	SNF (*n* = 81)	Overall (*n* = 323)
General health (c1a)					
No change	38	36	29	40	36
Improve	54	53	60	49	53
Worsen	8	11	12	12	10
Quality of life (c1b)					
No change	40	41	38	31	38
Improve	44	42	43	49	44
Worsen	16	18	19	21	18

Data Element	HHA (*n* = 92)	IRF (*n* = 108)	LTCH (*n* = 42)	SNF (*n* = 81)	Overall (*n* = 323)
Physical health (c1c)					
No change	34	41	29	38	36
Improve	49	41	43	51	46
Worsen	17	18	29	11	17
Mental health (c1d)					
No change	45	39	29	30	37
Improve	38	39	27	46	39
Worsen	17	22	44	24	24
Social satisfaction (c1e)					
No change	43	42	22	29	37
Improve	41	41	32	56	43
Worsen	16	17	46	15	20
Ability to carry out social activities (c1f)					
No change	33	36	30	23	31
Improve	52	44	40	55	49
Worsen	15	19	30	23	20
Able to carry out physical activities (c1g)					
No change	33	32	33	31	32
Improve	53	59	43	53	54
Worsen	14	8	25	17	14
How often bothered by emotional problems (c1h)					
No change	46	48	44	49	47
Improve	35	38	29	38	36
Worsen	19	14	27	13	17
Rate fatigue (c1i)					
No change	45	48	27	39	42
Improve	37	37	49	51	42
Worsen	18	15	24	10	16
Rate pain (0–10) (c1j)					
No change	38	33	17	26	31
Improve	52	44	56	53	50
Worsen	10	23	27	22	20
Physical Health total score					
No change	12	10	14	10	11
Improve	70	70	60	75	70
Worsen	18	19	26	15	19

Data Element	HHA (*n* = 92)	IRF (*n* = 108)	LTCH (*n* = 42)	SNF (*n* = 81)	Overall (*n* = 323)
Physical Health T-score					
No change	2	4	3	4	3
Improve	77	73	58	80	74
Worsen	21	23	39	16	23
Mental Health total score					
No change	18	17	2	10	14
Improve	60	60	43	69	60
Worsen	22	23	55	21	26
Mental Health T-score					
No change	7	6	0	4	5
Improve	65	61	37	70	61
Worsen	28	33	63	26	34

Assessor Feedback

Standardized assessment of a patient's/resident's perception of his or her health was important to assessors. On average, PROMIS Global Health data elements were reported as somewhat to moderately clinically useful on the assessor survey by facility staff and research nurses. Most facility staff in focus groups agreed that the data elements were important. One member of the facility staff said

> There were very pertinent questions in that section about how do you feel your physical health is, how is your mental health? Those are the things that I'm much more concerned about and that we would go digging into if we had to.
>
> —Durham, N.C., SNF staff

However, the facility staff in the focus groups said that several of these questions were inappropriate for their patient/resident populations, which affected the burden of data collection and potentially reduced the usefulness of the reported answers. Some mentioned that the word *fatigue* was not widely understood and therefore confusing. Facility staff reported that the prompts in questions about social activities and roles and physical activities were perceived as irrelevant and confusing. Patients/residents usually do not carry out the specified activities in the PAC settings and may not have carried them out prior to the acute event. At best, the facility staff "got a lot of funny looks" asking these questions, and at worst, these prompts disrupted the flow of the interview when residents had a negative reaction to being asked about activities they obviously could not perform under the circumstances.

> So, you're lumping "walking" along with "moving a chair." If our patients can move a chair, they're not homebound. . . . These include at home, at work. Our patients are homebound. They don't go to work. And community and

> responsibilities as a parent, child, spouse, employee, that doesn't even fit—those are useless.
>
> —Durham, N.C., HHA staff

Facility staff also said reporting "average" pain was not understood by patients/residents. This was not always apparent until completion of the pain assessment, when patients/residents would frequently give the same answer about their "worst" pain as they did for their "average" pain and patients/residents frequently expressed that they had already answered that question. In particular, it was noted in the assessor survey that IRF patients found it especially difficult to speak to "average" pain, since their pain varied substantially from preoperation to postoperation and from acute care settings to rehabilitation, both of which could fall within the look-back period.

Overall, the facility staff indicated in both the survey and focus groups that select questions in PROMIS Global Health were useful and others were irrelevant and potentially disruptive.

Summary

Results for the PROMIS Global Health data elements are somewhat mixed. Assessors considered some of the PROMIS Global Health data elements to be clinically useful but also considered many of them to be irrelevant for the majority of PAC patients/residents, thus reducing the potential usefulness of the data elements. This limited relevance also resulted in increased assessor and patient burden. However, we found that the data elements performed similarly according to setting, gender, and age (i.e., did not observe any DIF), which supports their use in the population. For interrater reliability, kappas were excellent and percent agreement was high, with minimal variation across the settings. Although psychometric properties of the data elements were similar across versions, there were substantial differences in mean responses for several data elements, depending on the version. Essentially, the reference to *in general* in version A tended to yield higher scores and thus better global health relative to the use of *the past three days* (version B). In contrast to many of the data elements tested in the National Beta Test, responses tended to change substantially from admission to discharge, most often reflecting improvement in global health. In addition, the associations of PROMIS Physical and Mental Health T-scores with patient/resident characteristics aligned well with our expected results, indicating validity of the data elements.

4. Care Preferences

Data Element Description

The Care Preferences data elements assess patient/resident preferences for the involvement of family and friends in care decisions and patient/resident involvement in his or her own care, as well as whether the patient/resident has a designated health care agent. Elicitation and documentation of care preferences can increase patient/resident autonomy and, as a result, satisfaction with the decisionmaking process and reduce patient/resident decisional conflict.[35] Assessment of preferences for patient/resident and family involvement in care decisions and designation of a health care agent can improve the alignment of care with expressed preferences and goals and facilitate goal achievement.

The Care Preference data elements are completed through patient/resident interviews (Involvement of Family/Friends in Care Decisions, Preferences for Involvement in Decision Making Questionnaire) or medical record review (Designated Health Care Agent). A similar data element is included in the MDS that assesses how important it is to the patient/resident to have his or her family involved in discussions about care. The Care Preferences data elements are shown in Figure 4.1.

Testing Objectives

Basic descriptive statistics (e.g., frequencies, means, SDs) are presented for the Care Preferences data elements to characterize patients'/residents' preferences in each setting and for the overall sample. To examine known groups validity, we also examined the rate of patients/residents in the admission sample indicating that they would *prefer to know as much as they can* about their condition and treatment in response to the F2 data element by patient/resident characteristics and clinical groups of interest, both for the combined sample and for each setting separately. For admission data, feasibility (frequencies, rate of missingness, and time to complete) and interrater reliability (kappa and percent agreement) were examined. Lastly, frequencies at admission and discharge were compared to inform stability or possible change over time.

[35] Garfield et al., 2007; Housen et al., 2008; Rockwood et al., 2003.

Figure 4.1. Care Preferences Data Elements

F1. ASK PATIENT/RESIDENT: "It is important for us to understand how you'd like your family, friends, or significant other involved in your care. How important is it to you to have your family or a close friend or significant other involved in discussions about your care?"

- ☐ 1 = Very important
- ☐ 2 = Somewhat important
- ☐ 3 = Not very important
- ☐ 4 = Not important at all
- ☐ 5 = Important, but can't do or no choice
- ☐ 7 = **Patient/resident declined to respond**
- ☐ 9 = **Unknown or unable to assess**

F2. ASK PATIENT/RESIDENT: "I'd like to talk to you about how you prefer to be involved in your care. Everyone copes with their condition differently. Do you prefer to know as much as you can about the details of your condition and treatment, prefer some information, or prefer not to know or to know very little?"

- ☐ 1 = To know as much as you can
- ☐ 2 = Some information
- ☐ 3 = Not to know or to know very little
- ☐ 7 = **Patient/resident declined to respond**
- ☐ 9 = **Unknown or unable to assess**

F3. Does the patient/resident have a designated Health Care Agent as authorized under state law to make healthcare decisions in the event that he/she is unable to make his or her own decisions AND there is legal documentation in the medical record?

- ☐ 0 = No
- ☐ 1 = Yes→ IF YES: Specify type of legal documentation:_____

Results

Feasibility

Frequencies/Missing

Table 4.1 shows the percentage of responses at admission for the Care Preferences data elements, both overall and by setting. The first two are patient/resident interview data elements and the third is a chart review data element. The Care Preference interview data elements were administered to 2,980 of the 3,121 patients/residents, or 95 percent of the admission sample: 640

in HHAs, 771 in IRFs, 470 in LTCHs, and 1,099 in SNFs. Among these, overall missing data at the data element level ranged from 0.70 percent to 0.94 percent with minimal setting differences. Overall, 73 percent of patients/residents indicated that it was *very important* to have a close person involved in their care. The rates were similar across settings, ranging from 72 percent in HHAs and SNFs to 76 percent in IRFs. Furthermore, 88 percent of patients/residents overall preferred *to know as much as they could* about their condition, and rates were similar across settings, ranging from 85 percent in SNFs to 90 percent in HHAs.

The Care Preference chart review data element indicating presence of a designated health care agent was completed for 2,923 of the 3,121 patients/residents, or 94 percent of the admission sample: 625 in HHAs, 759 in IRFs, 451 in LTCHs, and 1,088 in SNFs. Among these, there were no missing data overall or by setting. Overall, a health care agent was noted for 30 percent of patients but was somewhat more common in SNFs (34 percent) and less common in LTCHs (22 percent). Rates of designated health care agent for HHAs and IRFs were both 28 percent.

Table 4.1. Overall and Setting-Specific Response Frequencies for Care Preferences Data Elements (percent)

Data Element	HHA (f1, f2: *n* = 640; f3: *n* = 625)	IRF (f1, f2: *n* = 771; f3: *n* = 759)	LTCH (f1, f2: *n* = 470; f3: *n* = 451)	SNF (f1, f2: *n* = 1,099; f3: *n* = 1,088)	Overall (f1, f2: *n* = 2,980; f3: *n* = 2,923)
How important to have close person involved in care? (f1)[a]					
Very important	72	76	73	72	73
Other response	28	24	27	28	27
How much prefer to know about your condition? (f2)[a]					
To know as much as you can	90	89	88	85	88
Other response	10	11	12	15	12
Does patient have health care agent? (f3)					
Yes	28	28	22	34	30

[a] Data element was transformed from original to combine response options 2 (“Some information”) and 3 (“Not to know or to know very little”) into one “Other response” category.

Known Groups Validity

Comparing the performance of patients/residents on the Care Preferences data elements according to other patient/resident characteristics adds information about the validity of data elements. If known or logical associations between patients/resident characteristics and data elements are observed in data from the National Beta test, this contributes to the evidence that the data elements are valid, or assessing the construct that they are intended to capture.

Table 4.2 shows the percentage of patients/residents in the overall admission sample indicating that they would *prefer to know as much as they can* about their condition and treatment in response to the F2 data element (*Do you prefer to know as much as you can about the details of your condition and treatment, prefer some information, or prefer not to know or to know very little?*) stratified by patient/resident characteristics and clinical groups as described in Chapter 1: gender (male or female, as documented by National Beta Test assessor), age (as categorized into the following ranges: 18–44, 45–64, 65–74, 75–89, 90 and older), length of stay (in days), disposition at discharge (e.g., to another PAC setting, home, to hospital), sepsis, heart failure, stroke, and two ADLs: toileting (not available for HHA patients) and ability to transfer from lying to sitting. As a reminder, these clinical conditions were chosen based on their common occurrence across settings, their frequent relationship with many of the data elements tested in the National Beta Test, and their availability in all four standardized assessments (OASIS, IRF-PAI, LCDS, MDS). Setting-specific results are presented in Tables A.17–A.20 in the appendix.

Based on the research literature, we generated several hypotheses or expectations for associations between the data elements and the patient/resident characteristics. We expected preferences about knowledge to be related to gender and age such that patients/residents with preferences to know as much as they can would tend to be female and younger.[36]

In the overall sample, significant associations for preference about knowledge were observed with gender, age, disposition, and toileting. Preference about knowledge was also associated with sepsis and heart failure among SNF residents.

Table 4.2. Overall Frequencies for Patients/Residents Preferring to Know as Much as They Can by Patient/Resident Characteristics and Clinical Groups (percent)

Patient/Resident Characteristics and Clinical Groups	Prefer to Know as Much as I Can (Yes)
Gender (*n* = 2,858[a])	
Male (*n* = 1,181)	86.2
Female (*n* = 1,677)	88.9
Age (*n* = 2,847[a])	
18–44 (*n* = 38)	89.5
45–64 (*n* = 305)	91.2
65–74 (*n* = 894)	89.5
75–89 (*n* = 1,313)	86.9
90+ (*n* = 297)	83.5

[36] Arora and McHorney, 2000; Levinson et al., 2005; Say, Murtagh, and Thomson, 2006; Benbassat, Pilpel, and Tidhar, 1998.

Patient/Resident Characteristics and Clinical Groups	Prefer to Know as Much as I Can (Yes)
Length of stay (*n* = 2,527)	Yes: 21.5 (12.7) No: 22.1 (13.3)
Disposition at discharge (*n* = 2,810[a])	
Home (*n* = 1,322)	89.8
Hospital (*n* = 193)	82.4
Hospice (*n* = 38)	89.5
SNF (*n* = 269)	81.4
IRF (*n* = 51)	90.2
HHA (*n* = 614)	87.6
LTCH (*n* = 10)	80.0
Other (*n* = 313)	88.2
Clinical conditions (*n* = 2,200)	
Sepsis	
Yes (*n* = 147)	83.0
No (*n* = 2,053)	88.1
Heart failure	
Yes (*n* = 378)	85.7
No (*n* = 1,822)	88.1
Stroke	
Yes (*n* = 193)	85.0
No (*n* = 2,007)	88.0
Hygiene—Toileting (*n* = 1,484[a])[b]	
Independent (*n* = 71)	94.4
Setup or clean-up assistance (*n* = 77)	96.1
Supervision or touching assistance (*n* = 316)	91.1
Partial/moderate assistance (*n* = 358)	86.9
Substantial/maximal assistance (*n* = 328)	85.1
Dependent (*n* = 334)	86.5
Mobility—Transfer from lying to sitting (*n* = 1,843)	
Independent (*n* = 189)	93.7
Setup or clean-up assistance (*n* = 111)	91.0
Supervision or touching assistance (*n* = 525)	88.4
Partial/moderate assistance (*n* = 602)	87.9
Substantial/maximal assistance (*n* = 287)	84.7
Dependent (*n* = 129)	87.6

[a] Significant ($p < 0.05$) associations with "prefer to know as much as I can" as indicated by chi-square tests of independence (ANOVA for length of stay).
[b] Toileting hygiene data not available for HHA patients.

Gender and Age

- Gender, overall, was significantly associated with preference about knowledge $\left(\chi^2_{(1)} = 4.75, p < 0.05\right)$, with a greater percentage of females (88.9 percent) preferring to know as much as possible compared with males (86.2 percent). There were no significant associations of preference with gender at the setting level. *The association in the overall sample is consistent with our expectations that women are more likely to want information to participate in medical decisions than men, although the difference is not large in absolute terms.*
- Age, overall, was significantly associated with preference about knowledge $\left(\chi^2_{(4)} = 11.81, p < 0.05\right)$. Although the majority of patients/residents tended to prefer to know as much as they can regardless of age, those in the oldest age group (90 and older) preferred to know as much as they can at a slightly lower rate (83.5 percent) relative to those in the other age groups (range 86.9–91.2 percent). At the setting level, age was not significantly associated with preference about knowledge. *This association (in the overall sample) is consistent with our expectations and the research literature cited in this chapter, supporting the validity of this data element.*

Length of Stay, Disposition at Discharge

- Length of stay, overall, was not significantly associated with preference about knowledge ($F_{(1,2525)} = 0.65$, $p > 0.05$). However, at the setting level, LTCH patients who indicated they preferred to know as much as they can had significantly shorter lengths of stay (M = 23.3 days, SD = 10.9) relative to those who endorsed other response categories for this data element (M = 27.5 days, SD = 12.4; $F_{(1,394)} = 5.56$, $p < 0.05$). Preference about knowledge was not associated with length of stay within HHA, IRF, or SNF settings. *We did not predict an association of the knowledge data element and length of stay. The finding in LTCHs may represent a "third variable" result. That is, it is possible that length of stay is related to other patient characteristics that would be associated with wanting more knowledge of medical information, such as clinical acuity, which is likely lower for those with shorter lengths of stay.*
- Disposition at discharge, overall, was significantly associated with preference about knowledge $\left(\chi^2_{(7)} = 21.40, p < 0.01\right)$. Patients/residents being discharged to LTCHs (80.0 percent), SNFs (81.4 percent), and hospitals (82.4 percent) tended to endorse a preference to know as much as they can at slightly lower rates than those being discharged to all other settings (range 87.6–90.2 percent). Disposition at discharge was significantly associated with preference about knowledge at the setting level only among IRF patients $\left(\chi^2_{(6)} = 26.43, p < 0.001\right)$, whereas those discharged to home had the highest endorsement rate (94.2 percent) and those discharged to hospice had the lowest endorsement rate (71.4 percent). *We did not predict an association of the knowledge data element and discharge disposition. The pattern of results within settings suggests a pattern of sicker patients/residents (e.g., those discharged to higher levels of care or hospice) being less likely to want maximum information about their medical conditions.*

Clinical Conditions

- There were no overall significant associations of preference about knowledge with sepsis, heart failure, or stroke. However, LTCH residents with stroke had lower rates of preference about knowledge than those without (76 percent versus 89.9 percent; $\chi^2_{(1)} = 4.56, p < 0.05$). Among SNF residents, those with sepsis and heart failure had lower rates of preference about knowledge than those without (sepsis: 71.4 percent versus 86.6 percent, $\chi^2_{(1)} = 8.7, p < 0.01$; heart failure: 80.5 percent versus 87.4 percent, $\chi^2_{(1)} = 6.06, p < 0.05$). *We did not predict an association of the knowledge data element with any of the clinical conditions. The setting-specific findings suggest that some patient groups and/or some disease conditions—perhaps related to severity of condition—may carry with them more or less desire for knowledge of the medical conditions.*

ADLs: Toileting and Ability to Transfer from Lying to Sitting

- Preference about knowledge, overall, was significantly associated with toileting $\left(\chi^2_{(5)} = 14.38, p < 0.05\right)$, in that preference about knowledge tended to decrease with increased dependence. The association of preference about knowledge with toileting was also significant among LTCH patients $\left(\chi^2_{(5)} = 12.58, p < 0.05\right)$ but not among patients/residents in other settings. Preference about knowledge was not associated with ability to transfer from lying to sitting either overall or at any setting. *We did not predict an association of the knowledge data element with either of the ADLs, but the association observed among patients/residents needing greater assistance with toileting is consistent with the theme of sicker patients/residents endorsing desire for knowledge of medical information at lower rates.*

Time to Complete

Table 4.3 shows average time to complete the Care Preference data elements overall and by setting. On average, the two interview data elements took 1.5 minutes (SD = 0.7) to complete. Setting-specific times to complete ranged from 1.3 minutes (SD = 0.6) in IRFs to 1.5 minutes (SD = 0.6–0.7) in HHAs, LTCHs, and SNFs. Time to complete was associated with setting type ($F_{(3,1670)} = 13.13$, $p < 0.01$), such that it took significantly less time in IRFs than in HHAs ($t_{(1,670)} = 5.16$, $p < 0.01$), SNFs ($t_{(1,670)} = 5.07$, $p < 0.01$), or LTCHs ($t_{(1,670)} = 4.46$, $p < 0.01$). The chart review data element on average took 1.2 minutes (SD = 0.6) to complete overall. There is no significant difference in setting-specific times to complete for the chart review data element.

Table 4.3. Time to Complete the Care Preferences Data Elements (minutes)

Data Element	HHA (f1, f2: *n* = 404; f3: *n* = 386	IRF (f1, f2: *n* = 518; f3: *n* = 479	LTCH (f1, f2: *n* = 289; f3: *n* = 284	SNF (f1, f2: *n* = 463; f3: *n* = 422	Overall (f1, f2: *n* = 1,674; f3: *n* = 1,571
Interview data elements (f1, f2); mean (SD)	1.5 (0.6)	1.3 (0.6)	1.5 (0.7)	1.5 (0.7)	1.5 (0.7)
Chart Review data element (f3);	1.2 (0.7)	1.2 (0.6)	1.3 (0.7)	1.2 (0.6)	1.2 (0.6)

Time to complete was also evaluated for the two interview data elements (F1 and F2) and the single chart review data element (F3) according to urbanicity (urban versus nonurban), geographic region (Northeast, South, Midwest, West), facility ownership (for-profit versus nonprofit), and facility size (below or above setting-type median) to evaluate the generalizability of these performance results (see Tables A.21–A.24 in the appendix). Both interview data element types were completed significantly more quickly in urban areas (interview: M = 1.5, SD = 0.7; chart: M = 1.2, SD = 0.6) relative to nonurban areas (interview: M = 1.6, SD = 0.7; chart: M = 1.5, SD = 0.7). Finally, the chart review data element was completed significantly more quickly in the South region (M = 1.2, SD = 0.6) compared with the West region (M = 1.3, SD = 0.7) and in smaller facilities (M =1.2, SD = 0.6) compared with larger facilities (M = 1.3, SD = 0.6). Three of these effect sizes were quite small: Cohen's $d = 0.14$ for the interview data elements urbanicity difference, Cohen's $d = 0.15$ for the chart data element regional difference, and Cohen's d = 0.19 for the chart data element facility size difference in time to complete. However, Cohen's $d = 0.46$ for the chart data element urbanicity difference, which reflects a moderate effect.

Interrater Reliability

Table 4.4 shows kappa interrater reliability coefficients for the Care Preferences data elements overall and by setting. As described in more detail in Volume 3, paired assessment data for interrater reliability evaluation was collected on a subset of the National Beta Test admission sample of patients/residents according to setting-level target totals. For example, each participating LTCH was asked to conduct 20 paired assessments to contribute to interrater reliability. Inclusion in interrater reliability data collection depended on paired facility staff and research nurse assessors' ability to schedule assessments. For Care Preferences interview data elements, kappas were computed on 930 patients/residents who were assessed by research nurses and facility/agency staff assessor pairs: 193 in HHAs, 249 in IRFs, 226 in LTCHs, and 262 in SNFs. Kappa for *importance of a close person involved in care* was excellent overall (0.96) and in all four settings (0.93 in HHAs, 0.97 in IRFs, 0.95 in LTCHs, and 0.98 in SNFs). Similarly, kappa for *how much a patient/resident prefers to know about his or her condition* was excellent overall (0.96) and in all four settings (0.98 in HHAs and IRFs, 0.94 in LTCHs, and 0.97 in SNFs).

For the Care Preference chart review data element, kappas were computed on 881 patients/residents who were assessed by research nurses and facility/agency staff assessor pairs: 187 in HHAs, 234 in IRFs, 204 in LTCHs, 256 in SNFs. Kappa for whether a patient/resident had a designated health care agent was moderate overall (0.56) and in HHAs (0.51), LTCHs (0.59), and SNFs (0.51), and good in IRFs (0.63).

Table 4.4. Interrater Reliability Kappa or Weighted Kappa for Care Preferences Data Elements

Data Element	HHA (f1, f2: *n* = 193; f3: *n* = 187	IRF (f1, f2: *n* = 249; f3: *n* = 234	LTCH (f1, f2: *n* = 226; f3: *n* = 204	SNF (f1, f2: *n* = 262; f3: *n* = 256	Overall (f1, f2: *n* = 930; f3: *n* = 881
How important to have close person involved in care? (f1)	0.93	0.97	0.95	0.98	0.96
How much prefer to know about your condition? (f2)	0.98	0.98	0.94	0.97	0.96
Does patient have health care agent? (f3)	0.51	0.63	0.59	0.51	0.56

NOTE: Interpretation of kappa or weighted kappa is as follows: 0.00–0.20 is slight/poor, 0.21–0.40 is fair, 0.41–0.60 is moderate, 0.61–0.80 is substantial/good, 0.81–1.00 is excellent/almost perfect.

Interrater reliability (kappa) was also evaluated according to urbanicity (urban versus nonurban), geographic region (Northeast, South, Midwest, West), facility ownership (for-profit versus nonprofit), and facility size (below or above setting-type median) to evaluate the generalizability of these performance results (see Tables A.25–A.28 in the appendix). The South region had a substantially lower kappa value for the health care agent data element (0.39) relative to the other regions (range: 0.64–0.68). No other noteworthy differences were found for interrater reliability of the Care Preferences data elements in these sensitivity analyses.

Table 4.5 shows percent agreement for the Care Preferences data elements overall and by setting. For Care Preference interview data elements, overall percent agreement was near perfect for both data elements (98 percent and 99 percent). At the setting level, percent agreement was similar for both data elements, ranging from 98 percent to 100 percent across settings. For the Care Preference chart review data element, overall percent agreement was 83 percent and ranged from 78 percent in SNFs to 87 percent in LTCHs.

Table 4.5. Interrater Reliability—Percent Agreement for Care Preferences Data Elements

Data Element	HHA (*n* = 193)	IRF (*n* = 249)	LTCH (*n* = 226)	SNF (*n* = 262)	Overall (*n* = 930)
How important to have close person involved in care? (f1)	98	98	98	98	98
How much prefer to know about your condition? (f2)	99	100	99	99	99
Does patient have health care agent? (f3)	82	85	87	78	83

Admission to Discharge

Table 4.6 summarizes patterns of changes on the Care Preferences data elements from admission to discharge. Patterns are characterized as "no change" (scores stay the same at admission and discharge), "increase" (scores increase from admission to discharge), and

"decrease" (scores decrease from admission to discharge). As described in more detail in Volume 3, discharge data were collected on a subset of the National Beta Test admission sample of patients/residents. Availability of discharge data depended on advance notification of discharge and the ability to schedule assessments among the facility staff assessors in each participating site. For the Care Preferences data elements, both admission and discharge data were collected on 777 patients/residents: 145 in HHAs, 328 in IRFs, 83 in LTCHs, and 221 in SNFs. Overall responses to Care Preference data elements were very similar from admission to discharge, with no statistically significant differences. Between 78 percent and 89 percent of scores overall did not change from admission to discharge.

Table 4.6. Admission to Discharge Results for Care Preferences Data Elements (percent)

Data Element	HHA (f1, f2: *n* = 145; f3: *n* = 137	IRF (f1, f2: *n* = 328; f3: *n* = 333	LTCH (f1, f2: *n* = 83; f3: *n* = 82	SNF (f1, f2: *n* = 221; f3: *n* = 222	Overall (f1, f2: *n* = 777; f3: *n* = 774
Very important to have close person involved in care (f1)[a]					
No change	81	79	77	76	78
Increase	11	13	16	12	12
Decrease	8	9	7	12	9
Prefers to know as much as can about condition (f2)[a]					
No change	88	89	94	86	88
Increase	7	5	5	8	6
Decrease	6	6	1	5	5
Patient has designated Health Care Agent (f3)					
No change	92	92	82	86	89
Noted at discharge but not at admission	4	5	11	10	7
Noted at admission but not at discharge	5	2	7	5	4

[a] Data element was dichotomized from original response options.

Assessor Feedback

The Care Preferences data elements were deemed important by both facility staff and research nurses, who reported them as being moderately clinically useful on the assessor survey. In focus groups, facility staff clarified that sharing this information during patient transfers would be desirable to inform care transitions. Furthermore, most facility staff (but not all) liked the questions from the patient interview (i.e., how much involvement the client wanted, how much information they wanted to know, and whether they wanted that information shared with a family member).

As reported on the assessor survey, facility staff and research nurses considered Care Preferences to be among the data elements with the lowest burden, but research nurses reported that this was not true of the question about whether the patient/resident had a health care agent. In focus groups, research nurses and some facility staff explained that a weakness of the question about having a health care agent and a consideration for cross-setting standardization was that formal documentation of a health care agent is rarely obtained. Therefore, the data element would be marked as negative when the patient/resident did in fact have a health care agent (even recorded in the electronic medical record as such) because there was no copy of the legal documentation on file. This issue was a consideration for home health care in particular, where facility staff said that having this documentation was especially rare.

> "Does the patient have a designated health care agent, and have you gotten a copy in the medical record?" When you do home health care, very rarely can you get them to give you a copy.
>
> —Durham, N.C., HHA staff

Of note, this issue may be different at the state level and in some PAC settings, as some Boston facility staff reported that they are required to have legal documentation of a health care agent prior to SNF admission. Assessors in the focus groups suggested amending the data element into two questions to determine (1) whether a health care agent was designated and (2) whether legal documentation was present in the chart.

In summary, these data elements were well liked by the facility staff and research nurses who participated in the survey and focus groups, who cited the data elements' high clinical relevance and low burden, but the assessors in the focus groups thought the question about having a health care agent should be interpreted with the caveat that having a copy of the legal documents is rare.

Summary

Results for the Care Preferences data elements indicate strong overall support for cross-setting standardization in the PAC assessment instruments. Assessors considered the Care Preferences data elements to be clinically useful and have low assessment burden. For interrater reliability, kappas were moderate to excellent and percent agreement was high, with minimal variation across the settings. Responses demonstrated some degree of stability from admission to discharge, with most patients/residents having no change in their care preferences or having a designated health care agent. In addition, the associations between preference about knowledge and patient/resident characteristics aligned well with our expected results, indicating validity of the data elements.

5. Medication Reconciliation

Data Element Description

Approximately 60 percent of hospital-related medication errors have been found to occur during transitions, admission, transfer, or discharge from a hospital.[37] Medication reconciliation (MR), the process of obtaining a patient's/resident's multiple medication lists and reconciling any discrepancies, can promote patient/resident safety by reducing errors and resulting adverse drug events. The MR data elements assess whether a patient/resident is taking any medications in several classes, whether the original prescriber for each medication noted the indication, whether there were discrepancies and whether the discrepancies were addressed by involving the patient/resident or caregiver, whether discrepancies were communicated to a physician within 24 hours and whether recommended actions were carried out within 24 hours, and whether the reconciled medication list was communicated to the patient/resident, care team, and pharmacy. Multiple data sources are used to assess these data elements, including the patient's/resident's personal medication list, inspection of all medications, communication with the patient/resident or caregiver, medical and clinical records, plan of care, medication administration records, discharge summary, pharmacies, and communication with prescribers and staff. Data elements that assess MR with clear definitions of each step could help providers to better explicate processes. This could in turn facilitate quality monitoring and improvement activities, facilitate audits for assessment and adherence, and support future development of appropriate provider-level quality measures.

Similar data elements, standardized under the Improving Medicare Post-Acute Care Transformation (IMPACT) Act of 2014, are currently collected in all four PAC instruments assessing whether significant medication issues were identified and whether a physician was contacted and recommended actions were completed. In addition, the MDS currently collects resident medications received by classification. The MR data elements as assessed in the National Beta Test are shown in Figure 5.1.

[37] Rozich and Resar, 2001.

Figure 5.1. Medication Reconciliation Data Elements

I1a. Is the patient/resident currently taking any medications in any of the following medication classes?

CHECK "NO"OR "YES" FOR EACH OF THE MEDICATION CLASSES LISTED BELOW

	NO (0)	YES (1)
I1a1: Anticoagulants		
I1a2: Antiplatelets (excluding 81 mg aspirin)		
I1a3: Hypoglycemics (including insulin)		
I1a4: Opioids		
I1a5: Antipsychotics		
I1a6: Antimicrobials (excluding topicals)		

I1b. Was there an indication noted for all medications in these medication classes on the most recent medication list?

CHECK ONE BOX FOR EACH OF THE MEDICATION CLASSES THE PATIENT/RESIDENT IS TAKING

	NO (0)	YES (1)
I1b1: Anticoagulants		
I1b2: Antiplatelets (excluding 81 mg aspirin)		
I1b3: Hypoglycemics (including insulin)		
I1b4: Opioids		
I1b5: Antipsychotics		
I1b6: Antimicrobials (excluding topicals)		

I1c. Were there discrepancies involving medications in these medication classes?

CHECK ONE BOX FOR EACH OF THE MEDICATION CLASSES THE PATIENT/RESIDENT IS TAKING

	NO (0)	YES (1)
I1c1: Anticoagulants		
I1c2: Antiplatelets (excluding 81 mg aspirin)		
I1c3: Hypoglycemics (including insulin)		

I1c4: Opioids		
I1c5: Antipsychotics		
I1c6: Antimicrobials (excluding topicals)		

I1d. Were the patient's/resident's discrepancies regarding these medication classes addressed by involving the patient/resident or patient's/resident's family/formal caregiver?

CHECK ONE BOX FOR EACH OF THE MEDICATION CLASSES THE PATIENT/RESIDENT IS TAKING

	NO (0)	YES (1)
I1d1: Anticoagulants		
I1d2: Antiplatelets (excluding 81 mg aspirin)		
I1d3: Hypoglycemics (including insulin)		
I1d4: Opioids		
I1d5: Antipsychotics		
I1d6: Antimicrobials (excluding topicals)		

I1e. Were discrepancies regarding these medication classes communicated to the physician (or physician-designee) within 24 hours of admission/discharge/SOC/ROC?

CHECK ONE BOX FOR EACH OF THE MEDICATION CLASSES THE PATIENT/RESIDENT IS TAKING

	Yes—Discrepancy communicated within 24 hours (2)	No—Discrepancy communicated more than 24 hours later or timing not clear (1)	No—Discrepancy not communicated (0)
I1e1: Anticoagulants			
I1e2: Antiplatelets (excluding 81 mg aspirin)			
I1e3: Hypoglycemics (including insulin)			
I1e4: Opioids			
I1e5: Antipsychotics			
I1e6: Antimicrobials (excluding topicals)			

I1f. Were recommended physician (or physician-designee) actions regarding discrepancies for these medication classes carried out within 24 hours after the physician responded?

CHECK ONE BOX FOR EACH OF THE MEDICATION CLASSES THE PATIENT/RESIDENT IS TAKING

	Yes—Actions carried out within 24 hours (2)	No—Actions carried out more than 24 hours later or timing not clear (1)	No—Actions not carried out (0)	Physician or physician-designee has not responded (8)
I1f1: Anticoagulants				
I1f2: Antiplatelets (excluding 81 mg aspirin)				
I1f3: Hypoglycemics (including insulin)				
I1f4: Opioids				
I1f5: Antipsychotics				
I1f6: Antimicrobials (excluding topicals)				

I1g. Was the reconciled medication list (for all medications) communicated to any of the following?

CHECK ALL THAT APPLY

☐ 1 = Patient/resident or patient's/resident's family/formal caregiver

☐ 2 = Prescribers and the care team responsible for the patient's/resident's care following admission/discharge/SOC/ROC

☐ 3 = Patient's/resident's pharmacy that will be filling most of the medications following admission/discharge/SOC/ROC

☐ 4 = None of the above (list not communicated)

NOTE: SOC = start of care; ROC = resumption of care.

Testing Objectives

Basic descriptive statistics (e.g., frequencies, means, SDs) are presented for the MR data elements to characterize rates of medication classes being taken by patients/residents and identify indications and discrepancies for each class taken. These rates are presented for each setting and

for the overall sample. To examine known groups validity, we also examined the average number of high-risk medication classes being taken by patients/residents in the admission sample by patient/resident characteristics and clinical groups of interest, for the combined sample and for each setting separately. For admission data, feasibility (frequencies, rate of missingness, and time to complete), and interrater reliability (kappa and percent agreement) were examined. Lastly, frequencies at discharge were tabulated to characterize rates on the MR data elements at discharge. Because of the low number of discrepancies identified, sample sizes were very small for the data elements documenting actions taken when discrepancies were identified (i1d1–i1d6, i1e1–i1e6, i1f1–i1f6). Thus, admission and discharge frequency results for these data elements are included in the appendix rather than in this chapter.

Results

Feasibility

Frequencies/Missing

Tables 5.1 and 5.2 show the percentage of responses at admission for the MR data elements, both overall and by setting. The MR data elements were administered to 2,951 of the 3,121 patients/residents, or 95 percent of the admission sample: 627 in HHAs, 769 in IRFs, 459 in LTCHs, and 1,096 in SNFs. Among these, overall missing data at the data element level ranged from 0.2 percent to 4.2 percent. Ranges of missing data were similar to this overall range in each of the four settings. Overall, the rate of medication classes taken by patients/residents ranged from a low of 12 percent of patients/residents overall taking antipsychotics to a high of 51 percent of patients/residents taking opioids. At the setting level, the more-common medications taken in HHAs were opioids (which were taken by 39 percent of HHA patients) followed by anticoagulants and hypoglycemics (each was taken by 29 percent of HHA patients). Opioids were also the most prevalent medication among SNF residents (52 percent of SNF residents were taking opioids) followed by anticoagulants (42 percent of SNF residents were taking anticoagulants). Although opioids were also highly prevalent in IRFs (52 percent of IRF patients were taking opioids) and LTCHs (64 percent of LTCH patients were taking opioids), use of anticoagulants was slightly more prevalent among these patients (61 percent of IRF patients and 66 percent of LTCH patients). Antipsychotics were least commonly taken in all settings except SNFs, where antiplatelets were least common. On average, the total number of medication classes taken was 1.83 (SD = 1.17); however, this significantly varied across settings ($F_{(3, 2947)}$ = 147.15, $p < 0.01$). The average number of medication classes taken in LTCHs was significantly greater than in HHAs ($t_{(1,084)} = 23.12$, $p < 0.01$), IRFs ($t_{(1,226)} = 13.89$, $p < 0.01$), and SNFs ($t_{(1,526)} = 17.15$, $p < 0.01$). Furthermore, the average number of medication classes taken in HHAs was significantly lower than in IRFs ($t_{(1,394)} = 10.19$, $p < 0.01$) and SNFs ($t_{(1,694)} = 7.95$, $p < 0.01$).

Table 5.1. Admission Response Distributions for Medication Reconciliation Data Elements: Medication Classes Taken, Indications, and Discrepancies (percent)

Data Element	HHA (*n* = 627)			IRF (*n* = 769)			LTCH (*n* = 459)			SNF (*n* = 1,096)			Overall (*n* = 2,951)		
Medication Classes Taken (T), Indications (I), and Discrepancies (D)	**T**	**I**	**D**	**T**	**I**	**D**	**T**	**I**	**D**	**T**	**I**	**D**	**T**	**I**	**D**
Medication class (Yes)															
Anticoagulant	29	47	6	61	29	5	66	20	3	42	77	4	48	45	4
Antiplatelet	15	52	5	19	31	1	16	10	3	12	77	3	15	45	3
Hypoglycemic	29	47	6	30	49	6	48	52	3	26	72	3	31	56	4
Opioids	39	87	3	51	91	4	64	90	4	52	96	4	51	92	4
Antipsychotic	9	73	7	9	33	2	14	30	3	16	89	6	12	66	5
Antimicrobial	13	57	10	23	60	6	73	22	5	27	84	4	30	53	6
Mean number of classes taken (SD)	1.29 (0.96)			1.88 (1.06)			2.78 (1.16)			1.71 (1.10)			1.83 (1.17)		

NOTE: Table reflects percentages of patients/residents taking (T) medications in a given drug class, indications (I), and discrepancies (D). For instance, 29 percent of all patients/residents in HHAs took anticoagulants. Of these, indications were noted for 47 percent and discrepancies were noted for 6 percent.

Table 5.2. Admission Response Distributions for Medication Reconciliation Data Elements: Communicating Reconciled Medication List (percent)

Data Element	HHA (*n* = 627)	IRF (*n* = 769)	LTCH (*n* = 459)	SNF (*n* = 1,096)	Overall (*n* = 2,951)
Reconciled medication list communicated to (Yes):					
Patient/caregiver (i1g_1)	86	44	43	58	58
Prescribers (i1g_2)	70	88	90	84	83
Pharmacy (i1g_3)	19	46	59	65	49
None (i1g_4)	9	7	3	7	7

For each medication class noted as being taken by a patient/resident, the assessor next recorded whether there was an indication noted for the given medication. Overall, the percentage of cases in which indications were recorded as present for a given medication being taken by a patient/resident ranged from 45 percent (for anticoagulants and antiplatelets) to 92 percent (for opioids). That is, there was an indication noted for anticoagulants or antiplatelets in just under half of patients/residents who were taking one of these medications. Furthermore, there was an indication noted for opioids among the vast majority of patients/residents who were taking opioids. Across all settings, indications were highest for opioids and lowest for either anticoagulants or antiplatelets. Overall, discrepancies involving medication classes taken ranged from 3 percent (antiplatelets) to 6 percent (antimicrobials). At the setting level, discrepancies

were greatest for antimicrobials in all settings except for SNFs, where discrepancies were greatest for antipsychotics. When discrepancies were noted, three follow-up data elements were completed to determine whether (1) discrepancies were addressed by involving the patient/resident, (2) discrepancies were communicated to a doctor within 24 hours, and (3) the recommended discrepancy action was carried out within 24 hours. Given the extremely low prevalence rates of discrepancies, frequencies for these data elements are presented in Table A.29 in the appendix. Whether the *reconciled medication list was communicated* ranged from 8 percent (communicated to none) to 83 percent (communicated to prescribers). At the setting level, reconciled medication lists were most commonly communicated to prescribers in all settings except HHAs, where lists were most commonly communicated to the patient or caregiver.

Known Groups Validity

Comparing the performance of patients/residents on the MR data elements with other patient/resident characteristics adds information about the validity of data elements. If known or logical associations between patients/resident characteristics and data elements are observed in data from the National Beta test, this contributes to the evidence that the data elements are valid, or assessing the construct that they are intended to capture.

Table 5.3 shows the average number of medication classes taken for the overall admission sample, stratified by patient/resident characteristics and clinical groups as described in Chapter 1: gender (male or female, as documented by National Beta Test assessor), age (as categorized into the following ranges: 18–44, 45–64, 65–74, 75–89, 90 and over), length of stay (in days), disposition at discharge (e.g., to another PAC setting, home, to hospital), sepsis, heart failure, stroke, and two ADLs (toileting [not available for HHA patients] and ability to transfer from lying to sitting). As a reminder, these clinical conditions were chosen based on their common occurrence across settings, their frequent relationship with many of the data elements tested in the National Beta Test, and their availability in all four standardized assessments (OASIS, IRF-PAI, LCDS, MDS). Setting-specific results are presented in Tables A.30–A.33 in the appendix.

Table 5.3. Mean (SD) Number of Medication Classes Taken by Patient/Resident Characteristics and Clinical Groups

Patient/Resident Characteristics and Clinical Groups	Mean Number of Medication Classes Taken (SD)
Gender (*n* = 2,847[a])	
Male (*n* = 1,176)	1.9 (1.2)
Female (*n* = 1,671)	1.8 (1.2)
Age (*n* = 2,837[a])	
18–44 (*n* = 36)	2.1 (1.0)
45–64 (*n* = 302)	2.4 (1.3)
65–74 (*n* = 896)	2.1 (1.2)
75–89 (*n* = 1,299)	1.7 (1.1)
90 and older (*n* = 304)	1.3 (1.0)
Length of stay (*n* = 2,516)	Pearson *r* = -0.02
Disposition at discharge (*n* = 2,805[a])	
Home (*n* = 1,310)	1.6 (1.1)
Hospital (*n* = 192)	1.9 (1.2)
Hospice (*n* = 40)	1.9 (1.5)
HHA (*n* = 616)	2.0 (1.2)
IRF (*n* = 51)	2.5 (1.2)
LTCH (*n* = 11)	1.5 (1.1)
SNF (*n* = 271)	2.3 (1.3)
Other (*n* = 314)	1.7 (1.2)
Clinical conditions (*n* = 2,186)	
Sepsis	
Yes (*n* = 144[a])	2.4 (1.2)
No (*n* = 2,042)	1.8 (1.2)
Heart failure	
Yes (*n* = 369)	1.9 (1.2)
No (*n* = 1,817)	1.9 (1.2)
Stroke	
Yes (*n* = 193)	1.8 (1.1)
No (*n* = 1,993)	1.9 (1.2)

Patient/Resident Characteristics and Clinical Groups	Mean Number of Medication Classes Taken (SD)
Hygiene—Toileting (n = 1,477[a])[b]	
Independent (n = 69)	2.7 (1.4)
Setup or clean-up assistance (n = 77)	2.3 (1.1)
Supervision or touching assistance (n = 311)	1.9 (1.1)
Partial/moderate assistance (n = 355)	1.9 (1.2)
Substantial/maximal assistance (n = 332)	2.1 (1.2)
Dependent (n = 333)	2.2 (1.2)
Mobility—Transfer from lying to sitting (n = 1,829[a])	
Independent (n = 190)	2.2 (1.3)
Setup or clean-up assistance (n = 109)	1.8 (1.2)
Supervision or touching assistance (n = 517)	1.7 (1.2)
Partial/moderate assistance (n = 604)	1.8 (1.2)
Substantial/maximal assistance (n = 278)	2.0 (1.2)
Dependent (n = 131)	2.4 (1.2)

[a] Significant ($p < 0.05$) associations between patient/resident characteristic and number of medication classes taken.
[b] Toileting hygiene data not available for HHA patients.

We did not have hypotheses or expectations for the associations examined in Table 5.3. However, in the overall sample, significant associations for the number of medication classes taken were observed with gender, age, disposition at discharge, sepsis, level of assistance needed with toileting, and ability to transfer from lying to sitting. The number of medication classes taken was also associated at the setting level with heart failure among IRF residents.

Gender and Age

- Overall, there was a significant association between gender and medication classes taken ($t_{(2845)} = 2.30$, $p < 0.05$) such that females reported fewer medication classes on average (M = 1.8, SD = 1.2) compared with males (M = 1.9, SD = 1.2). There were no significant effects for gender at the setting level. *Although this is a statistically significant association, the means are nearly identical.*
- Age, overall, was significantly associated with the number of medication classes taken ($F_{(4,2832)} = 50.68$, $p < 0.001$) such that the two oldest age groups averaged fewer medication classes (ages 75–89: M = 1.7, SD = 1.1; ages 90 and older: M = 1.3, SD = 1.0), relative to the three younger age groups, from ages 18 to 74 (mean range: 2.1–2.4). Among the younger age groups, the 45–64 age group had the highest number of medication classes taken (M = 2.4, SD = 1.3). This association was also significant in each of the settings (HHA: $F_{(4,600)} = 16.15$, $p < 0.001$; IRF: $F_{(4,727)} = 3.38$, $p < 0.01$; LTCH: $F_{(4,435)} = 3.13$, $p < 0.05$; SNF: $F_{(4,1055)} = 12.45$, $p < 0.001$), and a similar trend of decreasing medication classes with increasing age was observed. *This is consistent with other associations between age and various data elements referenced earlier, which suggest that younger PAC patients/residents may be seriously ill or dealing with different types of medical conditions than older PAC patients/residents.*

Length of Stay, Disposition at Discharge

- Length of stay, overall, was not significantly associated with the number of medication classes taken (Pearson correlation $r = -0.02$, $p > 0.05$). Among LTCH patients, however, longer lengths of stay were associated with a higher number of medication classes taken (Pearson correlation $r = 0.22$, $p < 0.05$). *This is not surprising, given the types and level of severity of medical conditions that would cause longer stays in an LTCH.*
- Overall, disposition at discharge was significantly associated with the number of medication classes taken ($F_{(7,2797)} = 16.53$, $p < 0.001$). Relative to patients/residents discharged to all other placements, those discharged to home and LTCHs had the lowest number of medication classes taken (home: M = 1.6, SD = 1.1; LTCH: M = 1.5, SD = 1.1). In contrast, those discharged to IRFs had the highest number (M = 2.5, SD = 1.2). There were no significant effects for disposition at discharge at the setting level. *These associations are likely due to the underlying patient/resident characteristics (e.g., medical conditions) that influence the discharge disposition.*

Clinical Conditions

- Overall, patients/residents with sepsis had a significantly higher number of medication classes taken (M = 2.4, SD = 1.2; $t_{(2184)} = 5.04$, $p < 0.001$) relative to those without (M = 1.8, *SD* = 1.2). This relationship was also observed at the setting level in SNFs (with sepsis: M = 2.0, SD = 1.0; without: M = 1.7, SD = 1.1; $t_{(832)} = 2.09$, $p < 0.05$). *This is not surprising, given that patients/residents being treated for sepsis would be receiving antibiotics and would possibly also be receiving opioids for pain control and insulin to maintain stable blood sugar levels.*
- Other clinical conditions are not significantly associated with the number of medication classes taken overall, but some significant associations were observed at the setting level. Among IRF patients, those with heart failure reported a higher number of medication classes taken (M = 2.1, SD = 1.1; $t_{(569)} = 2.47$, $p < 0.05$) than those without (M = 1.9, SD = 1.1). *This is not surprising, given comorbidities of heart failure that may require medication and the additive burden of heart failure to whatever additional conditions that may be the cause of the IRF stay.*

ADLs: Toileting and Ability to Transfer from Lying to Sitting

- Level of independence in toileting hygiene was significantly associated with the number of medication classes taken ($F_{(5,1471)} = 7.67$, $p < 0.001$). The number of medication classes taken tended to be the lowest among those with supervision or touching assistance (M = 1.9, SD = 1.1) and those with partial or moderate assistance (M = 1.9, SD = 1.2), compared with those who are independent (M = 2.7, SD = 1.4) or dependent (M = 2.2, SD = 1.2). There were no significant effects for toileting at the setting level. *This is difficult to interpret but likely reflects the underlying conditions of different types of PAC patients/residents.*
- Level of independence in transferring from lying to sitting is significantly associated overall with the number of medication classes taken ($F_{(5,1823)} = 9.01$, $p < 0.001$). Similar to toileting, the number of medication classes taken tended to be lower among those needing less assistance (supervision or touching assistance: M = 1.7, SD = 1.2; setup or cleanup assistance: M = 1.8, SD = 1.2), compared with those who are completely

dependent (M = 2.4, SD = 1.2) or completely independent (M = 2.2, SD = 1.3). There were no significant effects for transferring from lying to sitting at the setting level. *Again, it is difficult to interpret this u-shaped distribution, other than to assume that it reflects the types of medical conditions for which patients/residents are receiving PAC services and their association with medications in different drug classes.*

Time to Complete

Table 5.4 shows the average time to complete the MR data elements overall and by setting. On average, it took 3.2 minutes (SD = 1.9) to complete. Setting-specific times to complete ranged from 2.9 minutes (SD = 1.7) in HHAs to 3.5 minutes (SD = 1.9) in LTCHs. There were significant differences in the time to complete the MR data elements ($F_{(3,1540)} = 7.98$, $p < 0.01$), such that it took significantly less time to complete in HHAs than in IRFs ($t_{(1,540)} = 3.89$, $p < 0.01$) and LTCHs ($t_{(1,540)} = 4.41$, $p < 0.01$). There were no other significant differences among settings.

Table 5.4. Time to Complete the Medication Reconciliation Data Elements (minutes)

Time to Complete	HHA (*n* = 406)	IRF (*n* = 446)	LTCH (*n* = 271)	SNF (*n* = 421)	Overall (*n* = 1,544)
Mean (SD)	2.9 (1.7)	3.4 (1.9)	3.5 (1.9)	3.2 (1.8)	3.2 (1.9)

Time to complete was also evaluated according to urbanicity (urban versus nonurban), geographic region (Northeast, South, Midwest, West), facility ownership (for-profit versus nonprofit), and facility size (below or above setting-type median) to evaluate the generalizability of these performance results (see Tables A.34–A.37 in the appendix). No significant differences were found for time to complete the MR data elements in these sensitivity analyses.

Interrater Reliability

Table 5.5 shows kappa interrater reliability coefficients for the MR data elements overall and by setting. As described in more detail in Volume 3, paired assessment data for interrater reliability evaluation were collected on a subset of the National Beta Test admission sample of patients/residents according to setting-level target totals. For example, each participating LTCH was asked to conduct 20 paired assessments to contribute to interrater reliability. Inclusion in interrater reliability data collection depended on paired facility staff and research nurse assessors' ability to schedule assessments. For the MR data elements, kappas were computed on 900 patients/residents who were assessed by research nurses and facility/agency staff assessor pairs: 187 in HHAs, 240 in IRFs, 212 in LTCHs, and 261 in SNFs.

Table 5.5. Interrater Reliability Kappa or Weighted Kappa for Medication Reconciliation Data Elements

Data Element	HHA (*n* = 187)	IRF (*n* = 240)	LTCH (*n* = 212)	SNF (*n* = 261)	Overall (*n* = 900)
Is patient taking: anticoagulants (i1a1)	0.78	0.84	0.87	0.85	0.85
Is patient taking: antiplatelets (i1a2)	—	0.71	0.83	—	0.72
Is patient taking: hypoglycemics (i1a3)	0.83	0.80	0.97	0.90	0.89
Is patient taking: opioids (i1a4)	0.84	0.86	0.90	0.85	0.86
Is patient taking: antipsychotics (i1a5)	—	—	—	—	—
Is patient taking: antimicrobials (i1a6)	—	0.76	0.93	0.82	0.86
Indication noted for all medications in class: anticoagulants (i1b1)	0.54	0.64	0.80	0.87	0.78
Indication noted for all medications in class: antiplatelets (i1b2)	0.69	0.85	—	0.89	0.87
Indication noted for all medications in class: hypoglycemics (i1b3)	0.39	0.62	0.70	0.75	0.65
Indication noted for all medications in class: opioids (i1b4)	—	—	—	—	—
Indication noted for all medications in class: antipsychotics (i1b5)	0.33	1.00	0.88	0.73	0.81
Indication noted for all medications in class: antimicrobials (i1b6)	0.74	0.63	0.72	—	0.81
Discrepancies identified for all medications in class: anticoagulant (i1c1)	0.44	—	—	—	—
Discrepancies identified for all medications in class: antiplatelet (i1c2)	—	—	—	—	—
Discrepancies identified for all medications in class: hypoglycemic (i1c3)	—	—	—	—	—
Discrepancies identified for all medications in class: opioids (i1c4)	—	—	—	—	—
Discrepancies identified for all medications in class: antipsychotics (i1c5)	—	—	—	—	—
Discrepancies identified for all medications in class: antimicrobials (i1c6)	0.29	—	—	—	—
Discrepancies addressed by involving patient (i1d1–6)	1.00	0.85	—	—	0.64
Discrepancies communicated to doctor within 24 hours (i1e1–6)	1.00	1.00	0.64	—	—
Recommended discrepancy actions carried out within 24 hours (i1f1–i1f6)	1.00	0.76	0.69	0.77	0.85
Reconciled medication list communicated to: patient/caregiver (i1g_1)	0.20	0.66	0.54	0.50	0.57
Reconciled medication list communicated to: prescribers (i1g_2)	0.30	0.39	0.62	0.38	0.42
Reconciled medication list communicated to: pharmacy (i1g_3)	0.52	0.41	0.52	0.66	0.57

Data Element	HHA (*n* = 187)	IRF (*n* = 240)	LTCH (*n* = 212)	SNF (*n* = 261)	Overall (*n* = 900)
Reconciled medication list communicated to: none (i1g_4)	0.26	0.58	—	0.53	0.52

NOTES: Interrater reliability not shown for items with proportions out of range for stable kappa estimate (per study power calculations). Interpretation of kappa or weighted kappa is as follows: 0.00–0.20 is slight/poor, 0.21–0.40 is fair, 0.41–0.60 is moderate, 0.61–0.80 is substantial/good, 0.81–1.00 is excellent/almost perfect.

Kappas for medication classes taken were good to excellent, ranging from 0.72 to 0.89 overall and from 0.78 to 0.84 in HHAs, 0.71 to 0.86 in IRFs, 0.83 to 0.97 in LTCHs, and 0.85 to 0.90 in SNFs. Overall kappas for *indication* data elements were good to excellent, ranging from 0.65 to 0.87. At the setting level, kappas were fair to excellent, ranging from 0.33 to 0.74 in HHAs, 0.62 to 1.00 in IRFs, 0.70 to 0.88 in LTCHs, 0.73 to 0.89 in SNFs. For *discrepancies identified* in HHAs, kappa was moderate for anticoagulants (0.44) and fair for antimicrobials (0.29). Kappa for *discrepancies addressed by involving patient* was good overall (0.64) and excellent in HHAs (1.00) and IRFs (0.85). For *discrepancies communicated to doctor within 24 hours*, kappas were perfect in HHAs and IRFs (1.00) and good in LTCHs (0.64). Kappas for *recommended discrepancy action carried out within 24 hours* were excellent overall (0.85) and in HHAs (1.00) and good in IRFs (0.76), LTCHs (0.69), and SNFs (0.77). Overall kappas for *reconciled medication lists being communicated* data elements were moderate, ranging from 0.42 to 0.57. At the setting level, kappas were fair to good, ranging from 0.39 to 0.66 in IRFs, 0.52 to 0.62 in LTCHs, 0.38 to 0.66 in SNFs, and 0.20 to 0.52 in HHAs.

Interrater reliability (kappa) was also evaluated according to urbanicity (urban versus nonurban) and geographic region (Northeast, South, Midwest, West) to evaluate the generalizability of these performance results (see Tables A.38–A.41 in the appendix). The South and West regions had a lower kappa value for the reconciled list communicated to prescriber data element (0.20 and 0.29, respectively) relative to the other regions (range: 0.49–0.56). Kappas were also relatively lower for the reconciled list communicated to pharmacy data element in nonprofit (0.45) and smaller (0.43) facilities compared with for-profit (0.63) and larger (0.69) facilities. No other noteworthy differences were found for interrater reliability of the MR data elements in these sensitivity analyses.

Table 5.6 shows percent agreement for the MR data elements overall and by setting. Percent agreement for *medication classes taken* data elements ranged from 92 percent to 95 percent overall and from 91 percent to 96 percent in HHAs, 91 percent to 95 percent in IRFs, 94 percent to 99 percent in LTCHs, and 91 percent to 96 percent in SNFs. For *indication* data elements, percent agreement ranged from 82 percent to 94 percent overall and from 63 percent to 88 percent in HHAs, 82 percent to 100 percent in IRFs, 85 percent to 100 percent in LTCHs, and 89 percent to 100 percent in SNFs. Percent agreement for *discrepancies addressed by involving patient* was 82 percent overall and ranged from 60 percent in SNFs to 100 percent in HHAs. For *discrepancies communicated to doctor within 24 hours*, percent agreement overall was 88 percent and ranged from 80 percent in SNFs to 100 percent in HHAs and IRFs. Percent

agreement for *recommended discrepancy action carried out within 24 hours* was 82 percent overall and ranged from 73 percent in LTCHs to 100 percent in HHAs. For *reconciled medication lists being communicated* data elements, percent agreement ranged from 79 percent to 92 percent overall and from 69 percent to 85 percent in HHAs, 71 percent to 93 percent in IRFs, 78 percent to 99 percent in LTCHs, and 75 percent to 91 percent in SNFs.

Table 5.6. Interrater Reliability—Percent Agreement for Medication Reconciliation Data Elements

Data Element	HHA (*n* = 187)	IRF (*n* = 240)	LTCH (*n* = 212)	SNF (*n* = 261)	Overall (*n* = 900)
Is patient taking: anticoagulants (i1a1)	91	93	94	93	93
Is patient taking: antiplatelets (i1a2)	92	91	95	91	92
Is patient taking: hypoglycemics (i1a3)	92	92	99	96	95
Is patient taking: opioids (i1a4)	92	93	96	92	93
Is patient taking: antipsychotics (i1a5)	96	95	94	93	94
Is patient taking: antimicrobials (i1a6)	94	91	97	93	94
Indication noted for all medications in class: anticoagulants (i1b1)	77	85	94	95	89
Indication noted for all medications in class: antiplatelets (i1b2)	84	93	100	95	94
Indication noted for all medications in class: hypoglycemics (i1b3)	69	82	85	90	82
Indication noted for all medications in class: opioids (i1b4)	87	96	89	100	94
Indication noted for all medications in class: antipsychotics (i1b5)	63	100	95	89	90
Indication noted for all medications in class: antimicrobials (i1b6)	88	81	91	98	91
Discrepancies identified for all medications in class: anticoagulant (i1c1)	86	93	99	97	95
Discrepancies identified for all medications in class: antiplatelet (i1c2)	89	97	100	100	97
Discrepancies identified for all medications in class: hypoglycemic (i1c3)	93	95	100	99	97
Discrepancies identified for all medications in class: opioids (i1c4)	90	96	98	95	95
Discrepancies identified for all medications in class: antipsychotics (i1c5)	100	100	100	96	99
Discrepancies identified for all medications in class: antimicrobials (i1c6)	81	91	99	96	96
Discrepancies addressed by involving patient (i1d1–6)	100	94	82	60	82
Discrepancies communicated to doctor within 24 hours (i1e1–6)	100	100	82	80	88

Data Element	HHA (*n* = 187)	IRF (*n* = 240)	LTCH (*n* = 212)	SNF (*n* = 261)	Overall (*n* = 900)
Recommended discrepancy actions carried out within 24 hours (i1f1–i1f6)	100	82	73	80	82
Reconciled medication list communicated to: patient/caregiver (i1g_1)	78	83	78	75	79
Reconciled medication list communicated to: prescribers (i1g_2)	69	84	92	80	82
Reconciled medication list communicated to: pharmacy (i1g_3)	81	71	79	84	79
Reconciled medication list communicated to: none (i1g_4)	85	93	99	91	92

Discharge Frequencies

Tables 5.7 and 5.8 show the percentage of responses at discharge for the MR data elements, both overall and by setting. As described in more detail in Volume 3, discharge data were collected on a subset of the National Beta Test admission sample of patients/residents. Availability of discharge data depended on advance notification of discharge and the ability to schedule assessments among the facility staff assessors in each participating site. For the MR data elements, discharge data were collected on 792 patients/residents: 140 in HHAs, 339 in IRFs, 85 in LTCHs, and 228 in SNFs. Overall, medication classes taken ranged from 8 percent (antipsychotics) to 48 percent (anticoagulant). At the setting level, anticoagulants were more common in IRFs and LTCHs, while opioids were slightly more common in HHAs and SNFs. Antipsychotics were less common in IRFs and LTCHs, while antimicrobials in HHAs and antiplatelets in SNFs were less common.

Indications for medication classes taken ranged from 40 percent (antiplatelets) to 92 percent (opioids) overall. Across all settings, indications were highest for opioids and lowest for antiplatelets, except in SNFs, where indications were lowest for hypoglycemics. Overall discrepancies involving medication classes taken ranged from 1 percent (antiplatelets) to 4 percent (antimicrobials). At the setting level, discrepancies were greatest for anticoagulants in HHAs and IRFs and greatest for hypoglycemics in LTCHs and SNFs. When discrepancies were noted, three follow-up data elements were completed to determine whether (1) *discrepancies were addressed by involving the patient*, (2) *discrepancies were communicated to a doctor within 24 hours*, and (3) *the recommended discrepancy action was carried out within 24 hours*. Given the extremely low prevalence rates of discrepancies, frequencies for these data elements are presented in Table A.42 in the appendix. Whether the *reconciled medication list was communicated* ranged from 7 percent (none) to 81 percent (prescribers). At the setting level, reconciled medication lists were most commonly communicated to prescribers in all settings except HHAs, where lists were most commonly communicated to the patient or caregiver.

Table 5.7. Discharge Response Distributions for Medication Reconciliation Data Elements: Medication Classes Taken, Indications, and Discrepancies (percent)

Data Element	HHA (*n* = 140)			IRF (*n* = 339)			LTCH (*n* = 85)			SNF (*n* = 228)			Overall (*n* = 792)		
Medication Classes Taken (T), Indications (I), and Discrepancies (D)	**T**	**I**	**D**	**T**	**I**	**D**	**T**	**I**	**D**	**T**	**I**	**D**	**T**	**I**	**D**
Medication class (Yes):															
Anticoagulant	29	63	3	58	36	3	63	43	2	38	86	1	48	51	2
Antiplatelet	18	36	0	20	31	0	17	14	0	10	86	5	16	40	1
Hypoglycemic	31	48	0	33	58	1	54	67	9	19	77	5	31	61	3
Opioids	31	98	2	45	86	2	53	93	7	44	96	2	43	92	3
Antipsychotic	6	63	0	6	40	0	12	20	0	12	96	4	8	63	2
Antimicrobial	4	80	0	18	61	2	49	34	7	14	87	3	18	60	4

NOTE: Table reflects percentages of patients/residents taking (T) medications in a given drug class, indications (I), and discrepancies (D). For instance, 29 percent of all patients/residents in HHAs took anticoagulants. Of these, indications were noted for 63 percent and discrepancies were noted for 3 percent.

Table 5.8. Discharge Response Distributions for Medication Reconciliation Data Elements: Reconciled Medication List (percent)

Data Element	HHA (*n* = 140)	IRF (*n* = 339)	LTCH (*n* = 85)	SNF (*n* = 228)	Overall (*n* = 792)
Reconciled medication list communicated to (Yes):					
Patient/caregiver (i1g_1)	91	68	64	80	75
Prescribers (i1g_2)	60	88	83	81	81
Pharmacy (i1g_3)	14	57	61	67	53
None (i1g_4)	6	5	7	9	7

Assessor Feedback

Assessors placed a high priority on the assessment of MR because of the implications for patient safety. Facility staff reported that these data elements were moderately clinically useful, and research nurses reported them as moderately to extremely clinically useful in the assessor survey. In focus groups, assessors explained that they believed MR was a safety issue, especially for patient/resident transfers.

However, a drawback of these data elements was that they were challenging to collect. Facility staff and research nurses reported MR as among the data elements with the highest burden in the assessor survey. In the focus groups, research nurses stated that MR documentation was rare, especially on communicating discrepancies and follow-up, and what was considered a discrepancy was confusing and vague. MR was much easier in facilities that had electronic

medical record (EMR) software that already incorporates this process, including communication logs between physicians, pharmacies, and the PAC site(s).

In focus groups, the field staff offered mixed feedback on the burden of this data element. This was largely because of differences in routine and common practice among settings, both in what and how information was shared and changes in patient needs (e.g., dosage frequency or route of administration). It is possible that the discrepancy between facility staff and research nurses may have been due to familiarity with EMRs and other documentation systems in use. However, it is also possible that facility staff feedback was mixed because the MR process and staff's ability to monitor medication adherence varied in critical ways across PAC settings.

> If you're talking to a rehab patient in a structured environment where the nurse manages the medication and has access to all of these medical records, the assessment is probably going to be a little bit different than when you're talking to a patient who was at home and doesn't have that structure and they self-medicate.
>
> —Nashville, Tenn., HHA staff

Therefore, burden of data collection is a key consideration for cross-setting use of the MR data elements. In summary, both the survey and focus groups confirmed that this data element has high clinical utility to the assessors, but burden is a significant limitation to implementation across PAC settings and facilities.

Summary

Results for the MR data elements indicate moderate overall support for cross-setting standardization in the PAC assessment instruments. Assessors considered the MR data elements to be moderately to extremely clinically useful. There was mixed feedback regarding data element burden. Overall assessment burden was reported to be high due to confusion about what constituted a discrepancy, lack of documentation (e.g., communicating discrepancies and follow-up), and differences between settings, such as how information is shared and changes in patient needs. However, it was noted that MR was much easier in facilities that had EMR software that already incorporated this process and was also easier for those familiar with EMRs and other documentation systems in use. For interrater reliability, kappas were moderate to excellent (higher for medication classes taken and indications) and percent agreement was high, with minimal variation across the settings. Overall responses at discharge were similar to those at admission. In addition, the associations between the number of medication classes taken and patient/resident characteristics aligned well with our expected results, indicating validity of the data elements.

6. Conclusion

The National Beta Test evaluated several candidate standardized data elements in the Other clinical category for use in the PAC assessment instruments as intended by the IMPACT Act of 2014. These data elements include PROMIS Global Health, Care Preferences (both patient interview and chart review), and MR.

The general performance of these three groups of data elements is summarized for the combined sample in Table 6.1. As can be seen in Table 6.1, all three data element sets performed fairly well, with some variability in performance. In terms of feasibility, missing data were very low for all three tested data element sets, but there was some variability in time to complete. Of the three sets tested, the Global Health data elements, which include ten questions, took the longest to complete (version A: mean = 3.7 minutes, SD = 1.6; version B: mean = 3.5 minutes, SD = 1.5). In contrast, the Care Preferences interview (mean = 1.5 minutes, SD = 0.7) and chart review (mean = 1.2 minutes, SD = 0.6) data elements were completed more quickly. The MR data elements also took a relatively longer time to complete, with an average of 3.2 minutes (SD = 1.9).

Interrater reliability was acceptable for all data elements, although some performed better than others. Specifically, overall kappas for the PROMIS Global Health data elements were excellent, ranging from 0.95 to 0.99 in both versions. Kappas were excellent for the Care Preferences interview data elements (0.96 for both data elements) and moderate for the chart data element (0.56). Kappas for the MR data elements, where calculated, were moderate to excellent, ranging from 0.42 to 0.89, and were highest for data elements asking about medication classes taken and indication of medication classes taken. The interrater reliability as represented by percent agreement was also somewhat variable, but the majority of these values were above 80 percent, reflecting acceptable agreement. In addition, the associations of these data elements with patient characteristics were generally in line with hypothesized associations, providing evidence of known groups validity. Furthermore, responses to these data elements tended to be similar from admission to discharge, with the exception of PROMIS Global Health. Although there was a moderate degree of stability from admission to discharge, patients/residents at discharge were more likely to show improvement in symptoms than to worsen (compared with admission). The few patients/residents who did show change between admission and discharge highlight the importance of maintaining an awareness of patient/resident status on these data elements during transfer and imply that assessment may be necessary at both admission and discharge to obtain a complete picture of a patient's/resident's status during his or her PAC stay.

Table 6.1. Summary of Other Categories Data Element Performance in National Beta Test (Combined Sample)

Data Element	Mean Time to Complete (SD) (minutes)	Interrater Reliability Kappa	Interrater Reliability Percent Agreement	Assessor Feedback
PROMIS Global Health	3.6 (1.6)	0.95–0.99	95–99 percent	Some clinical utility but may not be relevant for the majority of the PAC population, moderate burden
Care Preferences Interview	1.5 (0.7)	0.96, 0.96	98 percent, 99 percent	Moderate to high clinical utility, low burden
Care Preferences Chart	1.2 (0.6)	0.56	83 percent	Moderate to high clinical utility, moderate burden
Medication Reconciliation	3.2 (1.9)	0.42–0.89	79–97 percent	Moderate to high clinical utility, high burden

As with the quantitative results, assessor feedback is generally supportive of the Other Categories data elements. This was particularly true for clinical utility, in that all data elements were deemed at least moderately clinically useful and, for Care Preferences and MR, especially important for patient transfers. In general, assessment burden was low to moderate; however, MR data elements were viewed as having a relatively high burden by the National Beta Test research nurse and facility staff assessors. The assessors did raise some minor concerns regarding MR specifically. For some, there was confusion about what constituted a *discrepancy*, and there was some concern about lack of documentation, which increased burden. However, it was noted that MR was much easier in facilities that had EMR software that already incorporated this process and was also easier for those familiar with EMRs and other documentation systems in use. Assessors also noted that although some of the PROMIS Global Health data elements were clinically useful, some of the data elements were considered to not be relevant for the majority of PAC patients/residents. Lastly, assessors expressed some concern with the Care Preference health care agent data element, given that formal documentation of a health care agent is rarely obtained.

Appendix. Supplementary Tables

Supplementary Tables for PROMIS Global Health

Table A.1. Comparison of PROMIS Global Health Data Elements and Scale Scores According to Version

Data Element	Market Group A	Market Group B	*t*-Value	*p*-Value	Cohen's *d*
General health (c1a)[a]			−5.58	<0.001	−0.20
Number of assessments	1,517	1,506			
Mean score	2.77	2.55			
SD	1.07	1.05			
Quality of life (c1b)[a]			−9.75	<0.001	−0.36
Number of assessments	1,513	1,500			
Mean score	3.17	2.77			
SD	1.13	1.10			
Physical health (c1c)[a]			−4.18	<0.001	−0.15
Number of assessments	1,510	1,510			
Mean score	2.58	2.42			
SD	1.07	1.03			
Mental health (c1d)[a]			−7.05	<0.001	−0.26
Number of assessments	1,510	1,501			
Mean score	3.43	3.16			
SD	1.08	1.10			
Social satisfaction (c1e)[a]			−7.84	<0.001	−0.29
Number of assessments	1,494	1,485			
Mean score	3.33	3.00			
SD	1.13	1.16			
Ability to carry out social activities (c1f)[a]			−13.29	<0.001	−0.49
Number of assessments	1,479	1,457			
Mean score	3.20	2.63			
SD	1.12	1.19			
Extent able to carry out physical activities (c1g)			−5.88	<0.001	−0.22
Number of assessments	1,498	1,497			
Mean score	2.75	2.49			
SD	1.26	1.15			

Data Element	Market Group A	Market Group B	*t*-Value	*p*-Value	Cohen's *d*
How often bothered by emotional problems (c1h)			2.07	0.04	0.08
Number of assessments	1,500	1,502			
Mean score	3.45	3.54			
SD	1.18	1.15			
Rate fatigue (c1i)			2.52	0.01	0.09
Number of assessments	1,500	1,489			
Mean score	3.05	3.14			
SD	0.96	0.96			
Rate pain (0–10) (c1j)			1.50	0.13	0.06
Number of assessments	1,510	1,495			
Mean score	3.07	3.14			
SD	1.20	1.17			
PROMIS Physical Health total score[b]			−2.44	0.02	−0.09
Number of assessments	1,527	1,520			
Mean score	11.43	11.17			
SD	2.93	2.92			
Interquartile range	4.00	4.00			
PROMIS Mental Health total score[c]			−7.59	<0.001	−0.28
Number of assessments	1,523	1,516			
Mean score	13.36	12.46			
SD	3.29	3.26			
Interquartile range	5.00	5.00			
PROMIS Physical Health T-score			−3.11	<0.01	−0.11
Number of assessments	1,527	1,520			
Mean score	38.42	37.50			
SD	8.20	8.04			
Interquartile range	10.61	10.04			
PROMIS Mental Health T-score			−8.25	<0.001	−0.30
Number of assessments	1,523	1,516			
Mean score	47.07	44.48			
SD	8.75	8.57			
Interquartile range	11.59	10.76			

[a] These data elements use "in general" for Market Group A (c1a–c1f); data elements c1g–c1j reference "the past seven days" in Market Group A. All data elements reference "the past three days" in Market Group B.
[b] Physical Health score based on responses to c1c, c1g, c1i, c1j.
[c] Mental Health score based on responses to c1b, c1d, c1e, c1h.

Table A.2. DIF Evaluation Pseudo R^2 for PROMIS Physical and Mental Health Data Elements According to Version, Setting, Gender, and Age

Data Element	Version	Setting	Gender	Age
Quality of life (c1b)	0.0053	0.0109	0.0005	0.0002
Physical health (c1c)	0.0008	0.0018	0.0023	0.0001
Mental health (c1d)	0.0004	0.0015	0.0004	0.0001
Social satisfaction (c1e)	0.0006	0.0054	0.0011	0.0000
Extent able to carry out physical activities (c1g)	0.0062	0.0033	0.0002	0.0058
How often bothered by emotional problems (c1h)	0.0078	0.0080	0.0016	0.0015
Rate fatigue (c1i)	0.0061	0.0112	0.0025	0.0002
Rate pain (0–10) (c1j)	0.0053	0.0027	0.0061	0.0058

NOTES: Age is dichotomized as less than or equal to 65 versus greater than 65. Only data elements contributing to PROMIS Physical and Mental Health scale scores were evaluated.

Table A.3. PROMIS Physical and Mental Health T-Scores by Patient/Resident Characteristics and Clinical Groups in the HHA Setting

Patient/Resident Characteristics and Clinical Groups	Mean Physical Health T-Score (SD)	Mean Mental Health T-Score (SD)
Gender (*nph* = 626[a]; *nmh* = 626)		
Male (*nph* = 225; *nmh* = 225)	41.1 (8.3)	46.9 (9.6)
Female (*nph* = 401; *nmh* = 401)	39.0 (8.0)	45.9 (8.4)
Age (*nph* = 622[a]; *nmh* = 622[a])		
18–44 (*nph* = 4; *nmh* = 4)	39.4 (3.3)	48.3 (7.4)
45–64 (*nph* = 60; *nmh* = 60)	35.3 (6.7)	41.6 (9.0)
65–74 (*nph* = 175; *nmh* = 175)	38.0 (8.4)	45.5 (9.7)
75–89 (*nph* = 312; *nmh* = 312)	41.1 (7.9)	47.5 (8.3)
90 and older (*nph* = 71; *nmh* = 71)	42.0 (8.2)	46.8 (7.7)
Length of stay (*nph* = 499[a]; *nmh* = 499)	Pearson $r = -0.10$	Pearson $r = -0.07$
Disposition at discharge (*nph* = 618[a]; *nmh* = 618)		
Home (*nph* = 458; *nmh* = 458)	40.4 (8.1)	46.8 (9.0)
Hospital (*nph* = 23; *nmh* = 23)	35.1 (6.3)	43.0 (9.2)
Hospice (*nph* = 12; *nmh* = 12)	37.4 (11.6)	47.2 (7.7)
SNF (*nph* = 6; *nmh* = 6)	28.2 (10.8)	44.6 (9.9)
IRF (*nph* = 4; *nmh* = 4)	41.7 (6.7)	46.0 (10.6)
HHA (*nph* = 15; *nmh* = 15)	39.2 (7.8)	45.9 (8.1)
LTCH (*nph* = 1; *nmh* = 1)	34.2 (N/A)	45.3 (N/A)
Other (*nph* = 99; *nmh* = 99)	38.7 (7.7)	44.9 (8.4)

Patient/Resident Characteristics and Clinical Groups	Mean Physical Health T-Score (SD)	Mean Mental Health T-Score (SD)
Clinical conditions (*nph* = 421; *nmh* = 421)		
Sepsis		
Yes (*nph* = 9[a]; *nmh* = 9)	45.8 (6.9)	50.4 (10.0)
No (*nph* = 412; *nmh* = 412)	39.6 (8.0)	46.3 (8.6)
Heart failure		
Yes (*nph* = 32; *nmh* = 32)	38.3 (8.5)	48.2 (10.4)
No (*nph* = 389; *nmh* = 389)	39.8 (7.9)	46.3 (8.5)
Stroke		
Yes (*nph* = 7; *nmh* = 7)	41.5 (8.1)	41.1 (7.7)
No (*nph* = 414; *nmh* = 414)	39.7 (8.0)	46.5 (8.7)
Mobility—Transfer from lying to sitting (*nph* = 394; *nmh* = 394)		
Independent (*nph* = 30; *nmh* = 30)	39.7 (7.5)	45.5 (9.5)
Setup or clean-up assistance (*nph* = 60; *nmh* = 60)	42.1 (7.8)	47.0 (8.9)
Supervision or touching assistance (*nph* = 119; *nmh* = 119)	39.8 (8.1)	45.9 (8.1)
Partial/moderate assistance (*nph* = 125; *nmh* = 125)	38.7 (7.9)	47.2 (9.1)
Substantial/maximal assistance (*nph* = 54; *nmh* = 54)	38.6 (8.0)	45.7 (7.5)
Dependent (*nph* = 6; *nmh* = 6)	40.5 (13.5)	47.5 (8.1)

NOTE: N/A = not applicable.
[a] Significant ($p < 0.05$) associations with physical health T-score and mental health T-score as indicated by chi-square tests of independence. Because of differences in sample sizes for the data elements, we report sample sizes for each (*nph* = physical health T-score; *nmh* = mental health T-score).

Table A.4. PROMIS Physical and Mental Health T-Scores by Patient/Resident Characteristics and Clinical Groups in the IRF Setting

Patient/Resident Characteristics and Clinical Groups	Mean Physical Health T-Score (SD)	Mean Mental Health T-Score (SD)
Gender (*nph* = 749; *nmh* = 749)		
Male (*nph* = 321; *nmh* = 321)	38.4 (7.9)	46.7 (8.3)
Female (*nph* = 428; *nmh* = 428)	37.5 (7.7)	47.2 (8.8)
Age (*nph* = 746[a]; *nmh* = 746[a])		
18–44 (*nph* = 6; *nmh* = 6)	37.9 (9.2)	43.4 (7.8)
45–64 (*nph* = 58; *nmh* = 58)	35.2 (6.9)	44.1 (8.7)
65–74 (*nph* = 290; *nmh* = 290)	37.3 (8.0)	47.2 (8.0)
75–89 (*nph* = 337; *nmh* = 337)	38.8 (7.5)	47.5 (9.1)
90 and older (*nph* = 55; *nmh* = 55)	38.7 (8.3)	46.0 (8.1)
Length of stay (*nph* = 730; *nmh* = 730[a])	Pearson $r = -0.05$	Pearson $r = -0.10$

Patient/Resident Characteristics and Clinical Groups	Mean Physical Health T-Score (SD)	Mean Mental Health T-Score (SD)
Disposition at discharge (*nph* = 744; *nmh* = 744)		
Home (*nph* = 320; *nmh* = 320)	38.5 (7.6)	47.3 (8.4)
Hospital (*nph* = 36; *nmh* = 36)	34.9 (9.0)	45.5 (8.8)
Hospice (*nph* = 7; *nmh* = 7)	41.0 (9.9)	47.5 (6.0)
SNF (*nph* = 105; *nmh* = 105)	37.8 (8.3)	47.1 (9.3)
IRF (*nph* = 1; *nmh* = 1)	31.2 (N/A)	46.9 (N/A)
HHA (*nph* = 254; *nmh* = 254)	37.7 (7.6)	46.8 (8.8)
LTCH (*nph* = 1; *nmh* = 1)	32.7 (N/A)	46.9 (N/A)
Other (*nph* = 20; *nmh* = 20)	38.0 (6.8)	47.4 (6.8)
Clinical conditions (*nph* = 584; *nmh* = 584)		
Sepsis		
Yes (*nph* = 25; *nmh* = 25)	37.3 (8.0)	48.5 (8.4)
No (*nph* = 559; *nmh* = 559)	38.0 (8.1)	46.9 (8.9)
Heart failure		
Yes (*nph* = 132; *nmh* = 132)	37.4 (8.7)	46.0 (8.0)
No (*nph* = 452; *nmh* = 452)	38.1 (7.9)	47.2 (9.1)
Stroke		
Yes (*nph* = 99[a]; *nmh* = 99[a])	39.8 (9.0)	45.3 (8.2)
No (*nph* = 485; *nmh* = 485)	37.6 (7.8)	47.3 (9.0)
Hygiene—Toileting (*nph* = 568[a]; *nmh* = 568[a])		
Independent (*nph* = 5; *nmh* = 5)	41.3 (7.1)	53.6 (4.4)
Setup or clean-up assistance (*nph* = 21; *nmh* = 21)	37.0 (7.4)	48.7 (8.3)
Supervision or touching assistance (*nph* = 122; *nmh* = 122)	41.1 (7.9)	48.9 (8.3)
Partial/moderate assistance (*nph* = 136; *nmh* = 136)	38.2 (7.5)	47.3 (8.9)
Substantial/maximal assistance (*nph* = 140; *nmh* = 140)	37.0 (7.4)	45.9 (8.8)
Dependent (*nph* = 144; *nmh* = 144)	35.9 (8.3)	45.6 (9.4)
Mobility—Transfer from lying to sitting (*nph* = 581[a]; *nmh* = 581)		
Independent (*nph* = 42; *nmh* = 42)	42.4 (8.3)	50.6 (8.0)
Setup or clean-up assistance (*nph* = 16; *nmh* = 16)	37.2 (7.9)	48.7 (8.7)
Supervision or touching assistance (*nph* = 186; *nmh* = 186)	39.2 (7.7)	47.2 (8.7)
Partial/moderate assistance (*nph* = 218; *nmh* = 218)	37.7 (8.1)	46.4 (8.9)
Substantial/maximal assistance (*nph* = 92; *nmh* = 92)	36.0 (7.2)	46.6 (9.3)
Dependent (*nph* = 27; *nmh* = 27)	31.7 (7.4)	45.0 (8.1)

NOTE: N/A = not applicable.
[a] Significant ($p < 0.05$) associations with physical health T-score and mental health T-score as indicated by chi-square tests of independence. Because of differences in sample sizes for the data elements, we report sample sizes for each (*nph* = physical health T-score; *nmh* = mental health T-score).

Table A.5. PROMIS Physical and Mental Health T-Scores by Patient/Resident Characteristics and Clinical Groups in the LTCH Setting

Patient/Resident Characteristics and Clinical Groups	Mean Physical Health T-Score (SD)	Mean Mental Health T-Score (SD)
Gender (*nph* = 467[a]; *nmh* = 466)		
Male (*nph* = 242; *nmh* = 242)	36.9 (8.5)	44.5 (9.6)
Female (*nph* = 225; *nmh* = 224)	35.3 (8.3)	43.8 (9.2)
Age (*nph* = 468[a]; *nmh* = 467)		
18–44 (*nph* = 23; *nmh* = 23)	34.6 (6.4)	47.3 (11.2)
45–64 (*nph* = 117; *nmh* = 117)	34.5 (7.7)	43.5 (8.9)
65–74 (*nph* = 166; *nmh* = 166)	36.1 (8.3)	44.1 (9.3)
75–89 (*nph* = 148; *nmh* = 147)	37.1 (8.6)	43.9 (9.3)
90 and older (*nph* = 14; *nmh* = 14)	41.5 (12.2)	49.0 (11.4)
Length of stay (*nph* = 413[a]; *nmh* = 412[a])	Pearson $r = -0.12$	Pearson $r = -0.12$
Disposition at discharge (*nph* = 452[a]; *nmh* = 451)		
Home (*nph* = 90; *nmh* = 90)	38.1 (8.0)	46.3 (8.7)
Hospital (*nph* = 31; *nmh* = 31)	34.6 (7.3)	45.9 (7.8)
Hospice (*nph* = 12; *nmh* = 12)	35.7 (7.4)	44.5 (7.8)
SNF (*nph* = 132; *nmh* = 131)	35.5 (9.2)	42.8 (10.0)
IRF (*nph* = 45; *nmh* = 45)	32.7 (6.8)	41.7 (8.9)
HHA (*nph* = 77; *nmh* = 77)	38.5 (8.3)	45.3 (9.3)
LTCH (*nph* = 1; *nmh* = 1)	26.7 (N/A)	42.8 (N/A)
Other (*nph* = 64; *nmh* = 64)	34.3 (7.8)	43.4 (10.1)
Clinical conditions (*nph* = 399; *nmh* = 398)		
Sepsis		
Yes (*nph* = 68; *nmh* = 68)	35.1 (8.2)	42.3 (9.8)
No (*nph* = 331; *nmh* = 330)	36.0 (8.4)	44.5 (9.2)
Heart failure		
Yes (*nph* = 13; *nmh* = 13)	36.3 (10.6)	45.7 (6.7)
No (*nph* = 386; *nmh* = 385)	35.8 (8.3)	44.1 (9.4)
Stroke		
Yes (*nph* = 29; *nmh* = 28)	34.9 (8.7)	40.8 (9.9)
No (*nph* = 370; *nmh* = 370)	35.9 (8.3)	44.4 (9.2)

Patient/Resident Characteristics and Clinical Groups	Mean Physical Health T-Score (SD)	Mean Mental Health T-Score (SD)
Hygiene—Toileting (*nph* = 386[a]; *nmh* = 385[a])		
Independent (*nph* = 46; *nmh* = 46)	37.5 (8.8)	44.8 (9.1)
Setup or clean-up assistance (*nph* = 33; *nmh* = 33)	39.3 (7.5)	49.1 (8.4)
Supervision or touching assistance (*nph* = 57; *nmh* = 57)	39.6 (7.8)	45.7 (8.2)
Partial/moderate assistance (*nph* = 51; *nmh* = 51)	35.2 (7.5)	44.2 (8.4)
Substantial/maximal assistance (*nph* = 64; *nmh* = 64)	34.5 (8.7)	43.6 (10.4)
Dependent (*nph* = 135; *nmh* = 134)	33.8 (7.9)	42.3 (9.7)
Mobility—Transfer from lying to sitting (*nph* = 344[a]; *nmh* = 343[a])		
Independent (*nph* = 63; *nmh* = 63)	38.5 (8.6)	45.4 (9.6)
Setup or clean-up assistance (*nph* = 24; *nmh* = 24)	36.3 (7.6)	43.5 (9.2)
Supervision or touching assistance (*nph* = 58; *nmh* = 58)	38.6 (7.8)	47.3 (9.9)
Partial/moderate assistance (*nph* = 71; *nmh* = 71)	35.5 (8.2)	44.1 (7.5)
Substantial/maximal assistance (*nph* = 49; *nmh* = 49)	32.1 (7.4)	41.8 (9.9)
Dependent (*nph* = 79; *nmh* = 78)	34.3 (8.0)	42.8 (9.2)

NOTE: N/A = not applicable.
[a] Significant ($p < 0.05$) associations with physical health T-score and mental health T-score as indicated by chi-square tests of independence. Because of differences in sample sizes for the data elements, we report sample sizes for each (*nph* = physical health T-score; *nmh* = mental health T-score).

Table A.6. PROMIS Physical and Mental Health T-Scores by Patient/Resident Characteristics and Clinical Groups in the SNF Setting

Patient/Resident Characteristics and Clinical Groups	Mean Physical Health T-Score (SD)	Mean Mental Health T-Score (SD)
Gender (*nph* = 1,099; *nmh* = 1,092)		
Male (*nph* = 426; *nmh* = 423)	38.0 (8.3)	45.1 (8.2)
Female (*nph* = 673; *nmh* = 669)	37.7 (7.9)	45.4 (8.6)
Age (*nph* = 1,094[a]; *nmh* = 1,087)		
18–44 (*nph* = 9; *nmh* = 9)	33.4 (8.7)	43.5 (8.2)
45–64 (*nph* = 73; *nmh* = 73)	35.3 (8.3)	44.3 (8.7)
65–74 (*nph* = 287; *nmh* = 285)	37.1 (8.12	44.8 (8.6)
75–89 (*nph* = 550; *nmh* = 545)	38.1 (7.9)	45.4 (8.5)
90 and older (*nph* = 175; *nmh* = 175)	39.4 (8.0)	46.0 (7.7)
Length of stay (*nph* = 951; *nmh* = 945[a])	Pearson $r = -0.05$	Pearson $r = -0.06$

Patient/Resident Characteristics and Clinical Groups	Mean Physical Health T-Score (SD)	Mean Mental Health T-Score (SD)
Disposition at discharge (*nph* = 1,076[a]; *nmh* = 1,069[a])		
Home (*nph* = 481; *nmh* = 477)	38.2 (8.0)	45.9 (8.0)
Hospital (*nph* = 110; *nmh* = 109)	35.8 (8.4)	44.3 (9.0)
Hospice (*nph* = 9; *nmh* = 9)	32.8 (5.0)	42.4 (6.8)
SNF (*nph* = 43; *nmh* = 43)	37.5 (9.6)	41.2 (9.0)
IRF (*nph* = 1; *nmh* = 1)	48.2 (N/A)	64.6 (N/A)
HHA (*nph* = 279; *nmh* = 278)	37.8 (7.4)	46.2 (8.5)
LTCH (*nph* = 10; *nmh* = 10)	41.3 (8.3)	45.4 (5.3)
Other (*nph* = 143; *nmh* = 142)	37.8 (8.5)	44.2 (8.6)
Clinical conditions (*nph* = 863; *nmh* = 858)		
Sepsis		
Yes (*nph* = 52; *nmh* = 51)	36.1 (10.0)	43.7 (8.1)
No (*nph* = 811; *nmh* = 807)	37.7 (8.0)	45.3 (8.6)
Heart failure		
Yes (*nph* = 210; *nmh* = 209)	37.2 (8.2)	44.6 (8.5)
No (*nph* = 653; *nmh* = 649)	37.8 (8.1)	45.3 (8.6)
Stroke		
Yes (*nph* = 65; *nmh* = 65[a])	36.1 (7.6)	42.4 (9.5)
No (*nph* = 798; *nmh* = 793)	37.7 (8.2)	45.4 (8.5)
Hygiene—Toileting (*nph* = 580[a]; *nmh* = 575[a])		
Independent (*nph* = 22; *nmh* = 22)	42.3 (10.3)	45.0 (5.2)
Setup or clean-up assistance (*nph* = 23; *nmh* = 23)	40.7 (8.0)	48.0 (6.8)
Supervision or touching assistance (*nph* = 143; *nmh* = 143)	38.6 (7.9)	46.8 (9.0)
Partial/moderate assistance (*nph* = 181; *nmh* = 180)	39.0 (8.3)	46.0 (8.7)
Substantial/maximal assistance (*nph* = 136; *nmh* = 134)	37.2 (8.2)	45.6 (8.0)
Dependent (*nph* = 75; *nmh* = 73)	34.2 (7.2)	42.3 (9.8)
Mobility—Transfer from lying to sitting (*nph* = 572[a]; *nmh* = 567)		
Independent (*nph* = 58; *nmh* = 58)	41.7 (10.2)	46.9 (7.4)
Setup or clean-up assistance (*nph* = 14; *nmh* = 14)	37.2 (7.8)	45.9 (6.8)
Supervision or touching assistance (*nph* = 167; *nmh* = 166)	39.1 (8.0)	46.4 (8.5)
Partial/moderate assistance (*nph* = 207; *nmh* = 205)	37.8 (8.0)	45.3 (9.2)
Substantial/maximal assistance (*nph* = 100; *nmh* = 92)	36.0 (7.7)	45.5 (8.7)
Dependent (*nph* = 26; *nmh* = 25)	34.3 (6.7)	42.5 (8.9)

NOTE: N/A = not applicable.
[a] Significant ($p < 0.05$) associations with physical health T-score and mental health T-score as indicated by chi-square tests of independence. Because of differences in sample sizes for the data elements, we report sample sizes for each (*nph* = physical health T-score; *nmh* = mental health T-score).

Table A.7. Time to Complete PROMIS Global Health Data Elements by Urbanicity (minutes)

Time to Complete	Urban (*n* = 1,649)	Nonurban (*n* = 108)	Overall (*n* = 1,757)
Mean (SD)	3.6 (1.6)	3.8 (1.4)	3.6 (1.6)

Table A.8. Time to Complete PROMIS Global Health Data Elements by Region (minutes)

Time to Complete	Northeast (*n* = 473)	South (*n* = 645)	Midwest (*n* = 367)	West (*n* = 272)	Overall (*n* = 1,757)
Mean (SD)	3.5 (1.6)	3.7 (1.5)	3.6 (1.5)	3.7 (1.8)	3.6 (1.6)

Table A.9. Time to Complete PROMIS Global Health Data Elements by Facility Ownership (minutes)

Time to Complete	For-Profit (*n* = 1,080)	Nonprofit (*n* = 1,660)	Overall (*n* = 1,757)
Mean (SD)	3.6 (1.6)	3.6 (1.5)	3.6 (1.6)

NOTE: Patient/resident numbers in for-profit and nonprofit categories do not sum to overall total because of missing profit status data.

Table A.10. Time to Complete PROMIS Global Health Data Elements by Facility Size (minutes)

Time to Complete	Below Setting-Type Median (*n* = 738)	Above Setting-Type Median (*n* = 1,018)	Overall (*n* = 1,757)
Mean (SD)	3.6 (1.5)	3.6 (1.6)	3.6 (1.6)

NOTE: Patient/resident numbers in above and below setting-type median categories do not sum to overall total because of missing facility-size data.

Table A.11. Interrater Reliability Kappa or Weighted Kappa for PROMIS Global Health Data Elements by Urbanicity

Data Element	Urban (*n* = 894)	Nonurban (*n* = 67)
General health (c1a)	0.96	0.99
Quality of life (c1b)	0.97	1.00
Physical health (c1c)	0.97	1.00
Mental health (c1d)	0.97	0.95
Social satisfaction (c1e)	0.98	0.99
Ability to carry out social activities (c1f)	0.97	1.00
Able to carry out physical activities (c1g)	0.96	1.00
How often bothered by emotional problems (c1h)	0.98	0.99
Rate fatigue (c1i)	0.97	1.00
Rate pain (0–10) (c1j)[a]	0.99	1.00

NOTE: Interpretation of kappa or weighted kappa is as follows: 0.00–0.20 is slight/poor, 0.21–0.40 is fair, 0.41–0.60 is moderate, 0.61–0.80 is substantial/good, 0.81–1.00 is excellent/almost perfect.
[a] Pearson correlation for rating of average pain, which is on a 0–10 scale.

Table A.12. Interrater Reliability Kappa or Weighted Kappa for PROMIS Global Health Data Elements by Region

Data Element	Northeast (*n* = 214)	South (*n* = 361)	Midwest (*n* = 207)	West (*n* = 179)
General health (c1a)	0.96	0.98	0.97	0.92
Quality of life (c1b)	0.99	0.98	0.99	0.95
Physical health (c1c)	0.98	0.98	0.99	0.95
Mental health (c1d)	0.97	0.97	0.94	0.97
Social satisfaction (c1e)	0.96	0.98	0.98	0.97
Ability to carry out social activities (c1f)	0.97	0.97	0.98	0.96
Able to carry out physical activities (c1g)	0.96	0.97	0.97	0.96
How often bothered by emotional problems (c1h)	0.98	0.98	0.98	0.98
Rate fatigue (c1i)	0.95	0.99	0.96	0.96
Rate pain (0–10) (c1j)[a]	0.99	1.00	0.99	0.98

NOTE: Interpretation of kappa or weighted kappa is as follows: 0.00–0.20 is slight/poor, 0.21–0.40 is fair, 0.41–0.60 is moderate, 0.61–0.80 is substantial/good, 0.81–1.00 is excellent/almost perfect.
[a] Pearson correlation for rating of average pain, which is on a 0–10 scale.

Table A.13. Interrater Reliability Kappa or Weighted Kappa for PROMIS Global Health Data Elements by Facility Ownership

Data Element	For-Profit (*n* = 609)	Nonprofit (*n* = 346)
General health (c1a)	0.96	0.97
Quality of life (c1b)	0.98	0.96
Physical health (c1c)	0.98	0.97
Mental health (c1d)	0.97	0.95
Social satisfaction (c1e)	0.97	0.98
Ability to carry out social activities (c1f)	0.97	0.97
Able to carry out physical activities (c1g)	0.97	0.95
How often bothered by emotional problems (c1h)	0.99	0.97
Rate fatigue (c1i)	0.97	0.96
Rate pain (0–10) (c1j)[a]	0.99	0.98

NOTE: Interpretation of kappa or weighted kappa is as follows: 0.00–0.20 is slight/poor, 0.21–0.40 is fair, 0.41–0.60 is moderate, 0.61–0.80 is substantial/good, 0.81–1.00 is excellent/almost perfect.
[a] Pearson correlation for rating of average pain, which is on a 0–10 scale.

Table A.14. Interrater Reliability Kappa or Weighted Kappa for PROMIS Global Health Data Elements by Facility Size

Data Element	Below Setting-Type Median (*n* = 425)	Above Setting-Type Median (*n* = 535)
General health (c1a)	0.96	0.96
Quality of life (c1b)	0.97	0.98
Physical health (c1c)	0.97	0.98
Mental health (c1d)	0.99	0.95
Social satisfaction (c1e)	0.98	0.97
Ability to carry out social activities (c1f)	0.98	0.96
Able to carry out physical activities (c1g)	0.97	0.96
How often bothered by emotional problems (c1h)	0.98	0.98
Rate fatigue (c1i)	0.97	0.96
Rate pain (0–10) (c1j)[a]	0.99	0.99

NOTE: Interpretation of kappa or weighted kappa is as follows: 0.00–0.20 is slight/poor, 0.21–0.40 is fair, 0.41–0.60 is moderate, 0.61–0.80 is substantial/good, 0.81–1.00 is excellent/almost perfect.
[a] Pearson correlation for rating of average pain, which is on a 0–10 scale.

Table A.15. Summed Score to T-Score Conversion Table for PROMIS Physical Health

Raw Summed Score	T-Score	Standard Error of T-Score
4	21.2	4.5
5	25.1	4.1
6	28.4	3.9
7	31.3	3.7
8	33.8	3.7
9	36.3	3.7
10	38.8	3.6
11	41.1	3.6
12	43.5	3.6
13	45.8	3.6
14	48.3	3.7
15	50.8	3.7
16	53.3	3.7
17	56	3.8
18	59	3.9
19	62.5	4.2
20	67.6	5.3

NOTES: This table is only valid for the standard wording. The 0–10 pain item was recoded as follows: 0 = 5, 1–3 = 4, 4–6 = 3, 7–9 = 2, 10 = 1. For details on the PROMIS Global Health questionnaire and manual, use Search and View at www.healthmeasures.net.

Table A.16. Summed Score to T-Score Conversion Table for PROMIS Mental Health

Raw Summed Score	T-Score	Standard Error of T-Score
4	16.2	4.8
5	19.9	4.7
6	23.5	4.5
7	26.7	4.3
8	29.6	4.2
9	32.4	4.2
10	34.9	4.1
11	37.4	4.1
12	39.8	4.1
13	42.3	4.2
14	44.9	4.3
15	47.7	4.4
16	50.8	4.6
17	54.1	4.7
18	57.7	4.9
19	61.9	5.2
20	67.7	5.9

NOTES: This table is only valid for the standard wording. For details on the PROMIS Global Health questionnaire and manual, use Search and View at www.healthmeasures.net.

Supplementary Tables for Care Preferences

Table A.17. Frequencies for Patients Preferring to Know as Much as They Can by Patient/Resident Characteristics and Clinical Groups in the HHA Setting (percent)

Patient/Resident Characteristics and Clinical Groups	Prefer to Know as Much as I Can (Yes)
Gender (*n* = 616)	
Male (n = 220)	89.6
Female (n = 396)	89.7
Age (*n* = 612)	
18–44 (n = 4)	100.0
45–64 (n = 60)	93.3
65–74 (n = 173)	87.9
75–89 (n = 310)	91.3
90 and older (n = 65)	83.1
Length of stay (*n* = 491; mean, SD)	Yes: 30.9 (15.5) No: 32.8 (16.6)

Patient/Resident Characteristics and Clinical Groups	Prefer to Know as Much as I Can (Yes)
Disposition at discharge (*n* = 608)	
Home (n = 453)	89.2
Hospital (n = 23)	91.3
Hospice (n = 10)	80.0
SNF (n = 6)	100.0
IRF (n = 4)	100.0
HHA (n = 15)	80.0
LTCH (n = 1)	100.0
Other (n = 96)	91.7
Clinical conditions (*n* = 415)	
Sepsis	
Yes (*n* = 8)	100.0
No (*n* = 407)	88.9
Heart failure	
Yes (*n* = 31)	93.6
No (*n* = 384)	88.8
Stroke	
Yes (*n* = 6)	100.0
No (*n* = 409)	89.0
Mobility—Transfer from lying to sitting (*n* = 388)	
Independent (*n* = 30)	90.0
Setup or clean-up assistance (*n* = 58)	87.9
Supervision or touching assistance (*n* = 118)	89.8
Partial/moderate assistance (*n* = 125)	90.4
Substantial/maximal assistance (*n* = 52)	82.7
Dependent (*n* = 5)	100.0

Table A.18. Frequencies for Patients Preferring to Know as Much as They Can by Patient/Resident Characteristics and Clinical Groups in the IRF Setting (percent)

Patient/Resident Characteristics and Clinical Groups	Prefer to Know as Much as I Can (Yes)
Gender (*n* = 733)	
Male (*n* = 316)	87.0
Female (*n* = 417)	90.7
Age (*n* = 730)	
18–44 (*n* = 5)	80.0
45–64 (*n* = 58)	96.6
65–74 (*n* = 284)	90.1
75–89 (*n* = 330)	87.6
90 and older (*n* = 53)	86.8
Length of stay (*n* = 715; mean, SD)	Yes: 14.0 (5.0) No: 14.1 (4.9)
Disposition at discharge (*n* = 728[a])	
Home (*n* = 311)	94.2
Hospital (*n* = 36)	86.1
Hospice (*n* = 7)	71.4
SNF (*n* = 102)	81.4
IRF (*n* = 1)	0.0
HHA (*n* = 251)	87.3
LTCH (*n* = 0)	N/A
Other (*n* = 20)	85.0
Clinical conditions (*n* = 572)	
Sepsis	
Yes (*n* = 24)	95.8
No (*n* = 548)	88.5
Heart failure	
Yes (*n* = 129)	90.7
No (*n* = 443)	88.3
Stroke	
Yes (*n* = 98)	86.7
No (*n* = 474)	89.2

Patient/Resident Characteristics and Clinical Groups	Prefer to Know as Much as I Can (Yes)
Hygiene—Toileting (*n* = 556)	
Independent (*n* = 5)	100.0
Setup or clean-up assistance (*n* = 21)	100.0
Supervision or touching assistance (*n* = 119)	93.3
Partial/moderate assistance (*n* = 135)	87.4
Substantial/maximal assistance (*n* = 138)	87.0
Dependent (*n* = 138)	87.0
Mobility—Transfer from lying to sitting (*n* = 569)	
Independent (*n* = 42)	97.6
Setup or clean-up assistance (*n* = 16)	87.5
Supervision or touching assistance (*n* = 185)	90.8
Partial/moderate assistance (*n* = 210)	86.2
Substantial/maximal assistance (*n* = 90)	87.8
Dependent (*n* = 26)	84.6

NOTE: N/A = not applicable.
[a] Significant ($p < 0.05$) associations with Prefer to Know as Much as I Can as indicated by chi-square tests of independence (ANOVA for length of stay).

Table A.19. Frequencies for Patients Preferring to Know as Much as They Can by Patient/Resident Characteristics and Clinical Groups in the LTCH Setting (percent)

Patient/Resident Characteristics and Clinical Groups	Prefer to Know as Much as I Can (Yes)
Gender (*n* = 447)	
Male (*n* = 232)	87.1
Female (*n* = 215)	90.2
Age (*n* = 448)	
18–44 (*n* = 22)	86.4
45–64 (*n* = 114)	88.6
65–74 (*n* = 159)	90.6
75–89 (*n* = 140)	86.4
90 and older (*n* = 13)	92.3
Length of stay (*n* = 396[a]; mean, SD)	Yes: 23.3 (10.9) No: 27.5 (12.4)

Patient/Resident Characteristics and Clinical Groups	Prefer to Know as Much as I Can (Yes)
Disposition at discharge (*n* = 433)	
Home (*n* = 88)	92.1
Hospital (*n* = 31)	83.9
Hospice (*n* = 12)	100.0
SNF (*n* = 120)	81.7
IRF (*n* = 45)	91.1
HHA (*n* = 76)	92.1
LTCH (*n* = 1)	100.0
Other (*n* = 60)	91.7
Clinical conditions (*n* = 380)	
Sepsis	
Yes (*n* = 66)	84.9
No (*n* = 314)	89.8
Heart failure	
Yes (*n* = 13)	100.0
No (*n* = 367)	88.6
Stroke	
Yes (*n* = 25[a])	76.0
No (*n* = 355)	89.9
Hygiene—Toileting (*n* = 369[a])	
Independent (*n* = 45)	97.8
Setup or clean-up assistance (*n* = 33)	90.9
Supervision or touching assistance (*n* = 57)	94.7
Partial/moderate assistance (*n* = 50)	80.0
Substantial/maximal assistance (*n* = 61)	91.8
Dependent (*n* = 123)	84.6
Mobility—Transfer from lying to sitting (*n* = 335)	
Independent (*n* = 62)	96.8
Setup or clean-up assistance (*n* = 23)	95.7
Supervision or touching assistance (*n* = 58)	89.7
Partial/moderate assistance (*n* = 71)	88.7
Substantial/maximal assistance (*n* = 48)	83.3
Dependent (*n* = 73)	86.3

[a] Significant ($p < 0.05$) associations with Prefer to Know as Much as I Can as indicated by chi-square tests of independence (ANOVA for length of stay).

Table A.20. Frequencies for Patients Preferring to Know as Much as They Can by Patient/Resident Characteristics and Clinical Groups in the SNF Setting (percent)

Patient/Resident Characteristics and Clinical Groups	Prefer to Know as Much as I Can (Yes)
Gender (*n* = 1,062)	
Male (*n* = 413)	83.3
Female (*n* = 649)	86.9
Age (*n* = 1,057)	
18–44 (*n* = 7)	100.0
45–64 (*n* = 73)	89.0
65–74 (*n* = 278)	89.2
75–89 (*n* = 533)	84.1
90 and older (*n* = 166)	81.9
Length of stay (*n* = 925; mean, SD)	Yes: 21.4 (12.3) No: 20.8 (12.0)
Disposition at discharge (*n* = 1,041)	
Home (*n* = 470)	87.0
Hospital (*n* = 103)	78.6
Hospice (*n* = 9)	100.0
SNF (*n* = 41)	78.1
IRF (*n* = 1)	100.0
HHA (*n* = 272)	87.1
LTCH (*n* = 8)	75.0
Other (*n* = 137)	84.7
Clinical conditions (*n* = 833)	
Sepsis	
Yes (*n* = 49[a])	71.4
No (*n* = 784)	86.6
Heart failure	
Yes (*n* = 205[a])	80.5
No (*n* = 628)	87.4
Stroke	
Yes (*n* = 64)	84.4
No (*n* = 769)	85.8

Hygiene—Toileting (*n* = 559)	
Independent (*n* = 21)	85.7
Setup or clean-up assistance (*n* = 23)	100.0
Supervision or touching assistance (*n* = 140)	87.9
Partial/moderate assistance (*n* = 173)	88.4
Substantial/maximal assistance (*n* = 129)	79.8
Dependent (*n* = 73)	89.0
Mobility—Transfer from lying to sitting (*n* = 551)	
Independent (*n* = 55)	89.1
Setup or clean-up assistance (*n* = 14)	100.0
Supervision or touching assistance (*n* = 164)	84.2
Partial/moderate assistance (*n* = 196)	87.8
Substantial/maximal assistance (*n* = 97)	83.5
Dependent (*n* = 25)	92.0

[a] Significant ($p < 0.05$) associations with Prefer to Know as Much as I Can as indicated by chi-square tests of independence (ANOVA for length of stay).

Table A.21. Time to Complete the Care Preferences Data Elements by Urbanicity (minutes)

Data Element	Urban (f1, f2: *n* = 1,571; f3: *n* = 1,476)	Nonurban (f1, f2: *n* = 103; f3: *n* = 95)	Overall (f1, f2: *n* = 1,674; f3: *n* = 1,571)
Interview data elements (f1, f2); mean (SD)	1.5 (0.7)	1.6 (0.7)	1.5 (0.7)
Chart review data element (f3); mean (SD)	1.2 (0.6)	1.5 (0.7)	1.2 (0.6)

Table A.22. Time to Complete the Care Preferences Data Elements by Region (minutes)

Data Element	Northeast (f1, f2: *n* = 452; f3: *n* = 438)	South (f1, f2: *n* = 617; f3: *n* = 578)	Midwest (f1, f2: *n* = 335; f3: *n* = 298)	West (f1, f2: *n* = 270; f3: *n* = 257)	Overall (f1, f2: *n* = 1,674; f3: *n* = 1,571)
Interview data elements (f1, f2); mean (SD)	1.4 (0.6)	1.5 (0.7)	1.5 (0.6)	1.5 (0.7)	1.5 (0.7)
Chart review data element (f3); mean (SD)	1.3 (0.6)	1.2 (0.6)	1.3 (0.7)	1.3 (0.7)	1.2 (0.6)

Table A.23. Time to Complete the Care Preferences Data Elements by Facility Ownership (minutes)

Data Element	For-Profit (f1, f2: *n* = 1,022; f3: *n* = 972)	Nonprofit (f1, f2: *n* = 636; f3: *n* = 590)	Overall (f1, f2: *n* = 1,674; f3: *n* = 1,571)
Interview data elements (f1, f2); mean (SD)	1.5 (0.7)	1.5 (0.6)	1.5 (0.7)
Chart review data element (f3); mean (SD)	1.2 (0.7)	1.2 (0.6)	1.2 (0.6)

NOTE: Patient/resident numbers in for-profit and nonprofit categories do not sum to overall total because of missing profit status data.

Table A.24. Time to Complete the Care Preferences Data Elements by Facility Size (minutes)

Data Element	Below Setting-Type Median (f1, f2: *n* = 961; f3: *n* = 904)	Above Setting-Type Median (f1, f2: *n* = 712; f3: *n* = 666)	Overall (f1, f2: *n* = 1,674; f3: *n* = 1,571)
Interview data elements (f1, f2); mean (SD)	1.4 (0.6)	1.5 (0.7)	1.5 (0.7)
Chart review data elements (f3); mean (SD)	1.2 (0.6)	1.3 (0.6)	1.2 (0.6)

NOTE: Patient/resident numbers in above and below setting-type median categories do not sum to overall total because of missing facility-size data.

Table A.25. Interrater Reliability Kappa or Weighted Kappa for the Care Preferences Data Elements by Urbanicity

Data Element	Urban (f1, f2: *n* = 864; f3: *n* = 814)	Nonurban (f1, f2: *n* = 66; f3: *n* = 67)
How important to have close person involved in care? (f1)	0.96	1.00
How much prefer to know about your condition? (f2)	0.96	—
Does patient have health care agent? (f3)	0.57	0.41

NOTES: Interrater reliability not shown for items with proportions out of range for stable kappa estimate (per study power calculations). Interpretation of kappa or weighted kappa is as follows: 0.00–0.20 is slight/poor, 0.21–0.40 is fair, 0.41–0.60 is moderate, 0.61–0.80 is substantial/good, 0.81–1.00 is excellent/almost perfect.

Table A.26. Interrater Reliability Kappa or Weighted Kappa for the Care Preferences Data Elements by Region

Data Element	Northeast (f1, f2: *n* = 201; f3: *n* = 191)	South (f1, f2: *n* = 353; f3: *n* = 339)	Midwest (f1, f2: *n* = 205; f3: *n* = 200)	West (f1, f2: *n* = 171; f3: *n* = 151)
How important to have close person involved in care? (f1)	0.98	0.95	0.99	0.93
How much prefer to know about your condition? (f2)	0.98	0.96	1.00	0.89
Does patient have health care agent? (f3)	0.64	0.39	0.68	0.68

NOTE: Interpretation of kappa or weighted kappa is as follows: 0.00–0.20 is slight/poor, 0.21–0.40 is fair, 0.41–0.60 is moderate, 0.61–0.80 is substantial/good, 0.81–1.00 is excellent/almost perfect.

Table A.27. Interrater Reliability Kappa or Weighted Kappa for the Care Preferences Data Elements by Facility Ownership

Data Element	For-Profit (f1, f2: *n* = 589; f3: *n* = 551)	Nonprofit (f1, f2: *n* = 335; f3: *n* = 324)
How important to have close person involved in care? (f1)	0.95	0.97
How much prefer to know about your condition? (f2)	0.97	—
Does patient have health care agent? (f3)	0.60	0.50

NOTES: Interrater reliability not shown for items with proportions out of range for stable kappa estimate (per study power calculations). Interpretation of kappa or weighted kappa is as follows: 0.00–0.20 is slight/poor, 0.21–0.40 is fair, 0.41–0.60 is moderate, 0.61–0.80 is substantial/good, 0.81–1.00 is excellent/almost perfect.

Table A.28. Interrater Reliability Kappa or Weighted Kappa for the Care Preferences Data Elements by Facility Size

Data Element	Below Setting-Type Median (f1, f2: *n* = 416; f3: *n* = 401)	Above Setting-Type Median (f1, f2: *n* = 513; f3: *n* = 479)
How important to have close person involved in care? (f1)	0.98	0.94
How much prefer to know about your condition? (f2)	0.93	0.99
Does patient have health care agent? (f3)	0.52	0.60

NOTE: Interpretation of kappa or weighted kappa is as follows: 0.00–0.20 is slight/poor, 0.21–0.40 is fair, 0.41–0.60 is moderate, 0.61–0.80 is substantial/good, 0.81–1.00 is excellent/almost perfect.

Supplementary Tables for Medication Reconciliation

Table A.29. Admission Response Distributions for Medication Reconciliation: Discrepancy Follow-Up Data Elements (percent)

Data Element (Among Those with Discrepancies Identified)		HHA	IRF	LTCH	SNF	Overall
Anticoagulant (number of assessments)		10	21	8	16	55
Discrepancies addressed by involving patient (i1d2)	Yes	70	52	50	50	55
Discrepancies communicated to doctor within 24 hours (i1e1)	No—not done	20	19	25	38	25
	No—more than 24 hours	10	19	25	13	16
	Yes	70	62	50	50	58
Recommended discrepancy actions carried out within 24 hours: (i1f1)	No—not done	10	15	14	38	21
	No—more than 24 hours	0	5	14	13	8
	Yes	60	80	71	50	66
	Doc has not responded	30	0	0	0	6
Antiplatelets (number of assessments)		4	2	2	4	12
Discrepancies addressed by involving patient (i1d2)	Yes	75	50	50	0	42
Discrepancies communicated to doctor within 24 hours (i1e2)	No—not done	0	0	50	50	27
	No—more than 24 hours	33	0	0	25	18
	Yes	67	100	50	25	55
Recommended discrepancy actions carried out within 24 hours: (i1f2)	No—not done	0	0	0	25	9
	No—more than 24 hours	33	0	0	0	9
	Yes	67	100	100	50	73
	Doc has not responded	0	0	0	25	9
Hypoglycemic (number of assessments)		11	14	6	8	39
Discrepancies addressed by involving patient: (i1d3)	Yes	64	38	17	25	39
Discrepancies communicated to doctor within 24 hours: (i1e3)	No—not done	18	29	50	38	31
	No—more than 24 hours	9	0	17	13	8
	Yes	73	71	33	50	62
Recommended discrepancy actions carried out within 24 hours: (i1f3)	No—not done	0	29	33	38	23
	No—more than 24 hours	9	0	17	13	8
	Yes	55	71	50	50	59
	Doc has not responded	36	0	0	0	10

Data Element (Among Those with Discrepancies Identified)		HHA	IRF	LTCH	SNF	Overall
Opioids (number of assessments)		8	15	11	20	54
Discrepancies addressed by involving patient: (i1d4)	Yes	88	33	18	45	43
Discrepancies communicated to doctor within 24 hours: (i1e4)	No—not done	25	7	82	45	39
	No—more than 24 hours	0	7	0	5	4
	Yes	75	87	18	50	57
Recommended discrepancy actions carried out within 24 hours: (i1f4)	No—not done	38	13	64	25	31
	No—more than 24 hours	13	0	9	5	6
	Yes	38	87	27	60	57
	Doc has not responded	13	0	0	10	6
Antipsychotics (number of assessments)		4	1	2	11	18
Discrepancies addressed by involving patient: (i1d5)	Yes	75	–	0	45	47
Discrepancies communicated to doctor within 24 hours: (i1e5)	No—not done	25	0	50	27	28
	No—more than 24 hours	75	0	50	0	22
	Yes	0	100	0	73	50
Recommended discrepancy actions carried out within 24 hours: (i1f5)	No—not done	25	0	50	18	22
	No—more than 24 hours	75	0	0	0	17
	Yes	0	100	0	82	56
	Doc has not responded	0	0	50	0	6
Antimicrobials (number of assessments)		8	10	18	12	48
Discrepancies addressed by involving patient: (i1d6)	Yes	75	44	44	42	49
Discrepancies communicated to doctor within 24 hours: (i1e6)	No—not done	38	0	33	42	29
	No—more than 24 hours	0	10	6	17	8
	Yes	63	90	61	42	63
Recommended discrepancy actions carried out within 24 hours: (i1f6)	No—not done	25	0	22	25	19
	No—more than 24 hours	0	0	6	8	4
	Yes	63	100	72	58	73
	Doc has not responded	13	0	0	8	4

Table A.30. Mean (SD) Number of Medication Classes Taken by Patient/Resident Characteristics and Clinical Groups in the HHA Setting

Patient/Resident Characteristics and Clinical Groups	Mean Number of Medication Classes Taken(SD)
Gender (*n* = 608)	
Male (*n* = 217)	1.3 (1.0)
Female (*n* = 391)	1.3 (1.0)
Age (*n* = 605[a])	
18–44 (*n* = 4)	1.8 (0.5)
45–64 (*n* = 60)	1.5 (1.0)
65–74 (*n* = 173)	1.6 (0.9)
75–89 (*n* = 300)	1.2 (1.0)
90 and older (*n* = 68)	0.7 (0.7)
Length of stay (*n* = 485)	Pearson *r* = −0.06
Disposition at discharge (*n* = 600)	
Home (*n* = 445)	1.3 (1.0)
Hospital (*n* = 23)	1.2 (0.7)
Hospice (*n* = 12)	1.1 (1.2)
HHA (*n* = 15)	1.5 (1.1)
IRF (*n* = 4)	0.8 (1.0)
LTCH (*n* = 1)	2.0 (N/A)
SNF (*n* = 5)	1.2 (0.8)
Other (*n* = 95)	1.2 (0.9)
Clinical conditions (*n* = 406)	
Sepsis	
Yes (*n* = 7)	0.9 (0.7)
No (*n* = 399)	1.3 (1.0)
Heart failure	
Yes (*n* = 31)	1.3 (0.9)
No (*n* = 375)	1.3 (1.0)
Stroke	
Yes (*n* = 6)	1.2 (0.4)
No (*n* = 400)	1.3 (1.0)

Patient/Resident Characteristics and Clinical Groups	Mean Number of Medication Classes Taken(SD)
Mobility—Transfer from lying to sitting (*n* = 379[a])	
Independent (*n* = 30)	1.6 (1.1)
Setup or clean-up assistance (*n* = 57)	1.4 (1.0)
Supervision or touching assistance (*n* = 116)	1.1 (0.9)
Partial/moderate assistance (*n* = 123)	1.3 (0.9)
Substantial/maximal assistance (*n* = 47)	1.0 (1.0)
Dependent (*n* = 6)	1.8 (0.8)

NOTE: N/A = not applicable.
[a] Significant ($p < 0.05$) associations between patient/resident characteristic and Number of Medication Classes Taken.

Table A.31. Mean (SD) Number of Medication Classes Taken by Patient/Resident Characteristics and Clinical Groups in the IRF Setting

Patient/Resident Characteristics and Clinical Groups	Mean Number of Medication Classes Taken (SD)
Gender (*n* = 735)	
Male (*n* = 321)	1.9 (1.1)
Female (*n* = 414)	1.9 (1.0)
Age (*n* = 732[a])	
18–44 (*n* = 5)	1.6 (1.1)
45–64 (*n* = 58)	2.1 (1.1)
65–74 (*n* = 288)	2.0 (1.1)
75–89 (*n* = 328)	1.8 (1.0)
90 and older (*n* = 53)	1.5 (0.9)
Length of stay (*n* = 718)	Pearson *r* = 0.03
Disposition at discharge (*n* = 732)	
Home (*n* = 312)	1.8 (1.0)
Hospital (*n* = 35)	2.3 (1.1)
Hospice (*n* = 7)	1.9 (1.4)
HHA (n = 252)	2.0 (1.1)
IRF (*n* = 1)	2.0 (N/A)
LTCH (*n* = 0)	N/A
SNF (n = 105)	2.0 (1.1)
Other (*n* = 20)	1.9 (1.0)
Clinical conditions (*n* = 571)	
Sepsis	
Yes (*n* = 24)	1.9 (1.1)
No (*n* = 547)	1.9 (1.1)

Patient/Resident Characteristics and Clinical Groups	Mean Number of Medication Classes Taken (SD)
Heart failure	
Yes (*n* = 126[a])	2.1 (1.1)
No (*n* = 445)	1.9 (1.1)
Stroke	
Yes (*n* = 98)	1.8 (1.0)
No (*n* = 473)	1.9 (1.1)
Hygiene—Toileting (*n* = 555)	
Independent (*n* = 5)	2.2 (1.3)
Setup or clean-up assistance (*n* = 21)	1.8 (1.0)
Supervision or touching assistance (*n* = 118)	1.8 (1.0)
Partial/moderate assistance (*n* = 134)	1.9 (1.1)
Substantial/maximal assistance (*n* = 138)	2.0 (1.1)
Dependent (*n* = 139)	1.9 (1.0)
Mobility—Transfer from lying to sitting (*n* = 568)	
Independent (*n* = 42)	1.8 (1.1)
Setup or clean-up assistance (*n* = 16)	1.7 (0.9)
Supervision or touching assistance (*n* = 185)	1.9 (1.2)
Partial/moderate assistance (*n* = 209)	1.9 (1.0)
Substantial/maximal assistance (*n* = 90)	2.1 (0.9)
Dependent (*n* = 26)	2.0 (1.1)

NOTE: N/A = not applicable.
[a] Significant ($p < 0.05$) associations between patient/resident characteristic and Number of Medication Classes Taken.

Table A.32. Mean (SD) Number of Medication Classes Taken by Patient/Resident Characteristics and Clinical Groups in the LTCH Setting

Patient/Resident Characteristics and Clinical Groups	Mean Number of Medication Classes Taken (SD)
Gender (*n* = 439)	
Male (*n* = 224)	2.8 (1.2)
Female (*n* = 215)	2.8 (1.1)
Age (*n* = 440[a])	
18–44 (*n* = 18)	2.6 (1.0)
45–64 (*n* = 113)	3.0 (1.2)
65–74 (*n* = 155)	2.9 (1.2)
75–89 (*n* = 140)	2.6 (1.1)
90 and older (*n* = 14)	2.6 (1.5)
Length of stay (*n* = 390[a])	Pearson *r* = 0.22

Patient/Resident Characteristics and Clinical Groups	Mean Number of Medication Classes Taken (SD)
Disposition at discharge (*n* = 426)	
Home (*n* = 87)	2.8 (1.2)
Hospital (*n* = 30)	2.9 (0.8)
Hospice (*n* = 12)	2.5 (1.6)
HHA (*n* = 76)	2.9 (1.1)
IRF (*n* = 45)	2.6 (1.1)
LTCH (*n* = 1)	2.0 (N/A)
SNF (*n* = 118)	2.9 (1.2)
Other (*n* = 57)	2.7 (1.2)
Clinical conditions (*n* = 375)	
Sepsis	
Yes (*n* = 61)	3.0 (1.2)
No (*n* = 314)	2.8 (1.2)
Heart failure	
Yes (*n* = 12)	2.5 (1.2)
No (*n* = 363)	2.8 (1.2)
Stroke	
Yes (*n* = 26)	2.6 (1.2)
No (*n* = 349)	2.8 (1.2)
Hygiene—Toileting (*n* = 362)	
Independent (*n* = 43)	3.3 (1.2)
Setup or clean-up assistance (*n* = 33)	2.8 (1.2)
Supervision or touching assistance (*n* = 55)	2.6 (0.9)
Partial/moderate assistance (*n* = 49)	2.8 (1.1)
Substantial/maximal assistance (*n* = 61)	3.0 (1.2)
Dependent (*n* = 121)	2.8 (1.2)
Mobility—Transfer from lying to sitting (*n* = 330)	
Independent (*n* = 60)	3.2 (1.1)
Setup or clean-up assistance (*n* = 23)	2.8 (1.2)
Supervision or touching assistance (*n* = 58)	2.6 (1.1)
Partial/moderate assistance (*n* = 69)	2.9 (1.2)
Substantial/maximal assistance (*n* = 46)	2.9 (1.3)
Dependent (*n* = 74)	2.7 (1.1)

NOTE: N/A = not applicable.
[a] Significant ($p < 0.05$) associations between patient/resident characteristic and Number of Medication Classes Taken.

Table A.33. Mean (SD) Number of Medication Classes Taken by Patient/Resident Characteristics and Clinical Groups in the SNF Setting

Patient/Resident Characteristics and Clinical Groups	Mean Number of Medication Classes Taken (SD)
Gender (*n* = 1,065)	
Male (*n* = 414)	1.7 (1.1)
Female (*n* = 651)	1.7 (1.1)
Age (*n* = 1,060[a])	
18–44 (*n* = 9)	1.8 (0.7)
45–64 (*n* = 71)	2.3 (1.3)
65–74 (*n* = 280)	1.9 (1.2)
75–89 (*n* = 531)	1.6 (1.0)
90 and older (*n* = 169)	1.4 (1.0)
Length of stay (*n* = 923)	Pearson *r* = 0.03
Disposition at discharge (*n* = 1,047)	
Home (*n* = 466)	1.6 (1.1)
Hospital (*n* = 104)	1.7 (1.1)
Hospice (*n* = 9)	2.1 (1.5)
HHA (n = 273)	1.9 (1.1)
IRF (*n* = 1)	2.0 (N/A)
LTCH (*n* = 9)	1.3 (1.2)
SNF (*n* = 43)	1.4 (0.9)
Other (*n* = 142)	1.7 (1.2)
Clinical conditions (*n* = 834)	
Sepsis	
Yes (*n* = 52[a])	2.0 (1.0)
No (*n* = 782)	1.7 (1.1)
Heart failure	
Yes (*n* = 200)	1.7 (1.2)
No (*n* = 634)	1.7 (1.1)
Stroke	
Yes (*n* = 63)	1.5 (1.2)
No (*n* = 771)	1.7 (1.1)

Patient/Resident Characteristics and Clinical Groups	Mean Number of Medication Classes Taken (SD)
Hygiene—Toileting (*n* = 560)	
Independent (*n* = 21)	1.8 (1.2)
Setup or clean-up assistance (*n* = 23)	
Supervision or touching assistance (*n* = 138)	1.8 (1.1)
Partial/moderate assistance (*n* = 172)	1.7 (1.2)
Substantial/maximal assistance (*n* = 133)	1.7 (1.1)
Dependent (*n* = 73)	1.8 (1.3)
Mobility—Transfer from lying to sitting (*n* = 552)	
Independent (*n* = 58)	1.7 (1.1)
Setup or clean-up assistance (*n* = 13)	1.9 (1.3)
Supervision or touching assistance (*n* = 158)	1.8 (1.2)
Partial/moderate assistance (*n* = 203)	1.7 (1.1)
Substantial/maximal assistance (*n* = 95)	1.8 (1.1)
Dependent (*n* = 25)	2.0 (1.2)

NOTE: N/A = not applicable.
[a] Significant ($p < 0.05$) associations between patient/resident characteristic and Number of Medication Classes Taken.

Table A.34. Time to Complete the Medication Reconciliation Data Elements by Urbanicity (minutes)

Time to Complete	Urban (*n* = 1,460)	Nonurban (*n* = 84)	Overall (*n* = 1,544)
Mean (SD)	3.2 (1.9)	3.5 (1.6)	3.2 (1.9)

Table A.35. Time to Complete the Medication Reconciliation Data Elements by Region (minutes)

Time to Complete	Northeast (*n* = 431)	South (*n* = 564)	Midwest (*n* = 325)	West (*n* = 224)	Overall (*n* = 1,544)
Mean (SD)	3.1 (1.8)	3.3 (1.9)	3.1 (1.8)	3.4 (1.9)	3.2 (1.9)

Table A.36. Time to Complete the Medication Reconciliation Data Elements by Facility Ownership (minutes)

Time to Complete	For-Profit (*n* = 947)	Nonprofit (*n* = 591)	Overall (*n* = 1,544)
Mean (SD)	3.2 (1.9)	3.3 (1.8)	3.2 (1.9)

NOTE: Patient/resident numbers in for-profit and nonprofit categories do not sum to overall total because of missing profit status data.

Table A.37. Time to Complete the Medication Reconciliation Data Elements by Facility Size (minutes)

Time to Complete	Below Setting-Type Median (*n* = 629)	Above Setting-Type Median (*n* = 914)	Overall (*n* = 1,544)
Mean (SD)	3.4 (1.9)	3.1 (1.8)	3.2 (1.9)

NOTE: Patient/resident numbers in above and below setting-type median categories do not sum to overall total because of missing facility-size data.

Table A.38. Interrater Reliability Kappa or Weighted Kappa for Medication Reconciliation Data Elements by Urbanicity

Data Element	Urban (*n* = 833)	Nonurban (*n* = 67)
Is patient taking: anticoagulants (i1a1)	0.85	0.90
Is patient taking: antiplatelets (i1a2)	0.71	—
Is patient taking: hypoglycemics (i1a3)	0.89	0.87
Is patient taking: opioids (i1a4)	0.87	0.85
Is patient taking: antipsychotics (i1a5)	—	—
Is patient taking: antimicrobials (i1a6)	0.86	—
Indication noted for all medications in class: anticoagulants (i1b1)	0.77	0.91
Indication noted for all medications in class: antiplatelets (i1b2)	0.85	1.00
Indication noted for all medications in class: hypoglycemics (i1b3)	0.64	0.76
Indication noted for all medications in class: opioids (i1b4)	—	—
Indication noted for all medications in class: antipsychotics (i1b5)	0.82	0.55
Indication noted for all medications in class: antimicrobials (i1b6)	0.80	1.00
Discrepancies identified for all medications in class: anticoagulant (i1c1)	—	—
Discrepancies identified for all medications in class: antiplatelet (i1c2)	—	—
Discrepancies identified for all medications in class: hypoglycemic (i1c3)	—	—
Discrepancies identified for all medications in class: opioids (i1c4)	—	—
Discrepancies identified for all medications in class: antipsychotics (i1c5)	—	—
Discrepancies identified for all medications in class: antimicrobials (i1c6)	—	—
Reconciled prescription list communicated to: patient/caregiver (i1g_1)	0.58	0.51
Reconciled prescription list communicated to: prescribers (i1g_2)	0.37	0.46
Reconciled prescription list communicated to: pharmacy (i1g_3)	0.56	0.67
Reconciled prescription list communicated to: none (i1g_4)	0.54	0.42

NOTES: Interrater reliability not shown for items with proportions out of range for stable kappa estimate (per study power calculations). Interpretation of kappa or weighted kappa is as follows: 0.00–0.20 is slight/poor, 0.21–0.40 is fair, 0.41–0.60 is moderate, 0.61–0.80 is substantial/good, 0.81–1.00 is excellent/almost perfect.

Table A.39. Interrater Reliability Kappa or Weighted Kappa for Medication Reconciliation Data Elements by Region

Data Element	Northeast (*n* = 197)	South (*n* = 350)	Midwest (*n* = 201)	West (*n* = 152)
Is patient taking: anticoagulants (i1a1)	0.83	0.85	0.82	0.90
Is patient taking: antiplatelets (i1a2)	—	0.73	—	—
Is patient taking: hypoglycemics (i1a3)	0.87	0.90	0.88	0.86
Is patient taking: opioids (i1a4)	0.88	0.84	0.86	0.86
Is patient taking: antipsychotics (i1a5)	—	—	—	0.81
Is patient taking: antimicrobials (i1a6)	0.92	0.88	0.76	0.78
Indication noted for all medications in class: anticoagulants (i1b1)	0.85	0.65	0.77	0.70
Indication noted for all medications in class: antiplatelets (i1b2)	0.89	—	0.90	0.85
Indication noted for all medications in class: hypoglycemics (i1b3)	0.80	0.59	0.62	0.64
Indication noted for all medications in class: opioids (i1b4)	—	—	—	—
Indication noted for all medications in class: antipsychotics (i1b5)	0.67	0.82	0.71	0.86
Indication noted for all medications in class: antimicrobials (i1b6)	0.91	0.69	0.88	0.82
Discrepancies identified for all medications in class: anticoagulant (i1c1)	—	—	—	—
Discrepancies identified for all medications in class: antiplatelet (i1c2)	—	—	—	—
Discrepancies identified for all medications in class: hypoglycemic (i1c3)	—	—	—	—
Discrepancies identified for all medications in class: opioids (i1c4)	—	—	—	—
Discrepancies identified for all medications in class: antipsychotics (i1c5)	—	—	—	—
Discrepancies identified for all medications in class: antimicrobials (i1c6)	—	—	—	—
Reconciled prescription list communicated to: patient/caregiver (i1g_1)	0.63	0.40	0.59	0.82
Reconciled prescription list communicated to: prescribers (i1g_2)	0.49	0.20	0.56	0.29
Reconciled prescription list communicated to: pharmacy (i1g_3)	0.51	0.60	0.62	0.46
Reconciled prescription list communicated to: none (i1g_4)	0.63	0.33	0.59	—

NOTES: Interrater reliability not shown for items with proportions out of range for stable kappa estimate (per study power calculations). Interpretation of kappa or weighted kappa is as follows: 0.00–0.20 is slight/poor, 0.21–0.40 is fair, 0.41–0.60 is moderate, 0.61–0.80 is substantial/good, 0.81–1.00 is excellent/almost perfect.

Table A.40. Interrater Reliability Kappa or Weighted Kappa for the Medication Reconciliation Data Elements by Facility Ownership

Data Element	For-Profit (*n* = 567)	Nonprofit (*n* = 327)
Is patient taking: anticoagulants (i1a1)	0.87	0.83
Is patient taking: antiplatelets (i1a2)	0.74	—
Is patient taking: hypoglycemics (i1a3)	0.91	0.85
Is patient taking: opioids (i1a4)	0.88	0.84
Is patient taking: antipsychotics (i1a5)	—	—
Is patient taking: antimicrobials (i1a6)	0.88	0.82
Indication noted for all medications in class: anticoagulants (i1b1)	0.80	0.72
Indication noted for all medications in class: antiplatelets (i1b2)	0.85	0.88
Indication noted for all medications in class: hypoglycemics (i1b3)	0.65	0.65
Indication noted for all medications in class: opioids (i1b4)	—	—
Indication noted for all medications in class: antipsychotics (i1b5)	0.78	0.55
Indication noted for all medications in class: antimicrobials (i1b6)	0.81	0.82
Discrepancies identified for all medications in class: anticoagulant (i1c1)	—	—
Discrepancies identified for all medications in class: antiplatelet (i1c2)	—	—
Discrepancies identified for all medications in class: hypoglycemic (i1c3)	—	—
Discrepancies identified for all medications in class: opioids (i1c4)	—	—
Discrepancies identified for all medications in class: antipsychotics (i1c5)	—	—
Discrepancies identified for all medications in class: antimicrobials (i1c6)	—	—
Reconciled prescription list communicated to: patient/caregiver (i1g_1)	0.58	0.54
Reconciled prescription list communicated to: prescribers (i1g_2)	0.46	0.35
Reconciled prescription list communicated to: pharmacy (i1g_3)	0.63	0.45
Reconciled prescription list communicated to: none (i1g_4)	—	—

NOTES: Interrater reliability not shown for items with proportions out of range for stable kappa estimate (per study power calculations). Interpretation of kappa or weighted kappa is as follows: 0.00–0.20 is slight/poor, 0.21–0.40 is fair, 0.41–0.60 is moderate, 0.61–0.80 is substantial/good, 0.81–1.00 is excellent/almost perfect.

Table A.41. Interrater Reliability Kappa or Weighted Kappa for the Medication Reconciliation Data Elements by Facility Size

Data Element	Below Setting-Type Median (*n* = 409)	Above Setting-Type Median (*n* = 490)
Is patient taking: anticoagulants (i1a1)	0.86	0.85
Is patient taking: antiplatelets (i1a2)	—	0.70
Is patient taking: hypoglycemics (i1a3)	0.88	0.89
Is patient taking: opioids (i1a4)	0.82	0.90
Is patient taking: antipsychotics (i1a5)	—	—
Is patient taking: antimicrobials (i1a6)	0.83	0.89
Indication noted for all medications in class: anticoagulants (i1b1)	0.71	0.83
Indication noted for all medications in class: antiplatelets (i1b2)	0.82	0.92
Indication noted for all medications in class: hypoglycemics (i1b3)	0.60	0.69
Indication noted for all medications in class: opioids (i1b4)	—	—
Indication noted for all medications in class: antipsychotics (i1b5)	0.67	0.90
Indication noted for all medications in class: antimicrobials (i1b6)	0.78	0.83
Discrepancies identified for all medications in class: anticoagulant (i1c1)	—	—
Discrepancies identified for all medications in class: antiplatelet (i1c2)	—	—
Discrepancies identified for all medications in class: hypoglycemic (i1c3)	—	—
Discrepancies identified for all medications in class: opioids (i1c4)	—	—
Discrepancies identified for all medications in class: antipsychotics (i1c5)	—	—
Discrepancies identified for all medications in class: antimicrobials (i1c6)	—	—
Reconciled prescription list communicated to: patient/caregiver (i1g_1)	0.54	0.60
Reconciled prescription list communicated to: prescribers (i1g_2)	0.47	0.33
Reconciled prescription list communicated to: pharmacy (i1g_3)	0.43	0.69
Reconciled prescription list communicated to: none (i1g_4)	—	—

NOTES: Interrater reliability not shown for items with proportions out of range for stable kappa estimate (per study power calculations). Interpretation of kappa or weighted kappa is as follows: 0.00–0.20 is slight/poor, 0.21–0.40 is fair, 0.41–0.60 is moderate, 0.61–0.80 is substantial/good, 0.81–1.00 is excellent/almost perfect.

Table A.42. Discharge Response Distributions for Medication Reconciliation: Discrepancy Follow-Up Data Elements (percent)

Data Element (Among Those with Discrepancies Identified)		HHA	IRF	LTCH	SNF	Overall
Anticoagulants (number of assessments)		1	5	1	1	8
Discrepancies addressed by involving patient: (i1d1)	Yes	0	60	100	0	50
Discrepancies communicated to doctor within 24 hours: (i1e1)	No—not done	0	20	0	100	25
	No—more than 24 hours	0	20	0	0	13
	Yes	100	60	100	0	63
Recommended discrepancy actions carried out within 24 hours: (i1f1)	No—not done	100	0	0	0	13
	No—more than 24 hours	0	20	0	0	13
	Yes	0	80	100	0	63
	Doc has not responded	0	0	0	100	13
Antiplatelets (number of assessments)		0	0	0	1	1
Discrepancies addressed by involving patient: (i1d2)	Yes	N/A	N/A	N/A	0	0
Discrepancies communicated to doctor within 24 hours: (i1e2)	No—not done	N/A	N/A	N/A	100	100
	No—more than 24 hours	N/A	N/A	N/A	0	0
	Yes	N/A	N/A	N/A	0	0
Recommended discrepancy actions carried out within 24 hours: (i1f2)	No—not done	N/A	N/A	N/A	100	100
	No—more than 24 hours	N/A	N/A	N/A	0	0
	Yes	N/A	N/A	N/A	0	0
	Doc has not responded	N/A	N/A	N/A	0	0
Hypoglycemics (number of assessments)		0	1	4	2	7
Discrepancies addressed by involving patient: (i1d3)	Yes	N/A	0	75	50	57
Discrepancies communicated to doctor within 24 hours: (i1e3)	No—not done	N/A	0	0	50	14
	No—more than 24 hours	N/A	0	25	0	14
	Yes	N/A	100	75	50	71
Recommended discrepancy actions carried out within 24 hours: (i1f3)	No—not done	N/A	0	0	50	14
	No—more than 24 hours	N/A	0	25	0	14
	Yes	N/A	100	75	50	71
	Doc has not responded	N/A	0	0	0	0

Data Element (Among Those with Discrepancies Identified)		HHA	IRF	LTCH	SNF	Overall
Opioids (number of assessments)		1	3	3	2	9
Discrepancies addressed by involving patient: (i1d4)	Yes	0	67	33	50	44
Discrepancies communicated to doctor within 24 hours: (i1e4)	No—not done	0	33	67	50	44
	No—more than 24 hours	0	0	0	0	0
	Yes	100	67	33	50	56
Recommended discrepancy actions carried out within 24 hours: (i1f4)	No—not done	100	0	67	50	44
	No—more than 24 hours	0	0	0	0	0
	Yes	0	100	33	50	56
	Doc has not responded	0	0	0	0	0
Antipsychotics (number of assessments)		0	0	0	1	1
Discrepancies addressed by involving patient: (i1d5)	Yes	N/A	N/A	N/A	0	0
Discrepancies communicated to doctor within 24 hours: (i1e5)	No—not done	N/A	N/A	N/A	100	100
	No—more than 24 hours	N/A	N/A	N/A	0	0
	Yes	N/A	N/A	N/A	0	0
Recommended discrepancy actions carried out within 24 hours: (i1f5)	No—not done	N/A	N/A	N/A	100	100
	No—more than 24 hours	N/A	N/A	N/A	0	0
	Yes	N/A	N/A	N/A	0	0
	Doc has not responded	N/A	N/A	N/A	0	0
Antimicrobials (number of assessments)		0	1	3	1	5
Discrepancies addressed by involving patient: (i1d6)	Yes	N/A	100	67	0	60
Discrepancies communicated to doctor within 24 hours: (i1e6)	No—not done	N/A	0	0	100	20
	No—more than 24 hours	N/A	0	33	0	20
	Yes	N/A	100	67	0	60
Recommended discrepancy actions carried out within 24 hours: (i1f6)	No—not done	N/A	0	0	0	0
	No—more than 24 hours	N/A	0	33	100	40
	Yes	N/A	100	67	0	60
	Doc has not responded	N/A	0	0	0	0

N/A = not applicable.

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