Development and Evaluation of Candidate Standardized Patient Assessment Data Elements: Findings from the National Beta Test (Volume 6: Impairments and Special Services, Treatments, and Interventions)

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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 following 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, 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).

Contents

Preface ... iii
Contents ... iv
Figures ... vi
Tables ... vii
Abbreviations ... xii
1. Introduction ... 1
Feasibility ... 2
Reliability ... 3
Validity ... 3
Stability and Change over Time ... 3
Sensitivity to National Representativeness ... 3
Statistical Tests ... 4
2. Standardized Assessment of Impairments and Special Services, Treatments, and Interventions in Post-Acute Care ... 5
Sensory Impairments: Hearing and Vision ... 5
Continence Impairments: Bladder and Bowel ... 7
Special Services, Treatments, and Interventions ... 9
Summary of Candidate SPADEs in the National Beta Test ... 11
3. Sensory Impairments: Hearing and Vision ... 13
Data Element Description ... 13
Testing Objectives ... 14
Results ... 14
Summary ... 24
4. Impairments: Continence Interview ... 25
Data Element Description ... 25
Testing Objectives ... 27
Results ... 27
Summary ... 35
5. Impairments: Continence Chart Review ... 36
Data Element Description ... 36
Testing Objectives ... 41
Results ... 42
Summary ... 55
6. Nutritional Approaches ... 57
Data Element Description ... 57
Testing Objectives ... 58
Results ... 59

Summary 68
7. Special Treatments 69
Data Element Description 69
Testing Objectives 72
Results 72
Summary 87
8. Conclusion 89
Appendix. Supplementary Tables 91
References 144

Figures

Figure 3.1. Ability to Hear 13
Figure 3.2. Ability to See 14
Figure 4.1. Experience and Perceived Problem or Burden with Bladder Incontinent Events 26
Figure 4.2. Experience and Perceived Problem or Burden with Bowel Incontinent Events 26
Figure 5.1. Bladder Appliance Use 37
Figure 5.2. Bladder Frequency of Incontinent Events 39
Figure 5.3. Bowel Appliance Use 40
Figure 5.4. Bowel Frequency of Incontinent Events 41
Figure 6.1. Nutritional Approaches 58
Figure 7.1. Special Treatments (Cancer, Respiratory, Other) 70

Tables

Table 2.1. Impairments and Special Services, Treatments, and Interventions Data Elements Evaluated in the National Beta Test Communicative Sample 12
Table 3.1. Overall and Setting-Specific Response Frequencies for Sensory Impairment Data Elements at Admission (percent) 15
Table 3.2. Overall Frequencies for Adequate Hearing and Vision by Patient/Resident Characteristics and Clinical Groups (percent) 16
Table 3.3. Time to Complete the Sensory Impairments Data Elements (minutes)..... 20
Table 3.4. Interrater Reliability Kappa or Weighted Kappa for Sensory Impairment Data Elements..... 21
Table 3.5. Interrater Reliability Percent Agreement for Sensory Impairment Data Elements 22
Table 3.6. Admission to Discharge Results for Sensory Impairment Data Elements (percent)... 23
Table 4.1. Overall and Setting-Specific Response Frequencies for Continence Interview Data Elements (percent) 28
Table 4.2. Overall Frequencies for Bladder Incontinence Interview Data Element by Patient/Resident Characteristics and Clinical Groups (percent)..... 29
Table 4.3. Time to Complete the Continence Interview Data Elements (minutes) 32
Table 4.4. Interrater Reliability Kappa or Weighted Kappa for Continence Interview Data Elements..... 32
Table 4.5. Interrater Reliability Percent Agreement for Continence Interview Data Elements ... 33
Table 4.6. Admission to Discharge Results for Continence Interview Data Elements (percent). 34
Table 5.1. Overall and Setting-Specific Response Frequencies in Percent (counts) for Continence Chart Review Data Elements Noted on Any Day..... 43
Table 5.2. Overall Frequencies for Any Bladder Appliance Use by Patient/Resident Characteristics and Clinical Groups (percent) 44
Table 5.3. Time to Complete the Continence Chart Review Data Elements (minutes) 48
Table 5.4. Interrater Reliability Kappa or Weighted Kappa for Continence Chart Review Data Elements..... 49
Table 5.5. Interrater Reliability Percent Agreement for Continence Chart Review Data Elements 50
Table 5.6. Discharge Frequencies of Continence Chart Review Data Elements Noted on Any Day (percent) 51
Table 5.7. Admission to Discharge Results for Continence Chart Review Data Elements (percent, counts)..... 53
Table 6.1. Overall and Setting-Specific Response Frequencies for Nutritional Approaches Noted on Any Day (percent)..... 59

Table 6.2. Overall Frequencies for Mechanically Altered Diet by Patient/Resident Characteristics and Clinical Groups (percent) 60
Table 6.3. Time to Complete the Nutritional Approaches Data Elements (minutes) 64
Table 6.4. Interrater Reliability Kappa or Weighted Kappa for Nutritional Approaches (based on never noted versus noted any day) 64
Table 6.5. Interrater Reliability Percent Agreement for Nutritional Approaches (based on never noted versus noted any day) 65
Table 6.6. Discharge Response Distributions for the Nutritional Approaches Noted on Any Day (percent) 66
Table 6.7. Admission to Discharge Results for Nutritional Approaches (percent) 66
Table 7.1. Overall and Setting-Specific Response Frequencies for Special Treatments Noted on Any Day (percent) 73
Table 7.2. Overall Frequencies for IV Access by Patient/Resident Characteristics and Clinical Groups (percent) 74
Table 7.3. Time to Complete the Special Treatments Data Elements (minutes) 77
Table 7.4. Interrater Reliability Kappa or Weighted Kappa for Special Treatments Data Elements (based on never noted versus noted any day) 79
Table 7.5. Interrater Reliability Percent Agreement for Special Treatments Data Elements (based on never noted versus noted any day) 80
Table 7.6. Discharge Response Distributions for the Special Treatment Data Elements (percent) 82
Table 7.7. Admission to Discharge Results for Special Treatments Data Elements (percent) 83
Table 8.1. Summary of Impairments and Special Services, Treatments and Interventions Data Element Performance in National Beta Test (Combined Sample) 90
Table A.1. Frequencies for Adequate Hearing and Vision by Patient/Resident Characteristics and Clinical Groups in the HHA Setting (percent) 91
Table A.2. Frequencies for Adequate Hearing and Vision by Patient/Resident Characteristics and Clinical Groups in the IRF Setting (percent) 92
Table A.3. Frequencies (in percent) for Adequate Hearing and Vision by Patient/Resident Characteristics and Clinical Groups in the LTCH setting 93
Table A.4. Frequencies for Adequate Hearing and Vision by Patient/Resident Characteristics and Clinical Groups in the SNF Setting (percent) 95
Table A.5. Time to Complete Sensory Impairments Data Elements by Urbanicity (minutes) 96
Table A.6. Time to Complete Sensory Impairments Data Elements by Region (minutes) 96
Table A.7. Time to Complete Sensory Impairments Section by Facility Ownership (minutes) 96
Table A.8. Time to Complete Sensory Impairments Section by Facility Size (minutes) 96
Table A.9. Interrater Reliability Kappa or Weighted Kappa for Sensory Impairments Data Elements by Urbanicity 97

Table A.10. Interrater Reliability Kappa or Weighted Kappa for Sensory Impairments Data Elements by Region 97
Table A.11. Interrater Reliability Kappa or Weighted Kappa for Sensory Impairments items by Facility Ownership..... 97
Table A.12. Interrater Reliability Kappa or Weighted Kappa for Sensory Impairments items by Facility Size 97
Table A.13. Frequencies for Bladder Incontinence Interview Data Element by Patient/Resident Characteristics and Clinical Groups in the HHA Setting (percent) 98
Table A.14. Frequencies or Bladder Incontinence Interview Data Element by Patient/Resident Characteristics and Clinical Groups in the IRF Setting (percent)..... 99
Table A.15. Frequencies for Bladder Incontinence Interview Data Element by Patient/Resident Characteristics and Clinical Groups in the LTCH Setting (percent) 100
Table A.16. Frequencies for Bladder Incontinence Interview Data Element by Patient/Resident Characteristics and Clinical Groups in the SNF Setting (percent) 102
Table A.17. Time to Complete the Continence Interview Data Elements by Urbanicity (minutes) 103
Table A.18. Time to Complete the Continence Interview Data Elements by Region (minutes) 103
Table A.19. Time to Complete the Continence Interview Data Elements by Facility Ownership (minutes) 103
Table A.20. Time to Complete the Continence Interview Data Elements by Facility Size (minutes) 103
Table A.21. Interrater Reliability Kappa or Weighted Kappa for Continence Interview Data Elements by Urbanicity..... 104
Table A.22. Interrater Reliability Kappa or Weighted Kappa for Continence Interview Data Elements by Region 104
Table A.23. Interrater Reliability Kappa or Weighted Kappa for the Continence Interview Data Elements by Facility Ownership..... 104
Table A.24. Interrater Reliability Kappa or Weighted Kappa for the Continence Interview Data Elements by Facility Size..... 105
Table A.25. Overall and Setting-Specific Response Frequencies in % (counts) for Continence Appliance Use Data Elements by Day First Noted..... 105
Table A.26. Frequencies for Any Bladder Appliance Use by Patient/Resident Characteristics and Clinical Groups in the HHA Setting (percent)..... 106
Table A.27. Frequencies for Any Bladder Appliance Use by Patient/Resident Characteristics and Clinical Groups in the IRF Setting (percent) 108
Table A.28. Frequencies for Any Bladder Appliance Use by Patient/Resident Characteristics and Clinical Groups in the LTCH Setting (percent)..... 109
Table A.29. Frequencies for Any Bladder Appliance Use by Patient/Resident Characteristics and Clinical Groups in the SNF Setting (percent)..... 110

Table A.30. Time to Complete the Continence Chart Review Data Elements by Urbanicity (minutes) 112
Table A.31. Time to Complete the Continence Chart Review Data Elements by Region (minutes) 112
Table A.32. Time to Complete the Continence Chart Review Data Elements by Facility Ownership (minutes)..... 112
Table A.33. Time to Complete the Continence Chart Review Data Elements by Facility Size (minutes) 112
Table A.34. Interrater Reliability Kappa or Weighted Kappa for Continence Chart Review Data Elements by Urbanicity..... 112
Table A.35. Interrater Reliability Kappa or Weighted Kappa for Continence Chart Review Data Elements by Region 113
Table A.36. Interrater Reliability Kappa or Weighted Kappa for the Continence Chart Review Data Elements by Facility Ownership 114
Table A.37. Interrater Reliability Kappa or Weighted Kappa for the Continence Chart Review Data Elements by Facility Size..... 114
Table A.38. Discharge Frequencies in % *(*counts) of Continence Appliance Use Data Elements by Day First Noted..... 115
Table A.39. Overall and Setting-Specific Response Frequencies for Nutritional Approaches Data Elements by Day First Noted (percent) 116
Table A.40. Frequencies for Mechanically Altered Diet by Patient/Resident Characteristics and Clinical Groups in the HHA Setting (percent)..... 117
Table A.41. Frequencies for Mechanically Altered Diet by Patient/Resident Characteristics and Clinical Groups in the IRF Setting (percent) 118
Table A.42. Frequencies for Mechanically Altered Diet by Patient/Resident Characteristics and Clinical Groups in the LTCH Setting (percent)..... 119
Table A.43. Frequencies for Mechanically Altered Diet by Patient/Resident Characteristics and Clinical Groups in the SNF Setting (percent)..... 120
Table A.44. Time to Complete Nutritional Approach Data Elements by Urbanicity (minutes) 122
Table A.45. Time to Complete Nutritional Approach Data Elements by Region (minutes)..... 122
Table A.46. Time to Complete the Nutritional Approach Data Elements by Facility Ownership (minutes) 122
Table A.47. Time to Complete the Nutritional Approach Data Elements by Facility Size (minutes) 122
Table A.48. Interrater Reliability Kappa or Weighted Kappa for Nutritional Approach Data Elements by Urbanicity..... 123
Table A.49. Interrater Reliability Kappa or Weighted Kappa for Nutritional Approach Data Elements by Region 123

Table A.50. Interrater Reliability Kappa or Weighted Kappa for the Nutritional Approach Data Elements by Facility Ownership..... 123
Table A.51. Interrater Reliability Kappa or Weighted Kappa for the Nutritional Approach Data Elements by Facility Size..... 124
Table A.52. Discharge Response Distributions for the Nutritional Approaches Day First Noted (percent)..... 124
Table A.53. Overall and Setting-Specific Response Frequencies for Special Treatments by Day First Noted (percent)..... 125
Table A.54. Frequencies for IV Access by Patient/Resident Characteristics and Clinical Groups in the HHA Setting (percent)..... 130
Table A.55. Frequencies for IV Access by Patient/Resident Characteristics and Clinical Groups in the IRF Setting (percent)..... 131
Table A.56. Frequencies for IV Access by Patient/Resident Characteristics and Clinical Groups in the LTCH Setting (percent)..... 132
Table A.57. Frequencies for IV Access by Patient/Resident Characteristics and Clinical Groups in the SNF Setting (percent)..... 134
Table A.58. Time to Complete Treatment Data Elements by Urbanicity (minutes)..... 135
Table A.59. Time to Complete Treatment Data Elements by Region (minutes)..... 135
Table A.60. Time to Complete the Treatment Data Elements by Facility Ownership (minutes)135
Table A.61. Time to Complete the Treatment Data Elements by Facility Size (minutes)..... 136
Table A.62. Interrater Reliability Kappa or Weighted Kappa for Treatment Data Elements by Urbanicity..... 136
Table A.63. Interrater Reliability Kappa or Weighted Kappa for Treatment Data Elements by Region..... 137
Table A.64. Interrater Reliability Kappa or Weighted Kappa for the Treatments Data Elements by Facility Ownership..... 138
Table A.65. Interrater Reliability Kappa or Weighted Kappa for the Treatments Data Elements by Facility Size..... 139
Table A.66. Discharge Response Distributions for the Treatment Data Elements by Day First Noted (percent)..... 140

Abbreviations

ADLs	activities of daily living
BIMS	Brief Interview for Mental Status
BiPAP	bilevel positive airway pressure
CAM	Confusion Assessment Method
CMS	Centers for Medicare & Medicaid Services
CPAP	continuous positive airway pressure
CY	calendar year
FY	fiscal year
HHA	home health agency
IMPACT Act	Improving Medicare Post-Acute Care Transformation Act of 2014
IRF	inpatient rehabilitation facility
IRF-PAI	Inpatient Rehabilitation Facility Patient Assessment Instrument
IV	intravenous
LCDS	Long-Term Care Hospital Care Data Set
LTCH	long-term care hospital
MDS	Minimum Data Set
NIMV	non-invasive mechanical ventilator
OASIS	Outcome and Assessment Information Set
PAC	post-acute care
PAC-PRD	Post-Acute Care Payment Reform Demonstration
PC	public comment
QRP	quality reporting program
SD	standard deviation
SME	subject-matter expert
SNF	skilled nursing facility
SPADE	standardized patient assessment data element
SSTIs	special services, treatments, and interventions
TEP	technical expert panel
TPN	Total Parenteral Nutrition

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 6 of the final report on the National Beta Test, which includes the identification and testing of candidate SPADEs in the clinical categories of (1) *impairments* and (2) *special services, treatments, and interventions* (SSTIs). 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; RAND Corporation, 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 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 the 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 a 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 nurse 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, or item, of each data element for all admission data, first combined across settings (overall), and then by setting.
- Extent of missing data for each data element overall. Missing data were minimal and did not vary by setting so they are only briefly summarized.
- Average time to complete the assessment of each data element, for each data element overall and by setting.

[6] Edelen et al., 2019b.

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, 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.

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]) with 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 characteristics 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 contained in the appendix.

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 within the Day 3, 5, and 7 repeat assessment design. These results are reported for all data elements included in the repeat assessment design 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]),[7] 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.[8] Significant results from chi-square tests are reported in the following format: ($\chi^2_{(df)}$ = X.X, $p < 0.05$), where *df* are 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).
- Associations involving continuous variables were statistically evaluated using either an analysis of variance 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 analysis of variance 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* are 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).
- Effect sizes for many of the significant findings are reported using Cohen's *d*[9] 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,[10] 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.

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

[8] Mantel and Haenszel, 1959.

[9] Cohen, 2013.

[10] Benjamini and Hochberg, 1995.

2. Standardized Assessment of Impairments and Special Services, Treatments, and Interventions in Post-Acute Care

Assessment of common impairments (hearing, vision, bladder, and bowel impairments) is important for promoting person-centered care, care transitions, and understanding the resources required to care for patients/residents. For patients/residents requiring more-complex care, it can also be useful to assess their need for less-common medical treatments and interventions, such as hemodialysis or parenteral nutrition. 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. This chapter provides background on the importance of standardized assessment in the clinical categories of Impairments and SSTIs, the activities undertaken to identify candidate SPADEs for these categories during the project period, and the final data elements tested in the National Beta Test. This chapter also gives an overview of the results presented in subsequent chapters of this volume.

Sensory Impairments: Hearing and Vision

Hearing and vision impairments are common conditions among older adults that, if unaddressed, may affect communication, ADLs and other aspects of physical functioning, rehabilitation outcomes, and overall quality of life.[11] Sensory limitations can lead to confusion in new settings and increased isolation, and they may contribute to mood disorders and are associated with adverse inpatient events and cognitive impairment.[12] Failure to appropriately assess and treat these conditions may increase the likelihood that patients/residents will require more intensive and prolonged treatment.[13] Onset of these conditions can be subtle, so accurate screening tools are essential to determine which patients/residents need specific medical attention and assistive devices and to ensure that person-directed care plans are developed to accommodate a patient's/resident's needs.

Information Gathering

Two PAC assessment instruments include questions about sensory impairments: The OASIS-D for HHAs uses interviews, observations, physical assessment, and referral history to assess for

[11] Dalton et al., 2003; Hawkins et al., 2012; Crews and Campbell, 2004; Brink and Stones, 2007; Cólon-Emeric et al., 2003; Freeman et al., 2007.

[12] Sprinzl and Riechelmann, 2010; Lin et al., 2011; Chou, 2008; Bartlett et al., 2008; Prager et al., 2016.

[13] Cimarolli and Jung, 2016.

vision, whereas the MDS for SNFs contains two questions each on hearing (ability to hear and use of corrective devices) and vision (ability to see and use of corrective lenses). The Post-Acute Care Payment Reform Demonstration (PAC-PRD), described in Volume 2, included two Sensory Impairment data elements, Ability to Hear and Ability to See, which are very similar to the data elements in the OASIS-D.

Of the data elements identified during information gathering from the research literature, four hearing assessment tools (Hearing Handicap Inventory for the Elderly-Screening Version, Pure-Tone Auditory screener, Nursing Home Hearing Handicap Index, and the Hearing Assessment Test) and four vision assessment tools (National Eye Institute Visual Functioning Questionnaire-25, Nursing Home Vision-Targeted Health-Related Quality-of-Life Questionnaire, A Low-Vision Visual Functioning Questionnaire, and the Adaptation to Age-Related Vision Loss Scale) were identified for further consideration. These data elements were considered for further testing along with the PAC assessment questions currently in use and the data elements tested during the PAC-PRD.

Stakeholder Feedback and Field Testing

Various stakeholders, including experts in the field, individuals from clinical communities serving PAC populations, and partners within CMS and the U.S. Department of Health and Human Services, identified several challenges in choosing data elements for hearing and vision impairments. Stakeholders commented on trade-offs between different modes of assessment, such as performance-based assessment (e.g., "Can you hear this tone?" "Can you read these letters?"), observation (e.g., "Can the patient/resident hear me when I speak?"), and patient/resident self-report to achieve a feasible, reliable, and valid screening assessment. Focus group participants expressed a desire for data elements focused on sensory impairments to also distinguish between cognitive and physical impairment, so as to be pertinent to care planning.

At the first convening of the TEP (April 2016), members of the TEP gave high ratings to two data elements (Ability to See in Adequate Light and Ability to Hear Sounds) that were similar to those tested in the PAC-PRD. The TEP made a few recommendations for slight modifications, including the addition of basic questions about the availability of and use of glasses and hearing aids to better document the context of the impairment and to help identify possible pathways for treating or managing it. Some TEP members also suggested that the data elements around hearing and vision be structured as "drill down" elements, in which certain levels of impairment would trigger additional questions. Specifically, they advised asking patients/residents who were determined to have severe hearing or vision impairments when they last had a physician or hearing or vision specialist test their hearing or vision.

Federal subject-matter experts (SMEs) expressed support for the TEP recommendations for standardizing sensory impairment data elements. They also saw potential utility in asking all patients/residents—not just those with severe impairment—the date of their last hearing/vision test.

In light of the strong support from TEP members and SMEs, Ability to Hear and Ability to See in Adequate Light were included in the proposed rules for the LTCH, IRF, and SNF quality reporting programs (QRPs) (FY 2018) and Home Health QRP (CY 2018); commenters expressed support for both and raised some questions regarding response option clarity, relevance across all PAC settings, validity, and interrater reliability for Ability to See in Adequate Light.

The remaining four data elements suggested by the TEP (Regular Use of a Hearing Aid; Most Recent Screening by a Physician, Audiologist, or Other Health Care Professional; Regular Use of Corrective Lenses; and Most Recent Screening by a Physician, Optometrist, or Other Health Care Professional) were pilot tested in the first Alpha feasibility test (Alpha 1) and included for discussion during the second TEP convening. All four data elements tested well in Alpha 1, but TEP members at the second convening raised concerns about being able to obtain the dates of the most recent exams for the Most Recent Screening by a Physician, Audiologist, or Other Health Care Professional data element, which required obtaining dates of patients'/residents' most recent hearing and vision exams. They acknowledged that such data could be useful but may be difficult to get in practice, and they suggested that perhaps screening for impairment should be a higher priority for clinical utility. TEP members agreed that such screening for current impairment should be conducted at the beginning of an assessment so that assessors can be aware of accommodations that may need to be made to complete the assessment. Based on results from Alpha 1 testing, the two data elements regarding device use (Regular Use of a Hearing Aid and Regular Use of Corrective Lenses) were modified slightly and included in the second subregulatory public comment period (as Use of Hearing Aid During Assessment of Ability to Hear and Use of Corrective Lenses During Assessment of Ability to See). Commenters generally expressed support for these data elements but raised concerns over applicability to special populations, such as children, and whether reasons such as the cost of devices could affect whether patients/residents have the assistive devices they need.

Candidate SPADEs in the National Beta Test

After thorough consideration through the activities described above, Ability to Hear and Ability to See were included in the National Beta Test. The data elements are presented, and results are described, in Chapter 3 of this volume.

Continence Impairments: Bladder and Bowel

Impaired bladder and bowel continence are common among older persons in the United States.[14] Bladder or bowel continence has been shown to be associated with adverse outcomes,

[14] Gorina et al., 2014.

including skin breakdown, falls, social isolation, depression, and overall poor quality of life.[15] A number of treatment options are available for patients/residents who experience bladder incontinence, including noninvasive behavioral methods, lifestyle changes, bladder training, pelvic floor therapy, toileting schedules, pharmacologic treatment, and surgical procedures. Accurate assessment of bladder and bowel incontinence would be expected to lead to therapy or treatment to alleviate the problem. When patients/residents are discharged or transferred, information about a patient's/resident's bladder and bowel incontinence can be transmitted to the receiving PAC facility, acute care hospital, HHA, or treating physician, which may result in improved quality of care, higher patient/resident and family satisfaction, and more efficient use of health care resources.

Information Gathering

Four bowel assessment/scoring tools were identified during information gathering through literature review, including the Cleveland Clinic Incontinence Score, Fecal Incontinence Quality of Life Scale, Quality of Life Scoring Tool Relating to Bowel Management, and Wexner Score for Fecal Incontinence, and five bladder assessment/scoring tools were identified for further consideration, including the King's Health Questionnaire, Nursing Home Disabilities Instrument, Overactive Bladder and Quality of Life Questionnaire, Urinary Incontinence Severity Score, and Urogenital Distress Inventory-6. These elements were considered alongside the data elements in the PAC assessments currently in use and the data elements tested during the PAC-PRD (which were identical to those used in the IRF-PAI and the LCDS except for a slight change in look-back period from three days to two). Upon careful deliberation by the project team and advisers, and in consultation with CMS, the data elements used in the MDS and tested in the PAC-PRD were selected to form the basis of the standardized continence assessment. Although it was agreed that these data elements should be reviewed by the TEP and stakeholders (see below) and might require modification, evidence existed for the sound performance of these data elements in PAC, and they sufficiently covered the content of most interest for standardized patient assessment of continence.

Stakeholder Feedback and Field Testing

When the PAC-PRD version of the data elements were presented to the TEP for consideration, TEP members were asked to consider how data elements could be modified to account for severity of incontinence, as well as how incontinence affects individuals based on their priorities and values. TEP members expressed favorable views toward the data elements as candidates for standardization; however, they had concerns regarding the structure and wording of those data elements and did not support the inclusion of the stress incontinence option for

[15] Landefeld et al., 2008; Nygaard et al., 2003; Brown et al., 2000; Alessi, 2003; Ouslander et al., 2010; Elpern et al., 2009.

cross-setting standardization, because assessors may not have enough available information to solicit a diagnosis. The TEP recommended separating data elements for appliance use from continence and distinguishing between bladder and bowel data elements.

Other stakeholders, including federal SMEs and provider and consumer focus groups, acknowledged the importance of collecting information on continence, not only for payment, care planning, and quality measurement, but also to capture the presence and causes of incontinence. Some stakeholders underscored the importance of distinguishing between "situational" and "biological" incontinence, as well as the impact incontinence can have on one's ability to conduct daily activities.

Overall, commenters during a subregulatory public comment period expressed support for a focus on the impact of incontinent events, noting that such events affect fall risk, discharge planning, and resource needs. However, concern was also expressed over the burden imposed on PAC facilities by the data elements because of the number of data elements on each topic and the length of time it could take to complete the interview.

The set of continence data elements pilot tested in Alpha 1 consisted of modified versions of the PAC-PRD data elements, as well as new items that assessed bladder and bowel functioning with respect to two primary content areas: (1) bladder and bowel appliance use and (2) patients'/residents' bladder and bowel continence, including patient/resident and caregiver interview questions regarding perceived burden of incontinent events. The data elements had moderate to excellent reliability, and qualitative feedback from assessors was generally supportive. Assessors noted that the data elements were easy to complete, and recommendations for improvement involved how to resolve conflicting patient and caregiver accounts, availability of incontinence information within the look-back window, and clarifying understanding of the word "continence" for patients/residents.

Candidate SPADEs in the National Beta Test

After thorough consideration through the activities described above, both chart review and interview data elements were included in the National Beta Test. Continence Chart Review data elements included Bladder—Appliance Use, Bladder—Incontinence, Bowel—Appliance Use, and Bowel—Incontinence; and Continence Interview data elements included Bladder—Incontinence Interview; and Bowel—Incontinence Interview. These data elements are described, and results are presented, in Chapters 4 and 5 of this volume.

Special Services, Treatments, and Interventions

Some medical conditions require complex clinical care consisting of SSTIs, such as hemodialysis, use of a ventilator, and nutritional assistance, and the implementation of these interventions can be life-sustaining. Understanding the patient's/resident's clinical needs is important for planning the provision of important therapies, ensuring continued medical

necessity, and supporting care transitions between acute and varying levels of PAC services. The accurate assessment of SSTIs is also important for identifying resource use intensity by capturing the medical complexity.

Information Gathering

For development of the SSTI data elements, including the Nutritional Approaches, rather than beginning with a literature review as was done for the other data elements in this project, RAND and CMS identified as a starting point for data element development the established set of data elements that were tested during the PAC-PRD: Hemodialysis, intravenous (IV) Chemotherapy, Radiation, Central Line, Vasoactive Medications, Oxygen, BiPAP/CPAP (bilevel or continuous positive airway pressure), Invasive Mechanical Ventilator, Suctioning, Tracheostomy Care, Total Parenteral Nutrition (TPN), and Enteral Nutrition. These data elements are in use in most, but not all, of the four existing PAC assessment instruments.

The MDS 3.0 includes data elements that indicate special treatments (Chemotherapy, Radiation, Oxygen Therapy, Suctioning, Tracheostomy Care, Invasive Mechanical Ventilator, Non-Invasive Mechanical Ventilator, IV Medications, Blood Transfusions, and Dialysis), several of which are very similar to those tested during the PAC-PRD. The OASIS collects Oxygen (intermittent or continuous) and Ventilator (continually or at night) data elements, and the LCDS includes Invasive Mechanical Ventilator, Non-Invasive Mechanical Ventilator, and Dialysis.

Data elements that indicate therapeutic nutritional approaches are currently collected in each of the instruments for all four PAC settings but vary by assessment instrument. An OASIS data element assesses whether the patient is receiving parenteral nutrition and/or enteral nutrition. Section O of the IRF-PAI includes a checkbox data element to assess TPN. In the IRF-PAI, a Swallowing Status data element also captures information related to enteral nutrition through the response option "Tube/Parenteral Feeding." The LCDS includes a checklist, including a question asking whether TPN is part of the patient's treatment plan, and the MDS 3.0 includes a checklist of nutritional approaches, including questions about parenteral/IV feeding, feeding tube, mechanically altered diet, and therapeutic diet.

Stakeholder Feedback

The TEP provided input on all the considered data elements for SSTIs and concluded that these data elements are appropriate for standardization because they would provide useful clinical information to inform care planning and care coordination. The TEP affirmed that assessment of these services and interventions is standard clinical practice, and that the collection of these data by means of a list and checkbox format would follow workflow for PAC providers.

Comments on the category of SSTIs were also submitted by stakeholders during the proposed rule public comment period for the LTCH, IRF, and SNF QRPs (FY 2018) and Home Health QRP (CY 2018). Comments across all SSTI data elements emphasized the additional reporting burden of the SSTI data elements for settings that did not already collect these data.

Several commenters supported the inclusion of nutritional data elements as standardized data elements, noting their importance in capturing information on care coordination, clinical decisionmaking, safe care transitions, and resource use.

Candidate SPADEs in the National Beta Test

Because the PAC-PRD provided evidence of the feasibility of assessing SSTIs across the PAC settings, and because the SSTI data elements were extensions of basic clinical assessment and documentation using checkboxes, these data elements did not undergo additional Alpha feasibility testing. However, based on concerns by commenters that the finalization of the standardized patient assessment data proposals would require providers to spend significant resources to report the data, including updating relevant protocols and systems and training appropriate staff, CMS and RAND chose to further assess the SSTI data elements in the National Beta Test prior to reconsideration. In addition to expanding our understanding of these data elements and evaluating the interrater reliability, clinical utility, and burden, the National Beta Test also evaluated different assessment timeframes for SSTI data elements at admission (Days 1, 3, 5, and 7) and discharge (Discharge Day and two days prior to discharge). The data elements are presented, and results are described, in Chapters 6 and 7 of this volume.

Summary of Candidate SPADEs in the National Beta Test

The Sensory Impairments (Hearing and Vision), Bladder and Bowel Impairments, and SSTI data elements that were 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.

Table 2.1. Impairments and Special Services, Treatments, and Interventions Data Elements Evaluated in the National Beta Test Communicative Sample

Data Element	Input Opportunities	National Beta Test Inclusion Notes	Current Assessment Instrument Use
Ability to hear, ability to see	Public Comment (PC) 1, FY 2018 proposed rule		Ability to hear (OASIS,[a] MDS) Ability to see (OASIS, MDS)
Continence (bladder and bowel) Interview: Perceived burden with incontinent events	Alpha 1, PC2		
Continence (bladder and bowel) Chart Review: Appliance use, frequency of events	Alpha 1, PC2	Recorded on admission Days 1, 3, 5, and 7; Discharge Day and Discharge Day minus 2	Appliance use (OASIS, MDS) Frequency of events (OASIS, IRF-PAI, LCDS, MDS)
Nutritional approaches: IV or feeding tube, diet	PC1, FY 2018 proposed rule	Recorded on admission Days 1, 3, 5, and 7; Discharge Day and Discharge Day minus 2	Parenteral/IV (OASIS, IRF-PAI, LCDS, MDS) Feeding tube (OASIS, IRF-PAI, MDS) Mechanically altered diet, therapeutic diet (MDS)
Services and treatments: Cancer, respiratory, other	PC1, FY 2018 proposed rule	Recorded on admission Days 1, 3, 5, and 7; Discharge Day and Discharge Day minus 2	Chemotherapy, radiation, suctioning, tracheostomy, transfusions, IV Access (MDS) Oxygen (OASIS,[a] MDS) Invasive mechanical ventilator, BiPAP/CPAP (OASIS,[a] LCDS, MDS) IV meds, Dialysis (LCDS, MDS)

NOTE: 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).
[a] Item M1210 (Hearing) and Item M1410 (Respiratory Treatments) were removed from the OASIS with the adoption of the OASIS-D, effective January 1, 2019.

3. Sensory Impairments: Hearing and Vision

Data Element Description

The Ability to Hear and Ability to See data elements assess the level of hearing and vision impairment. Each data element consists of one question. Hearing loss is one of the most common complaints in adults over the age of 60, is a major contributor to difficulties in speech comprehension.[16] and may cause difficulty in communicating important information concerning the patient's/resident's condition, preferences, and care transitions. Vision impairment has been strongly associated with multiple chronic health conditions, mortality, falls, hip fractures, and higher levels of social isolation.[17] Accurate identification of hearing and visual impairments may lead to improvements in multiple domains of a patient's/resident's life.

Multiple sources are used to assess these data elements, including interviewing and observing the patient/resident, reviewing the medical record, and consulting with family and staff. Ability to Hear is currently assessed in the MDS, and Ability to See is currently assessed in the MDS and OASIS. The Ability to Hear and Ability to See data elements are shown in Figures 3.1 and 3.2.

Figure 3.1. Ability to Hear

A1. Ability to Hear (with hearing aid or hearing appliance, if normally used)

- ☐ 0 = Adequate – no difficulty in normal conversation, social interaction, listening to TV
- ☐ 1 = Minimal difficulty – difficulty in some environments (e.g., when person speaks softly or setting is noisy)
- ☐ 2 = Moderate difficulty – speaker has to increase volume and speak distinctly
- ☐ 3 = Highly impaired – absence of useful hearing
- ☐ 9 = **Unknown or unable to assess**

[16] Peelle et al., 2011.

[17] Crews, Jones, and Kim, 2006; Lord, 2006; Coleman et al., 2004; Crews and Campbell, 2004; Lee et al., 2002; Reed-Jones et al., 2013; Gopinath et al., 2013; Crews, 2016; Mitoku et al., 2016.

Figure 3.2. Ability to See

A2. Ability to See in Adequate Light (with glasses or other visual appliances)

- ☐ 0 = Adequate – sees fine detail such as regular print in newspapers/books
- ☐ 1 = Impaired – sees large print, but not regular print in newspapers/books
- ☐ 2 = Moderately impaired – limited vision; not able to see newspaper headlines but can identify objects
- ☐ 3 = Highly impaired – object identification in question, but eyes appear to follow objects
- ☐ 4 = Severely impaired – no vision or sees only light, colors or shapes; eyes do not appear to follow objects
- ☐ 9 = **Unknown or unable to assess**

Testing Objectives

Basic descriptive statistics (e.g., frequencies, means, SDs) are presented for the hearing and visual impairment data to characterize the rates of impairment for patients/residents in each setting and for the overall sample. To examine known groups validity, we also examined Sensory Impairment data elements 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.

Results

Feasibility

Frequencies/Missing

Table 3.1 shows the percentage of responses at admission for each of the Sensory Impairment data elements overall and by setting. Sensory Impairment data elements were administered to 643 patients/residents in HHAs, 783 in IRFs, 498 in LTCHs, and 1,141 in SNFs (n = 3,065 overall). Overall, more than 98 percent of the sample was administered the Sensory Impairment data elements. Among those who were administered the Sensory Impairment data elements, missing data at the data element level were 0.3 percent for hearing and 0.6 percent for vision overall with minimal setting differences. Overall, 74 percent of patients/residents had adequate hearing, and 17 percent had minimal difficulty hearing. Setting-specific hearing ranged from 65 percent adequate hearing and 24 percent minimal difficulty hearing in HHAs to 81

percent adequate hearing and 13 percent minimal difficulty hearing in LTCHs. Overall, 78 percent of patients/residents had adequate vision and 16 percent had impaired vision. Setting-specific vision ranged from 73 percent adequate vision and 21 percent impaired vision in HHAs to 85 percent adequate vision and 12 percent impaired vision in IRFs.

Table 3.1. Overall and Setting-Specific Response Frequencies for Sensory Impairment Data Elements at Admission (percent)

Data Element	HHA (*n* = 643)	IRF (*n* = 783)	LTCH (*n* = 498)	SNF (*n* = 1,141)	Overall (*n* = 3,065)
Ability to hear (a1)					
Adequate	65	75	81	76	74
Minimal difficulty	24	18	13	15	17
Moderate difficulty	11	6	4	8	8
Highly impaired	0	1	1	1	1
Ability to see (a2)					
Adequate	73	85	76	78	78
Impaired	21	12	16	16	16
Moderately impaired	4	2	6	4	4
Highly impaired	1	1	1	1	1
Severely impaired	1	0	1	1	1

Known Groups Validity

Comparing the performance of patients/residents on the hearing and vision 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 are assessing the construct that they are intended to capture.

Table 3.2 shows the percent of patients/residents with adequate hearing and adequate vision 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 for these individual characteristics are presented in Tables A.1–A.4 in the appendix.

Table 3.2. Overall Frequencies for Adequate Hearing and Vision by Patient/Resident Characteristics and Clinical Groups (percent)

Patient/Resident Characteristics and Clinical Groups	Adequate Hearing (Yes)	Adequate Vision (Yes)
Gender (*nhear* = 2,948[a]*; nvis* = 2,939)		
Male (*nhear* = 1,220; *nvis* = 1,216)	70.7	79.0
Female (*nhear* = 1,728; *nvis* = 1,723)	76.6	77.7
Age (*nhear* = 2,937[a]; *nvis* = 2,928[a])		
18–44 (*nhear* = 42; *nvis* = 42)	92.9	81.0
45–64 (*nhear* = 310; *nvis* = 310)	87.4	80.0
65–74 (*nhear* = 913; *nvis* = 914)	80.7	80.9
75–89 (*nhear* = 1,355; *nvis* = 1,348)	71.7	78.3
90+ (*nhear* = 317; *nvis* = 314)	49.8	67.8
Length of stay (*nhear* = 2,594[a]; *nvis* = 2,587[a]; mean, SD)	Yes: 21.2 (12.5) No: 22.6 (13.6)	Yes: 21.0 (12.4) No: 23.9 (14.1)
Disposition at discharge (*nhear* = 2,893[a]; *nvis* = 2,884[a])		
Home (*nhear* = 1,346; *nvis* = 1,339)	72.3	78.9
Hospital (*nhear* = 203; *nvis* = 203)	79.3	74.4
Hospice (*nhear* = 41; *nvis* = 41)	68.3	68.3
HHA (*nhear* = 623; *nvis* = 623)	77.5	85.7
IRF (*nhear* = 51; *nvis* = 51)	84.3	80.4
LTCH (*nhear* = 13; *nvis* = 13)	84.6	84.6
SNF (*nhear* = 286; *nvis* = 286)	74.5	71.3
LTCH (*nhear* = 13; *nvis* = 13)	84.6	84.6
Other (*nhear* = 330; *nvis* = 328)	70.3	72.0
Clinical conditions *(n,hear = 2,*271*; nvis* = 2,261*)*		
Sepsis		

Patient/Resident Characteristics and Clinical Groups	Adequate Hearing (Yes)	Adequate Vision (Yes)
Yes (*nhear* = 154; *nvis* = 153[a])	79.9	86.3
No (*nhear* = 2,117; *nvis* = 2,108)	73.7	77.4
Heart failure		
Yes (*nhear* = 387; *nvis* = 387)	71.3	74.7
No (*nhear* = 1,884; *nvis* = 1,874)	74.7	78.7
Stroke		
Yes (*nhear* = 202; *nvis* = 200a)	71.8	71.0
No (*nhear* = 2,069; *nvis* = 2,061)	74.4	78.7
Hygiene—Toileting (*nhear* = 1,539; *nvis* = 1,533)[b]		
Independent (*nhear* = 72; *nvis* = 72)	80.6	79.2
Setup or clean-up assistance (*nhear* = 79; *nvis* = 79)	82.3	81.0
Supervision or touching assistance (*nhear* = 324; *nvis* = 322)	77.5	82.6
Partial/moderate assistance (*nhear* = 368; *nvis* = 367)	76.9	80.9
Substantial/maximal assistance (*nhear* = 339; *nvis* = 339)	76.1	77.6
Dependent (*nhear* = 357; *nvis* = 354)	76.5	76.6
Mobility—Lying to Sitting (*nhear* = 1,893; *nvis* = 1,883)		
Independent (*nhear* = 193; *nvis* = 193)	75.7	82.9
Setup or clean-up assistance (*nhear* = 114; *nvis* = 113)	72.8	78.8
Supervision or touching assistance (*nhear* = 530; *nvis* = 526)	74.9	82.3
Partial/moderate assistance (*nhear* = 621; *nvis* = 619)	74.6	77.4
Substantial/maximal assistance (*nhear* = 296; *nvis* = 296)	74.7	75.3
Dependent (*nhear* = 139; *nvis* = 136)	76.3	77.9

NOTE: Because of differences in sample sizes for hearing and vision data elements, we report sample sizes for each (*nhear* = hearing; *nvis* = vision).
[a] Significant ($p < 0.05$) associations with adequate hearing or adequate vision as indicated by chi-square tests of independence.
[b] Toileting data not available for HHA patients.

Based on the research literature, we generated several hypotheses or expectations for associations between the data elements and the patient/resident characteristics. We expected sensory impairments to be related to age, stroke, and needing assistance with toileting such that more impaired patients/residents would tend to be older[18] and be more likely to have suffered a stroke.[19] We expected vision impairment to be related to having less independence in toileting.[20]

[18] Lin et al., 2011; Dillon et al., 2010.

[19] Gopinath et al., 2009.

[20] Rowe et al., 2009; Talley et al., 2014.

We also expected hearing impairment to be related to gender, with hearing impairment more prevalent among male patients/residents.[21] For other patient/resident characteristics (length of stay, disposition at discharge, sepsis, heart failure, and ability to transfer from lying to sitting), we did not have an expectation of what associations might be observed in the data.

Across the full sample, adequate hearing and vision were significantly associated with age, disposition at discharge, and length of stay. It is consistent with the epidemiological literature that older people are more likely to experience impaired hearing and vision. Additionally, adequate hearing but not vision was associated with gender, and adequate vision but not hearing was associated with sepsis and stroke. Within some settings, we observed associations between adequate vision and heart failure and need for assistance with toileting. We review the statistical associations between variables in the bullets below.

Gender and Age

- Gender was significantly associated with adequate hearing ($\chi^2_{(1)} = 13.3$, $p < 0.05$) such that a greater percentage of females (76.6 percent) had adequate hearing compared with males (70.7 percent). Similar trends were observed at the setting level in IRFs ($\chi^2_{(1)} = 10.6$, $p < 0.05$) and SNFs ($\chi^2_{(1)} = 9.6$, $p < 0.05$) but not in HHAs and LTCHs. Gender was not associated with adequate vision overall or in any of the settings. *Although we did not anticipate this relationship, this association is consistent with other studies that have found hearing impairment is more prevalent in men than in women.*[22]
- Age, overall, was significantly associated with both hearing ($\chi^2_{(4)} = 158.5$, $p < 0.01$) and vision ($\chi^2_{(4)} = 24.4$, $p < 0.01$), with a general trend of fewer patients/residents with adequate hearing and vision as age increased. For example, the 18–44-year-old age group had the highest rates of adequate hearing (92.9 percent) and vision (81 percent), and the 90+ age group had the lowest rates for both hearing (49.8 percent) and vision (67.8 percent). At the setting level, age was significantly associated with both hearing and vision among SNF residents (hearing: $\chi^2_{(4)} = 38.4$, $p < 0.01$; vision: $\chi^2_{(4)} = 14.7$, $p < 0.01$), with similar trends of higher impairment in older age groups, but only hearing, and not vision, was associated with age in HHAs ($\chi^2_{(4)} = 49.6$, $p < 0.01$), IRFs ($\chi^2_{(4)} = 46.1$, $p < 0.01$) and LTCHs ($\chi^2_{(4)} = 33.6$, $p < 0.01$). In all cases, hearing impairment rates increased with increased age. *This is consistent with our expectations and likely due to age-related decrements in hearing*[23] *and vision.*[24]

Length of Stay, Disposition at Discharge

- Length of stay, overall, was also significantly associated with both hearing ($F_{(1,2592)} = 5.8$, $p < 0.05$) and vision ($F_{(1,2586)} = 21.8$, $p < 0.001$), with significantly shorter lengths of stay for patients/residents with adequate hearing (M = 21.2 days, SD = 12.5) and vision (M =

[21] Lin et al., 2011; Dillon et al., 2010.

[22] Agrawal, Platz, and Niparko, 2008; Lin et al., 2011.

[23] Lin et al., 2011

[24] Cigolle et al., 2007.

21.0 days, SD = 12.4) relative to those with less than adequate hearing (M = 22.6 days, SD = 13.6) and vision (M = 23.9 days, SD = 14.1). Similar results were observed for patients in HHAs for both hearing ($F_{(1,494)} = 4.4$, $p < 0.05$) and vision ($F_{(1,492)} = 14.1$, $p < 0.001$) and for vision only in IRFs ($F_{(1,720)} = 25.6$, $p < 0.05$). Adequate hearing and vision were not associated with length of stay within LTCH and SNF settings. *We did not form hypotheses around the association between length of stay and sensory impairments. However, the associations we did observe are in a logically explainable direction. That is, patients/residents with more impairments, perhaps because they are also older or sicker, have longer lengths of stay.*

- Overall, disposition at discharge was significantly associated with both hearing ($\chi^2_{(7)} = 15.7$, $p < 0.05$) and vision ($\chi^2_{(7)} = 41.2$, $p < 0.001$), with those with adequate hearing being discharged at higher rates to LTCHs (84.6 percent of those discharged to LTCHs had adequate hearing whereas 15.4 percent did not) and IRFs (84.3 percent of those discharged to IRFs had adequate hearing whereas 16.7 percent did not) relative to all other locations (70.3–79.3 percent of those discharged to other locations had adequate hearing, whereas 20.7–29.7 percent did not), and those with adequate vision being discharged at higher rates to HHAs (85.7 percent of those discharged to HHAs had adequate vision whereas 14.3 percent did not) and LTCHs (84.6 percent of those discharged to LTCHs had adequate vision whereas 15.4 percent did not) relative to all other locations (68.3–80.4 percent of those discharged to other locations had adequate vision, whereas 19.6 – 31.7 percent did not). This pattern of results was not significant at the setting level for hearing, but disposition at discharge was significantly related to vision in HHAs ($\chi^2_{(7)} = 14.4$, $p < 0.05$), LTCHs ($\chi^2_{(7)} = 14.1$, $p < 0.05$) and SNFs ($\chi^2_{(7)} = 17.0$, $p < 0.05$). Patients with adequate vision from HHAs were discharged at higher rates to home (76.4 percent), hospice (75.0 percent), or IRFs (75.0 percent) relative to all other settings (range: 61.2–66.7 percent). Results for LTCHs are challenging to interpret because of very small numbers of patients being discharged to many of the locations. However, it appears that LTCH patients with adequate vision tend to be discharged from LTCHs at lower rates to SNFs (76.7 percent) relative to all other locations (Other, 95.0 percent; HHA, 87.4 percent; hospital, 86.5 percent; home, 85.0 percent). Finally, relative to SNF residents with less than adequate vision, SNF residents with adequate vision were discharged at higher rates to LTCHs (90 percent), HHAs (85.3 percent), and home (78.5 percent) relative to all other locations (range: 70.3–72.9 percent). *Because vision and hearing impairments are related to age and medical conditions, these associations are difficult to interpret without accounting for other differences between patients/residents.*

Clinical Conditions

- There was an overall significant association of sepsis with adequate vision ($\chi^2_{(1)} = 6.6$, $p < 0.05$) such that a greater percent of patients/residents with sepsis had adequate vision (86.3 percent) compared with those without (77.4 percent). This association was also observed among SNF residents ($\chi^2_{(1)} = 3.9$, $p < 0.05$), but was not significant in any of the other three settings, possibly because the number of patients with sepsis is somewhat smaller in the other three settings. *This association suggests that patients/residents with sepsis who are receiving PAC care or care from a SNF are perhaps younger or otherwise do not have sensory impairments at the rate to be expected in SNF or PAC patients/residents overall.*

- There were no overall associations of heart failure with hearing or vision, but SNF residents with heart failure were less likely to have adequate vision than those without (70.5 percent versus 79.7 percent; $\chi^2_{(1)} = 7.7$, $p < 0.01$). *We interpret this association as reflecting the older age of SNF residents with heart failure, who therefore have higher levels of impaired vision. It is also possible that individuals with heart failure are more likely to require SNF-level nursing care, and that, with adequate vision, these SNF residents would have been residing in the community.*
- Adequate vision, but not hearing, was also related to stroke, both overall ($\chi^2_{(1)} = 6.2$, $p < 0.05$) and in HHAs ($\chi^2_{(1)} = 6.8$, $p < 0.01$), LTCHs ($\chi^2_{(1)} = 3.8$, $p < 0.05$), and SNFs ($\chi^2_{(1)} = 5.1$, $p < 0.05$). In all cases, those with stroke were less likely to have adequate vision (71.0 percent overall) relative to those without (78.7 percent overall). *We had anticipated associations between sensory impairments and stroke, but observe this association only for vision and not for hearing.*

ADLs: Toileting and Ability to Transfer from Lying to Sitting

- There were no significant associations overall of vision and hearing with level of assistance needed for toileting, but vision was related to level of assistance with toileting in LTCHs ($\chi^2_{(5)} = 15.2$, $p < 0.01$) and SNFs ($\chi^2_{(5)} = 11.3$, $p < 0.05$). Results for LTCHs do not present a clearly interpretable pattern, but among SNF residents, those with adequate vision tended to be more independent in this ADL. *This association was in the expected direction, although limited to only one setting*.
- There were no significant associations overall of vision and hearing with ability to transfer from lying to sitting. This lack of association is not surprising, given that the functional ability to transfer from lying to sitting would not be expected to be inhibited by sensory impairments, or vice versa.

Time to Complete

Table 3.3 shows average time to complete the Sensory Impairment data elements overall and by setting. On average, the two Sensory Impairment data elements took 0.6 minutes (SD = 0.3) to complete. Setting-specific times to complete ranged from 0.6 minutes (SD = 0.3) in IRFs and SNFs to 0.7 minutes (SD = 0.3) in HHAs and LTCHs.

Table 3.3. Time to Complete the Sensory Impairments Data Elements (minutes)

	HHA (*n* = 396)	IRF (*n* = 499)	LTCH (*n* = 301)	SNF (*n* = 456)	Overall (*n* = 1,652)
Mean (SD)	0.7 (0.3)	0.6 (0.3)	0.7 (0.3)	0.6 (0.3)	0.6 (0.3)

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 (above or below setting-type median) to evaluate the generalizability of these performance results (see Tables A.5–A.8 in the appendix). No significant differences were found for time to complete the Sensory Impairments data elements in terms of urbanicity,

geographic region, or facility ownership in these sensitivity analyses. However, the Sensory Impairments data elements took significantly more time to complete in smaller facilities (M = 0.7, SD = 0.3) than in larger facilities (M = 0.6, SD = 0.3), but the effect size was small (Cohen's $d = 0.38$).

Interrater Reliability

Table 3.4 shows kappa interrater reliability coefficients for the Sensory Impairment 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. Kappas were computed on 960 patients/residents who were assessed by research nurses and facility/agency staff assessor pairs: 197 in HHAs, 258 in IRFs, 237 in LTCHs, and 268 in SNFs. Overall kappas for the ability to hear tended to be good, ranging from 0.58 to 0.71. Overall kappas for the ability to see tended to be moderate, ranging from 0.47 to 0.67. Kappa values were similar for HHAs and SNFs, while the kappa values for ability to hear were higher than the kappa for ability to see in IRFs and LTCHs.

Table 3.4. Interrater Reliability Kappa or Weighted Kappa for Sensory Impairment Data Elements

Data Element	HHA (*n* = 197)	IRF (*n* = 258)	LTCH (*n* = 237)	SNF (*n* = 268)	Overall (*n* = 960)
Ability to hear (a1)	0.71	0.67	0.58	0.62	0.65
Ability to see (a2)	0.67	0.50	0.47	0.57	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, and 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 (above or below setting-type median) to evaluate the generalizability of these performance results (see Tables A.9–A.12 in the appendix). The kappas did tend to vary somewhat based on both region and urbanicity in these analyses, with higher values in nonurban areas, the Midwest, and smaller sites. There were no other noteworthy differences for kappa in these sensitivity analyses.

Table 3.5 shows percent agreement for the Sensory Impairment data elements overall and by setting. Overall, percent agreement was high for all data elements, ranging from 83 percent to 87 percent for the ability to hear and 75 percent to 90 percent for the ability to see. At the setting

level, percent agreement was similar for each data element, with the exception of LTCHs, where percent agreement was higher for ability to hear (84 percent) than ability to see (75 percent).

Table 3.5. Interrater Reliability Percent Agreement for Sensory Impairment Data Elements

Data Element	HHA (*n* = 197)	IRF (*n* = 258)	LTCH (*n* = 237)	SNF (*n* = 268)	Overall (*n* = 960)
Ability to hear (a1)	83	87	84	83	84
Ability to see (a2)	83	90	75	83	83

Admission to Discharge

Table 3.6 summarizes patterns of changes on the Sensory Impairment data elements from admission to discharge. Patterns are characterized as "no change" (scores stay the same at admission and discharge), "improve" (scores improve from admission to discharge), and "worsen" (scores 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, as well as availability to schedule assessments among the facility staff assessors in each participating site. For the Sensory Impairment data elements, both admission and discharge data were collected on 792 patients/residents: 145 in HHAs, 338 in IRFs, 83 in LTCHs, and 226 in SNFs. Overall, for both Ability to Hear and Ability to See, there were no significant differences from admission to discharge. For Ability to Hear, 82 percent saw no change, 6 percent saw a worsening, and 12 percent saw an improvement from admission to discharge. For Ability to See, 87 percent saw no change, 5 percent saw a worsening, and 8 percent saw an improvement from admission to discharge. A decline in hearing and/or vision during a PAC stay is not necessarily unexpected. Although it is possible that some patients/residents could have improved in their hearing and vision (e.g., because of a new device or prescription), it is also possible that some of this small percentage of patients/residents who showed change in hearing or vision reflect variation in assessors' coding, which is in keeping with the moderate to good reliability observed in the interrater reliability evaluation. Overall, responses to the Sensory Impairment data elements were similar from admission to discharge. Between 72 percent and 86 percent of scores for Ability to Hear did not change from admission to discharge, and between 81 percent and 89 percent of scores for Ability to See did not change from admission to discharge. For Ability to Hear, when changes did occur, they tended to reflect improvement in Ability to Hear from admission to discharge. For Ability to See, changes were roughly equal between worsening (between 3 percent and 9 percent) and improving (4 percent to 10 percent).

Table 3.6. Admission to Discharge Results for Sensory Impairment Data Elements (percent)

Data Element	HHA (*n* = 145)	IRF (*n* = 338)	LTCH (*n* = 83)	SNF (*n* = 226)	Overall (*n* = 792)
Ability to Hear (a1)					
No change	72	84	86	84	82
Worsening	7	6	4	6	6
Improvement	21	11	11	10	12
Ability to See (a2)					
No change	81	89	89	88	87
Worsening	9	3	7	5	5
Improvement	10	8	4	8	8

Assessor Feedback

In assessor focus groups and the survey, assessors indicated that the Sensory Impairment data elements were clinically useful and had low assessment burden. In fact, the Sensory Impairment data elements were rated among the top three most clinically useful data elements in the survey by both facility staff and research nurses. Facility staff reported these data elements as having the lowest clinical burden in the assessor survey. In the focus groups, research nurses described hearing and vision as among the most important data elements for facilitating transfer and as critical to assessing a patient's/resident's baseline health. Further, facility/agency staff and research nurse participants in the focus groups reported that these data elements were very easy to collect because they did not require a structured patient/resident interview and assessors could make the assessment based on their care experience with the patient/resident.

However, facility staff focus group participants pointed out that a potential challenge in the standardized assessment of these data elements is that the preferred collection method differed among assessors. One participant from an HHA remarked, "We've all probably done [hearing and vision assessments] long enough that we've developed our own little tools in our own little toolbox that we know."

When to complete a hearing and vision assessment was also discussed in the focus groups. Some felt strongly that a direct assessment of sensory impairments should begin before the formal standardized assessment even begins, and others felt strongly that the data elements should be recorded after extensive time has been spent with that individual. One nurse noted, "You would ask them that when you introduced yourselves, like 'Can you hear me okay?' . . . But I didn't answer the section until I was done . . . till I really spent 40 minutes with them." At that point, she described being able to rely on the broader experience of the interview, including whether environmental factors (e.g., heater coming on) affected the patient or residents' abilities.

Facility staff in focus groups also mentioned that HHAs may be more likely to directly observe adaptations to the home environment in response to the impairments (e.g., television volume is very loud) and/or how the person functions in his/her own home.

> You'll look around for clues in the environment, and they can't see. So you would think can you count fingers at arm's length? . . . But then they still aren't functional with their vision. . . . If they can't see their walker's over there, you're right. Their vision is not adequate for what they need to know.
>
> —Durham, N.C., HHA staff

In summary, both the survey and focus groups revealed that vision and hearing are important, clinically relevant concepts to assess, according to facility staff and research nurses, especially as the patient/resident is first entering their facility/agency's care. These data elements posed a low burden because of their observational nature. But the data elements were collected using different preferred data collection methods, which might be a challenge for standardized assessment. In focus groups, facility staff indicated that HHAs might be more likely to observe adaptations to the environment in response to the impairments, however other settings may also observe these adaptations.

Summary

Results for the Sensory Impairment data elements indicate strong overall support for cross-setting standardization. Assessors considered the Sensory Impairment data elements to be clinically useful and have low assessment burden. For interrater reliability, kappas were moderate to good 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 impairment. In addition, the associations between Sensory Impairments and patient/resident characteristics aligned well with our expected results, indicating validity of the data elements.

4. Impairments: Continence Interview

Data Element Description

The Continence Interview data elements assess the occurrence of incontinent events, as well as the patient's/resident's perception of burden of bladder and bowel incontinent events. Impaired bowel and bladder continence adversely affects patients'/residents' quality of life because of greater likelihood of social isolation[25] and depression.[26] While there are multiple approaches to patient-centered continence care, such as identification and treatment of causes, scheduled toileting interventions, and use of pads or adult briefs, patients vary in their preferences for incontinence interventions.[27] Assessing patient/resident perception of burden of incontinent events is vital to informing preferences for incontinence interventions and care planning.

These data elements are completed through patient/resident interview and are not assessed in any of the current PAC assessment instruments. The Continence Interview data elements are shown in Figures 4.1 and 4.2.

[25] Landefeld et al., 2008.

[26] Nygaard et al., 2003.

[27] Cohen-Mansfield and Jensen, 2005.

Figure 4.1. Experience and Perceived Problem or Burden with Bladder Incontinent Events

G1a. ASK PATIENT/RESIDENT: "Have you experienced any bladder incontinent events (or 'accidental leaking of urine') during the past 3 days?"

- ☐ 0 = No **[SKIP to G2a]**
- ☐ 1 = Yes
- ☐ 7 = **Patient/resident declined to respond [SKIP to G2a]**
- ☐ 9 = **Unknown or unable to assess [SKIP to G2a]**

G1b. IF PATIENT/RESIDENT REPORTS EXPERIENCING INCONTINENT EVENTS [If G1a = 1], ASK PATIENT/RESIDENT: "How big of a problem or burden are incontinent events (or 'accidental leaking of urine') to you?"

- ☐ 1 = No problem
- ☐ 2 = Small problem
- ☐ 3 = Moderate problem
- ☐ 4 = Big problem
- ☐ 7 = **Patient/resident declined to respond**
- ☐ 9 = **Unknown or unable to assess**

Figure 4.2. Experience and Perceived Problem or Burden with Bowel Incontinent Events

G2a. ASK PATIENT/RESIDENT: "Have you experienced any bowel incontinent events (or "accidental leaking of stool") during the past 3 days?"

- ☐ 0 = No **[SKIP to G-TIME]**
- ☐ 1 = Yes
- ☐ 7 = **Patient/resident declined to respond [SKIP to G-TIME]**
- ☐ 9 = **Unable to assess/no response [SKIP to G-TIME]**

G2b. IF PATIENT/RESIDENT REPORTS EXPERIENCING INCONTINENT EVENTS [If G2a = 1], ASK PATIENT/RESIDENT: "How big of a problem or burden are incontinent events (or 'accidental leaking of stool') to you?"

- ☐ 1 = No problem

- ☐ 2 = Small problem
- ☐ 3 = Moderate problem
- ☐ 4 = Big problem
- ☐ 7 = **Patient/resident declined to respond**
- ☐ 9 = **Unable to assess/no response**

Testing Objectives

Basic descriptive statistics (e.g., frequencies, means, SDs) are presented for Continence Interview data elements to characterize the level of bladder and bowel incontinent events and perceived problem for patients/residents in each setting and for the overall sample. To examine known groups validity, we also examined rates of bladder incontinent events by patient/resident characteristics and clinical groups of interest, both for the combined sample and for each setting separately. For admission data, feasibility (frequencies, rates 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.

Results

Feasibility

Frequencies/Missing

Table 4.1 shows response frequencies for the Continence Interview data elements at admission overall and by setting. The Continence Interview data elements were administered to 2,977 of the 3,121 patients/residents, or 95 percent of the sample: 640 in HHAs, 769 in IRFs, 469 in LTCHs, and 1,099 in SNFs. Among those who were administered the Continence Interview data elements, missing data at the data element level ranged from 0.2 to 0.7 percent overall with minimal setting differences. Further, overall rates for "declined to respond" ranged from 0.03 to 0.17 percent. Overall, over a third of patients/residents reported any bladder incontinent events, and 20 percent reported bowel incontinent events. Both types of events were reported to have posed at least a small problem (only 13 percent of bladder and 10 percent of bowel incontinent events were rated as being "no problem"). Rates of bladder incontinent events and extent of bother for both types did not differ markedly across settings. However, rates of bowel incontinent events were significantly associated with setting ($\chi^2_{(3)} = 61.9$, $p < 0.001$), as they were less frequent in the HHA setting (11 percent) relative to the other three settings (range: 19–29 percent).

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

Data Element	HHA (*n* = 640)	IRF (*n* = 769)	LTCH (*n* = 469)	SNF (*n* = 1,099)	Overall (*n* = 2,977)
Any bladder incontinent events past 3 days (g1a)					
Yes	36	36	35	42	38
How big problem are bladder incontinent events (g1b)					
No problem	13	14	11	12	13
Small problem	36	26	34	29	30
Moderate problem	31	27	25	27	28
Big problem	20	33	30	32	29
Any bowel incontinent events past 3 days (g2a)					
Yes	11	19	29	23	20
How big problem are bowel incontinent events (g2b)					
No problem	13	6	9	13	10
Small problem	35	28	23	25	27
Moderate problem	20	24	18	20	21
Big problem	32	42	50	42	43

Known Groups Validity

Comparing the performance of patients/residents on the bladder incontinent events data element with other patient/resident characteristics adds information about the validity of the data element. 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 are assessing the construct that they are intended to capture.

Table 4.2 shows rates of bladder incontinent events 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 and ability to transfer from lying to sitting. Setting-specific results are presented in Tables A.13–A.16 in the appendix.

Table 4.2. Overall Frequencies for Bladder Incontinence Interview Data Element by Patient/Resident Characteristics and Clinical Groups (percent)

Patient/Resident Characteristics and Clinical Groups	Bladder Incontinence (Yes)
Gender (*n* = 2,854[a])	
Male (*n* = 1,172)	32.0
Female (*n* = 1,682)	42.3
Age (*n* = 2,843[a])	
18–44 (*n* = 37)	29.7
45–64 (*n* = 304)	31.6
65–74 (*n* = 896)	33.7
75–89 (*n* = 1,305)	40.9
90+ (*n* = 301)	45.9
Length of stay (*n* = 2,523[a]; mean, SD)	Yes: 22.47 (12.87) No: 20.96 (12.67)
Disposition at discharge (*n* = 2,807)	
Home (*n* = 1,319)	35.5
Hospital (*n* = 196)	38.3
Hospice (*n* = 39)	48.7
SNF (*n* = 267)	42.0
IRF (*n* = 48)	45.8
HHA (*n* = 612)	39.7
LTCH (*n* = 10)	30.0
Other (*n* = 316)	39.9
Clinical conditions (*n* = 2,194*)*	
Sepsis	
Yes (*n* = 149)	36.2
No (*n* = 2,045)	38.0
Heart failure	
Yes (*n* = 376)	42.0
No (*n* = 1,818)	37.1
Stroke	
Yes (*n* = 192)	37.5
No (*n* = 2,002)	38.0
Hygiene—Toileting (*n* = 1,478[a])[b]	
Independent (*n* = 71)	33.8
Setup or clean-up assistance (*n* = 77)	24.7
Supervision or touching assistance (*n* = 316)	30.1
Partial/moderate assistance (*n* = 357)	37.3
Substantial/maximal assistance (*n* = 325)	44.6

Patient/Resident Characteristics and Clinical Groups	Bladder Incontinence (Yes)
Dependent (*n* = 332)	42.5
Mobility—Lying to Sitting (*n* = 1,839[a])	
Independent (*n* = 189)	31.8
Setup or clean-up assistance (*n* = 110)	34.6
Supervision or touching assistance (*n* = 522)	35.3
Partial/moderate assistance (*n* = 604)	38.6
Substantial/maximal assistance (*n* = 286)	45.1
Dependent (*n* = 128)	41.4

[a] Significant ($p < 0.05$) associations with Bladder Incontinence as indicated by chi-square tests of independence.
[b] Toileting hygiene data not available for HHA patients.

Based on the research literature, we generated several hypotheses or expectations for associations between the data elements and the patient/resident characteristics. We expected bladder incontinent events to be related to gender, age, length of stay, stroke, toileting (not available for HHA patients), and ability to transfer from lying to sitting. Specifically, we expected that patients/residents reporting bladder incontinence would be more likely to be female,[28] be older,[29] have longer stays,[30] be more likely to have suffered a stroke,[31] and have less independence in both ADLs.[32]

In the overall sample, significant associations for bladder incontinence were observed with gender, age, length of stay, toileting, and transfer from lying to sitting. Bladder incontinence was also associated with heart disease among SNF residents. We review the statistical associations between variables in the bullets below.

Gender and Age

- Gender, overall, was significantly associated with bladder incontinence ($\chi^2_{(1)} = 31.3$, $p < 0.01$) such that a greater percentage of females (42.3 percent) experienced bladder incontinence compared with males (32.0 percent). Similar trends were observed at the setting level in HHAs ($\chi^2_{(1)} = 18.2$, $p < 0.01$) and SNFs ($\chi^2_{(1)} = 15.1$, $p < 0.01$) but not in IRFs and LTCHs. *This finding is consistent with our expectation that we would observe more bladder incontinence in women compared with men and speaks to the valid performance of the bladder incontinence events data element.*
- Age, overall, was significantly associated with bladder incontinence ($\chi^2_{(4)} = 26.0$, $p < 0.01$), with a general trend of higher rates of incontinence with increased age. For

[28] Markland et al., 2011.

[29] Gorina et al., 2014.

[30] Jumadilova et al., 2005.

[31] Kolominsky-Rabas et al., 2003.

[32] Jumadilova et al., 2005; Cigolle et al., 2007.

example, the 18–44-year-old age group had the lowest rates of incontinence (29.7 percent) and the 90+ age group had the highest rates (45.9 percent). At the setting level, age was significantly associated with bladder incontinence among SNF residents ($\chi^2_{(4)} = 13.1$, $p < 0.05$) but not in other settings, with similar trends of higher incontinence rates in SNF residents in older age groups. *This finding overall is consistent with our expectation that we would observe more bladder incontinence in older patients/residents and speaks to the valid performance of the bladder incontinence events data element.*

Length of Stay, Disposition at Discharge

- Length of stay, overall, was also significantly associated with bladder incontinence ($F_{(1,2521)} = 8.3$, $p < 0.01$), with significantly longer lengths of stay for patients/residents with incontinence (M = 22.5 days, SD = 12.9) relative to those without (M = 21.0 days, SD = 12.7). Similar results were observed for patients in IRFs ($F_{(1,713)} = 31.1$, $p < 0.001$). Bladder Incontinence was not associated with length of stay within HHA, LTCH, and SNF settings. *This finding is consistent with our expectation that patients/residents with bladder incontinence would experience longer lengths of stay.*
- Disposition at discharge was not significantly associated with bladder incontinence overall or at the setting level. *We had no expectations related to discharge disposition for patients/residents with bladder incontinence.*

Clinical Conditions

- There were no overall significant associations of bladder incontinence with sepsis, heart failure, or stroke. However, SNF residents with heart failure had higher rates of bladder incontinence than those without (47.0 percent versus 38.8 percent; $\chi^2_{(1)} = 4.3$, $p < 0.05$). *We had expected to find higher rates of bladder incontinence in patients/residents who experienced stroke. However, there is evidence of an association between heart failure and bladder incontinence,*[33] *which we observed in SNF residents.*

ADLs: Toileting and Ability to Transfer from Lying to Sitting

- Bladder incontinence was significantly associated overall with both toileting ($\chi^2_{(5)} = 23.7$, $p < 0.001$) and ability to transfer from lying to sitting ($\chi^2_{(5)} = 12.2$, $p < 0.05$). In both cases, rates of incontinence tended to increase with increased dependence. The association of incontinence with toileting was also significant among IRF patients ($\chi^2_{(5)} = 22.1$, $p < 0.001$) and SNF residents ($\chi^2_{(5)} = 12.9$, $p < 0.05$), and bladder incontinence was also associated with ability to transfer from lying to sitting among IRF patients ($\chi^2_{(5)} = 11.7$, $p < 0.05$). *These findings are consistent with our expectation that we would observe more bladder incontinence in patients/residents who need more assistance with ADLs and speaks to the valid performance of the bladder incontinence events data element.*

[33] Palmer et al., 2009; Hwang et al., 2013; Lee, Cigolle, and Blaum, 2009.

Time to Complete

Table 4.3 shows average time to complete the Continence Interview data elements overall and by setting. On average, the Continence Interview data elements took 1.4 minutes (SD = 0.7) to complete. Setting-specific times to complete range from 1.3 minutes (SD = 0.6) in IRFs to 1.5 minutes (SD = 0.7) in LTCHs.

Table 4.3. Time to Complete the Continence Interview Data Elements (minutes)

	HHA (*n* = 416)	IRF (*n* = 523)	LTCH (*n* = 297)	SNF (*n* = 458)	Overall (*n* = 1,694)
Mean (SD)	1.4 (0.7)	1.3 (0.6)	1.5 (0.7)	1.4 (0.7)	1.4 (0.7)

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 (above or below setting-type median) to evaluate the generalizability of these performance results (see Tables A.17–A.20 in the appendix). No significant differences were found for time to complete the Continence Interview data elements in these sensitivity analyses.

Interrater Reliability

Table 4.4 shows kappa interrater reliability coefficients for the Continence Interview 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 site-level quotas. Inclusion in interrater reliability data collection depended on paired facility staff and research nurse assessors' ability to schedule assessments. For the Continence Interview data elements, kappas were computed on the 927 patients/residents who were assessed by research nurse and facility/agency staff assessor pairs: 193 in HHAs, 248 in IRFs, 226 in LTCHs, and 260 in SNFs. Overall kappas for the Continence Interview data elements were excellent, ranging from 0.96 to 0.98, with minimal setting differences. Kappas ranged from 0.94 to 1.00 in HHAs, 0.96 to 1.00 in IRFs, 0.85 to 0.99 in LTCHs, and 0.95 to 0.98 in SNFs.

Table 4.4. Interrater Reliability Kappa or Weighted Kappa for Continence Interview Data Elements

Data Element	HHA (*n* = 193)	IRF (*n* = 248)	LTCH (*n* = 226)	SNF (*n* = 260)	Overall (*n* = 927)
Any bladder incontinent events past 3 days (g1a)	0.99	0.96	0.97	0.96	0.97
How big problem are bladder incontinent events (g1b)	0.94	0.97	0.95	0.98	0.96
Any bowel incontinent events past 3 days (g2a)	0.97	0.99	0.99	0.95	0.97
How big problem are bowel incontinent events (g2b)	1.00	1.00	0.97	0.97	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, and 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 (above or below setting-type median) to evaluate the generalizability of these performance results (see Tables A.21–A.24 in the appendix). No noteworthy differences were found for interrater reliability of the Continence Interview data elements in these sensitivity analyses.

Table 4.5 shows percent agreement for the Continence Interview data elements overall and by setting. Overall percent agreement was high for all data elements, ranging from 98 to 99 percent with minimal setting differences.

Table 4.5. Interrater Reliability Percent Agreement for Continence Interview Data Elements

Data Element	HHA (*n* = 193)	IRF (*n* = 248)	LTCH (*n* = 226)	SNF (*n* = 260)	Overall (*n* = 927)
Any bladder incontinent events past 3 days (g1a)	99	98	99	98	99
How big problem are bladder incontinent events (g1b)	97	99	96	98	98
Any bowel incontinent events past 3 days (g2a)	99	100	100	98	99
How big problem are bowel incontinent events (g2b)	100	100	98	97	98

Admission to Discharge

Table 4.6 summarizes patterns of change on the Continence Interview data elements 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 as well as availability to schedule assessments among the facility staff assessors in each participating site. Patterns are characterized as "no change" (scores stay the same at admission and discharge), "improve" (scores improve from admission to discharge), and "worsen" (scores decline from admission to discharge). For the Continence Interview data elements, admission and discharge data were collected on 778 patients/residents: 145 in HHAs, 328 in IRFs, 84 in LTCHs, and 221 in SNFs.

Overall, responses to the Continence Interview data elements tended to reflect improvement from admission to discharge, with fewer patients/residents reporting incontinent bladder and bowel events at discharge. For example, among the 25 percent of patients/residents whose reporting of bladder incontinence changed from admission to discharge, 19 percent of those changes reflected improvement, and this change was statistically significant ($t_{(765)} = 7.43$, $p < 0.001$). A similar effect was seen for bowel incontinent events ($t_{(772)} = 7.03$, $p < 0.001$), with the majority of change from admission to discharge reflecting improvement. For both bladder and bowel, patients/residents also tended to report improvement in the extent to which the

incontinence was a problem. However, these changes in patient/resident reports, although clinically meaningful, were not statistically significant because of the relatively small numbers of patients/residents answering these questions (i.e., those who had incontinent events at either admission or discharge).

Table 4.6. Admission to Discharge Results for Continence Interview Data Elements (percent)

Data Element	HHA (*n* = 145)	IRF (*n* = 328)	LTCH (*n* = 84)	SNF (*n* = 221)	Overall (*n* = 778)
Any bladder incontinent events past 3 days (g1a)					
No Change	81	76	75	71	75
Worsen	6	4	5	8	6
Improve	13	20	20	21	19
How big problem are bladder incontinent events (g1b)					
No Change	53	48	40	59	53
Worsen	13	27	40	8	18
Improve	34	25	20	33	30
Any bowel incontinent events past 3 days (g2a)					
No Change	90	82	87	76	82
Worsen	3	4	2	4	3
Improve	7	14	11	20	14
How big problem are bowel incontinent events (g2b)					
No Change	75	58	33	50	50
Worsen	0	17	33	11	17
Improve	25	25	33	39	33

Assessor Feedback

Facility staff considered the Continence Interview to be clinically relevant. Facility staff and research nurses rated Continence among the top five data elements in terms of clinical utility in the assessor survey, with Continence Interview data elements ranked in the middle of the Chart Review data elements. In the focus groups, facility staff explained that it was useful to know how incontinence could be affecting the patient/resident's functionality and quality of life to inform the care plan.

> If they're incontinent and going home, we always try and get them on a toileting schedule but we don't ask them that on admission like, "Is this a problem to you?" So I think that would be something interesting to initiate. . . . We don't want to start a care plan with it when they're like, "Oh, it's been like this for ten years" or something like that.
>
> —Phoenix, SNF Staff

However, a weakness of this data element noted by both types of assessors was validity. As noted in both the assessor survey and focus groups, patients/residents who reported no incontinence would sometimes contradict their chart, a spouse or family member's report (if one was present), or physical evidence observed by the assessor. Further, some facility staff and research nurses reported in the assessor survey that patients/residents were uneasy or did not want to answer any continence-related questions (although outright refusals to these interview items were very low).

> A lot of my patients that I know were incontinent were denying the incontinence questions, so that was interesting. . . . I don't think their opinion really captured sometimes if the spouse was sitting in the back listening and [the spouse] wouldn't give me the answers, they'd just be shaking their head. And I know for a fact there were dirty [adult diapers] in their trash can and in the bathroom.
>
> —St. Louis, HHA Staff

In summary, all feedback from assessors was consistent that knowing whether incontinence was a problem for the patient/resident was important for care planning. However, assessors had deep distrust of the accuracy of patient/resident answers for these data elements.

Summary

Results for the Continence Interview data elements indicate moderate overall support for cross-setting standardization. Assessors considered Continence to have high clinical utility. For interrater reliability, kappas were excellent and percent agreement was high, with minimal setting differences. Responses demonstrated some degree of stability from admission to discharge; among the approximately 50 percent of patients/residents who did change, change was more likely to show improvement in having incontinent events and improvement in the perceived burden at discharge. In addition, the associations between reported incontinent events and patient/resident characteristics aligned well with our expected results. However, assessors were concerned about the accuracy of patient/resident reports of continence issues and noted that patients/residents may not be comfortable answering continence-related questions.

5. Impairments: Continence Chart Review

Data Element Description

The Continence Chart Review data elements assess for the use of equipment and appliances to manage incontinence, whether such equipment and appliances were placed in the current care setting, the primary reason for catheter placement, need for assistance to manage use of appliances, and frequency of incontinent events. As described in Chapter 4, impaired bowel and bladder continence are common conditions that, if unaddressed, can increase the risk of skin breakdown and infections[34] and depression,[35] and could adversely affects patients'/residents' quality of life because of greater likelihood of social isolation.[36] Further, patients/residents are at greater risk for falls[37] and sleep disturbances while attempting to manage bowel or bladder events. Assessing patient/resident appliance use and frequency of incontinent events is vital to maintaining standards of care, improving bladder care management for patients/residents in PAC settings, improving quality of life, and informing care planning.

The Continence Chart Review data elements are completed via multiple sources, including medical record review, observation of the patient/resident, and communication with staff and other caregivers. Similar data elements for Appliance Use are currently used in the OASIS and MDS, and for Frequency of events in the OASIS, IRF-PAI, LCDS, and MDS. In the National Beta Test, assessors documented each data element according to when it was first noted in the chart from Admission Days 1, 3, 5, and 7 and at discharge for Discharge Day and Discharge Day minus 2. The Continence Chart Review data elements as assessed in the National Beta Test are shown in Figures 5.1–5.4.

[34] Gray, 2007.

[35] Landefeld et al., 2008.

[36] Landefeld et al., 2008.

[37] Hasegawa, Kuzuya, and Iguchi, 2010; Chiarelli, Mackenzie, and Osmotherly, 2009.

Figure 5.1. Bladder Appliance Use

G3b. If patient/resident has indwelling or external CATHETER, was the CATHETER placed while the patient/resident was in the current setting?	**Day 1**	**Day 3**	**Day 5**	**Day 7**
0 = No	☐ 0	☐ 0	☐ 0	☐ 0
1 = Yes	☐ 1	☐ 1	☐ 1	☐ 1
8 = **Not applicable**	☐ 8	☐ 8	☐ 8	☐ 8
9 = **Unknown or unable to assess**	☐ 9	☐ 9	☐ 9	☐ 9
Notes: _____ _____ _____				

G3c. If patient/resident has an indwelling or external CATHETER placed in current setting (G3b = 1), what is the PRIMARY reason the catheter was put in place?	**Day 1**	**Day 3**	**Day 5**	**Day 7**
1 = Retention	☐ 1	☐ 1	☐ 1	☐ 1
2 = Skin Condition (pressure injury, surgical wound, rash, other)	☐ 2	☐ 2	☐ 2	☐ 2
3 = Monitor Urine Output	☐ 3	☐ 3	☐ 3	☐ 3
4 = Patient preference (e.g., patient or proxy desires as part of comfort, end-of-life or hospice care plan)	☐ 4	☐ 4	☐ 4	☐ 4
5 = Other (specify): _____	☐ 5 _____	☐ 5 _____	☐ 5 _____	☐ 5 _____
8 = **Not applicable**	☐ 8	☐ 8	☐ 8	☐ 8
9 = **Unknown or Unable to assess**	☐ 9	☐ 9	☐ 9	☐ 9
Notes: _____ _____ _____				

G3d. IF PATIENT/RESIDENT USES A BLADDER APPLIANCE: Does the patient/resident need assistance to manage use of the bladder appliance for ANY reason (e.g., cognitive impairment/mental status, physical limitation, medical issue, etc.)?	**Day 1**	**Day 3**	**Day 5**	**Day 7**
0 = No 1 = Yes 8 = **Not applicable** 9 = **Unknown or unable to assess** **Notes:** _____ _____ _____	☐ 0 ☐ 1 ☐ 8 ☐ 9	☐ 0 ☐ 1 ☐ 8 ☐ 9	☐ 0 ☐ 1 ☐ 8 ☐ 9	☐ 0 ☐ 1 ☐ 8 ☐ 9

Figure 5.2. Bladder Frequency of Incontinent Events

G4. Indicate the frequency of incontinent events.	**Day 1**	**Day 3**	**Day 5**	**Day 7**
0 = No incontinent events during the assessment period	☐ 0	☐ 0	☐ 0	☐ 0
1 = Incontinent events less than daily (on at least one day but not every day during the assessment period)	☐ 1	☐ 1	☐ 1	☐ 1
2 = Incontinent events daily (at least once a day on each day during the assessment period)	☐ 2	☐ 2	☐ 2	☐ 2
3 = Incontinent events more than daily (more than once a day on each day during the assessment period)	☐ 3	☐ 3	☐ 3	☐ 3
8 = **Not applicable** (e.g., patient/resident has indwelling catheter or no urine output due to renal failure)	☐ 8	☐ 8	☐ 8	☐ 8
9 = **Unknown or unable to assess**	☐ 9	☐ 9	☐ 9	☐ 9
Notes: _____ _____ _____				

Figure 5.3. Bowel Appliance Use

G5a. Does this patient/resident use an indwelling or external bowel appliance (ostomy or other fecal diversion appliance)?	**Day 1**	**Day 3**	**Day 5**	**Day 7**
0 = No 1 = Yes **Notes:** _____ _____ _____	☐ 0 ☐ 1	☐ 0 ☐ 1	☐ 0 ☐ 1	☐ 0 ☐ 1
G5b. IF PATIENT/RESIDENT USES AN INDWELLING OR EXTERNAL BOWEL APPLIANCE (G5a = 1; YES), was the appliance placed while the patient/resident was in the current setting?	**Day 1**	**Day 3**	**Day 5**	**Day 7**
☐ 0 = No ☐ 1 = Yes ☐ 8 = **Not applicable** ☐ 9 = **Unknown or unable to assess** **Notes:** _____ _____ _____	☐ 0 ☐ 1 ☐ 8 ☐ 9	☐ 0 ☐ 1 ☐ 8 ☐ 9	☐ 0 ☐ 1 ☐ 8 ☐ 9	☐ 0 ☐ 1 ☐ 8 ☐ 9
G5c. IF PATIENT/RESIDENT USES AN INDWELLING OR EXTERNAL BOWEL APPLIANCE (G5a = 1; YES), does the patient/resident need assistance to manage use of the bowel appliance for ANY reason (e.g., cognitive impairment/mental status, physical limitation, medical issue, etc.)?	**Day 1**	**Day 3**	**Day 5**	**Day 7**
☐ 0 = No ☐ 1 = Yes ☐ 8 = **Not applicable** ☐ 9 = **Unknown or unable to assess** **Notes:** _____ _____ _____	☐ 0 ☐ 1 ☐ 8 ☐ 9	☐ 0 ☐ 1 ☐ 8 ☐ 9	☐ 0 ☐ 1 ☐ 8 ☐ 9	☐ 0 ☐ 1 ☐ 8 ☐ 9

Figure 5.4. Bowel Frequency of Incontinent Events

G6. Indicate the frequency of incontinent events.	Day 1	Day 3	Day 5	Day 7
0 = No incontinent events during the assessment period	☐ 0	☐ 0	☐ 0	☐ 0
1 = Incontinent events only once during the assessment period	☐ 1	☐ 1	☐ 1	☐ 1
2 = Incontinent events more than once during the assessment period	☐ 2	☐ 2	☐ 2	☐ 2
3 = No bowel output during the assessment period	☐ 3	☐ 3	☐ 3	☐ 3
8 = **Not applicable** (e.g., patient/resident has a colostomy)	☐ 8	☐ 8	☐ 8	☐ 8
9 = **Unknown or unable to assess**	☐ 9	☐ 9	☐ 9	☐ 9
Notes: _____ _____ _____				

Testing Objectives

Basic descriptive statistics (e.g., frequencies, means, SDs) are presented for the Continence Chart Review data elements for patients/residents in each setting and for the overall sample. Admission and discharge frequency tables include information about the day the data element was noted (i.e., Admission [Day 1] and on Days 3, 5, and 7; Discharge Day and Discharge Day minus 2). To examine known groups validity, we also examined a select Continence Chart Review data element (Any Bladder Appliance Use) by patient/resident characteristics and clinical groups of interest, both for the combined sample and for each setting separately. For admission data, feasibility (frequencies, rates of missingness, and time to complete) and interrater reliability (kappa and percent agreement) were examined. Lastly, frequencies combining across the days noted at admission and discharge were compared to inform stability or possible change over time.

Results

Feasibility

Frequencies/Missing

Table 5.1 shows response frequencies for the Continence Chart Review data elements at admission, overall and by setting. The Continence Chart Review data elements were administered to 2,926 of the 3,121 patients/residents, or 94 percent of the sample: 628 in HHAs, 762 in IRFs, 448 in LTCHs, and 1,088 in SNFs. Among those who were administered the Continence Chart Review data elements, missing data at the data element level ranged from 0 to 6.9 percent overall with minimal setting differences. Because the majority of appliances, when noted, were noted on Day 1, Table 5.1 shows rates for having noted the appliance on any day (Day 1, 3, 5, or 7) for data elements G3a1, a2, a3, a4, a5, a6, and G5a. The detailed results for the rates of "day first noted" for each appliance are shown in Table A.25 in the appendix. For the majority of the overall sample, the use of a bladder or bowel appliance was not noted; among those needing an appliance, it was most typically noted on Day 1. Although the use of a bladder appliance was uncommon, the appliance most frequently used was an indwelling urethral catheter (10 percent overall), and this was most commonly used among LTCH patients, of whom over a third noted use of this appliance (34 percent), relative to less than 10 percent in the other settings (range: 2–8 percent). The majority of appliances noted (80 percent) were not placed in the current setting. Of those placed in the current setting, the reason for placement varied, with retention being slightly more common (8 percent) relative to other reasons (skin condition, monitor urine output, patient preference, other; range: 1–5 percent). Further, the majority of patients/residents with a bladder appliance needed some assistance with management (overall 89 percent, setting range: 74–98 percent). Similar to what was found based on the Continence Interview data elements described in the previous chapter, just under 40 percent of the overall sample was noted as having bladder incontinent events, and this varied slightly across settings with events more frequent in HHAs and SNFs (46 percent) relative to IRFs (26 percent) and LTCHs (34 percent). Bowel incontinent events were even less frequent, at 14 percent , and occurred most often among LTCH patients (26 percent) relative to patients/residents in other settings (range: 6–17 percent). Bowel appliance use was also uncommon (5 percent overall), but when it was noted, it was typically placed prior to the current setting, and the majority of those with a bowel appliance needed assistance with it (87 percent).

Table 5.1. Overall and Setting-Specific Response Frequencies in Percent (counts) for Continence Chart Review Data Elements Noted on Any Day

Data Element	HHA (*n* = 628)	IRF (*n* = 762)	LTCH (*n* = 448)	SNF (*n* = 1,088)	Overall (*n* = 2,926)
Use of bladder appliance: indwelling urethral catheter (g3a1)	2 (13)	8 (63)	34 (147)	6 (65)	10 (288)
Use of bladder appliance: other indwelling catheter (g3a2)	1 (5)	1 (7)	6 (26)	2 (21)	2 (59)
Use of bladder appliance: external catheter (g3a3)	0 (0)	1 (11)	4 (16)	0 (2)	1 (29)
Use of bladder appliance: urostomy (g3a4)	0 (2)	0 (2)	1 (3)	0 (3)	0 (10)
Use of bladder appliance: intermittent catheterization (g3a5)	0 (1)	4 (32)	0 (2)	1 (8)	1 (43)
Use of bladder appliance: other (g3a6)	0 (2)	3 (19)	2 (8)	2 (25)	2 (55)
Number of bladder appliances noted across days (g3a1–6)					
None	97 (606)	84 (638)	59 (263)	89 (970)	85 (2477)
One	3 (21)	15 (113)	38 (169)	10 (112)	14 (415)
Two	0 (1)	1 (11)	3 (15)	1 (6)	1 (33)
Three	0 (0)	0 (0)	0 (1)	0 (0)	0 (1)
Catheter was placed in current setting and reason (g3b and g3c)					
Not placed in current setting	73 (16)	85 (102)	72 (126)	88 (102)	80 (346)
Retention	9 (2)	7 (8)	6 (11)	11 (13)	8 (34)
Skin condition	4.5 (1)	0 (1)	11 (19)	0 (0)	5 (21)
Monitor urine output	4.5 (1)	0 (0)	7 (12)	1 (1)	3 (14)
Patient preference	0 (0)	3 (3)	0 (1)	0 (0)	1 (4)
Other	9 (2)	5 (6)	3 (6)	0 (0)	3 (14)
If catheter ever noted, does patient need help with management (g3d)					
Yes	74 (14)	98 (96)	86 (144)	88 (77)	89 (331)
Frequency of bladder incontinent events, day 3 (g4)					
None	54 (258)	74 (512)	66 (192)	54 (505)	61 (1467)
Less than daily	14 (66)	12 (83)	14 (41)	21 (196)	16 (386)
Daily	15 (73)	3 (24)	9 (25)	10 (92)	9 (214)
More than daily	17 (79)	10 (72)	12 (35)	15 (144)	14 (330)
Use of indwelling or external bowel appliance (g5a)	4 (23)	2 (19)	12 (55)	4 (40)	5 (137)
If bowel appliance ever noted, was it placed in current setting (g5b)					
Yes	13 (1)	0 (0)	4 (2)	11 (3)	6 (6)

Data Element	HHA (*n* = 628)	IRF (*n* = 762)	LTCH (*n* = 448)	SNF (*n* = 1,088)	Overall (*n* = 2,926)
If bowel appliance ever noted, does patient need help with management (g5c)					
Yes	50 (4)	100 (7)	93 (43)	84 (21)	87 (75)
Frequency of bowel incontinent events, day 1 (g6)					
No events or no output	91 (499)	94 (681)	74 (288)	83 (789)	86 (2257)
Only once	6 (36)	4 (29)	15 (59)	10 (93)	8 (217)
More than once	3 (16)	2 (17)	11 (42)	7 (69)	6 (144)

Known Groups Validity

Comparing the performance of patients/residents on the bladder appliance use data element with other patient/resident characteristics adds information about the validity of the data element. 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 5.2 shows rates of Bladder Appliance Use 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 and ability to transfer from lying to sitting. Setting-specific results are presented in Tables A.26–A.29 in the appendix.

Table 5.2. Overall Frequencies for Any Bladder Appliance Use by Patient/Resident Characteristics and Clinical Groups (percent)

Patient/Resident Characteristics and Clinical Groups	Any Appliance Use (Yes)
Gender (*n* = 2,820[a])	
Male (*n* = 1,220)	20.7
Female (*n* = 1,728)	11.5
Age (*n* = 2,810[a])	
18–44 (*n* = 36)	36.1
45–64 (*n* = 294)	18.4
65–74 (*n* = 890)	15.5
75–89 (*n* = 1,287)	15.2
90+ (*n* = 303)	9.2
Length of stay (*n* = 2,493; mean, SD)	Yes: 22.0 (11.0) No: 21.5 (13.0)

Patient/Resident Characteristics and Clinical Groups	Any Appliance Use (Yes)
Disposition at discharge (*n* = 2,780[a])	
Home (*n* = 1,304)	9.4
Hospital (*n* = 188)	20.7
Hospice (*n* = 38)	29.0
HHA (*n* = 612)	15.5
IRF (*n* = 50)	44.0
LTCH (*n* = 12)	25.0
SNF (*n* = 267)	33.7
Other (*n* = 309)	13.6
Clinical conditions (*n* = 2,162*)*	
Sepsis	
Yes (*n* = 143[a])	25.9
No (*n* = 2019)	15.9
Heart failure	
Yes (*n* = 367)	15.5
No (*n* = 1,795)	16.8
Stroke	
Yes (*n* = 191)	19.9
No (*n* = 1,971)	16.2
Hygiene—Toileting (*n* = 1,454[a])[b]	
Independent (*n* = 68)	8.8
Setup or clean-up assistance (*n* = 76)	17.1
Supervision or touching assistance (*n* = 308)	11.7
Partial/moderate assistance (*n* = 351)	14.5
Substantial/maximal assistance (*n* = 322)	21.4
Dependent (*n* = 329)	39.5
Mobility—Lying to sitting (*n* = 1,807[a])	
Independent (*n* = 188)	9.0
Setup or clean-up assistance (*n* = 109)	6.4
Supervision or touching assistance (*n* = 515)	11.8
Partial/moderate assistance (*n* = 596)	14.1
Substantial/maximal assistance (*n* = 273)	22.0
Dependent (*n* = 126)	45.2

[a] Significant ($p < 0.05$) associations with Appliance Use as indicated by chi-square tests of independence.
[b] Toileting hygiene data not available for HHA patients.

Based on the research literature, we generated several hypotheses or expectations for associations between the data elements and the patient/resident characteristics. We expected

bladder appliance use to be related to gender, toileting, and mobility (i.e., ability to transfer from lying to sitting) such that patients/residents with Bladder Appliance Use would more likely be male[38] and have less independence in ADLs.[39]

In the overall sample, significant associations for Bladder Appliance Use were observed with gender, age, disposition at discharge, sepsis, toileting, and ability to transfer from lying to sitting. Although there were no overall associations of Bladder Appliance Use with length of stay, this association was significant among IRF patients. We review the statistical associations between variables in the bullets below.

Gender and Age

- Gender, overall, was significantly associated with Bladder Appliance Use ($\chi^2_{(1)} = 45.0$, $p < 0.001$), with males showing higher rates of appliance use (20.7 percent) relative to females (11.5 percent). Similar trends were observed at the setting level in IRFs ($\chi^2_{(1)} = 20.8$, $p < 0.001$) and SNFs ($\chi^2_{(1)} = 18.9$, $p < 0.001$) but not in HHAs and LTCHs. *This association was consistent with our expectation, based on prior literature, and supports the validity of the Bladder Appliance Use data element.*
- Age, overall, was significantly associated with Bladder Appliance Use ($\chi^2_{(4)} = 22.8$, $p < 0.001$), with a general trend of higher rates of Bladder Appliance Use in the lower age groups. The 18–44-year-old age group had the highest rates of Bladder Appliance Use (36.1 percent) and the 90+ age group had the lowest rates (9.2 percent). At the setting level, age was significantly associated with Bladder Appliance Use only among LTCH patients ($\chi^2_{(4)} = 11.8$, $p < 0.05$), with similar trends of higher appliance use rates in younger age groups. There were no other setting-specific associations of age with Bladder Appliance Use. *We did not expect to observe an association between age and bladder appliance use. This finding is notable in that younger PAC patients are more likely to be using catheters and other bladder appliances. This is most likely due to the types of conditions (e.g., spinal cord injury[40]) that cause younger patients/residents to use PAC services.*

Length of Stay, Disposition at Discharge

- Length of stay was not significantly associated with Bladder Appliance Use overall. However, IRF patients who were using a bladder appliance had significantly longer lengths of stay (M = 16.2 days, SD = 5.8) compared with patients not using a bladder appliance (M = 13.7 days, SD = 4.7; $F_{(1,710)} = 25.4$, $p < 0.001$). *We did not expect to observe an association. However, this finding in the IRF setting is logically consistent with the idea that IRF patients with less independence or greater levels of medical need (i.e., those patients with bladder devices) may benefit from longer periods of rehabilitation.*

[38] Rogers et al., 2008.

[39] Holroyd-Leduc et al., 2007.

[40] National Spinal Cord Injury Statistical Center, 2016.

- Disposition at discharge was also significantly associated with Bladder Appliance Use overall ($\chi^2_{(7)} = 147.7$, $p < 0.001$), with higher rates of appliance use among those discharged to IRFs (44.0 percent) and SNFs (33.7 percent) compared with other locations (range: 9.4–29.0 percent). This association was also significant in HHAs ($\chi^2_{(7)} = 59.3$, $p < 0.001$), where the rates of appliance use were highest among those discharged to hospital (30.4 percent) compared with other locations (range: 0.0–6.7 percent), and LTCHs ($\chi^2_{(5)} = 30.1$, $p < 0.001$), where the discharge pattern revealed that higher rates of Bladder Appliance Use were observed among those being discharged to hospice (80 percent), SNFs (51.8 percent), IRFs (50 percent), and hospital (48.3 percent) relative to those discharged to other unspecified locations (38.6 percent), HHAs (37.3 percent), and home (20.9 percent). *We did not expect to observe an association between bladder appliance use and discharge disposition, and the range of discharge settings makes these associations difficult to interpret. Clinically, the continued use of a bladder appliance may be associated with a higher ongoing level of care needed, which is reflected in the fact that these patients/residents are being discharged to relatively higher-intensity care settings (e.g., hospital, hospice, SNF, IRF), rather than being discharged to HHAs or home with HHA services.*

Clinical Conditions

- There was an overall significant association of Bladder Appliance Use with sepsis, where patients/residents with this condition had higher rates of Bladder Appliance Use than those without (25.9 percent versus 15.9 percent; $\chi^2_{(1)} = 9.6$, $p < 0.01$). *We did not expect to observe an association between bladder appliance use and sepsis. However, it is likely that patients/residents with sepsis are the most critically ill of patients/residents receiving PAC services and therefore may require bladder appliances at higher rates than patients/residents without sepsis, because of sepsis-related functional limitations (e.g., being confined to a bed, being in a coma, being mechanically ventilated).*
- There were no associations between heart failure and stroke with use of bladder appliance. *We did not expect to observe associations between these variables.*

ADLs: Toileting and Ability to Transfer from Lying to Sitting

- Bladder Appliance Use was significantly associated overall with both toileting ($\chi^2_{(5)} = 99.8$, $p < 0.001$) and ability to transfer from lying to sitting ($\chi^2_{(5)} = 110.8$, $p < 0.001$). In both cases, rates of appliance use tended to increase with increased dependence. This pattern of significance was also observed among IRF (toileting: $\chi^2_{(5)} = 20.3$, $p < 0.01$; transfer: $\chi^2_{(5)} = 20.7$, $p < 0.001$) and LTCH patients (toileting: $\chi^2_{(5)} = 45.6$, $p < 0.001$; transfer: $\chi^2_{(5)} = 39.7$, $p < 0.001$), as well as SNF residents (toileting: $\chi^2_{(5)} = 23.2$, $p < 0.001$; transfer: $\chi^2_{(5)} = 13.5$, $p < 0.05$). *This is consistent with our expectation and supports the validity of the Bladder Appliance Use data element.*

Time to Complete

Table 5.3 shows average time to complete the Continence Chart Review data elements overall and by setting. On average, the Continence Chart Review data elements took 3.5 minutes

(SD = 1.8) to complete. Setting-specific times to complete range from 3.3 minutes (SD = 1.7) in HHAs to 3.6 minutes (SD = 1.8) in IRFs and SNFs.

Table 5.3. Time to Complete the Continence Chart Review Data Elements (minutes)

	HHA (*n* = 409)	IRF (*n* = 471)	LTCH (*n* = 259)	SNF (*n* = 407)	Overall (*n* = 1,546)
Mean (SD)	3.3 (1.7)	3.6 (1.8)	3.5 (1.7)	3.6 (1.8)	3.5 (1.8)

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 (above or below setting-type median) to evaluate the generalizability of these performance results (see Tables A.30–A.33 in the appendix). No significant differences were found for time to complete the Continence Chart Review section in these sensitivity analyses.

Interrater Reliability

Table 5.4 shows kappa interrater reliability coefficients for the Continence Chart Review 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 site-level quotas. Inclusion in interrater reliability data collection depended on paired facility staff and research nurse assessors' ability to schedule assessments. For the Continence Chart Review data elements, paired assessments were completed on 884 patients/residents who were assessed by research nurse and facility/agency staff assessor pairs: 187 in HHAs, 237 in IRFs, 204 in LTCHs, and 256 in SNFs.

Many of the kappas for the Continence Chart Review data elements were not able to be calculated due to proportions of responses being out of range to support stable kappa estimates. The kappas that were calculable (i.e., for data elements observed at higher frequencies) tended to be substantial/good overall (0.66, 0.69, 0.79) as well as in IRFs, LTCHs, and SNFs (range: 0.67–0.91) but were only moderate in HHAs for bladder (0.52) and bowel (0.50) incontinent events, where assessors noted that it may have been relatively difficult to reliably track occurrence of these events. (See Assessor Feedback section later in this chapter for more discussion of this point.)

Table 5.4. Interrater Reliability Kappa or Weighted Kappa for Continence Chart Review Data Elements

Data Element	HHA (*n* = 187)	IRF (*n* = 237)	LTCH (*n* = 204)	SNF (*n* = 256)	Overall (*n* = 884)
Noted use of bladder appliance: indwelling urethral catheter (g3a1)	-	-	0.91	-	-
Noted use of bladder appliance: other indwelling catheter (g3a2)	-	-	-	-	-
Noted use of bladder appliance: external catheter (g3a3)	-	-	-	-	-
Noted use of bladder appliance: urostomy (g3a4)	-	-	-	-	-
Noted use of bladder appliance: intermittent catheterization (g3a5)	-	-	-	-	-
Noted use of bladder appliance: other (g3a6)	-	-	-	-	-
Catheter was placed in current setting, any day (g3b)	-	0.78	0.74	-	0.79
If catheter ever noted, does patient need help with management (g3d)	-	-	-	-	-
Frequency of bladder incontinent events, day 3 (g4)	0.52	0.69	0.70	0.67	0.66
Noted use of indwelling or external bowel appliance (g5a)	-	-	-	-	-
If bowel appliance ever noted, was it placed in current setting (g5b)	-	-	-	-	-
If bowel appliance ever noted, does patient need help with management (g5c)	-	-	-	-	-
Frequency of bowel incontinent events, day 3 (g6)	0.50	0.76	0.68	0.70	0.69

NOTES: Interrater reliability not shown for data elements with proportions out of range for stable kappa estimate (per study power calculations) or when sample size is less than five. 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, and 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 (above or below setting-type median) to evaluate the generalizability of these performance results (see Tables A.34–A.37 in the appendix). Kappa for whether a catheter was placed in current setting data element was higher in larger facilities (0.90) than in smaller facilities (0.62). No other significant differences were found for interrater reliability of the Continence Chart Review data elements in these sensitivity analyses.

Table 5.5 shows percent agreement for the Continence Chart Review data elements overall and by setting. Overall percent agreement was moderate to high for all data elements, ranging from 74 to 100 percent with minimal setting differences, although percent agreement tended to be lower for HHAs on the data elements documenting frequency of incontinent events and device placement.

Table 5.5. Interrater Reliability Percent Agreement for Continence Chart Review Data Elements

Data Element	HHA (*n* = 187)	IRF (*n* = 237)	LTCH (*n* = 204)	SNF (*n* = 256)	Overall (*n* = 884)
Use of bladder appliance: indwelling urethral catheter (g3a1)	98	97	95	99	97
Use of bladder appliance: other indwelling catheter (g3a2)	100	100	97	99	99
Use of bladder appliance: external catheter (g3a3)	100	99	97	99	99
Use of bladder appliance: urostomy (g3a4)	100	100	99	100	100
Use of bladder appliance: intermittent catheterization (g3a5)	100	99	99	98	99
Use of bladder appliance: other (g3a6)	98	95	94	98	96
Catheter was placed in current setting, any day (g3b)	100	92	88	100	91
If catheter ever noted, does patient need help with management (g3d)	100	100	87	71	86
Frequency of bladder incontinent events, Day 1 (g4)	61	86	77	78	76
Frequency of bladder incontinent events, Day 3 (g4)	58	85	79	74	75
Frequency of bladder incontinent events, Day 5 (g4)	58	84	78	72	75
Frequency of bladder incontinent events, Day 7 (g4)	60	83	77	72	74
use of indwelling or external bowel appliance (g5a)	97	98	93	98	96
If bowel appliance ever noted, was it placed in current setting (g5b)	50	67	93	100	88
If bowel appliance ever noted, does patient need help with management (g5c)	50	67	87	83	81
Frequency of bowel incontinent events, Day 1 (g6)	87	95	78	86	87
Frequency of bowel incontinent events, Day 3 (g6)	84	95	79	85	86
Frequency of bowel incontinent events, Day 5 (g6)	79	93	79	85	85
Frequency of bowel incontinent events, Day 7 (g6)	83	91	80	81	84

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, and 0.81–1.00 is excellent/almost perfect.

Discharge

Table 5.6 shows discharge frequency response distributions for the Continence Chart Review data elements overall and by setting. These data elements were recorded as noted in the chart on Discharge Day and two days prior to discharge. Because the majority of the appliance use data elements (G3a1, a2, a3, a4, a5, a6, G5a), when noted, were noted on the discharge day, the percent noted on either day is shown in this table. More detailed information regarding the day the appliance use data elements were noted is shown in Table A.38 in the appendix. At discharge, bladder appliance use was noted among fewer than 10 percent of patients/residents, with the majority (71 percent) not having been placed in the current setting. Among those placed in the current setting, the primary reason was retention (21 percent), and the majority of patients/residents needed assistance with the appliance (80 percent). In addition, the majority of patients/residents had no bladder incontinent events at discharge (78 percent) or two days prior to discharge (75 percent). Similarly, very few patients/residents had a bowel appliance at discharge

(2 percent), but those who did tended to need assistance with it (72 percent), and the majority of patients/residents had no bowel incontinent events at discharge (90 percent) or two days prior to discharge (87 percent).

Table 5.6. Discharge Frequencies of Continence Chart Review Data Elements Noted on Any Day (percent)

Data Element	HHA (*n* = 139)	IRF (*n* = 340)	LTCH (*n* = 84)	SNF (*n* = 228)	Overall (*n* = 791)
Use of bladder appliance: indwelling urethral catheter (g3a1)	0 (0)	3 (11)	20 (17)	8 (18)	6 (46)
Use of bladder appliance: other indwelling catheter (g3a2)	0 (0)	1 (4)	2 (3)	1 (3)	1 (9)
Use of bladder appliance: external catheter (g3a3)	0 (0)	1 (2)	1 (1)	0 (0)	0 (3)
Use of bladder appliance: urostomy (g3a4)	0 (0)	0 (0)	1 (1)	0 (0)	0 (1)
Use of bladder appliance: intermittent catheterization (g3a5)	0 (0)	2 (7)	1 (1)	1 (2)	1 (10)
Use of bladder appliance: other (g3a6)					
Never	0 (0)	2 (6)	0 (0)	0 (1)	1 (8)
Number of bladder appliances noted across days (g3a1–6)					
None	100 (139)	91 (310)	75 (63)	90 (205)	91 (717)
One	0 (0)	9 (29)	24 (20)	10 (22)	9 (71)
Two	0 (0)	0 (1)	1 (1)	0 (1)	0 (3)
Catheter was placed in current setting and reason (g3b and g3c)					
Not placed in current setting	–	70 (21)	70 (14)	74 (17)	71 (52)
Retention	–	20 (6)	20 (4)	22 (5)	21 (15)
Skin condition	–	0 (0)	5 (1)	0 (0)	1 (1)
Monitor urine output	–	0 (0)	5 (1)	4 (1)	3 (2)
Patient preference	–	0 (0)	0 (0)	0 (0)	0 (0)
Other	–	10 (3)	0 (0)	0 (0)	4 (3)
If catheter ever noted, does patient need help with management (g3d)					
Yes	–	83 (20)	79 (15)	77 (17)	80 (52)
Frequency of bladder incontinent events, Discharge Day (g4)					
None	64 (74)	89 (284)	78 (50)	68 (135)	78 (543)
Less than daily	11 (13)	2 (5)	8 (5)	12 (24)	7 (47)
Daily	17 (19)	2 (5)	3 (2)	13 (26)	7 (52)
More than daily	8 (9)	8 (25)	11 (7)	7 (13)	8 (54)

Data Element	HHA (*n* = 139)	IRF (*n* = 340)	LTCH (*n* = 84)	SNF (*n* = 228)	Overall (*n* = 791)
Frequency of bladder incontinent events, Discharge Day minus 2 (g4)					
None	67 (76)	84 (267)	74 (48)	64 (126)	75 (517)
Less than daily	10 (11)	6 (18)	12 (8)	19 (37)	11 (74)
Daily	16 (18)	1 (4)	3 (2)	10 (19)	6 (43)
More than daily	8 (9)	9 (28)	11 (7)	8 (15)	9 (59)
Use of indwelling or external bowel appliance (g5a)	1 (1)	1 (4)	11 (9)	2 (4)	2 (19)
If bowel appliance ever noted, was it placed in current setting (g5b)					
Yes	100 (1)	0 (0)	22 (2)	0 (0)	17 (3)
If bowel appliance ever noted, does patient need help with management (g5c)					
Yes	0 (0)	100 (4)	89 (8)	25 (1)	72 (13)
Frequency of bowel incontinent events, Discharge Day (g6)					
No events or no output	95 (109)	96 (308)	78 (59)	83 (174)	90 (650)
Only once	3 (4)	3 (8)	12 (9)	10 (21)	6 (42)
More than once	2 (2)	1 (3)	10 (8)	7 (15)	4 (28)
Frequency of bowel incontinent events, Discharge Day minus 2 (g6)					
No events or no output	93 (106)	94 (301)	75 (57)	78 (163)	87 (627)
Only once	4 (4)	3 (11)	13 (10)	12 (26)	7 (51)
More than once	3 (3)	3 (10)	12 (9)	10 (21)	6 (43)

Admission to Discharge

Table 5.7 summarizes patterns of change on Continence Chart Review data elements 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, as well as availability to schedule assessments among the facility staff assessors in each participating site. Patterns are characterized as "no change" (scores stay the same at admission and discharge), noted at discharge but not at admission, and noted at admission but not at discharge. For the Continence Chart Review, both admission and discharge data were collected on 773 patients/residents: 137 in HHAs, 336 in IRFs, 79 in LTCHs, and 221 in SNFs. Overall, responses to the Continence Chart Review data elements were very similar from admission to discharge. Between 74 and 100 percent of scores did not change from admission to discharge. Of all Continence Chart Review data elements, there was only one statistically significant difference from admission to discharge. Among patients/residents for whom a bowel appliance was noted, it was more likely at discharge for it to be noted that it was placed in the current setting than at admission, $t_{(15)} = 9.94$, $p < 0.01$.

This is logically consistent with a scenario of a device being placed in the setting and supports the validity of the data element.

Table 5.7. Admission to Discharge Results for Continence Chart Review Data Elements (percent, counts)

Data Element	HHA (*n* = 137)	IRF (*n* = 336)	LTCH (*n* = 79)	SNF (*n* = 221)	Overall (*n* = 773)
Use of bladder appliance: indwelling urethral catheter (g3a1)					
No change	99 (132)	97 (320)	84 (66)	95 (202)	95 (720)
Noted at discharge but not admission	0 (0)	0 (1)	1 (1)	2 (5)	1 (7)
Noted at admission but not discharge	1 (2)	3 (11)	15 (11)	3 (7)	4 (31)
Use of bladder appliance: other indwelling catheter (g3a2)					
No change	100 (134)	99 (331)	97 (76)	99 (210)	99 (751)
Noted at discharge but not admission	0 (0)	0 (1)	1 (1)	1 (2)	1 (4)
Noted at admission but not discharge	0 (0)	0 (1)	1 (1)	0 (1)	0 (3)
Use of bladder appliance: external catheter (g3a3)					
No change	100 (134)	99 (329)	96 (75)	100 (213)	99 (751)
Noted at discharge but not admission	0 (0)	0 (1)	1 (1)	0 (0)	0 (2)
Noted at admission but not discharge	0 (0)	1 (3)	3 (2)	0 (0)	1(5)
Use of bladder appliance: urostomy (g3a4)					
No change	100 (134)	100 (330)	99 (78)	100 (213)	100 (756)
Noted at discharge but not admission	0 (0)	0 (0)	1 (1)	0 (0)	0 (1)
Noted at admission but not discharge	0 (0)	0 (1)	0 (0)	0 (0)	0 (1)
Use of bladder appliance: intermittent catheterization (g3a5)					
No change	100 (134)	97 (321)	96 (76)	99 (211)	98 (743)
Noted at discharge but not admission	0 (0)	0 (0)	3 (2)	1 (1)	0 (3)
Noted at admission but not discharge	0 (0)	3 (10)	1 (1)	1 (1)	2 (12)
Use of bladder appliance: other (g3a6)					
No change	100 (134)	95 (314)	99 (78)	98 (210)	97 (736)
Noted at discharge but not admission	0 (0)	2 (7)	0 (0)	1 (1)	1 (8)
Noted at admission but not discharge	0 (0)	3 (10)	1 (1)	1 (3)	2 (14)
Catheter was placed in current setting, any day (g3b)					
No change	–	64 (14)	83 (15)	93 (13)	78 (42)
Noted at discharge but not admission	–	23 (5)	11 (2)	7 (1)	15 (8)
Noted at admission but not discharge	–	13 (3)	6 (1)	0 (0)	7 (4)

Data Element	HHA (*n* = 137)	IRF (*n* = 336)	LTCH (*n* = 79)	SNF (*n* = 221)	Overall (*n* = 773)
If catheter ever noted, does patient need help with management (g3d)					
No change	–	86 (18)	89 (16)	81 (13)	85 (47)
Noted at discharge but not admission	–	0 (0)	0 (0)	12 (2)	4 (2)
Noted at admission but not discharge	–	14 (3)	11 (2)	6 (1)	11 (6)
Frequency of bladder incontinent events, day 1 (g4)					
No change	65 (71)	83 (241)	78 (42)	66 (115)	74 (469)
Noted at discharge but not admission	13 (14)	6 (18)	13 (7)	17 (30)	11 (69)
Noted at admission but not discharge	22 (24)	11 (34)	9 (5)	17 (29)	15 (92)
Use of indwelling or external bowel appliance (g5a)					
No change	96 (132)	98 (327)	98 (78)	98 (217)	98 (753)
Noted at discharge but not admission	1 (1)	0 (0)	1 (1)	1 (1)	0 (3)
Noted at admission but not discharge	3 (4)	2 (7)	1 (1)	1 (3)	2 (16)
If bowel appliance ever noted, was it placed in current setting (g5b)					
No change	–	100 (4)	88 (7)	100 (4)	94 (15)
Noted at discharge but not admission	–	0 (0)	12 (1)	0 (0)	6 (1)
Noted at admission but not discharge	–	0 (0)	0 (0)	0 (0)	0
If bowel appliance ever noted, does patient need help with management (g5c)					
No change	–	100 (4)	(100) 8	50 (2)	88 (14)
Noted at discharge but not admission	–	0 (0)	0 (0)	0 (0)	0 (0)
Noted at admission but not discharge	–	0 (0)	0 (0)	50 (2)	12 (2)
Frequency of bowel incontinent events, day 1 (g6)					
No change	91 (100)	93 (285)	75 (52)	79 (150)	87 (587)
Worsen	5 (6)	3 (8)	16 (11)	11 (21)	7 (46)
Improve	4 (4)	4 (12)	9 (6)	10 (18)	6 (40)

Assessor Feedback

As described in the Continence Interview chapter, facility staff and research nurses rated Continence among the top five data elements in terms of clinical utility in the assessor survey. In the focus groups, facility staff explained that Continence was very clinically relevant for care decisionmaking and planning—specifically for determining interventions, planning discharge, and protecting skin integrity.

> [Continence is] one of the most important because [. . .] making sure that skin integrity is maintained is one of the most paramount things in the skilled nursing facility. And it also impacts their discharge plan. If you were continent at home but now you're not, that's a problem.
>
> —Boston, SNF Staff

In both focus groups and the assessor survey, the assessors reported that Continence data elements that required chart review were problematic because of high data collection burden. Research nurses in particular rated the Continence Chart Review among the top five data elements in terms of burden on the assessor survey and emphasized that the Continence Chart Review was among the most burdensome set of data elements to collect in the National Beta Test when discussed in the focus groups. Although facility staff rated the Continence Chart Review as less burdensome than research nurses in the assessor survey, some noted in focus groups that it was very difficult to locate continence information in patient charts. Facility staff and research nurses in the focus groups elaborated that data collection was perceived to be tedious and confusing, depending on the electronic medical records system. For example, in the PointClickCare system, an electronic medical record system that is fairly common in PAC settings, the assessor must read through each of the notes in the look-back window to complete the data element because Continence is described in comments. However, other electronic medical records allow "sorting" by day and Continence events, which enables easier searching for these data. Regardless of the look-back period, the process was burdensome given the additional need to consult multiple data sources.

Research nurses noted in the focus groups that a consideration for cross-setting standardization is that there is rarely any record of Continence after admission in the HHA setting. They also described how the software used by agencies or facilities does not drive nurses to record incontinence episodically. In this case, the patients/residents can be broadly noted as incontinent, but assessors do not have documentation available to determine frequency of incontinence.

In summary, the facility staff and research nurses thought the continence questions were highly clinically relevant. However, the assessors described the high burden of reviewing medical records (depending on the records system), consultation of multiple sources, and lack of a skip pattern.

Summary

Results for the Continence Chart Review data elements indicate moderate overall support for cross-setting standardization. Based on the assessor survey, both facility staff and research nurse assessors rated the Continence Chart Review data elements as one of the top five in terms of utility and clinical relevance. However, focus group feedback from nurses indicated that the Continence Chart Review data elements involved high data collection burden. These data elements took longer than others to complete, but completion times did not vary by facility, region, or urbanicity. Associations of Bladder Appliance Use with patient characteristics provide evidence of known groups validity. Specifically, although we only hypothesized the relationships between gender, toileting, and ability to transfer from lying to sitting, we found additional associations with age, disposition at discharge, and sepsis. Although some of these associations

may be spurious or related to medical condition, clinical staff still thought this information was important for treatment/discharge planning where present. For interrater reliability, those kappas that could be calculated were substantial to good overall with some variation by setting. Responses demonstrated some degree of stability from admission to discharge overall, with patients/residents showing more improvement than decline at discharge. The combined results for the Continence Chart Review are somewhat mixed, showing acceptable interrater reliability but only moderate feasibility because of the relatively high burden of locating information in the chart and some to moderate clinical utility as a candidate data element for standardization across PAC settings.

6. Nutritional Approaches

Data Element Description

The Nutritional Approaches data elements assess approaches that are used for nutrition and/or hydration in patients/residents. The patient's/resident's clinical condition may potentially benefit from various nutritional approaches. However, nutritional approaches that vary from the normal (e.g., mechanically altered food) or that rely on alternative methods (e.g., parenteral/IV or feeding tubes) can diminish an individual's quality of life,[41] sense of dignity, and self-worth and diminish pleasure from eating.[42] Alternative nutritional approaches should be monitored to ensure that the nutritional approach is meeting the patient's/resident's nutritional goals, and care planning should include periodic reevaluation of the appropriateness of the approach.

Nutritional approaches are assessed by reviewing the medical record. These data elements, assessing parenteral/IV feeding, feeding tube, mechanically altered diet, and therapeutic diet, are currently collected in the MDS 3.0. In addition, similar versions of the parenteral/IV data element are assessed in the OASIS, IRF-PAI, and LCDS, and the feeding tube data element is assessed in the OASIS and IRF-PAI. In the National Beta Test, assessors documented each data element according to when it was first noted in the chart from Admission Days 1, 3, 5, and 7 and at discharge for Discharge Day and Discharge Day minus 2. The Nutritional Approaches data elements as assessed in the National Beta Test are shown in Figure 6.1.

[41] Winkler, 2005.

[42] Dharmarajan and Unnikrishnan, 2005.

Figure 6.1. Nutritional Approaches

J1. Check all of the following nutritional approaches that were performed during the assessment period. **CHECK ALL THAT APPLY**	**Day 1**	**Day 3**	**Day 5**	**Day 7**
J1a = **Parenteral/ IV feeding** J1b = **Feeding tube** – nasogastric or abdominal (e.g., PEG) J1c = **Mechanically altered diet** – require change in texture of food or liquids (e.g., pureed food, thickened liquids) J1d = **Therapeutic diet** (e.g., low salt, diabetic, low cholesterol) J1z = **None of the above** J1z1 = **Unknown/Unable to assess** **Notes:** _____ _____ _____	☐ J1a ☐ J1b ☐ J1c ☐ J1d ☐ J1z ☐ J1z1	☐ J1a ☐ J1b ☐ J1c ☐ J1d ☐ J1z ☐ J1z1	☐ J1a ☐ J1b ☐ J1c ☐ J1d ☐ J1z ☐ J1z1	☐ J1a ☐ J1b ☐ J1c ☐ J1d ☐ J1z ☐ J1z1

Testing Objectives

Basic descriptive statistics (e.g., frequencies, means, SDs) are presented for the Nutritional Approaches data elements for patients/residents in each setting and for the overall sample. Admission and discharge frequency tables include information about the day the data element was noted (i.e., Admission [Day 1] and Days 3, 5, and 7; Discharge Day and Discharge Day minus 2). To examine known groups validity, we also examined the Mechanically Altered Diet Nutritional Approach data element by patient/resident characteristics and clinical groups of interest for the combined sample and for each setting separately. For admission data, feasibility (frequencies, rates of missingness, and time to complete) and interrater reliability (kappa and percent agreement) were examined. Lastly, frequencies combining across the days noted at admission and discharge were compared to inform stability or possible change over time.

Results

Feasibility

Frequencies/Missing

Table 6.1 shows the percentage of responses at admission for the Nutritional Approaches data element overall and by setting. The data elements were administered to 2,926 of the 3,121, or 94 percent, of patients/residents in the admission sample: 629 in HHAs, 762 in IRFs, 448 in LTCHs, and 1,087 in SNFs. Among those who were administered the Nutritional Approaches data elements, missing data at the data element level ranged from 0.7 to 1.3 percent overall with minimal setting differences. Because the majority of approaches, when noted, were noted on admission (Day 1), Table 6.1 shows rates for having noted the approach on any day (Day 1, 3, 5, or 7). The detailed results for the rates "day first noted" for each approach are shown in Table A.39 in the appendix. Results for the Nutritional Approaches data elements show that three of the four Nutritional Approaches were seldom performed for individuals in the admission sample (range: 1–10 percent overall). However, approximately half of patients/residents were receiving a therapeutic diet (52 percent), and this was true across all settings, although rates were somewhat higher in LTCHs (59 percent).

Table 6.1. Overall and Setting-Specific Response Frequencies for Nutritional Approaches Noted on Any Day (percent)

Data Elements	HHA (*n* = 629)	IRF (*n* = 762)	LTCH (*n* = 448)	SNF (*n* = 1,087)	Overall (*n* = 2,926)
Nutritional approach performed: parenteral/IV (j1a)	0	1	4	0	1
Nutritional approach performed: feeding tube (j1b)	0	3	7	2	3
Nutritional approach performed: mechanically altered diet (j1c)	2	15	14	11	10
Nutritional approach performed: therapeutic diet (j1d)	54	49	59	49	52

Known Groups Validity

Comparing patient/resident assessments on the nutritional approaches data element with other patient/resident characteristics adds information about the validity of these 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 6.2 shows rates of patients/residents receiving a mechanically altered diet on admission (noted on any of the Days 1, 3, 5, or 7) 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 and ability to transfer from lying to sitting. Setting-specific results are presented in Tables A.40–A.43 in the appendix.

Table 6.2. Overall Frequencies for Mechanically Altered Diet by Patient/Resident Characteristics and Clinical Groups (percent)

Patient/Resident Characteristics and Clinical Groups	Mechanically Altered Diet (Yes)
Gender (*n* = 2,786[a])	
Male (*n* = 1,149)	12.1
Female (*n* = 1,637)	9.0
Age (*n* = 2,776)	
18–44 (*n* = 35)	11.4
45–64 (*n* = 289)	6.6
65–74 (*n* = 884)	10.0
75–89 (*n* = 1,269)	10.5
90+ (*n* = 299)	13.0
Length of stay (*n* = 2,461[a]; mean, SD)	Yes: 19.9 (10.1) No: 21.8 (10.1)
Disposition at discharge (*n* = 2,747[a])	
Home (*n* = 1,290)	9.7
Hospital (*n* = 179)	8.9
Hospice (*n* = 38)	7.9
HHA (*n* = 609)	7.1
IRF (*n* = 50)	12.0
LTCH (*n* = 12)	25.0
SNF (*n* = 265)	17.4
Other (*n* = 304)	13.2
Clinical conditions *(n* = 2,139*)*	
Sepsis	
Yes (*n* = 141[a])	17.7
No (*n* = 1,998)	9.4
Heart failure	
Yes (*n* = 363)	11.0
No (*n* = 1,776)	9.7
Stroke	
Yes (*n* = 188[a])	22.3
No (*n* = 1,951)	8.8

Patient/Resident Characteristics and Clinical Groups	Mechanically Altered Diet (Yes)
Hygiene—Toileting (*n* = 1,441[a])[b]	
Independent (*n* = 68)	2.9
Setup or clean-up assistance (*n* = 76)	9.2
Supervision or touching assistance (*n* = 305)	10.5
Partial/moderate assistance (*n* = 347)	11.0
Substantial/maximal assistance (*n* = 320)	14.1
Dependent (*n* = 325)	18.2
Mobility—Lying to sitting (*n* = 1,789[a])	
Independent (*n* = 188; *niv* = 186)	6.4
Setup or clean-up assistance (*n* = 109)	4.6
Supervision or touching assistance (*n* = 510)	9.2
Partial/moderate assistance (*n* = 590)	12.0
Substantial/maximal assistance (*n* = 268)	10.5
Dependent (*n* = 124)	21.0

[a] Significant ($p < 0.05$) associations with Mechanically Altered Diet as indicated by chi-square tests of independence.
[b] Toileting hygiene data not available for HHA patients.

Based on the research literature, we generated several hypotheses or expectations for associations between the data elements and the patient/resident characteristics. We expected Mechanically Altered Diet to be related to age, stroke, toileting, and mobility (i.e., ability to transfer from lying to sitting). Patients/residents with dysphagia, who often require a change in texture of food or liquids, tend to be older,[43] are more likely to have suffered a stroke[44] and have lower functional status,[45] and are more likely to be more dependent on care.[46]

In the overall sample, significant associations for Mechanically Altered Diet were observed with gender, length of stay, disposition at discharge, sepsis, stroke, toileting, and ability to transfer from lying to sitting. Although there were no overall associations of Mechanically Altered Diet with age, this association was significant among LTCH patients.

Gender and Age

- Gender, overall, was significantly associated with Mechanically Altered Diet ($\chi^2_{(1)} = 7.1$, $p < 0.01$), with males showing higher rates of Mechanically Altered Diet (12.1 percent) relative to females (9.0 percent). Similar trends were observed at the setting level in SNFs ($\chi^2_{(1)} = 6.5$, $p < 0.05$) but not in HHAs, IRFs, or LTCHs. *We did not expect this*

[43] Park et al., 2013; Van der Maarel-Wierink et al., 2014.

[44] Park et al., 2013.

[45] Park et al., 2013.

[46] Van der Maarel-Wierink et al., 2014.

association, which is likely due to a gender-related factor, such as age or clinical conditions.

- Age, overall, was not significantly associated with Mechanically Altered Diet. However, at the setting level, age was significantly associated with Mechanically Altered Diet among LTCH patients ($\chi^2_{(4)} = 12.5$, $p < 0.05$), with higher rates of Mechanically Altered Diet in older age groups. Rates for Mechanically Altered Diet were above 20 percent for those age 75 and over and closer to 10 percent for the younger age groups. There were no other setting-specific associations of age with Mechanically Altered Diet. *This finding did not conform to our hypothesis that older patients/residents across all settings would receive mechanically altered diets at higher rates.*

Length of Stay, Disposition at Discharge

- Length of stay was significantly associated with Mechanically Altered Diet overall ($F_{(1,2459)} = 5.6$, $p < 0.05$). Patients/residents who were on a mechanically altered diet had significantly shorter lengths of stay (M = 19.9 days, SD = 10.1) compared with patients not on a mechanically altered diet (M = 21.8 days, SD = 10.1). A significant association was also observed at the setting level among IRF patients ($F_{(1,707)} = 23.1$, $p < 0.001$), but the trend was in the opposite direction. In the IRF setting, patients receiving a mechanically altered diet had significantly longer lengths of stay (M = 16.3 days, SD = 7.0) compared with patients not on a mechanically altered diet (M = 13.8 days, SD = 4.5). *We did not anticipate an association between the Mechanically Altered Diet data element and length of stay. The direction of the association suggests that IRF patients who receive a mechanically altered diet may require longer rehabilitation periods than patients/residents in other PAC settings, likely because of underlying differences in clinical conditions by setting.*
- Disposition at discharge was also significantly associated with Mechanically Altered Diet overall ($\chi^2_{(7)} = 28.1$, $p < 0.001$), with higher rates of Mechanically Altered Diet among those discharged to LTCHs (25.0 percent) and SNFs (17.4 percent) compared with other locations (range: 7.1–13.2 percent). This association was also significant in HHAs ($\chi^2_{(7)} = 57.4$, $p < 0.001$), where Mechanically Altered Diet rates were quite low regardless of disposition at discharge, but 50 percent of those discharged to the IRF setting were on a Mechanically Altered Diet, although this rate represented only two patients. In IRFs ($\chi^2_{(5)} = 26.5$, $p < 0.001$), the discharge pattern revealed that higher rates of Mechanically Altered Diet were observed among those being discharged to other unspecified locations (38.9 percent), SNFs (20.0 percent), and home (18.4 percent), relative to other locations (range: 0.0–11.4 percent). Finally, among residents discharged from SNFs ($\chi^2_{(5)} = 14.1$, $p < 0.05$), the highest rates of Mechanically Altered Diet were observed among those being discharged to LTCHs (30.0 percent), relative to those discharged to other locations (range: 0.0–16.3 percent). *We did not predict associations between Mechanically Altered Diet and disposition at discharge. This pattern of findings generally suggests that patients/residents who require mechanically altered diets are discharged to higher-intensity care settings, relative to other patients/residents without this nutritional need.*

Clinical Conditions

- There was an overall significant association of Mechanically Altered Diet with sepsis ($\chi^2_{(1)} = 10.2$, $p < 0.01$), where patients/residents with this condition had higher rates of Mechanically Altered Diet than those without (17.7 percent versus 9.4 percent). This association was also significant among SNF residents ($\chi^2_{(1)} = 7.2$, $p < 0.01$), with a similar trend of those with sepsis having higher rates of Mechanically Altered Diet than those without (21.6 percent versus 9.7 percent). *We did not anticipate this association. However, some research has found sepsis to be a risk factor for dysphagia*.[47] *Patients with sepsis might also be more likely to have received mechanical ventilation in a prior care setting, and swallowing disorders are a documented aftereffect of prolonged endotracheal intubation.*[48]
- Heart failure was not significantly associated with Mechanically Altered Diet overall or by setting. *We did not expect to observe associations between these variables.*
- There was also an overall significant association of Mechanically Altered Diet with stroke ($\chi^2_{(1)} = 35.2$, $p < 0.001$), where patients/residents with stroke had higher rates of Mechanically Altered Diet than those without (22.3 percent versus 8.8 percent). This association was also significant among IRF patients ($\chi^2_{(1)} = 25.6$, $p < 0.001$), with a similar trend of those with stroke having higher rates of Mechanically Altered Diet than those without (29.6 percent versus 10.3 percent). *This association was expected, as swallowing disorders that may require a mechanically altered diet are a common consequence of stroke,*[49] *and supports the validity of this data element.*

ADLs: Toileting and Ability to Transfer from Lying to Sitting

- Mechanically Altered Diet was significantly associated overall with both level of assistance needed with toileting ($\chi^2_{(5)} = 18.2$, $p < 0.01$) and ability to transfer from lying to sitting ($\chi^2_{(5)} = 24.1$, $p < 0.001$). In both cases, rates of Mechanically Altered Diet tended to increase with increased dependence. This pattern of significance was also observed among IRF patients (toileting: $\chi^2_{(5)} = 11.5$, $p < 0.05$; transfer: $\chi^2_{(5)} = 14.4$, $p < 0.05$) but was not observed in the other settings. *This overall pattern of associations is consistent with our expectations and supports the validity of the Mechanically Altered Diet data element.*

Time to Complete

Table 6.3 shows the average time to complete the Nutritional Approaches data elements. On average, the entire section took 0.9 minutes (SD = 0.5) to complete. Setting-specific time to complete ranges from 0.8 minutes (SD = 0.4) in HHAs to 1.1 minutes (SD = 0.5) in LTCHs.

[47] Zielske et al., 2014.

[48] Skoretz, Flowers, and Martino, 2010.

[49] Martino et al., 2005.

Table 6.3. Time to Complete the Nutritional Approaches Data Elements (minutes)

	HHA (*n* = 422)	IRF (*n* = 457)	LTCH (*n* = 244)	SNF (*n* = 431)	Overall (*n* = 1,554)
Mean (SD)	0.8 (0.4)	1.0 (.5)	1.0 (0.5)	0.9 (1.5)	0.9 (.5)

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 (above or below setting-type median) to evaluate the generalizability of these performance results (see Tables A.44–A.47 in the appendix). No significant differences were found for time to complete the Nutritional Approaches data elements in these sensitivity analyses.

Interrater Reliability

Table 6.4 shows kappa interrater reliability coefficients for the Nutritional Approaches data element 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 site-level quotas. Inclusion in interrater reliability data collection depended on paired facility staff and research nurse assessors' ability to schedule assessments. For these data elements, paired assessments were completed on the 882 patients/residents who were assessed by research nurse and facility/agency staff assessor pairs: 187 in HHAs, 236 in IRFs, 203 in LTCHs, and 256 in SNFs. Kappa for "mechanically altered diet" was good overall (0.65) and in LTCHs (0.69) and SNFs (0.70), and moderate in IRFs (0.52). Kappa for "therapeutic diet" was moderate overall (0.60) and in HHAs (0.43) and good in IRFs (0.70), LTCHs (0.62), and SNFs (0.61). Remaining kappas, overall and by setting, were not stable and thus not reported or discussed.

Table 6.4. Interrater Reliability Kappa or Weighted Kappa for Nutritional Approaches (based on never noted versus noted any day)

Data Element	HHA (*n* = 187)	IRF (*n* = 236)	LTCH (*n* = 203)	SNF (*n* = 256)	Overall (*n* = 882)
Nutritional approach performed: parenteral/IV (j1a)	-	-	-	-	-
Nutritional approach performed: feeding tube (j1b)	-	-	-	-	-
Nutritional approach performed: mechanically altered diet (j1c)	-	0.53	0.69	0.70	0.65
Nutritional approach performed: therapeutic diet (j1d)	0.43	0.70	0.62	0.61	0.60

NOTES: Interrater reliability not shown for data elements 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, and 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 (above or below setting-type median) to evaluate the generalizability of these performance results (see Tables A.48–A.51 in the appendix). No noteworthy differences were found for interrater reliability of the Nutritional Approaches in these sensitivity analyses.

Table 6.5 shows percent agreement for the Nutritional Approaches data element overall and by setting. Overall percent agreement was high for all data elements, ranging from 80 percent to 100 percent with minimal setting differences. However, percent agreement was noticeably lower for therapeutic diet both overall (80 percent) and within each setting (71 percent in HHAs, 85 percent in IRFs, 82 percent in LTCHs, and 78 percent in SNFs) relative to agreement for the other three nutritional approaches.

Table 6.5. Interrater Reliability Percent Agreement for Nutritional Approaches (based on never noted versus noted any day)

Data Element	HHA (*n* = 187)	IRF (*n* = 236)	LTCH (*n* = 203)	SNF (*n* = 256)	Overall (*n* = 882)
Nutritional approach performed: parenteral/IV (j1a)	100	100	99	100	100
Nutritional approach performed: feeding tube (j1b)	100	100	98	100	100
Nutritional approach performed: mechanically altered diet (j1c)	100	89	92	94	93
Nutritional approach performed: therapeutic diet (j1d)	71	85	82	80	80

Discharge

Table 6.6 shows discharge frequency response distributions for the Nutritional Approaches data elements overall and by setting. These approaches were recorded as noted in the chart on Discharge Day, as well as two days prior to discharge. Because the majority of approaches, when noted, were noted on the discharge day, the percentage noted on either day is shown in this table. More detailed information regarding the day the approaches were noted is shown in Table A.52 in the appendix. With the exception of therapeutic diet, which was noted for 46 percent of patients/residents, very few nutritional approaches were noted at discharge.

Table 6.6. Discharge Response Distributions for the Nutritional Approaches Noted on Any Day (percent)

Data Element	HHA (*n* = 139)	IRF (*n* = 339)	LTCH (*n* = 84)	SNF (*n* = 228)	Overall (*n* = 790)
Nutritional approach performed: parenteral/IV (j1a)	0	0	1	0	0
Nutritional approach performed: feeding tube (j1b)	1	3	5	1	2
Nutritional approach performed: mechanically altered diet (j1c)	0	11	12	9	8
Nutritional approach performed: therapeutic diet (j1d)	48	47	62	36	46

Admission to Discharge

Table 6.7 summarizes patterns of change on the Nutritional Approaches data element. Patterns are characterized as "no change" (scores stay the same at admission and discharge), noted at discharge but not at admission, and noted at admission but not at 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 as well as availability to schedule assessments among the facility staff assessors in each participating site.

Table 6.7. Admission to Discharge Results for Nutritional Approaches (percent)

Data Element	HHA (*n* = 137)	IRF (*n* = 335)	LTCH (*n* = 79)	SNF (*n* = 221)	Overall (*n* = 772)
Noted nutritional approach performed: parenteral/IV (j1a)					
No change	100	100	96	100	99
Noted at discharge but not at admission	0	0	0	0	0
Noted at admission but not at discharge	0	0	4	0	1
Noted nutritional approach performed: feeding tube (j1b)					
No change	100	99	95	98	98
Noted at discharge but not at admission	0	1	1	1	1
Noted at admission but not at discharge	0	1	4	1	1
Noted nutritional approach performed: mechanically altered diet (j1c)					
No change	98	91	90	94	93
Noted at discharge but not at admission	0	3	4	2	3
Noted at admission but not at discharge	2	6	6	4	5
Noted nutritional approach performed: therapeutic diet (j1d)					
No change	85	83	84	85	84
Noted at discharge but not at admission	10	7	8	4	7
Noted at admission but not at discharge	5	10	9	11	9

For this data element, both admission and discharge data were collected on 772 patients/residents: 137 in HHAs, 335 in IRFs, 79 in LTCHs, and 221 in SNFs. Overall, responses were very similar from admission to discharge. Between 84 and 100 percent of scores did not change from admission to discharge. The only significant difference from admission to discharge was for parenteral/IV, $t_{(759)} = 26.04$, $p < 0.01$, such that, compared with admission, fewer patients/residents were still on a parenteral/IV at discharge.

Assessor Feedback

Facility staff considered the Nutritional Approaches data elements to be clinically relevant, rating them in the middle of the data elements in terms of clinical utility in the assessor survey. However, research nurses rated Nutritional Approaches lower. In focus groups, Nutritional Approaches and SSTIs were discussed as a group. These data elements were considered to be important by assessors to convey patient/resident significant health care needs, complexity, and progress. For this reason, research nurses thought that standardization would benefit PAC settings by helping facilities and agencies prepare for transfers.

In the survey, facility staff and research nurses rated Nutritional Approaches as having a lower burden than more than half of the data elements. In focus groups, both types of assessors noted that specialty care reports are not always accessible or easy to find in the chart. Completion of these data elements required consulting multiple charts, and, even if these data were not missing, charts often did not clearly describe what day an event took place. Both research nurses and facility staff reported burden related to collecting these data elements—that is, the process of finding the information in the medical record. In the assessor survey, facility staff rated Special Treatments to be in the middle of the data elements in terms of burden, and research nurses rated it to be higher burden than more than half of the other data elements. Further, research nurses noted that field staff had difficulty retrieving information corresponding to the look-back period because the process of abstraction from the electronic medical records could be confusing, tedious, and error-prone. However, it is likely that the burden would be reduced with more experience; facility staff mentioned that an assessor must know the "specific places" in the electronic medical record (i.e., burden and efficiency may have depended on how familiar they were with where the data appear within the system). Therefore, assessor feedback suggests that new hires to facilities may struggle with collecting these data elements, causing inefficiencies, because electronic medical records systems vary by facility.

Assessors participating in the focus groups mentioned that a consideration for standardization across PAC settings is how these concepts are documented in home health care. One research nurse mentioned that there is no way to determine whether nutritional approaches that have been prescribed are being followed.

In summary, these data elements were very important for clinical care planning, but assessors indicated that they were burdensome in focus groups.

Summary

Results for the Nutritional Approaches data elements indicate moderate support for cross-setting standardization. Facility staff found Nutritional Approaches to be clinically relevant with middle-range ratings of clinical utility based on the survey, but research nurses' ratings were somewhat lower. Research nurse assessors noted that these data elements were burdensome to access in the electronic medical record, but this was likely due to their lack of familiarity with the various facility/agency electronic medical records. Nonetheless, research nurses considered these data elements important and thought that standardization would help prepare facilities to transfer patients. Associations of Nutritional Approaches with patient characteristics provide evidence of known groups validity. Specifically, and as expected, mechanically altered diet was associated with higher rates of use among older age, stroke, toileting, and mobility. For interrater reliability, although within acceptable ranges, both kappas and percent agreement tended to be lower than expected, perhaps because of the unfamiliarity of the research nurses with the electronic medical records. Specifically, kappas for mechanically altered diet and therapeutic diet were good to moderate overall and across facilities. Kappas for parenteral/IV or feeding tube were not discussed or reported given their instabilities overall and across facilities. Percent agreement ranged from 80 to 100 percent with one exception: For therapeutic diet within HHA settings, it was only 71 percent. In combination, results suggest that the Nutritional Approaches data elements have high clinical relevance and are important for care planning but have somewhat lower feasibility because of the burden of collecting the information. They displayed acceptable interrater reliability and associations with known groups that are consistent with expectations.

7. Special Treatments

Data Element Description

The Special Treatments data elements assess complex clinical care that the patient/resident receives, including cancer treatments, respiratory treatments, and other treatments. The services, treatments, and interventions an individual receives can have a profound effect on an individual's health status, self-image, dignity, and quality of life.[50] Assessment of Special Treatments the patient/resident received or performed is important to ensure the continued appropriateness of the services, treatments, and interventions.[51]

Special Treatments (Chemotherapy [IV, Oral, Other], Radiation, Oxygen Therapy [Intermittent, Continuous, High-concentration oxygen delivery system], Suctioning [Scheduled, As needed], Tracheostomy Care, Invasive Mechanical Ventilator, Non-Invasive Mechanical Ventilator [BiPAP, CPAP], IV Medications [Antibiotics, Anticoagulation, Other], Transfusions, Dialysis [Hemodialysis, Peritoneal dialysis], IV Access [Peripheral IV, Midline, Central line, Other]) are assessed by reviewing the medical record. With the exception of IV Access and the sub–data elements, similar data elements are currently collected in the MDS 3.0. In addition, similar versions of Invasive Mechanical Ventilator, Non-Invasive Mechanical Ventilator, IV Medications, and Dialysis are currently collected in the LCDS. In the National Beta Test, assessors documented each data element according to when it was first noted in the chart from Admission Days 1, 3, 5, and 7 and at discharge for Discharge Day and Discharge Day minus 2. The Special Treatments data elements, as collected in the National Beta Test, are shown in Figure 7.1.

[50] Eaton, 2004; American Association for Respiratory Care, 2010; Davenport, 2006.

[51] Gay, 2009; Klompas et al., 2011; Kornbau et al., 2015; National Cancer Institute, 2017; National Cancer Institute, 2019; Morris, Whitmer, and McIntosh, 2013.

Figure 7.1. Special Treatments (Cancer, Respiratory, Other)

J2. Check all of the following services, treatments, and interventions that were performed during the assessment period. **CHECK ALL THAT APPLY:**	**Day 1**	**Day 3**	**Day 5**	**Day 7**
Cancer Treatments				
J2a = **Chemotherapy** (if checked, please specify below)	☐ J2a	☐ J2a	☐ J2a	☐ J2a
J2a2a = IV				
J2a3a = Oral	☐ J2a2a	☐ J2a2a	☐ J2a2a	☐ J2a2a
J2a10a = Other	☐ J2a3a	☐ J2a3a	☐ J2a3a	☐ J2a3a
	☐ J2a10a	☐ J2a10a	☐ J2a10a	☐ J2a10a
J2b = **Radiation**	☐ J2b	☐ J2b	☐ J2b	☐ J2b
Respiratory Treatments				
J2c = **Oxygen Therapy** (if checked, please specify below)	☐ J2c	☐ J2c	☐ J2c	☐ J2c
J2c2a = Intermittent				
J2c3a = Continuous				
J2c4a = High-concentration oxygen delivery system	☐ J2c2a ☐ J2c3a ☐ J2c4a	☐ J2c2a ☐ J2c3a ☐ J2c4a	☐ J2c2a ☐ J2c3a ☐ J2c4a	☐ J2c2a ☐ J2c3a ☐ J2c4a
J2d = **Suctioning** (if checked, please specify below)				
J2d2a = Scheduled	☐ J2d	☐ J2d	☐ J2d	☐ J2d
J2d3a = As needed				
J2e = **Tracheostomy Care**	☐ J2d2a	☐ J2d2a	☐ J2d2a	☐ J2d2a
	☐ J2d3a	☐ J2d3a	☐ J2d3a	☐ J2d3a
J2f = **Invasive Mechanical Ventilator**	☐ J2e	☐ J2e	☐ J2e	☐ J2e
	☐ J2f	☐ J2f	☐ J2f	☐ J2f
J2g = **Non-Invasive Mechanical Ventilator** (BiPAP/CPAP) (if checked, please specify below)				

J2g2a = BiPAP J2g3a = CPAP **Other Treatments** J2h = **IV Medications** (if checked, please specify below) J2h3a = Antibiotics J2h4a = Anticoagulation J2h10a = Other J2i = **Transfusions** J2j = **Dialysis** (if checked, please specify below) J2j2a = Hemodialysis J2j3a = Peritoneal dialysis J2k = **IV Access** (if checked, please specify below) J2k2a = Peripheral IV J2k3a = Midline J2k4a = Central line (e.g., PICC, tunneled, port) J2k10a = Other **None of the Above** J2z = **None of the above** J2z1 = **Unknown/Unable to assess** **NOTES:** ________________________ ________________________________ ________________________________	☐ J2g ☐ J2g2a ☐ J2g3a ☐ J2h ☐ J2h3a ☐ J2h4a ☐ J2h10a ☐ J2i ☐ J2j ☐ J2j2a ☐ J2j3a ☐ J2k ☐ J2k2a ☐ J2k3a ☐ J2k4a ☐ J2k10a ☐ J2z ☐ J2z1	☐ J2g ☐ J2g2a ☐ J2g3a ☐ J2h ☐ J2h3a ☐ J2h4a ☐ J2h10a ☐ J2i ☐ J2j ☐ J2j2a ☐ J2j3a ☐ J2k ☐ J2k2a ☐ J2k3a ☐ J2k4a ☐ J2k10a ☐ J2z ☐ J2z1	☐ J2g ☐ J2g2a ☐ J2g3a ☐ J2h ☐ J2h3a ☐ J2h4a ☐ J2h10a ☐ J2i ☐ J2j ☐ J2j2a ☐ J2j3a ☐ J2k ☐ J2k2a ☐ J2k3a ☐ J2k4a ☐ J2k10a ☐ J2z ☐ J2z1	☐ J2g ☐ J2g2a ☐ J2g3a ☐ J2h ☐ J2h3a ☐ J2h4a ☐ J2h10a ☐ J2i ☐ J2j ☐ J2j2a ☐ J2j3a ☐ J2k ☐ J2k2a ☐ J2k3a ☐ J2k4a ☐ J2k10a ☐ J2z ☐ J2z1

Testing Objectives

Basic descriptive statistics (e.g., frequencies, means, SDs) are presented for the Special Treatments data elements within the category of Special Services, Treatments, and Interventions (SSTIs) for patients/residents in each setting and for the overall sample. Admission and discharge frequency tables include information about the day the data element was noted (i.e., Admission [Day 1] and Days 3, 5, and 7; Discharge Day and Discharge Day minus 2). To examine known groups validity, we also examined the IV Access Special Treatments 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, rates of missingness, and time to complete) and interrater reliability (kappa and percent agreement) were examined. Lastly, frequencies combining across the days noted at admission and discharge were compared to inform stability or possible change over time.

Results

Feasibility

Frequencies/Missing

Table 7.1 shows the percentage of responses at admission for each Special Treatments data element overall and by setting. These data elements were administered to 2,926 of the 3,121, or 94 percent, of patients/residents in the admission sample: 629 in HHAs, 762 in IRFs, 448 in LTCHs, and 1,087 in SNFs. Among those who were administered the Special Treatments data elements, missing data at the data element level ranged from 0.5 to 1.4 percent overall with minimal setting differences. Because the majority of treatments, when noted, were noted on Day 1, this table shows rates for having noted the treatment on any day (Day 1, 3, 5, or 7). The detailed results for the rates "day first noted" for each treatment are shown in Table A.53 in the appendix. Results for the Special Treatments data elements show that the majority of treatments were not performed for individuals in the admission sample, and those that were performed tended to be more common in the LTCH setting. For example, oxygen therapy was administered to 20 percent of the overall sample and 44 percent of LTCH patients. Similarly, IV medication and IV access were noted among 25 percent and 24 percent of the overall sample, respectively, but in 77 percent and 91 percent of LTCH patients.

Table 7.1. Overall and Setting-Specific Response Frequencies for Special Treatments Noted on Any Day (percent)

Data Element	HHA (*n* = 629)	IRF (*n* = 762)	LTCH (*n* = 448)	SNF (*n* = 1,087)	Overall (*n* = 2,926)
Cancer treatments					
Treatment performed: Chemotherapy (j2a)	1	3	0	1	1
Chemo treatment performed: IV (j2a2a)	0	1	0	0	0
Chemo treatment performed: Oral (j2a3a)	0	2	0	1	1
Chemo treatment performed: Other (j2a10a)	0	0	0	0	0
Treatment performed: Radiation (j2b)	0	0	0	0	0
Respiratory treatments					
Treatment performed: Oxygen therapy (j2c)	13	17	44	16	20
Type of oxygen therapy performed: Intermittent (j2c2a)	7	11	37	11	14
Type of oxygen therapy performed: Continuous (j2c3a)	6	8	5	5	6
Type of oxygen therapy performed: High-concentration (j2c4a)	0	1	6	0	1
Treatment performed: Suctioning (j2d)	0	1	5	1	1
Type of suctioning performed: Scheduled (j2d2a)	0	0	1	0	0
Type of suctioning performed: As needed (j2d3a)	0	1	5	1	1
Treatment performed: Tracheostomy Care (j2e)	0	1	5	0	1
Treatment performed: Invasive Mechanical Ventilator (j2f)	0	0	3	0	0
Treatment performed: Non-Invasive Mechanical Ventilator (NIMV) (j2g)	4	6	9	4	5
Type of NIMV performed: BiPAP (j2g2a)	1	1	7	1	2
Type of NIMV performed: CPAP (j2g3a)	2	6	2	3	3
Other treatments					
Other performed: IV Meds (j2h)	15	17	77	16	25
Type of IV meds given: Antibiotics (j2h3a)	4	8	64	9	16
Type of IV meds given: Anticoagulation (j2h4a)	8	6	17	6	8
Type of IV meds given: Other (j2h10a)	6	5	20	4	7
Other treatment performed: Transfusions (j2i)	0	1	2	0	0
Other treatment performed: Dialysis (j2j)	3	5	15	3	5
Type of dialysis performed: Hemodialysis (j2j2a)	3	4	15	3	5
Type of dialysis performed: Peritoneal (j2j3a)	0	0	0	0	0
Other treatment performed: IV Access (j2k)	4	22	91	10	24
Type of IV access: Peripheral IV (j2k2a)	0	14	40	2	11
Type of IV access: Midline (j2k3a)	0	1	13	0	2
Type of IV access: Central line (j2k4a)	3	6	54	7	13
Type of IV access: Other (j2k10a)	0	2	3	1	1

Known Groups Validity

Comparing the performance of patients/residents on the IV Access data element with other patient/resident characteristics adds information about the validity of the 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 7.2 shows rates of patients/residents receiving IV Access on admission (noted on any of the Days 1, 3, 5, or 7) 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 and ability to transfer from lying to sitting. Setting-specific results are presented in Tables A.54–A.57 in the appendix.

Table 7.2. Overall Frequencies for IV Access by Patient/Resident Characteristics and Clinical Groups (percent)

Patient/Resident Characteristics and Clinical Groups	IV Access (Yes)
Gender (*n* = 2,799[a])	
Male (*n* = 1,155)	28.8
Female (*n* = 1,644)	20.7
Age (*n* = 2,789[a])	
18–44 (*n* = 36)	61.1
45–64 (*n* = 289)	50.2
65–74 (*n* = 879)	28.2
75–89 (*n* = 1,282)	17.8
90+ (*n* = 303)	10.2
Length of stay (*n* = 2,482; mean, SD)	Yes: 22.2 (11.5) No: 21.4 (13.0)
Disposition at discharge (*n* = 2,760[a])	
Home (*n* = 1,299)	14.4
Hospital (*n* = 184)	27.7
Hospice (*n* = 38)	42.1
HHA (*n* = 612)	25.3
IRF (*n* = 50)	80.0
LTCH (*n* = 12)	8.3
SNF (*n* = 265)	54.7
Other (*n* = 300)	23.0

Patient/Resident Characteristics and Clinical Groups	IV Access (Yes)
Clinical conditions *(n* = 2,153*)*	
Sepsis	
Yes (*n* = 142[a])	57.0
No (*n* = 2,011)	24.3
Heart failure	
Yes (*n* = 365a)	18.1
No (*n* = 1,788)	28.1
Stroke	
Yes (*n* = 190)	25.3
No (*n* = 1,963)	26.5
Hygiene—Toileting (*n* = 1,451[a])[b]	
Independent (*n* = 68)	69.1
Setup or clean-up assistance (*n* = 76)	44.7
Supervision or touching assistance (*n* = 308)	28.3
Partial/moderate assistance (*n* = 351)	28.2
Substantial/maximal assistance (*n* = 321)	30.2
Dependent (*n* = 327)	48.3
Mobility—Lying to sitting (*n* = 1,801[a])	
Independent (*n* = 186)	43.6
Setup or clean-up assistance (*n* = 109)	26.6
Supervision or touching assistance (*n* = 515)	20.4
Partial/moderate assistance (*n* = 594)	24.4
Substantial/maximal assistance (*n* = 271)	27.3
Dependent (*n* = 126)	59.5

[a] Significant ($p < 0.05$) associations with IV Access as indicated by chi-square tests of independence.
[b] Toileting hygiene data not available for HHA patients.

Although we did not have hypotheses or expectations for most characteristics and conditions listed in this table, we did expect IV access to be related to having sepsis. IV access among patients/residents with sepsis is often required to infuse IV fluids, medications, and blood products, as well as draw blood for frequent laboratory studies.[52]

In the overall sample, significant associations for IV access were observed with gender, age, disposition at discharge, sepsis, heart failure, toileting, and ability to transfer from lying to sitting. Although there were no overall associations of IV access with length of stay, this association was significant among IRF patients and SNF residents.

[52] Rhodes et al., 2017.

Gender and Age

- Gender, overall, was significantly associated with IV access ($\chi^2_{(1)} = 24.3$, $p < 0.001$), with males showing higher rates of IV Access (28.8 percent) relative to females (20.7 percent). Similar trends were observed at the setting level in SNFs ($\chi^2_{(1)} = 5.2$, $p < 0.05$) but not in HHAs, IRFs, or LTCHs. *We did not expect this association, which is likely due to a gender-related factor, such as age or clinical conditions.*
- Age, overall, was significantly associated with IV access ($\chi^2_{(4)} = 201.9$, $p < 0.001$), with the lowest rates of IV access in the oldest age groups. Rates for IV access were much lower for those 65 and over (range: 10.2–28.2 percent) compared with those under age 45 (61 percent). This association was also significant among SNF residents ($\chi^2_{(4)} = 70.0$, $p < 0.001$), with a similar trend. There were no other setting-specific associations of age with IV Access. *We did not expect this association, but it is possibly due to the types of conditions for which people in different age groups are receiving PAC services. Alternatively, this could be attributed to proper care intervention based on age and condition.*

Length of Stay, Disposition at Discharge

- Length of stay was not significantly associated with IV access overall. However, significant associations were observed in both IRFs ($F_{(1,707)} = 4.0$, $p < 0.05$) and SNFs ($F_{(1,911)} = 7.4$, $p < 0.01$), where those with IV access had significantly longer stays (IRF: M = 14.8 days, SD = 4.8; SNF: M = 24.7 days, SD = 14.1) relative to those without IV access (IRF: M = 13.9 days, SD = 5.0; SNF: M = 21.1 days, SD = 11.9). *We did not expect this association, but it is logically consistent with the idea that PAC patients/residents with more serious conditions—that is, those patients/residents who might require IV Access for their care—would have longer lengths of stay.*
- Disposition at discharge was significantly associated with IV access overall ($\chi^2_{(7)} = 298.8$, $p < 0.001$), with higher rates of IV access among those discharged to IRFs (80.0 percent), SNFs (54.7 percent), and hospice (42.1 percent) compared with other locations (range: 8.3–27.7 percent). This association was also significant in LTCHs ($\chi^2_{(7)} = 19.0$, $p < 0.01$), where the discharge pattern revealed that rates of IV access were slightly lower among those being discharged to unspecified ("other") locations (86.0 percent) and home (81.4 percent), relative to other locations (range: 86.0–100.0 percent). *We did not expect an association between IV access and setting to which the patient/resident is discharged. Interpreting overall trends within such a range of discharge settings is also challenging. However, the higher rates of discharge to higher-care settings (e.g., SNF, IRF, and hospice) relative to, for example, home or HHA, suggest that patients/residents with IV access have more-serious conditions that require ongoing care.*

Clinical Conditions

- There was an overall significant association of IV access with sepsis ($\chi^2_{(1)} = 73.3$, $p < 0.001$), where patients/residents with this condition had higher rates of IV access than those without (57.0 percent versus 24.3 percent). This association was also significant among SNF residents ($\chi^2_{(1)} = 21.3$, $p < 0.001$), with a similar trend of those with sepsis having higher rates of IV access than those without (29.4 percent versus 9.1 percent).

This association was as hypothesized, supporting the validity of the IV Access data element to proxy for patient/resident acuity.

- There was also an overall significant association of IV access with heart failure ($\chi^2_{(1)} = 15.7$, $p < 0.001$), where patients/residents with heart failure had lower rates of IV access than those without (18.1 percent versus 28.1 percent). This association was not significant at the setting level for any of the four settings. *We did not anticipate this association, which suggests that patients/residents with heart failure are less likely to require IV access via peripherally inserted central catheter, midline, or central line than other patients/residents receiving PAC services.*

ADLs: Toileting and Ability to Transfer from Lying to Sitting

- IV access was significantly associated overall with both level of assistance needed with toileting ($\chi^2_{(5)} = 78.4$, $p < 0.001$) and ability to transfer from lying to sitting ($\chi^2_{(5)} = 102.5$, $p < 0.001$). In both cases, rates of IV access tended to be highest at the extremes; that is, among the most independent and the most dependent. For example, with respect to ability to transfer from lying to sitting, rates of IV access were highest among patients/residents who were rated as independent (43.6 percent) and dependent (59.5) relative to those with other levels of dependence (range: 20.4–27.3 percent). This pattern of significance was also observed among LTCH patients (toileting: $\chi^2_{(5)} = 14.8$, $p < 0.05$; transfer: $\chi^2_{(5)} = 14.2$, $p < 0.05$), and among HHA patients for transfer ($\chi^2_{(5)} = 16.0$, $p < 0.01$) but was not observed in the other settings. *This association was not anticipated and is somewhat difficult to interpret. It is most likely related to the underlying conditions or clinical situations of these patients/residents. That is, patients/residents with IV access with high dependence on ADLs might be seriously ill, perhaps with central lines, while patients/residents with IV access who are not dependent on ADLs may be receiving treatments for different types of medical conditions.*

Time to Complete

Table 7.3 shows the average time to complete the Special Treatments data elements. On average, the entire section took 2.4 minutes (SD = 1.3) to complete. Setting-specific time to complete ranges from 2.1 minutes (SD = 1.2) in HHAs to 2.8 minutes (SD = 1.2) in LTCHs. Across settings, the average time per data element was approximately 13 seconds.

Table 7.3. Time to Complete the Special Treatments Data Elements (minutes)

Data Element		HHA (*n* = 422)	IRF (*n* = 457)	LTCH (*n* = 244)	SNF (*n* = 431)	Overall (*n* = 1,554)
Cancer	Mean (SD)	0.4 (0.2)	0.5 (0.3)	0.5 (0.2)	0.4 (0.2)	0.4 (0.2)
Respiratory	Mean (SD)	1.0 (0.5)	1.2 (0.7)	1.3 (0.6)	1.1 (0.5)	1.1 (0.6)
Other	Mean (SD)	0.8 (0.4)	1.0 (0.5)	1.0 (0.5)	0.9 (0.4)	0.9 (0.5)
All	Mean (SD)	2.1 (1.2)	2.7 (1.5)	2.8 (1.2)	2.3 (1.1)	2.4 (1.3)

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 (above or below setting-type median) to evaluate the generalizability of these performance results (see Tables A.58–A.61 in the appendix). No significant differences were found for time to complete the Special Treatments data elements in these sensitivity analyses.

Interrater Reliability

Table 7.4 shows kappa interrater reliability coefficients for the Special Treatments data elements overall and by setting. As described in more detail in Volume 3, paired assessment data for interrater evaluation were collected on a subset of the National Beta Test admission sample of patients/residents according to site-level quotas. Inclusion in interrater data collection depended on paired facility staff and research nurse assessors' ability to schedule assessments. For these data elements, paired assessments were completed on the 882 patients/residents who were assessed by research nurse and facility/agency staff assessor pairs: 187 in HHAs, 236 in IRFs, 203 in LTCHs, and 256 in SNFs.

Kappa for "oxygen therapy" was excellent overall (0.82) and in HHAs (0.82) and LTCHs (0.86), and good in IRFs (0.80) and SNFs (0.71). For type of "oxygen therapy," kappa for "intermittent" oxygen therapy was excellent overall (0.81) and in LTCHs (0.82) and good in IRFs (0.76) and SNFs (0.75). Kappa for "continuous" oxygen therapy was moderate overall (0.55), good in IRFs (0.68), and fair in LTCHs (0.35). Kappa for "IV medications" was good overall (0.70) and in IRFs (0.61) and LTCHs (0.68), moderate in SNFs (0.52), and poor in HHAs (0.15). For type of "IV medications," kappa for "antibiotics" was excellent overall (0.88) and in LTCHs (0.84) and good in SNFs (0.78). Kappa was poor for "anticoagulation" overall (0.13) and in LTCHs (0.13). Kappa was moderate overall (0.46) and in LTCHs (0.46) for "other." For "IV access," kappa was excellent overall (0.90) and in IRFs (0.81) and good in SNFs (0.74). For type of "IV access," kappa was excellent for "peripheral IV" overall (0.81) and in IRFs (0.81) and good in LTCHs (0.77). For "central line," kappa was excellent overall (0.85) and good in LTCHs (0.78). For "midline," kappa was good (0.75) in LTCHs. In LTCHs, kappa for "non-invasive" therapy was good (0.77) and excellent for "dialysis" therapy (0.92) and "peritoneal" type of dialysis (0.92). As a reminder, 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.

Table 7.4. Interrater Reliability Kappa or Weighted Kappa for Special Treatments Data Elements (based on never noted versus noted any day)

Data Element	HHA (*n* = 187)	IRF (*n* = 236)	LTCH (*n* = 203)	SNF (*n* = 256)	Overall (*n* = 882)
Cancer treatments					
Treatment performed: Chemotherapy (j2a)	-	-	-	-	-
Chemo treatment performed: IV (j2a2a)	-	-	-	-	-
Chemo treatment performed: oral (j2a3a)	-	-	-	-	-
Chemo treatment performed: other (j2a10a)	-	-	-	-	-
Treatment performed: Radiation (j2b)	-	-	-	-	-
Respiratory treatments					
Treatment performed: Oxygen Therapy (j2c)	0.82	0.80	0.86	0.71	0.82
Type of oxygen therapy performed: Intermittent (j2c2a)	-	0.76	0.82	0.75	0.81
Type of oxygen therapy performed: Continuous (j2c3a)	-	0.68	0.35	-	0.55
Type of oxygen therapy performed: High-concentration (j2c4a)	-	-	-	-	-
Treatment performed: Suctioning (j2d)	-	-	-	-	-
Type of suctioning performed: Scheduled (j2d2a)	-	-	-	-	-
Type of suctioning performed: As needed (j2d3a)	-	-	-	-	-
Treatment performed: Tracheostomy Care (j2e)	-	-	-	-	-
Treatment performed: Invasive Mechanical Ventilator (j2f)	-	-	-	-	-
Treatment performed: Non-Invasive Mechanical Ventilator (NIMV) (j2g)	-	-	0.77	-	-
Type of NIMV performed: BiPAP (j2g2a)	-	-	-	-	-
Type of NIMV performed: CPAP (j2g3a)	-	-	-	-	-
Other treatments					
Other treatment performed: IV Meds (j2h)	0.15	0.61	0.68	0.52	0.70
Type of IV meds given: Antibiotics (j2h3a)	-	-	0.84	0.78	0.88
Type of IV meds given: Anticoagulation (j2h4a)	-	-	0.13	-	0.13
Type of IV meds given: Other (j2h10a)	-	-	0.46	-	0.46
Other treatment performed: Transfusions (j2i)	-	-	-	-	-
Other treatment performed: Dialysis (j2j)	-	-	0.92	-	-
Type of dialysis performed: Hemodialysis (j2j2a)	-	-	0.90	-	-
Type of dialysis performed: Peritoneal (j2j3a)	-	-	-	-	-
Other treatment performed: IV Access (j2k)	-	0.81	-	0.74	0.90
Type of IV access: Peripheral IV (j2k2a)	-	0.81	0.77	-	0.81
Type of IV access: Midline (j2k3a)	-	-	0.75	-	-

Data Element	HHA (*n* = 187)	IRF (*n* = 236)	LTCH (*n* = 203)	SNF (*n* = 256)	Overall (*n* = 882)
Type of IV access: Central line (j2k4a)	-	-	0.78	-	0.85
Type of IV access: Other (j2k10a)	-	-	-	-	-

NOTES: Interrater reliability not shown for data elements 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, and 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 (above or below setting-type median) to evaluate the generalizability of these performance results (see Tables A.62–A.65 in the appendix). No noteworthy differences were found for interrater reliability of the Special Treatments data elements in these sensitivity analyses.

Table 7.5 shows percent agreement for the Special Treatments data elements overall and by setting. Overall percent agreement was high for all data elements, ranging from 88 percent to 100 percent with minimal setting differences. The lowest percent agreement was 88 percent for IV Medication therapy performed: 83 percent in HHAs, 91 percent in IRFs, 89 percent in LTCHs, and 87 percent in SNFs.

Table 7.5. Interrater Reliability Percent Agreement for Special Treatments Data Elements (based on never noted versus noted any day)

Data Element	HHA (*n* = 187)	IRF (*n* = 236)	LTCH (*n* = 203)	SNF (*n* = 256)	Overall (*n* = 882)
Cancer treatments					
Treatment performed: Chemotherapy (j2a)	99	100	100	99	100
Chemo treatment performed: IV (j2a2a)	100	100	100	99	100
Chemo treatment performed: oral (j2a3a)	100	100	100	100	100
Chemo treatment performed: other (j2a10a)	100	100	100	100	100
Treatment performed: Radiation (j2b)	99	100	100	100	100
Respiratory treatments					
Treatment performed: Oxygen Therapy (j2c)	96	94	93	91	93
Type of oxygen therapy performed: intermittent (j2c2a)	98	95	92	94	95
Type of oxygen therapy performed: continuous (j2c3a)	97	95	92	93	94
Type of oxygen therapy performed: high-concentration (j2c4a)	100	100	97	100	99
Treatment performed: Suctioning (j2d)	99	99	98	96	98
Type of suctioning performed: scheduled (j2d2a)	100	99	99	99	99
Type of suctioning performed: as needed (j2d3a)	99	100	98	96	98
Treatment performed: Tracheostomy Care (j2e)	100	100	99	100	100
Treatment performed: Invasive Mechanical Ventilator (j2f)	100	100	100	100	100

Data Element	HHA (*n* = 187)	IRF (*n* = 236)	LTCH (*n* = 203)	SNF (*n* = 256)	Overall (*n* = 882)
Treatment performed: Non-Invasive Mechanical Ventilator (NIMV) (j2g)	96	98	96	98	97
Type of NIMV performed: BiPAP (j2g2a)	96	100	97	100	98
Type of NIMV performed: CPAP (j2g3a)	98	98	98	98	98
Other treatments					
Other treatment performed: IV Meds (j2h)	83	91	89	87	88
Type of IV meds given: antibiotics (j2h3a)	98	97	93	96	96
Type of IV meds given: anticoagulation (j2h4a)	90	94	82	92	90
Type of IV meds given: other (j2h10a)	93	98	79	94	91
Other treatment performed: Transfusions (j2i)	100	99	99	100	100
Other treatment performed: Dialysis (j2j)	98	98	98	99	98
Type of dialysis performed: hemodialysis (j2j2a)	98	98	97	99	98
Type of dialysis performed: peritoneal (j2j3a)	100	100	100	100	100
Other treatment performed: IV Access (j2k)	97	94	99	95	96
Type of IV access: peripheral IV (j2k2a)	100	96	89	97	96
Type of IV access: midline (j2k3a)	100	99	94	100	98
Type of IV access: central line (j2k4a)	98	98	89	97	96
Type of IV access: other (j2k10a)	97	98	95	99	97

Discharge

Table 7.6 shows discharge frequency response distributions for the Special Treatments data elements overall and by setting. These treatments were recorded as noted in the chart on the discharge day as well as two days prior to discharge. Because the majority of treatments, when noted, were noted on the discharge day, the percentage noted on either day is shown in this table. More-detailed information regarding the day the treatments were noted is shown in Table A.66 in the appendix. As can be seen in Table A.66, very few treatments were noted at discharge, and similar to admission trends, when noted, treatments were more common among LTCH patients.

Table 7.6. Discharge Response Distributions for the Special Treatment Data Elements (percent)

Data Element	HHA (*n* = 139)	IRF (*n* = 339)	LTCH (*n* = 84)	SNF (*n* = 228)	Overall (*n* = 790)
Cancer treatments					
Treatment performed: Chemotherapy (j2a)	1	1	1	1	1
Chemo treatment Performed: IV (j2a2a)	1	0	0	1	1
Chemo treatment Performed: oral (j2a3a)	1	2	1	1	1
Chemo treatment Performed: other (j2a10a)	0	0	0	0	0
Treatment performed: Radiation (j2b)	0	0	0	0	0
Respiratory treatments					
Treatment performed: Oxygen Therapy (j2c)	11	11	37	10	14
Type of oxygen therapy performed: Intermittent (j2c2a)	6	5	25	8	8
Type of oxygen therapy performed: Continuous (j2c3a)	4	7	10	2	6
Type of oxygen therapy performed: High-concentration (j2c4a)	1	0	1	0	1
Treatment performed: Suctioning (j2d)	0	1	1	0	0
Type of suctioning performed: Scheduled (j2d2a)	0	0	0	0	0
Type of suctioning performed: As needed (j2d3a)	0	1	1	0	0
Treatment performed: Tracheostomy Care (j2e)	0	1	1	0	0
Treatment performed: Invasive Mechanical Ventilator (j2f)	0	0	0	0	0
Treatment performed: Non-Invasive Mechanical Ventilator (NIMV) (j2g)	7	3	11	2	4
Type of NIMV performed: BiPAP (j2g2a)	1	0	8	0	1
TYPE of NIMV performed: CPAP (j2g3a)	5	3	2	2	3
Other treatments					
Other treatment performed: IV Meds (j2h)	12	10	48	8	13
Type of IV meds given: Antibiotics (j2h3a)	1	4	36	4	7
Type of IV meds given: Anticoagulation (j2h4a)	7	4	5	4	4
Type of IV meds given: Other (j2h10a)	4	2	11	0	3
Other treatment performed: Transfusions (j2i)	0	0	1	0	0
Other treatment performed: Dialysis (j2j)	2	3	14	0	3
Type of dialysis performed: Hemodialysis (j2j2a)	2	3	14	0	3
Type of dialysis performed: Peritoneal (j2j3a)	0	0	0	0	0
Other treatment performed: IV Access (j2k)	2	10	65	4	13
Type of IV access: Peripheral IV (j2k2a)	0	5	21	1	4
Type of IV access: Midline (j2k3a)	0	1	12	0	1
Type of IV access: Central line (j2k4a)	2	4	31	3	6
Type of IV access: Other (j2k10a)	0	1	1	0	1

Admission to Discharge

Table 7.7 summarizes patterns of change on the Special Treatments data elements. Patterns are characterized as "no change" (scores stay the same at admission and discharge), noted at discharge but not at admission, and noted at admission but not at 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 as well as availability to schedule assessments among the facility staff assessors in each participating site.

Both admission and discharge data for the Special Treatments data elements were collected on 772 patients/residents: 137 in HHAs, 335 in IRFs, 79 in LTCHs, and 221 in SNFs. Overall, responses were very similar from admission to discharge. Between 87 and 100 percent of scores did not change from admission to discharge. When change was noted, it tended to reflect Special Treatments (or treatment types) noted at admission but not at discharge. Specifically, compared with admission, fewer treatments (and/or treatment types) were noted at discharge for other types of chemotherapy ($t_{(761)} = 10.68$, $p < 0.01$); scheduled suctioning ($t_{(765)} = 10.68$, $p < 0.01$); oxygen therapy ($t_{(676)} = 4.46$, $p < 0.01$) and intermittent oxygen therapy ($t_{(766)} = 4.52$, $p < 0.01$); IV medications ($t_{(768)} = 6.12$, $p < 0.01$), antibiotics ($t_{(767)} = 5.05$, $p < 0.01$), and anticoagulants ($t_{(766)} = 2.98$, $p < 0.01$); and IV access ($t_{(766)} = 6.82$, $p < 0.01$), peripheral IV ($t_{(763)} = 4.75$, $p < 0.01$), and central line ($t_{(764)} = 3.91$, $p < 0.01$).

Table 7.7. Admission to Discharge Results for Special Treatments Data Elements (percent)

Data Element	HHA (*n* = 137)	IRF (*n* = 335)	LTCH (*n* = 79)	SNF (*n* = 221)	Overall (*n* = 772)
Cancer treatments					
Treatment performed: Chemotherapy (j2a)					
No change	99	99	99	99	99
At discharge but not at admission	1	1	1	1	1
At admission but not at discharge	0	1	0	0	0
Chemo treatment performed: IV (j2a2a)					
No change	99	100	100	100	100
At discharge but not at admission	1	0	0	0	0
At admission but not at discharge	0	0	0	0	0
Chemo treatment performed: Oral (j2a3a)					
No change	100	99	99	99	99
At discharge but not at admission	0	1	1	0	1
At admission but not at discharge	0	1	0	0	0
Chemo treatment performed: Other (j2a10a)					
No change	100	100	100	100	100

Data Element	HHA (*n* = 137)	IRF (*n* = 335)	LTCH (*n* = 79)	SNF (*n* = 221)	Overall (*n* = 772)
At discharge but not at admission	0	0	0	0	0
At admission but not at discharge	0	0	0	0	0
Treatment performed: Radiation (j2b)					
No change	100	100	100	100	100
At discharge but not at admission	0	0	0	0	0
At admission but not at discharge	0	0	0	0	0
Respiratory treatments					
Treatment performed: Oxygen Therapy (j2c)					
No change	96	93	82	93	92
At discharge but not at admission	1	1	5	2	2
At admission but not at discharge	2	7	13	6	6
Type of oxygen therapy performed: Intermittent (j2c2a)					
No change	98	94	77	94	93
At discharge but not at admission	1	1	5	1	1
At admission but not at discharge	1	5	18	5	6
Type of oxygen therapy performed: Continuous (j2c3a)					
No change	97	93	91	97	95
At discharge but not at admission	1	3	6	1	2
At admission but not at discharge	2	4	3	2	3
Type of oxygen therapy performed: High-concentration (j2c4a)					
No change	100	99	95	100	99
At discharge but not at admission	0	0	0	0	0
At admission but not at discharge	0	1	5	0	1
Treatment performed: Suctioning (j2d)					
No change	100	99	95	100	99
At discharge but not at admission	0	0	1	0	0
At admission but not at discharge	0	0	4	0	1
Type of suctioning performed: scheduled (j2d2a)					
No change	100	100	99	100	100
At discharge but not at admission	0	0	0	0	0
At admission but not at discharge	0	0	1	0	0
Type of suctioning performed: As needed (j2d3a)					
No change	100	99	95	99	99
At discharge but not at admission	0	0	1	0	0
At admission but not at discharge	0	0	4	0	1
Treatment performed: Tracheostomy Care (j2e)					
No change	100	100	96	100	100

Data Element	HHA (*n* = 137)	IRF (*n* = 335)	LTCH (*n* = 79)	SNF (*n* = 221)	Overall (*n* = 772)
At discharge but not at admission	0	0	1	0	0
At admission but not at discharge	0	0	3	0	0
Treatment performed: Invasive Mechanical Ventilator (j2f)					
No change	100	100	99	100	100
At discharge but not at admission	0	0	0	0	0
At admission but not at discharge	0	0	1	0	0
Treatment performed: Non-Invasive Mechanical Ventilator (NIMV) (j2g)					
No change	98	97	94	99	97
At discharge but not at admission	1	1	1	0	1
At admission but not at discharge	1	3	5	1	2
Type of NIMV performed: BiPAP (j2g2a)					
No change	99	100	95	100	99
At discharge but not at admission	1	0	1	0	0
At admission but not at discharge	0	0	4	0	1
Type of NIMV performed: CPAP (j2g3a)					
No change	97	97	96	99	98
At discharge but not at admission	1	0	1	0	1
At admission but not at discharge	1	3	3	1	2
Other treatments					
Other treatment performed: IV Meds (j2h)					
No change	92	87	72	91	87
At discharge but not at admission	2	3	4	2	3
At admission but not at discharge	6	10	24	7	10
Type of IV meds given: Antibiotics (j2h3a)					
No change	96	95	77	95	93
At discharge but not at admission	1	1	4	0	1
At admission but not at discharge	3	4	19	5	6
Type of IV meds given: Anticoagulation (j2h4a)					
No change	93	93	86	95	93
Noted at discharge but not at admission	2	2	1	2	2
Noted at admission but not at discharge	5	4	13	3	5
Type of IV meds given: Other (j2h10a)					
No change	98	95	82	100	95
At discharge but not at admission	2	1	6	0	2
At admission but not at discharge	0	4	11	0	3
Other treatment performed: Transfusions (j2i)					
No change	100	100	96	100	99

Data Element	HHA (*n* = 137)	IRF (*n* = 335)	LTCH (*n* = 79)	SNF (*n* = 221)	Overall (*n* = 772)
At discharge but not at admission	0	0	1	0	0
At admission but not at discharge	0	0	3	0	0
Other treatment performed: Dialysis (j2j)					
No change	99	99	97	99	99
At discharge but not at admission	0	0	3	0	0
At admission but not at discharge	1	1	0	1	1
Type of dialysis performed: hemodialysis (j2j2a)					
No change	99	99	97	99	99
At discharge but not at admission	0	0	3	0	0
At admission but not at discharge	1	1	0	1	1
Type of dialysis performed: peritoneal (j2j3a)					
No change	100	100	100	100	100
At discharge but not at admission	0	0	0	0	0
At admission but not at discharge	0	0	0	0	0
Other treatment performed: IV Access (j2k)					
No change	98	89	84	95	92
At discharge but not at admission	0	1	1	0	1
At admission but not at discharge	2	10	15	5	8
Type of IV access: peripheral IV (j2k2a)					
No change	100	90	73	98	92
At discharge but not at admission	0	1	8	0	1
At admission but not at discharge	0	9	19	1	6
Type of IV access: Midline (j2k3a)					
No change	100	99	90	100	98
At discharge but not at admission	0	1	5	0	1
At admission but not at discharge	0	1	5	0	1
Type of IV access: Central line (j2k4a)					
No change	99	98	80	96	96
At discharge but not at admission	0	0	5	0	1
At admission but not at discharge	1	1	15	4	4
Type of IV access: Other (j2k10a)					
No change	99	99	95	100	99
At discharge but not at admission	0	0	0	0	0
At admission but not at discharge	1	1	5	0	1

Assessor Feedback

Facility staff considered the Special Treatments data elements to be clinically relevant. Compared with all the data elements in the National Beta Test, facility staff rated the Special

Treatments data elements in the middle for clinical utility in the assessor survey; the research nurses rated these data elements even higher. However, the moderate burden of collecting these data elements was indicated in the assessor survey and the focus groups. In the assessor survey, compared with the other data elements in the National Beta Test, facility staff rated Special Treatments in the middle in terms of burden. Research nurses rated them as having a higher burden than more than half of the other data elements. As discussed in the previous chapter on Nutritional Approaches, the burden associated with completing the Special Treatments data elements had to do primarily with difficulty locating the information in the chart. Completion of these data elements required consulting multiple charts, and even if these data were not missing, charts often did not clearly describe what day an event took place. Further, research nurses noted that field staff had difficulty retrieving information corresponding to the look-back period because the process of abstraction from the electronic medical records could be confusing, tedious, and error-prone. However, it is likely that the burden would be reduced with more experience; facility staff mentioned that an assessor must know the "specific places" in the electronic medical record (i.e., burden and efficiency may have depended on how familiar they were with where the data appear within the system). Therefore, assessor feedback suggests that new hires to facilities may struggle with collecting these data elements, causing inefficiencies, because electronic medical records systems vary by facility.

Assessors participating in the focus groups mentioned that a consideration for standardization across PAC settings is how these concepts are documented in home health care. Facility staff said it is especially difficult in home health care to determine when the treatment or medication was implemented because facility staff only document new or changed orders or events, not ongoing issues.

Summary

Results from the review of Special Treatments data elements suggest that they are important for clinical care planning. Survey data indicated that facility staff rated these data elements in the midrange of clinical utility and burden, whereas research nurses had higher ratings on utility and burden. Feedback from focus groups emphasized consideration of standardizing how these treatments are documented across PAC settings, including ongoing issues in addition to new or changed orders or events. Overall, we found associations of IV access treatment with patient characteristics, which provides evidence of known groups validity. Specifically, IV access overall was significantly associated with gender, age, disposition at discharge, sepsis, heart failure, toileting, and mobility. For interrater reliability, kappas varied in their strength across measures. Overall, for example, kappas were excellent for oxygen therapy but varied from fair to excellent by type of setting. Kappas were good overall for IV medications but varied by type of medication—for antibiotics, overall kappa was excellent, but for anticoagulation overall, kappa was poor. Many of the other kappas overall and by setting were unstable and therefore not

reported or discussed. Percent agreement was high for all data elements, ranging from 88 percent to 100 percent with minimal variation by setting. Overall, responses had high stability from admission to discharge, with most patients/residents demonstrating no change. In summary, results for Special Treatments are somewhat mixed, showing high clinical utility but also high burden. Interrater reliability and percent agreement were mostly high but with some exceptions.

8. Conclusion

The National Beta Test evaluated several standardized data elements in the clinical categories of (1) Impairments and (2) Special Services, Treatments, and Interventions for use in the PAC assessment instruments. Impairments data elements included (1) Hearing and Vision and (2) Bladder and Bowel Continence (both patient interview and chart review). Special Services, Treatments, and Interventions data elements included (1) Nutritional Approaches and (2) Special Treatments.

The general performance of these five data elements is summarized for the combined sample in Table 8.1. As can be seen in Table 8.1, all five data elements performed fairly well, but there was some variability in performance. In terms of feasibility, missing data were very low for all five tested data elements, but there was some variability in time to complete. Of the five tested, the Continence Chart Review data elements, which include nine questions, took the longest to complete (M = 3.5 minutes, SD = 1.8). In contrast, the Continence Interview data element was completed more quickly (M = 1.4 minutes, SD = 0.7). The Special Treatments data elements also took a relatively longer time to complete, with an average of 2.4 minutes (SD = 1.3). However, the Nutritional Approaches and Hearing and Vision data elements each took less than a minute (Nutritional Approaches: 0.88 minutes, SD = 0.5; Hearing and Vision: 0.6 minutes, SD = 0.3).

Interrater reliability varied quite a bit across these five data elements. The low rates of occurrence for many of the chart review data elements precluded calculation of stable kappas. However, with the exception of kappas for the Continence Interview data element, which reflected excellent agreement (0.80–1.00), among the kappas that could be estimated, most reflected moderate (0.41–0.60) to good (0.61–0.80) agreement. 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 are generally in line with expected associations, which provides evidence of known groups validity.

Table 8.1. Summary of Impairments and Special Services, Treatments and Interventions Data Element Performance in National Beta Test (Combined Sample)

Data Element	Time to Complete (Mean, SD)	Interrater Reliability (Kappa)	Interrater Reliability (Percent Agreement)	Assessor Feedback
Hearing and Vision	0.6 (0.3)	Hearing: 0.65 Vision: 0.56	H: 84% V: 83%	High clinical utility, low burden
Continence Interview	1.4 (0.7)	0.96–0.98	98–99%	Moderate clinical utility, moderately low burden
Continence Chart	3.5 (1.8)	0.66–0.79	74–100%	High clinical utility, high burden
Nutritional Approaches	0.88 (0.5)	0.60–0.65	80–100%	Moderate clinical utility, moderately low burden
Special Treatments	2.4 (1.3)	0.13; 0.46–0.90	88–100%	Moderate clinical utility, moderate burden

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.

Although not shown in this table, the evaluation of different look-back periods (Admission [Day 1] and Days 3, 5, 7; Discharge Day and Discharge Day minus 2) for the chart review data elements (Continence, Nutritional Approaches, Special Treatments) produced very clear findings. Specifically, results showed that if an appliance, service, or treatment was present for a given patient/resident, it tended to be noted on Admission [Day 1] and on the Discharge Day. That is, assessors gained very little additional information about these data elements when extending the chart review beyond those days. Further, these data elements showed high stability from admission to discharge, with most patients/residents demonstrating no change.

Still, the few patients/residents who did show change between admission and discharge, as well as the importance of maintaining an awareness of patient/resident status on these data elements during transfer, 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.

As with the quantitative results, assessor feedback is generally supportive of the data elements in the categories of (1) Impairments and (2) Special Services, Treatments, and Interventions, although some data elements posed implementation challenges related to data collection that concerned assessors. However, all data elements were deemed at least moderately clinical useful.

Appendix. Supplementary Tables

Supplementary Tables for Hearing and Vision

Table A.1. Frequencies for Adequate Hearing and Vision by Patient/Resident Characteristics and Clinical Groups in the HHA Setting (percent)

Patient/Resident Characteristics and Clinical Groups	Adequate Hearing (Yes)	Adequate Vision (Yes)
Gender (*nhear* = 623; *nvis* = 621)		
Male (*nhear* = 225; *nvis* = 223)	62.2	71.8
Female (*nhear* = 398; *nvis* = 398)	66.6	73.4
Age (*nhear* = 619[a]; *nvis* = 617)		
18–44 (*nhear* = 4; *nvis* = 4)	100.0	75.0
45–64 (*nhear* = 60; *nvis* = 60)	75.0	68.3
65–74 (*nhear* = 173; *nvis* = 172)	75.7	76.2
75–89 (*nhear* = 311; *nvis* = 311)	64.0	73.6
90+ (*nhear* = 71; *nvis* = 70)	31.0	64.3
Length of stay (*nhear* = 496[a]; *nvis* = 494[a]; mean, SD)	Yes: 30.0 (15.3) No: 33.1 (16.2)	Yes: 29.7 (15.1) No: 35.8 (16.5)
Disposition at discharge (*nhear* = 615; *nvis* = 613[a])		
Home (*nhear* = 456; *nvis* = 454)	64.9	76.4
Hospital (*nhear* = 23; *nvis* = 23)	82.6	65.2
Hospice (*nhear* = 12; *nvis* = 12)	58.3	75.0
HHA (*nhear* = 15; *nvis* = 15)	66.7	60.0
IRF (*nhear* = 4; *nvis* = 4)	75.0	75.0
LTCH (*nhear* = 1; *nvis* = 1)	100.0	0.0
SNF (*nhear* = 6; *nvis* = 6)	83.3	66.7
Other (*nhear* = 98; *nvis* = 98)	59.2	61.2
Clinical conditions *(nhear = 418; nvis* = 415*)*		
Sepsis		
Yes (*nhear* = 9; *nvis* = 9)	77.8	88.9
No (*nhear* = 409; *nvis* = 406)	63.1	71.9
Heart failure		
Yes (*nhear* = 32; *nvis* = 32)	56.3	71.9
No (*nhear* = 386; *nvis* = 383)	64.0	72.3
Stroke		
Yes (*nhear* = 7; *nvis* = 7[a])	71.4	28.6

Patient/Resident Characteristics and Clinical Groups	Adequate Hearing (Yes)	Adequate Vision (Yes)
No (*nhear* = 411; *nvis* = 408)	63.3	73.0
Mobility—Lying to sitting (*nhear* = 391; *nvis* = 388)		
Independent (*nhear* = 30; *nvis* = 30)	70.0	76.7
Setup or clean-up assistance (*nhear* = 60; *nvis* = 59)	70.0	83.1
Supervision or touching assistance (*nhear* = 117; *nvis* = 115)	65.8	78.3
Partial/moderate assistance (*nhear* = 124; *nvis* = 124)	62.9	70.2
Substantial/maximal assistance (*nhear* = 54; *nvis* = 54)	51.9	61.1
Dependent (*nhear* = 6; *nvis* = 6)	50.0	50.0

NOTE: Because of differences in sample sizes for hearing and vision data elements, we report sample sizes for each (*nhear* = hearing; *nvis* = vision).
[a] Significant ($p < 0.05$) associations with adequate hearing or adequate vision as indicated by chi-square tests of independence.

Table A.2. Frequencies for Adequate Hearing and Vision by Patient/Resident Characteristics and Clinical Groups in the IRF Setting (percent)

Patient/Resident Characteristics and Clinical Groups	Adequate Hearing (Yes)	Adequate Vision (Yes)
Gender (*nhear* = 744[a]; *nvis* = 742)		
Male (*nhear* = 319; *nvis* = 318)	68.0	84.3
Female (*nhear* = 425; *nvis* = 424)	78.6	85.4
Age (*nhear* = 741[a]; *nvis* = 739)		
18–44 (*nhear* = 5; *nvis* = 5)	100.0	100.0
45–64 (*nhear* = 57; *nvis* = 57)	93.0	89.5
65–74 (*nhear* = 288; *nvis* = 288)	79.9	86.5
75–89 (*nhear* = 336; *nvis* = 334)	70.5	83.5
90+ (*nhear* = 55; *nvis* = 55)	43.6	78.2
Length of stay (*nhear* = 724; *nvis* = 722[a]; mean, SD)	Yes: 14.1 (5.2) No: 14.3 (4.5)	Yes: 13.9 (4.9) No: 15.1 (5.7)
Disposition at discharge (*nhear* = 738; *nvis* = 736)		
Home (*nhear* = 315; *nvis* = 314)	75.9	85.4
Hospital (*nhear* = 37; *nvis* = 37)	83.8	86.5
Hospice (*nhear* = 7; *nvis* = 7)	42.9	57.1
HHA (*nhear* = 254; *nvis* = 253)	74.8	87.4
IRF (*nhear* = 1; *nvis* = 1)	100.0	100.0
LTCH (*nhear* = 1; *nvis* = 1)	100.0	100.0
SNF (*nhear* = 103; *nvis* = 103)	66.0	76.7
Other (*nhear* = 20; *nvis* = 20)	70.0	95.0
Clinical conditions (*nhear* = *580; nvis* = 578*)*		
Sepsis		

Patient/Resident Characteristics and Clinical Groups	Adequate Hearing (Yes)	Adequate Vision (Yes)
Yes (*nhear* = 25; *nvis* = 25)	64.0	92.0
No (*nhear* = 555; *nvis* = 553)	74.1	85.4
Heart failure		
Yes (*nhear* = 132; *nvis* = 131)	72.0	83.2
No (*nhear* = 448; *nvis* = 447)	74.1	86.4
Stroke		
Yes (*nhear* = 99; *nvis* = 99)	75.8	80.8
No (*nhear* = 481; *nvis* = 479)	73.2	86.6
Hygiene—Toileting (*nhear* = 564; *nvis* = 562)		
Independent (*nhear* = 4; *nvis* = 4)	75.0	100.0
Setup or clean-up assistance (*nhear* = 22; *nvis* = 22)	90.9	90.9
Supervision or touching assistance (*nhear* = 122; *nvis* = 121)	74.6	86.8
Partial/moderate assistance (*nhear* = 135; *nvis* = 136)	69.6	85.3
Substantial/maximal assistance (*nhear* = 139; *nvis* = 137)	74.8	85.4
Dependent (*nhear* = 142; *nvis* = 142)	71.8	83.8
Mobility—Lying to sitting (*nhear* = 577; *nvis* = 575)		
Independent (*nhear* = 41; *nvis* = 41)	63.4	87.8
Setup or clean-up assistance (*nhear* = 16; *nvis* = 16)	62.5	75.0
Supervision or touching assistance (*nhear* = 183; *nvis* = 183)	73.8	91.8
Partial/moderate assistance (*nhear* = 217; *nvis* = 217)	75.6	82.0
Substantial/maximal assistance (*nhear* = 93; *nvis* = 91)	77.4	85.7
Dependent (*nhear* = 27; *nvis* = 27)	70.4	77.8

NOTE: Because of differences in sample sizes for hearing and vision data elements, we report sample sizes for each (*nhear* = hearing; *nvis* = vision).
[a] Significant ($p < 0.05$) associations with adequate hearing or adequate vision as indicated by chi-square tests of independence.

Table A.3. Frequencies for Adequate Hearing and Vision by Patient/Resident Characteristics and Clinical Groups in the LTCH Setting (in percent)

Patient/Resident Characteristics and Clinical Groups	Adequate Hearing (Yes)	Adequate Vision (Yes)
Gender (*nhear* = 475; *nvis* = 474)		
Male (*nhear* = 245; *nvis* = 245)	80.4	79.2
Female (*nhear* = 230; *nvis* = 229)	81.7	71.6
Age (*nhear* = 476[a]; *nvis* = 475)		
18–44 (*nhear* = 24; *nvis* = 24)	91.7	83.3
45–64 (*nhear* = 118; *nvis* = 119)	92.4	80.7
65–74 (*nhear* = 167; *nvis* = 168)	82.0	75.6
75–89 (*nhear* = 152; *nvis* = 150)	73.7	72.7

Patient/Resident Characteristics and Clinical Groups	Adequate Hearing (Yes)	Adequate Vision (Yes)
90+ (*nhear* = 15; *nvis* = 14)	40.0	50.0
Length of stay (*nhear* = 419; *nvis* = 419; mean, SD)	Yes: 23.8 (11.1) No: 23.7 (11.6)	Yes: 23.6 (11.1) No: 24.1 (11.4)
Disposition at discharge (*nhear* = 459; *nvis* = 458[a])		
Home (*nhear* = 93; *nvis* = 92)	75.3	70.7
Hospital (*nhear* = 32; *nvis* = 32)	78.1	81.3
Hospice (*nhear* = 12; *nvis* = 12)	75.0	66.7
HHA (*nhear* = 77; *nvis* = 77)	81.8	87.0
IRF (*nhear* = 45; *nvis* = 45)	84.4	80.0
LTCH (*nhear* = 1; *nvis* = 1)	100.0	100.0
SNF (*nhear* = 133; *nvis* = 133)	81.2	66.9
Other (*nhear* = 66; *nvis* = 66)	83.3	78.8
Clinical conditions *(nhear = 405; nvis* = 404*)*		
Sepsis		
Yes (*nhear* = 68; *nvis* = 67)	82.4	82.1
No (*nhear* = 337; *nvis* = 337)	79.2	72.4
Heart failure		
Yes (*nhear* = 14; *nvis* = 14)	78.6	64.3
No (*nhear* = 391; *nvis* = 390)	79.8	74.4
Stroke		
Yes (*nhear* = 30; *nvis* = 29[a])	66.7	58.6
No (*nhear* = 375; *nvis* = 375)	80.8	75.2
Hygiene—Toileting (*nhear* = 391; *nvis* = 390[a])		
Independent (*nhear* = 46; *nvis* = 46)	80.4	71.7
Setup or clean-up assistance (*nhear* = 33; *nvis* = 33)	75.8	63.6
Supervision or touching assistance (*nhear* = 59; *nvis* = 59)	79.7	91.5
Partial/moderate assistance (*nhear* = 51; *nvis* = 51)	84.3	74.5
Substantial/maximal assistance (*nhear* = 64; *nvis* = 65)	76.6	63.1
Dependent (*nhear* = 138; *nvis* = 136)	80.4	73.5
Mobility—Lying to sitting (*nhear* = 349; *nvis* = 347)		
Independent (*nhear* = 64; *nvis* = 64)	82.8	76.6
Setup or clean-up assistance (*nhear* = 24; *nvis* = 24)	75.0	66.7
Supervision or touching assistance (*nhear* = 61; *nvis* = 61)	77.1	75.4
Partial/moderate assistance (*nhear* = 72; *nvis* = 72)	83.3	77.8
Substantial/maximal assistance (*nhear* = 49; *nvis* = 50)	79.6	68.0
Dependent (*nhear* = 79; *nvis* = 76)	82.3	84.2

NOTE: Because of differences in sample sizes for hearing and vision data elements, we report sample sizes for each (*nhear* = hearing; *nvis* = vision).
[a] Significant ($p < 0.05$) associations with adequate hearing or adequate vision as indicated by chi-square tests of independence.

Table A.4. Frequencies for Adequate Hearing and Vision by Patient/Resident Characteristics and Clinical Groups in the SNF Setting (percent)

Patient/Resident Characteristics and Clinical Groups	Adequate Hearing (Yes)	Adequate Vision (Yes)
Gender (*nhear* = 1,106[a]; *nvis* = 1,102)		
Male (*nhear* = 431; *nvis* = 430)	71.5	78.6
Female (*nhear* = 675; *nvis* = 672)	79.6	77.4
Age (*nhear* = 1,101[a]; *nvis* = 1,097[a])		
18–44 (*nhear* = 9; *nvis* = 9)	88.9	66.7
45–64 (*nhear* = 75; *nvis* = 74)	75.3	81.1
65–74 (*nhear* = 285; *nvis* = 286)	83.9	81.1
75–89 (*nhear* = 556; *nvis* = 553)	76.3	79.4
90+ (*nhear* = 176; *nvis* = 175)	60.2	67.4
Length of stay (*nhear* = 955; *nvis* = 952; mean, SD)	Yes: 21.3 (12.4) No: 21.4 (11.9)	Yes: 21.2 (12.3) No: 21.6 (12.3)
Disposition at discharge (*nhear* = 1,081; *nvis* = 1,077[a])		
Home (*nhear* = 482; *nvis* = 479)	76.4	78.5
Hospital (*nhear* = 111; *nvis* = 111)	77.5	70.3
Hospice (*nhear* = 10; *nvis* = 10)	90.0	70.0
HHA (*nhear* = 277; *nvis* = 278)	79.4	85.3
IRF (*nhear* = 1; *nvis* = 1)	100.0	100.0
LTCH (*nhear* = 10; *nvis* = 10)	80.0	90.0
SNF (*nhear* = 44; *nvis* = 44)	72.7	72.7
Other (*nhear* = 146; *nvis* = 144)	71.9	72.9
Clinical conditions *(nhear* = 868*; nvis* = 864*)*		
Sepsis		
Yes (*nhear* = 52; *nvis* = 52[a])	84.6	88.5
No (*nhear* = 816; *nvis* = 812)	76.6	76.7
Heart failure		
Yes (*nhear* = 209; *nvis* = 210[a])	72.7	70.5
No (*nhear* = 659; *nvis* = 654)	78.5	79.7
Stroke		
Yes (*nhear* = 66; *nvis* = 65[a])	68.2	66.2
No (*nhear* = 802; *nvis* = 799)	77.8	78.4
Hygiene—Toileting (*nhear* = 584; *nvis* = 581[a])		
Independent (*nhear* = 22; *nvis* = 22)	81.8	90.9
Setup or clean-up assistance (*nhear* = 24; *nvis* = 24)	83.3	95.8
Supervision or touching assistance (*nhear* = 143; *nvis* = 142)	79.0	75.4
Partial/moderate assistance (*nhear* = 182; *nvis* = 180)	80.2	79.4
Substantial/maximal assistance (*nhear* = 136; *nvis* = 137)	77.2	76.6

Patient/Resident Characteristics and Clinical Groups	Adequate Hearing (Yes)	Adequate Vision (Yes)
Dependent (*nhear* = 77; *nvis* = 76)	77.9	68.4
Mobility—Lying to sitting (*nhear* = 576; *nvis* = 573)		
Independent (*nhear* = 58; *nvis* = 58)	79.3	89.7
Setup or clean-up assistance (*nhear* = 14; *nvis* = 14)	92.9	85.7
Supervision or touching assistance (*nhear* = 169; *nvis* = 167)	81.7	77.3
Partial/moderate assistance (*nhear* = 208; *nvis* = 206)	77.4	76.7
Substantial/maximal assistance (*nhear* = 100; *nvis* = 101)	82.0	77.2
Dependent (*nhear* = 27; *nvis* = 27)	70.4	66.7

NOTE: Because of differences in sample sizes for hearing and vision data elements, we report sample sizes for each (*nhear* = hearing; *nvis* = vision).
[a] Significant ($p < 0.05$) associations with adequate hearing or adequate vision as indicated by chi-square tests of independence.

Table A.5. Time to Complete Sensory Impairments Data Elements by Urbanicity (minutes)

	Urban (*n* = 1,550)	Nonurban (*n* = 102)	Overall (*n* = 1,652)
Mean (SD)	0.6 (0.3)	0.7 (0.3)	0.6 (0.3)

Table A.6. Time to Complete Sensory Impairments Data Elements by Region (minutes)

	Northeast (*n* = 452)	South (*n* = 625)	Midwest (*n* = 325)	West (*n* = 250)	Overall (*n* = 1,652)
Mean (SD)	0.6 (0.3)	0.6 (0.3)	0.6 (0.3)	0.6 (0.3)	0.6 (0.3)

Table A.7. Time to Complete Sensory Impairments Data Elements by Facility Ownership (minutes)

	For-Profit (*n* = 623)	Nonprofit (*n* = 1,018)	Overall (*n* = 1,652[a])
Mean (SD)	0.6 (0.3)	0.6 (0.3)	0.6 (0.3)

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

Table A.8. Time to Complete Sensory Impairments Data Elements by Facility Size (minutes)

	Below Setting-Type Median (*n* = 706)	Above Setting-Type Median (*n* = 945)	Overall (*n* = 1,652[a])
Mean (SD)	0.7 (0.3)	0.6 (0.3)	0.6 (0.3)

[a] 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.9. Interrater Reliability Kappa or Weighted Kappa for Sensory Impairments Data Elements by Urbanicity

Data Element	Urban (*n* = 893)	Nonurban (*n* = 67)
Ability to hear (a1)	0.64	0.77
Ability to see (a2)	0.54	0.77

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, and 0.81–1.00 is excellent/almost perfect.

Table A.10. Interrater Reliability Kappa or Weighted Kappa for Sensory Impairments Data Elements by Region

Data Element	Northeast (*n* = 212)	South (*n* = 359)	Midwest (*n* = 209)	West (*n* = 180)
Ability to hear (a1)	0.46	0.54	0.86	0.71
Ability to see (a2)	0.45	0.48	0.76	0.62

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, and 0.81–1.00 is excellent/almost perfect.

Table A.11. Interrater Reliability Kappa or Weighted Kappa for Sensory Impairments items by Facility Ownership

Data Element	For-Profit (*n* = 607)	Nonprofit (*n* = 347)
Ability to hear (a1)	0.66	0.63
Ability to see (a2)	0.57	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, and 0.81–1.00 is excellent/almost perfect.

Table A.12. Interrater Reliability Kappa or Weighted Kappa for Sensory Impairments items by Facility Size

Data Element	Below Setting-Type Median (*n* = 424)	Above Setting-Type Median (*n* = 424)
Ability to hear (a1)	0.70	0.60
Ability to see (a2)	0.61	0.52

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, and 0.81–1.00 is excellent/almost perfect.

Supplementary Tables for Continence Interview

Table A.13. Frequencies for Bladder Incontinence Interview Data Element by Patient/Resident Characteristics and Clinical Groups in the HHA Setting (percent)

Patient/Resident Characteristics and Clinical Groups	Bladder Incontinence (Yes)
Gender (*n* = 618[a])	
Male (*n* = 220)	25.5
Female (*n* = 398)	42.7
Age (*n* = 614)	
18–44 (*n* = 4)	25.0
45–64 (*n* = 60)	38.3
65–74 (*n* = 173)	30.1
75–89 (*n* = 309)	37.2
90+ (*n* = 68)	48.5
Length of stay (*n* = 493; mean, SD)	Yes: 32.75 (15.90) No: 30.16 (15.36)
Disposition at discharge (*n* = 610)	
Home (*n* = 453)	35.3
Hospital (*n* = 23)	21.7
Hospice (*n* = 12)	50.0
HHA (*n* = 15)	60.0
IRF (*n* = 4)	25.0
LTCH (*n* = 1)	0.0
SNF (*n* = 6)	66.7
Other (*n* = 96)	39.6
Clinical conditions (*n* = 415)	
Sepsis	
Yes (*n* = 8)	50.0
No (*n* = 407)	38.1
Heart failure	
Yes (*n* = 32)	50.0
No (*n* = 383)	37.3
Stroke	
Yes (*n* = 6)	16.7
No (*n* = 409)	38.6
Mobility—Lying to sitting (*n* = 388)	
Independent (*n* = 30)	36.7
Setup or clean-up assistance (*n* = 58)	36.2

Patient/Resident Characteristics and Clinical Groups	Bladder Incontinence (Yes)
Supervision or touching assistance (*n* = 118)	33.9
Partial/moderate assistance (*n* = 124)	37.9
Substantial/maximal assistance (*n* = 53)	49.1
Dependent (*n* = 5)	80.0

[a] Significant *(p* < 0.05) associations with Bladder Incontinence as indicated by chi-square tests of independence.

Table A.14. Frequencies or Bladder Incontinence Interview Data Element by Patient/Resident Characteristics and Clinical Groups in the IRF Setting (percent)

Patient/Resident Characteristics and Clinical Groups	Bladder Incontinence (Yes)
Gender (*n* = *732*)	
Male (*n* = 314)	32.8
Female (*n* = 418)	38.3
Age (*n* = 729)	
18–44 (*n* = 5)	20.0
45–64 (*n* = 58)	34.5
65–74 (*n* = 285)	34.0
75–89 (*n* = 327)	37.6
90+ (*n* = 54)	37.0
Length of stay (*n* = 715[a]; mean, SD)	Yes: 15.42 (5.80) No: 13.28 (4.37)
Disposition at discharge (*n* = 727)	
Home (*n* = 312)	32.7
Hospital (*n* = 36)	33.3
Hospice (*n* = 7)	57.1
HHA (*n* = 251)	37.5
IRF (*n* = 1)	100
LTCH (*n* = 0)	—
SNF (*n* = 100)	42.0
Other (*n* = 20)	30.0
Clinical conditions *(n* = 570*)*	
Sepsis	
Yes (*n* = 24)	41.7
No (*n* = 546)	35.7
Heart failure	
Yes (*n* = 129)	34.9
No (*n* = 441)	36.3

Patient/Resident Characteristics and Clinical Groups	Bladder Incontinence (Yes)
Stroke	
Yes (*n* = 98)	33.7
No (*n* = 472)	36.4
Hygiene—Toileting (*n* = 554[a])	
Independent (*n* = 5)	0.0
Setup or clean-up assistance (*n* = 21)	28.6
Supervision or touching assistance (*n* = 119)	25.2
Partial/moderate assistance (*n* = 135)	30.4
Substantial/maximal assistance (*n* = 136)	42.7
Dependent (*n* = 138)	47.8
Mobility—Lying to sitting (*n* = 567[a])	
Independent (*n* = 42)	16.7
Setup or clean-up assistance (*n* = 16)	31.3
Supervision or touching assistance (*n* = 184)	34.2
Partial/moderate assistance (*n* = 212)	37.3
Substantial/maximal assistance (*n* = 87)	40.2
Dependent (*n* = 26)	53.9

[a] Significant ($p < 0.05$) associations with Bladder Incontinence as indicated by chi-square tests of independence.

Table A.15. Frequencies for Bladder Incontinence Interview Data Element by Patient/Resident Characteristics and Clinical Groups in the LTCH Setting (percent)

Patient/Resident Characteristics and Clinical Groups	Bladder Incontinence (Yes)
Gender (*n* = *444*)	
Male (*n* = 228)	32.9
Female (*n* = 216)	37.0
Age (*n* = 445)	
18–44 (*n* = 21)	23.8
45–64 (*n* = 113)	27.4
65–74 (*n* = 160)	33.8
75–89 (*n* = 137)	42.3
90+ (*n* = 14)	50.0
Length of stay (*n* = 393; mean, SD)	Yes: 23.84 (11.32) No: 23.60 (10.82)
Disposition at discharge (*n* = 430)	
Home (*n* = 89)	29.2
Hospital (*n* = 1631	38.7
Hospice (*n* = 11)	27.3

Patient/Resident Characteristics and Clinical Groups	Bladder Incontinence (Yes)
SNF (*n* = 119)	37.8
IRF (*n* = 42)	47.6
HHA (*n* = 76)	36.8
LTCH (*n* = 1)	0.0
Other (*n* = 61)	26.2
Clinical conditions *(n* = 378*)*	
Sepsis	
Yes (*n* = 66)	33.3
No (*n* = 312)	34.3
Heart failure	
Yes (*n* = 13)	15.4
No (*n* = 365)	34.8
Stroke	
Yes (*n* = 25)	44.0
No (*n* = 353)	33.4
Hygiene—Toileting (*n* = 368)	
Independent (*n* = 45)	42.2
Setup or clean-up assistance (*n* = 33)	24.2
Supervision or touching assistance (*n* = 57)	29.8
Partial/moderate assistance (*n* = 50)	34.0
Substantial/maximal assistance (*n* = 62)	40.3
Dependent (*n* = 121)	34.7
Mobility—Lying to sitting (*n* = 336)	
Independent (*n* = 62)	38.7
Setup or clean-up assistance (*n* = 23)	39.1
Supervision or touching assistance (*n* = 58)	32.8
Partial/moderate assistance (*n* = 71)	33.8
Substantial/maximal assistance (*n* = 50)	38.0
Dependent (*n* = 72)	30.6

[a] Significant ($p < 0.05$) associations with Bladder Incontinence as indicated by chi-square tests of independence.

Table A.16. Frequencies for Bladder Incontinence Interview Data Element by Patient/Resident Characteristics and Clinical Groups in the SNF Setting (percent)

Patient/Resident Characteristics and Clinical Groups	Bladder Incontinence (Yes)
Gender (*n* = 1,060[a])	
Male (*n* = 410)	34.4
Female (*n* = 650)	46.5
Age (*n* = 1,055[a])	
18–44 (*n* = 7)	57.1
45–64 (*n* = 73)	30.1
65–74 (*n* = 278)	35.6
75–89 (*n* = 532)	44.7
90+ (*n* = 165)	47.3
Length of stay (*n* = 922; mean, SD)	Yes: 22.01 (12.09) No: 20.82 (12.41)
Disposition at discharge (*n* = 1,040)	
Home (*n* = 465)	38.7
Hospital (*n* = 106)	43.4
Hospice (*n* = 9)	66.7
SNF (*n* = 42)	50.0
IRF (*n* = 1)	0.0
HHA (*n* = 270)	41.5
LTCH (*n* = 8)	37.5
Other (*n* = 139)	47.5
Clinical conditions (*n* = 831*)*	
Sepsis	
Yes (*n* = 51)	35.3
No (*n* = 780)	41.2
Heart failure	
Yes (*n* = 202[a])	47.0
No (*n* = 629)	38.8
Stroke	
Yes (*n* = 63)	42.9
No (*n* = 768)	40.6
Hygiene—Toileting (*n* = 556[a])	
Independent (*n* = 21)	23.8
Setup or clean-up assistance (*n* = 23)	21.7
Supervision or touching assistance (*n* = 140)	34.3
Partial/moderate assistance (*n* = 172)	43.6

Patient/Resident Characteristics and Clinical Groups	Bladder Incontinence (Yes)
Substantial/maximal assistance (*n* = 127)	48.8
Dependent (*n* = 73)	45.2
Mobility—Lying to sitting (*n* = 548)	
Independent (*n* = 55)	32.7
Setup or clean-up assistance (*n* = 13)	23.1
Supervision or touching assistance (*n* = 162)	38.3
Partial/moderate assistance (*n* = 197)	42.1
Substantial/maximal assistance (*n* = 96)	51.0
Dependent (*n* = 25)	52.0

[a] Significant ($p < 0.05$) associations with Bladder Incontinence as indicated by chi-square tests of independence.

Table A.17. Time to Complete the Continence Interview Data Elements by Urbanicity (minutes)

	Urban (*n* = 584)	Nonurban (*n* = 110)	Overall (*n* = 1,694)
Mean (SD)	1.4 (0.7)	1.5 (0.7)	1.4 (0.7)

Table A.18. Time to Complete the Continence Interview Data Elements by Region (minutes)

	Northeast (*n* = 457)	South (*n* = 632)	Midwest (*n* = 338)	West (*n* = 267)	Overall (*n* = 1,694)
Mean (SD)	1.4 (0.6)	1.4 (0.7)	1.3 (0.7)	1.4 (0.7)	1.4 (0.7)

Table A.19. Time to Complete the Continence Interview Data Elements by Facility Ownership (minutes)

	For-Profit (*n* = 1,045)	Nonprofit (*n* = 634)	Overall (*n* = 1,694[a])
Mean (SD)	1.4 (0.7)	1.3 (0.7)	1.4 (0.7)

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

Table A.20. Time to Complete the Continence Interview Data Elements by Facility Size (minutes)

	Below Setting-Type Median (*n* = 723)	Above Setting-Type Median (*n* = 970)	Overall (*n* = 1,694[a])
Mean (SD)	1.4 (0.7)	1.3 (0.7)	1.4 (0.7)

[a] 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.21. Interrater Reliability Kappa or Weighted Kappa for Continence Interview Data Elements by Urbanicity

Data Element	Urban (*n* = 861)	Nonurban (*n* = 66)
Any bladder incontinent events past 3 days (g1a)	0.97	1.00
How big problem are bladder incontinent events (g1b)	0.96	1.00
Any bowel incontinent events past 3 days (g2a)	0.97	-
How big problem are bowel incontinent events (g2b)	0.98	1.00

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.22. Interrater Reliability Kappa or Weighted Kappa for Continence Interview Data Elements by Region

Data Element	Northeast (*n* = 201)	South (*n* = 352)	Midwest (*n* = 205)	West (*n* = 169)
Any bladder incontinent events past 3 days (g1a)	0.96	0.97	0.97	0.99
How big problem are bladder incontinent events (g1b)	0.93	0.98	1.00	0.92
Any bowel incontinent events past 3 days (g2a)	0.95	0.98	1.00	-
How big problem are bowel incontinent events (g2b)	0.98	0.97	1.00	1.00

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.23. Interrater Reliability Kappa or Weighted Kappa for the Continence Interview Data Elements by Facility Ownership

Data Element	For-Profit (*n* = 586)	Nonprofit (*n* = 335)
Any bladder incontinent events past 3 days (g1a)	0.97	0.96
How big problem are bladder incontinent events (g1b)	0.97	0.95
Any bowel incontinent events past 3 days (g2a)	0.97	-
How big problem are bowel incontinent events (g2b)	0.98	0.99

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.24. Interrater Reliability Kappa or Weighted Kappa for the Continence Interview Data Elements by Facility Size

Data Element	Below Setting-Type Median (*n* = 415)	Above Setting-Type Median (*n* = 511)
Any bladder incontinent events past 3 days (g1a)	0.98	0.96
How big problem are bladder incontinent events (g1b)	0.98	0.95
Any bowel incontinent events past 3 days (g2a)	0.99	0.96
How big problem are bowel incontinent events (g2b)	0.99	0.97

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 Continence Chart Review

Table A.25. Overall and Setting-Specific Response Frequencies in for Continence Appliance Use Data Elements by Day First Noted (percent, counts)

Data Element	HHA (*n* = 628)	IRF (*n* = 762)	LTCH (*n* = 448)	SNF (*n* = 1,088)	Overall (*n* = 2,926)
Day first noted use of bladder appliance: indwelling urethral catheter (g3a1)					
Never	98 (602)	92 (696)	67 (297)	94 (1,016)	90 (2,611)
Day 1	2 (13)	8 (57)	28 (126)	5 (59)	9 (255)
Day 3	0 (0)	0 (2)	3 (13)	1 (5)	1 (20)
Day 5	0 (0)	0 (3)	1 (4)	0 (1)	0 (8)
Day 7	0 (0)	0 (1)	1 (4)	0 (0)	0 (5)
Day first noted use of bladder appliance: other indwelling catheter (g3a2)					
Never	99 (610)	99 (752)	94 (418)	98 (1,060)	98 (2,840)
Day 1	1 (5)	1 (7)	6 (25)	2 (18)	2 (55)
Day 3	0 (0)	0 (0)	0 (1)	0 (2)	0 (3)
Day 5	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Day 7	0 (0)	0 (0)	0 (0)	0 (1)	0 (1)
Day first noted use of bladder appliance: external catheter (g3a3)					
Never	100 (615)	99 (748)	96 (428)	100 (1,079)	99 (2,870)
Day 1	0 (0)	1 (7)	2 (8)	0 (1)	1 (16)
Day 3	0 (0)	0 (1)	1 (3)	0 (1)	0 (5)
Day 5	0 (0)	0 (1)	0 (1)	0 (0)	0 (2)
Day 7	0 (0)	0 (2)	1 (4)	0 (0)	0 (6)
Day first noted use of bladder appliance: urostomy (g3a4)					
Never	100 (613)	100 (757)	99 (441)	100 (1,078)	100 (2,889)

Data Element	HHA (*n* = 628)	IRF (*n* = 762)	LTCH (*n* = 448)	SNF (*n* = 1,088)	Overall (*n* = 2,926)
Day 1	0 (2)	0 (2)	1 (3)	0 (3)	0 (10)
Day 3	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Day 5	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Day 7	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Day first noted use of bladder appliance: intermittent catheterization (g3a5)					
Never	100 (614)	96 (727)	100 (442)	99 (1,073)	99 (2,856)
Day 1	0 (1)	2 (16)	0 (1)	1 (7)	1 (25)
Day 3	0 (0)	1 (8)	0 (0)	0 (0)	0 (8)
Day 5	0 (0)	1 (6)	0 (1)	0 (1)	0 (8)
Day 7	0 (0)	0 (2)	0 (0)	0 (0)	0 (2)
Day first noted use of bladder appliance: other (g3a6)					
Never	100 (613)	97 (739)	98 (436)	98 (1,056)	98 (2,844)
Day 1	0 (2)	2 (16)	1 (6)	2 (20)	2 (44)
Day 3	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Day 5	0 (0)	1 (3)	0 (0)	0 (2)	0 (5)
Day 7	0 (0)	0 (1)	1 (2)	0 (3)	0 (6)
Day first noted use of indwelling or external bowel appliance (g5a)					
Never	96 (605)	98 (743)	88 (393)	96 (1,048)	95 (2,789)
Day 1	1 (8)	1 (9)	12 (52)	2 (26)	3 (95)
Day 3	1 (5)	0 (4)	0 (1)	0.5 (4)	1 (14)
Day 5	1 (8)	1 (5)	0 (2)	1 (6)	1 (21)
Day 7	0 (2)	0 (1)	0 (0)	0.5 (4)	0 (7)

Table A.26. Frequencies for Any Bladder Appliance Use by Patient/Resident Characteristics and Clinical Groups in the HHA Setting (percent)

Patient/Resident Characteristics and Clinical Groups	Any Appliance Use (Yes)
Gender (*n* = *608*)	
Male (*n* = 217)	4.2
Female (*n* = 391)	3.1
Age (*n* = 605)	
18–44 (*n* = 4)	0.0
45–64 (*n* = 60)	6.7
65–74 (*n* = 172)	4.1
75–89 (*n* = 301)	3.3
90+ (*n* = 68)	0.0

Patient/Resident Characteristics and Clinical Groups	Any Appliance Use (Yes)
Length of stay (*n* = 485; mean, SD)	Yes: 29.7 (14.8) No: 31.0 (15.5)
Disposition at discharge (*n* = 600[a])	
Home (*n* = 445)	2.0
Hospital (*n* = 23)	30.4
Hospice (*n* = 12)	0.0
HHA (*n* = 15)	6.7
IRF (*n* = 4)	0.0
LTCH (*n* = 1)	0.0
SNF (*n* = 5)	0.0
Other (*n* = 95)	2.1
Clinical conditions (*n* = 406*)*	
Sepsis	
Yes (*n* = 7)	0.0
No (*n* = 399)	2.8
Heart failure	
Yes (*n* = 31)	3.2
No (*n* = 375)	2.7
Stroke	
Yes (*n* = 6)	16.7
No (*n* = 400)	2.5
Mobility—Lying to sitting (*n* = 379)	
Independent (*n* = 30)	6.7
Setup or clean-up assistance (*n* = 57)	1.8
Supervision or touching assistance (*n* = 116)	1.7
Partial/moderate assistance (*n* = 123)	2.4
Substantial/maximal assistance (*n* = 47)	2.1
Dependent (*n* = 6)	0.0

[a] Significant ($p < 0.05$) associations with Appliance Use.

Table A.27. Frequencies for Any Bladder Appliance Use by Patient/Resident Characteristics and Clinical Groups in the IRF Setting (percent)

Patient/Resident Characteristics and Clinical Groups	Device Use (Yes)
Gender (*n* = 729[a])	
Male (*n* = 318)	23.9
Female (*n* = 411)	11.2
Age (*n* = 726)	
18–44 (*n* = 5)	20.0
45–64 (*n* = 57)	10.5
65–74 (*n* = 286)	17.8
75–89 (*n* = 325)	17.5
90+ (*n* = 53)	9.4
Length of stay (*n* = 712[a]; mean, SD)	Yes: 16.2 (5.8) No: 13.7 (4.7)
Disposition at discharge (*n* = 726)	
Home (*n* = 311)	14.5
Hospital (*n* = 35)	22.9
Hospice (*n* = 7)	42.9
SNF (*n* = 105)	24.8
IRF (*n* = 1)	0.0
HHA (*n* = 249)	14.9
LTCH (*n* = 0)	—
Other (*n* = 18)	16.7
Clinical conditions *(n = 565)*	
Sepsis	
Yes (*n* = 24)	16.7
No (*n* = 541)	17.7
Heart failure	
Yes (*n* = 125)	80.8
No (*n* = 440)	82.7
Stroke	
Yes (*n* = 98)	17.4
No (*n* = 467)	17.8
Hygiene—Toileting (*n* = 549[a])	
Independent (*n* = 5)	0.0
Setup or clean-up assistance (*n* = 21)	9.5
Supervision or touching assistance (*n* = 116)	7.8
Partial/moderate assistance (*n* = 133)	16.5
Substantial/maximal assistance (*n* = 135)	19.3

Patient/Resident Characteristics and Clinical Groups	Device Use (Yes)
Dependent (*n* = 139)	28.1
Mobility—Lying to sitting (*n* = 562[a])	
Independent (*n* = 42)	14.3
Setup or clean-up assistance (*n* = 16)	0.0
Supervision or touching assistance (*n* = 182)	13.2
Partial/moderate assistance (*n* = 208)	16.8
Substantial/maximal assistance (*n* = 88)	25.0
Dependent (*n* = 26)	42.3

[a] Significant ($p < 0.05$) associations with Bladder Appliance Use.

Table A.28. Frequencies for Any Bladder Appliance Use by Patient/Resident Characteristics and Clinical Groups in the LTCH Setting (percent)

Patient/Resident Characteristics and Clinical Groups	Device Use (Yes)
Gender (*n* = *427*)	
Male (*n* = 220)	40.9
Female (*n* = 207)	40.1
Age (*n* = 428[a])	
18–44 (*n* = 18)	61.1
45–64 (*n* = 108)	31.5
65–74 (*n* = 153)	37.3
75–89 (*n* = 135)	47.4
90+ (*n* = 14)	57.1
Length of stay (*n* = 380; mean, SD)	Yes: 25.0 (9.3) No: 23.3 (12.0)
Disposition at discharge (*n* = 416[a])	
Home (*n* = 86)	20.9
Hospital (*n* = 29)	48.3
Hospice (*n* = 10)	80.0
SNF (*n* = 114)	51.8
IRF (*n* = 44)	50.0
HHA (*n* = 75)	37.3
LTCH (*n* = 1)	100.0
Other (*n* = 57)	38.6
Clinical conditions (*n* = 365*)*	
Sepsis	
Yes (*n* = 60)	46.7
No (*n* = 305)	39.7

Patient/Resident Characteristics and Clinical Groups	Device Use (Yes)
Heart failure	
Yes (*n* = 11)	36.4
No (*n* = 354)	41.0
Stroke	
Yes (*n* = 26)	38.5
No (*n* = 339)	41.0
Hygiene—Toileting (*n* = 353[a])	
Independent (*n* = 42)	9.5
Setup or clean-up assistance (*n* = 32)	34.4
Supervision or touching assistance (*n* = 55)	23.6
Partial/moderate assistance (*n* = 48)	37.5
Substantial/maximal assistance (*n* = 59)	44.1
Dependent (*n* = 117)	61.5
Mobility—Lying to sitting (*n* = 322[a])	
Independent (*n* = 58)	10.3
Setup or clean-up assistance (*n* = 23)	17.4
Supervision or touching assistance (*n* = 58)	27.6
Partial/moderate assistance (*n* = 68)	44.1
Substantial/maximal assistance (*n* = 45)	51.1
Dependent (*n* = 70)	55.7

[a] Significant ($p < 0.05$) associations with Bladder Appliance Use.

Table A.29. Frequencies for Any Bladder Appliance Use by Patient/Resident Characteristics and Clinical Groups in the SNF Setting (percent)

Patient/Resident Characteristics and Clinical Groups	Device Use (Yes)
Gender (*n* = 1,056[a])	
Male (*n* = 409)	16.1
Female (*n* = 647)	7.6
Age (*n* = 1051)	
18–44 (*n* = 9)	11.1
45–64 (*n* = 69)	14.5
65–74 (*n* = 279)	8.2
75–89 (*n* = 526)	12.4
90+ (*n* = 168)	8.9
Length of stay (*n* = 916; mean, SD)	Yes: 23.1 (14.5) No: 21.2 (11.9)

Patient/Resident Characteristics and Clinical Groups	Device Use (Yes)
Disposition at discharge (*n* = 1,038)	
Home (*n* = 462)	11.0
Hospital (*n* = 109)	9.9
Hospice (*n* = 9)	0.0
SNF (*n* = 43)	11.6
IRF (*n* = 1)	0.0
HHA (*n* = 273)	10.6
LTCH (*n* = 10)	20.0
Other (*n* = 139)	10.8
Clinical conditions *(n = 826)*	
Sepsis	
Yes (*n* = 52)	9.6
No (*n* = 774)	12.0
Heart failure	
Yes (*n* = 200)	14.0
No (*n* = 626)	11.2
Stroke	
Yes (*n* = 61)	16.4
No (*n* = 765)	11.5
Hygiene—Toileting (*n* = 552[a])	
Independent (*n* = 21)	9.5
Setup or clean-up assistance (*n* = 23)	0.0
Supervision or touching assistance (*n* = 137)	10.2
Partial/moderate assistance (*n* = 170)	6.5
Substantial/maximal assistance (*n* = 128)	13.3
Dependent (*n* = 73)	26.0
Mobility—Lying to sitting (*n* = 544[a])	
Independent (*n* = 58)	5.2
Setup or clean-up assistance (*n* = 13)	15.4
Supervision or touching assistance (*n* = 159)	12.0
Partial/moderate assistance (*n* = 197)	8.1
Substantial/maximal assistance (*n* = 93)	15.1
Dependent (*n* = 24)	29.2

[a] Significant ($p < 0.05$) associations with Device Use as indicated by chi-square tests of independence.

Table A.30. Time to Complete the Continence Chart Review Data Elements by Urbanicity (minutes)

	Urban (*n* = 1,457)	Nonurban (*n* = 89)	Overall (*n* = 1,546)
Mean (SD)	3.5 (1.8)	3.7 (1.4)	3.5 (1.8)

Table A.31. Time to Complete the Continence Chart Review Data Elements by Region (minutes)

	Northeast (*n* = 433)	South (*n* = 549)	Midwest (*n* = 321)	West (*n* = 243)	Overall (*n* = 1,546)
Mean (SD)	3.4 (1.8)	3.6 (1.8)	3.4 (1.8)	3.7 (1.7)	3.5 (1.8)

Table A.32. Time to Complete the Continence Chart Review Data Elements by Facility Ownership (minutes)

	For-Profit (*n* = 942)	Nonprofit (*n* = 599)	Overall (*n* = 1,546[a])
Mean (SD)	3.5 (1.8)	3.5 (1.7)	3.5 (1.8)

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

Table A.33. Time to Complete the Continence Chart Review Data Elements by Facility Size (minutes)

	Below Setting-Type Median (*n* = 644)	Above Setting-Type Median (*n* = 901)	Overall (*n* = 1,546[a])
Mean (SD)	3.6 (1.7)	3.5 (1.8)	3.5 (1.8)

[a] 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.34. Interrater Reliability Kappa or Weighted Kappa for Continence Chart Review Data Elements by Urbanicity

Data Element	Urban (*n* = 817)	Nonurban (*n* = 817)
Number of patients		67
Use of bladder appliance: indwelling urethral catheter (g3a1)	-	-
Use of bladder appliance: other indwelling catheter (g3a2)	-	-
Use of bladder appliance: external catheter (g3a3)	-	-
Use of bladder appliance: urostomy (g3a4)	-	-
Use of bladder appliance: intermittent catheterization (g3a5)	-	-
Use of bladder appliance: other (g3a6)	-	-
Catheter was placed in current setting, any day (g3b)	0.79	-

Data Element	Urban (*n* = 817)	Nonurban (*n* = 817)
If catheter ever noted, does patient need help with management (g3d)	-	-
Frequency of bladder incontinent events, day 3 (g4)	0.66	0.57
Use of indwelling or external bowel appliance (g5a)	-	-
If bowel appliance ever noted, was it placed in current setting (g5b)	-	—
If bowel appliance ever noted, does patient need help with management (g5c)	-	—
Frequency of bowel incontinent events, day 3 (g6)	0.68	0.84

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.35. Interrater Reliability Kappa or Weighted Kappa for Continence Chart Review Data Elements by Region

Data Element	Northeast (*n* = 189)	South (*n* = 341)	Midwest (*n* = 200)	West (*n* = 154)
Use of bladder appliance: indwelling urethral catheter (g3a1)	-	0.90	-	-
Use of bladder appliance: other indwelling catheter (g3a2)	-	-	-	-
Use of bladder appliance: external catheter (g3a3)	-	-	-	-
Use of bladder appliance: urostomy (g3a4)	-	-	-	-
Use of bladder appliance: intermittent catheterization (g3a5)	-	-	-	-
Use of bladder appliance: other (g3a6)	-	-	-	-
Catheter was placed in current setting, any day (g3b)	0.81	0.77	-	0.61
If catheter ever noted, does patient need help with management (g3d)	-	-	-	-
Frequency of bladder incontinent events, day 3 (g4)	0.82	0.51	0.66	0.75
Use of indwelling or external bowel appliance (g5a)	-	-	-	-
If bowel appliance ever noted, was it placed in current setting (g5b)	-	-	-	-
If bowel appliance ever noted, does patient need help with management (g5c)	-	-	-	-
Frequency of bowel incontinent events, day 3 (g6)	0.83	0.58	0.74	0.79

NOTES: Interrater reliability not shown for items with proportions out of range for stable kappa estimate (per study power calculations) or if sample size is less than five. 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.36. Interrater Reliability Kappa or Weighted Kappa for the Continence Chart Review Data Elements by Facility Ownership

Data Element	For-Profit (*n* = 533)	Nonprofit (*n* = 325)
Use of bladder appliance: indwelling urethral catheter (g3a1)	-	-
Use of bladder appliance: other indwelling catheter (g3a2)	-	-
Use of bladder appliance: external catheter (g3a3)	-	-
Use of bladder appliance: urostomy (g3a4)	-	-
Use of bladder appliance: intermittent catheterization (g3a5)	-	-
Use of bladder appliance: other (g3a6)	-	-
Catheter was placed in current setting, any day (g3b)	0.79	0.76
If catheter ever noted, does patient need help with management (g3d)	-	-
Frequency of bladder incontinent events, day 3 (g4)	0.66	0.66
Use of indwelling or external bowel appliance (g5a)	-	-
If bowel appliance ever noted, was it placed in current setting (g5b)	-	-
If bowel appliance ever noted, does patient need help with management (g5c)	-	-
Frequency of bowel incontinent events, day 3 (g6)	0.66	0.77

NOTES: Interrater reliability not shown for items with proportions out of range for stable kappa estimate (per study power calculations) or if sample size is less than five. 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.37. Interrater Reliability Kappa or Weighted Kappa for the Continence Chart Review Data Elements by Facility Size

Data Element	Below Setting-Type Median (*n* = 404)	Above Setting-Type Median (*n* = 479)
Use of bladder appliance: indwelling urethral catheter (g3a1)	-	-
Use of bladder appliance: other indwelling catheter (g3a2)	-	-
Use of bladder appliance: external catheter (g3a3)	-	-
Use of bladder appliance: urostomy (g3a4)	-	-
Use of bladder appliance: intermittent catheterization (g3a5)	-	-
Use of bladder appliance: other (g3a6)	-	-
Catheter was placed in current setting, any day (g3b)	0.62	0.90
If catheter ever noted, does patient need help with management (g3d)	-	-
Frequency of bladder incontinent events, day 3 (g4)	0.63	0.68
Use of indwelling or external bowel appliance (g5a)	-	-
If bowel appliance ever noted, was it placed in current setting (g5b)	-	-
If bowel appliance ever noted, does patient need help with management (g5c)	-	-
Frequency of bowel incontinent events, day 3 (g6)	0.74	0.66

NOTES: Interrater reliability not shown for items with proportions out of range for stable kappa estimate (per study power calculations) or if sample size is less than five. 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.38. Discharge Frequencies of Continence Appliance Use Data Elements by Day First Noted (percent, count)

Data Element	HHA (*n* = 139)	IRF (*n* = 340)	LTCH (*n* = 84)	SNF (*n* = 228)	Overall (*n* = 791)
Day first noted use of bladder appliance: indwelling urethral catheter (g3a1)					
Never	100 (137)	97 (326)	80 (66)	92 (204)	94 (733)
Discharge	0 (0)	3 (10)	20 (17)	8 (17)	6 (44)
Discharge –2 days	0 (0)	0 (1)	0 (0)	0 (1)	0 (2)
Day first noted use of bladder appliance: other indwelling catheter (g3a2)					
Never % (count)	100 (137)	99 (333)	98 (81)	99 (219)	99 (770)
Discharge	0 (0)	1 (3)	2 (2)	1 (3)	1 (8)
Discharge –2 days	0 (0)	0 (1)	0 (0)	0 (0)	0 (1)
Day first noted use of bladder appliance: external catheter (g3a3)					
Never	100 (137)	99 (335)	99 (82)	100 (222)	100 (776)
Discharge	0 (0)	1 (2)	1 (1)	0 (0)	0 (3)
Discharge –2 days	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Day first noted use of bladder appliance: urostomy (g3a4)					
Never	100 (137)	100 (337)	99 (82)	100 (222)	100 (778)
Discharge	0 (0)	0 (0)	1 (1)	0 (0)	0 (1)
Discharge –2 days	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Day first noted use of bladder appliance: intermittent catheterization (g3a5)					
Never	100 (137)	98 (330)	99 (82)	99 (220)	99 (769)
Discharge	0 (0)	2 (7)	1 (1)	1 (2)	1 (10)
Discharge –2 days	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Day first noted use of bladder appliance: other (g3a6)					
Never	100 (137)	98 (330)	100 (83)	100 (221)	99 (771)
Discharge	0 (0)	2 (6)	0 (0)	0 (1)	1 (7)
Discharge –2 days	0 (0)	0 (1)	0 (0)	0 (0)	0 (1)
Day first noted use of indwelling or external bowel appliance (g5a)					
Never	99 (138)	99 (335)	89 (75)	98 (223)	98 (771)
Discharge	1 (1)	1 (4)	11 (9)	2 (4)	2 (18)
Discharge –2 days	0 (0)	0 (0)	0 (0)	0 (1)	0 (1)

Supplementary Tables for Nutritional Approaches

Table A.39. Overall and Setting-Specific Response Frequencies for Nutritional Approaches Data Elements by Day First Noted (percent)

Data Element	HHA (*n* = 629)	IRF (*n* = 762)	LTCH (*n* = 448)	SNF (*n* = 1,087)	Overall (*n* = 2,926)
Day first noted nutritional approach performed: parenteral/IV (j1a)					
Never	100	99	96	100	99
Day 1	0	1	2	0	0
Day 3	0	0	1	0	0
Day 5	0	0	0	0	0
Day 7	0	0	0	0	0
Day first noted nutritional approach performed: feeding tube (j1b)					
Never	100	97	92	98	97
Day 1	0	3	7	2	2
Day 3	0	0	0	0	0
Day 5	0	0	0	0	0
Day 7	0	0	0	0	0
Day first noted nutritional approach performed: mechanically altered diet (j1c)					
Never	98	85	86	89	90
Day 1	2	13	10	10	9
Day 3	0	1	2	0	1
Day 5	0	0	0	0	0
Day 7	0	0	1	0	0
Day first noted nutritional approach performed: therapeutic diet (j1d)					
Never	46	51	41	51	48
Day 1	54	48	55	48	50
Day 3	0	1	4	1	1
Day 5	0	0	0	0	0
Day 7	0	0	0	0	0

Table A.40. Frequencies for Mechanically Altered Diet by Patient/Resident Characteristics and Clinical Groups in the HHA Setting (percent)

Patient/Resident Characteristics and Clinical Groups	Mechanically Altered Diet (Yes)
Gender (*n* = 600)	
Male (*n* = 214)	2.8
Female (*n* = 386)	1.0
Age (*n* = 597)	
18–44 (*n* = 3)	0.0
45–64 (*n* = 60)	3.3
65–74 (*n* = 172)	2.9
75–89 (*n* = 294)	0.7
90+ (*n* = 68)	0.0
Length of stay (*n* = 478; mean, SD)	Yes: 25.6 (17.0) No: 31.1 (15.5)
Disposition at discharge (*n* = 592[a])	
Home (*n* = 440)	1.6
Hospital (*n* = 23)	0.0
Hospice (*n* = 12)	0.0
HHA (*n* = 15)	0.0
IRF (*n* = 4)	50.0
LTCH (*n* = 1)	0.0
SNF (*n* = 5)	0.0
Other (*n* = 92)	1.1
Clinical conditions *(n = 401)*	
Sepsis	
Yes (*n* = 7)	0.0
No (*n* = 394)	1.5
Heart failure	
Yes (*n* = 31)	0.0
No (*n* = 370)	1.6
Stroke	
Yes (*n* = 6)	0.0
No (*n* = 395)	1.5
Mobility—Lying to sitting (*n* = 374)	
Independent (*n* = 30)	3.3
Setup or clean-up assistance (*n* = 57)	1.8
Supervision or touching assistance (*n* = 113)	1.8
Partial/moderate assistance (*n* = 122)	0.8

Patient/Resident Characteristics and Clinical Groups	Mechanically Altered Diet (Yes)
Substantial/maximal assistance (*n* = 46)	0.0
Dependent (*n* = 6)	0.0

[a] Significant ($p < 0.05$) associations with Mechanically Altered Diet as indicated by chi-square tests of independence.

Table A.41. Frequencies for Mechanically Altered Diet by Patient/Resident Characteristics and Clinical Groups in the IRF Setting (percent)

Patient/Resident Characteristics and Clinical Groups	Mechanically Altered Diet (Yes)
Gender (*n* = *726*)	
Male (*n* = 317)	15.5
Female (*n* = 409)	14.2
Age (*n* = 723)	
18–44 (*n* = 5)	20.0
45–64 (*n* = 57)	10.5
65–74 (*n* = 286)	15.7
75–89 (*n* = 322)	12.4
90+ (*n* = 53)	24.5
Length of stay (*n* = 709[a]; mean, SD)	Yes: 16.3 (7.0) No: 13.8 (4.5)
Disposition at discharge (*n* = 723[a])	
Home (*n* = 310)	18.4
Hospital (*n* = 35)	11.4
Hospice (*n* = 7)	0.0
HHA (*n* = 247)	7.3
IRF (*n* = 1)	0.0
LTCH (*n* = 0)	—
SNF (*n* = 105)	20.0
Other (*n* = 18)	38.9
Clinical conditions *(n = 564)*	
Sepsis	
Yes (*n* = 24)	12.5
No (*n* = 540)	13.7
Heart failure	
Yes (*n* = 125)	10.4
No (*n* = 439)	14.6
Stroke	
Yes (*n* = 98[a])	29.6

Patient/Resident Characteristics and Clinical Groups	Mechanically Altered Diet (Yes)
No (*n* = 466)	10.3
Hygiene—Toileting (*n* = 548[a])	
Independent (*n* = 5)	0.0
Setup or clean-up assistance (*n* = 21)	9.5
Supervision or touching assistance (*n* = 116)	12.9
Partial/moderate assistance (*n* = 132)	6.8
Substantial/maximal assistance (*n* = 135)	14.8
Dependent (*n* = 139)	20.1
Mobility—Lying to sitting (*n* = 561[a])	
Independent (*n* = 42)	7.1
Setup or clean-up assistance (*n* = 16)	12.5
Supervision or touching assistance (*n* = 182)	10.4
Partial/moderate assistance (*n* = 208)	16.4
Substantial/maximal assistance (*n* = 87)	11.5
Dependent (*n* = 26)	34.6

[a] Significant ($p < 0.05$) associations with Mechanically Altered Diet as indicated by chi-square tests of independence.

Table A.42. Frequencies for Mechanically Altered Diet by Patient/Resident Characteristics and Clinical Groups in the LTCH Setting (percent)

Patient/Resident Characteristics and Clinical Groups	Mechanically Altered Diet (Yes)
Gender (*n* = *422*)	
Male (*n* = 218)	12.8
Female (*n* = 204)	13.7
Age (*n* = 423[a])	
18–44 (*n* = 18)	11.1
45–64 (*n* = 106)	7.6
65–74 (*n* = 152)	9.9
75–89 (*n* = 133)	21.1
90+ (*n* = 14)	21.4
Length of stay (*n* = 375; mean, SD)	Yes: 23.9 (10.0) No: 24.2 (10.9)
Disposition at discharge (*n* = 411)	
Home (*n* = 85)	11.8
Hospital (*n* = 27)	3.7
Hospice (*n* = 10)	20.0
HHA (*n* = 75)	10.7

Patient/Resident Characteristics and Clinical Groups	Mechanically Altered Diet (Yes)
IRF (*n* = 44)	9.1
LTCH (*n* = 1)	0.0
SNF (*n* = 112)	16.1
Other (*n* = 57)	19.3
Clinical conditions *(n = 361)*	
Sepsis	
Yes (*n* = 59)	18.6
No (*n* = 302)	11.3
Heart failure	
Yes (*n* = 11)	18.2
No (*n* = 350)	12.3
Stroke	
Yes (*n* = 26)	23.1
No (*n* = 335)	11.6
Hygiene—Toileting (*n* = 349)	
Independent (*n* = 42)	2.4
Setup or clean-up assistance (*n* = 32)	12.5
Supervision or touching assistance (*n* = 53)	7.6
Partial/moderate assistance (*n* = 48)	16.7
Substantial/maximal assistance (*n* = 59)	15.3
Dependent (*n* = 115)	13.9
Mobility—Lying to sitting (*n* = 318)	
Independent (*n* = 58)	3.5
Setup or clean-up assistance (*n* = 23)	8.7
Supervision or touching assistance (*n* = 57)	8.8
Partial/moderate assistance (*n* = 67)	17.9
Substantial/maximal assistance (*n* = 45)	15.6
Dependent (*n* = 68)	19.1

[a] Significant ($p < 0.05$) associations with Mechanically Altered Diet as indicated by chi-square tests of independence.

Table A.43. Frequencies for Mechanically Altered Diet by Patient/Resident Characteristics and Clinical Groups in the SNF Setting (percent)

Patient/Resident Characteristics and Clinical Groups	Mechanically Altered Diet (Yes)
Gender (*n* = 1,038[a])	
Male (*n* = 400)	14.0
Female (*n* = 638)	8.9

Patient/Resident Characteristics and Clinical Groups	Mechanically Altered Diet (Yes)
Age (*n* = 1,033)	
18–44 (*n* = 9)	11.1
45–64 (*n* = 66)	4.6
65–74 (*n* = 274)	8.4
75–89 (*n* = 520)	12.1
90+ (*n* = 164)	14.0
Length of stay (*n* = 899; mean, SD)	Yes: 21.2 (11.2) No: 21.5 (12.3)
Disposition at discharge (*n* = 1,021[a])	
Home (*n* = 455)	11.2
Hospital (*n* = 94)	11.7
Hospice (*n* = 9)	11.1
HHA (*n* = 272)	6.3
IRF (*n* = 1)	0.0
LTCH (*n* = 10)	30.0
SNF (*n* = 43)	16.3
Other (*n* = 137)	15.3
Clinical conditions *(n* = 813*)*	
Sepsis	
Yes (*n* = 51[a])	21.6
No (*n* = 762)	9.7
Heart failure	
Yes (*n* = 196)	12.8
No (*n* = 617)	9.7
Stroke	
Yes (*n* = 58)	12.1
No (*n* = 755)	10.3
Hygiene—Toileting (*n* = 544)	
Independent (*n* = 21)	4.8
Setup or clean-up assistance (*n* = 23)	4.4
Supervision or touching assistance (*n* = 136)	9.6
Partial/moderate assistance (*n* = 167)	12.6
Substantial/maximal assistance (*n* = 126)	12.7
Dependent (*n* = 71)	21.1
Mobility—Lying to sitting (*n* = 536)	
Independent (*n* = 58)	10.3
Setup or clean-up assistance (*n* = 13)	0.0

Patient/Resident Characteristics and Clinical Groups	Mechanically Altered Diet (Yes)
Supervision or touching assistance (*n* = 158)	13.3
Partial/moderate assistance (*n* = 193)	12.4
Substantial/maximal assistance (*n* = 90)	12.2
Dependent (*n* = 24)	16.7

[a] Significant ($p < 0.05$) associations with Mechanically Altered Diet as indicated by chi-square tests of independence.

Table A.44. Time to Complete Nutritional Approach Data Elements by Urbanicity (minutes)

	Urban (*n* = 1,455)	Nonurban (*n* = 99)	Overall (*n* = 1,554)
Mean (SD)	0.88 (.48)	0.93 (.40)	0.88 (0.48)

Table A.45. Time to Complete Nutritional Approach Data Elements by Region (minutes)

	Northeast (*n* = 438)	South (*n* = 544)	Midwest (*n* = 334)	West (*n* = 238)	Overall (*n* = 1,554)
Mean (SD)	0.88 (.48)	0.91 (.51)	0.80 (.43)	0.96 (.51)	0.88 (0.48)

Table A.46. Time to Complete the Nutritional Approach Data Elements by Facility Ownership (minutes)

	For-Profit (*n* = 947)	Nonprofit (*n* = 599)	Overall (*n* = 1,554[a])
Mean (SD)	0.9 (0.5)	0.9 (0.5)	0.9 (0.5)

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

Table A.47. Time to Complete the Nutritional Approach Data Elements by Facility Size (minutes)

	Below Setting-Type Median (*n* = 647)	Above Setting-Type Median (*n* = 906)	Overall (*n* = 1,554[a])
Mean (SD)	0.9 (0.5)	0.9 (0.5)	0.9 (0.5)

[a] 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.48. Interrater Reliability Kappa or Weighted Kappa for Nutritional Approach Data Elements by Urbanicity

Data Element	Urban (*n* = 815)	Nonurban (*n* = 67)
Nutritional approach performed: parenteral/IV (j1a)	-	-
Nutritional approach performed: feeding tube (j1b)	-	-
Nutritional approach performed: mechanically altered diet (j1c)	0.65	-
Nutritional approach performed: therapeutic diet (j1d)	0.59	0.75

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.49. Interrater Reliability Kappa or Weighted Kappa for Nutritional Approach Data Elements by Region

Data Element	Northeast (*n* = 188)	South (*n* = 340)	Midwest (*n* = 201)	West (*n* = 153)
Nutritional approach performed: parenteral/IV (j1a)	-	-	-	-
Nutritional approach performed: feeding tube (j1b)	-	-	-	-
Nutritional approach performed: mechanically altered diet (j1c)	0.75	0.57	-	0.58
Nutritional approach performed: therapeutic diet (j1d)	0.59	0.54	0.53	0.81

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.50. Interrater Reliability Kappa or Weighted Kappa for the Nutritional Approach Data Elements by Facility Ownership

Data Element	For-Profit (*n* = 552)	Nonprofit (*n* = 324)
Nutritional approach performed: parenteral/IV (j1a)	-	-
Nutritional approach performed: feeding tube (j1b)	-	-
Nutritional approach performed: mechanically altered diet (j1c)	-	-
Nutritional approach performed: therapeutic diet (j1d)	0.63	0.57

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.51. Interrater Reliability Kappa or Weighted Kappa for the Nutritional Approach Data Elements by Facility Size

Data Element	Below Setting-Type Median (*n* = 405)	Above Setting-Type Median (*n* = 476)
Nutritional approach performed: parenteral/IV (j1a)	-	-
Nutritional approach performed: feeding tube (j1b)	-	-
Nutritional approach performed: mechanically altered diet (j1c)	-	-
Nutritional approach performed: therapeutic diet (j1d)	0.65	0.57

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.52. Discharge Response Distributions for the Nutritional Approaches Day First Noted (percent)

Data Element	HHA (*n* = 139)	IRF (*n* = 339)	LTCH (*n* = 84)	SNF (*n* = 228)	Overall (*n* = 790)
Nutritional approach performed: Parenteral/IV (j1a)					
Never	100	100	99	100	100
Discharge	0	0	1	0	0
Discharge –2 days	0	0	0	0	0
Nutritional approach performed: Feeding tube (j1b)					
Never	99	97	95	99	98
Discharge	1	3	5	1	2
Discharge –2 days	0	0	0	0	0
Nutritional approach performed: Mechanically altered diet (j1c)					
Never	100	89	88	91	91
Discharge	0	10	12	9	8
Discharge –2 days	0	1	0	0	0
Nutritional approach performed: Therapeutic diet (j1d)					
Never	52	53	38	63	54
Discharge	48	47	62	36	46
Discharge –2 days	0	0	0	0	0

Supplementary Tables for Special Treatments

Table A.53. Overall and Setting-Specific Response Frequencies for Special Treatments by Day First Noted (percent)

Data Element	HHA (*n* = 629)	IRF (*n* = 762)	LTCH (*n* = 448)	SNF (*n* = 1,087)	Overall (*n* = 2,926)
Cancer treatments					
Day first noted treatment performed: Chemotherapy (j2a)					
Never	99	97	100	99	99
Day 1	0	2	0	1	1
Day 3	0	0	0	0	0
Day 5	0	0	0	0	0
Day 7	0	0	0	0	0
Day first noted chemo treatment performed: IV (j2a2a)					
Never	100	99	100	100	100
Day 1	0	0	0	0	0
Day 3	0	0	0	0	0
Day 5	0	0	0	0	0
Day 7	0	0	0	0	0
Day first noted chemo treatment performed: Oral (j2a3a)					
Never	100	98	100	99	99
Day 1	0	1	0	1	1
Day 3	0	0	0	0	0
Day 5	0	0	0	0	0
Day 7	0	0	0	0	0
Day first noted chemo treatment performed: Other (j2a10a)					
Never	100	100	100	100	100
Day 1	0	0	0	0	0
Day 3	0	0	0	0	0
Day 5	0	0	0	0	0
Day 7	0	0	0	0	0
Day first noted treatment performed: Radiation (j2b)					
Never	100	100	100	100	100
Day 1	0	0	0	0	0
Day 3	0	0	0	0	0
Day 5	0	0	0	0	0
Day 7	0	0	0	0	0

Data Element	HHA (*n* = 629)	IRF (*n* = 762)	LTCH (*n* = 448)	SNF (*n* = 1,087)	Overall (*n* = 2,926)
Respiratory treatments					
Day first noted treatment performed: Oxygen Therapy (j2c)					
Never	87	83	56	84	80
Day 1	13	16	40	14	18
Day 3	0	1	2	1	1
Day 5	0	0	1	1	1
Day 7	0	0	1	0	0
Day first noted type of oxygen therapy performed: Intermittent (j2c2a)					
Never	93	89	63	89	86
Day 1	7	10	34	10	13
Day 3	0	1	2	1	1
Day 5	0	0	1	0	0
Day 7	0	0	0	0	0
Day first noted type of oxygen therapy performed: Continuous (j2c3a)					
Never	94	92	95	95	94
Day 1	6	6	4	4	5
Day 3	0	1	0	1	0
Day 5	0	1	1	1	0
Day 7	0	0	0	0	0
Day first noted type of oxygen therapy performed: High-concentration (j2c4a)					
Never	100	99	94	100	99
Day 1	0	0	6	0	1
Day 3	0	0	0	0	0
Day 5	0	0	0	0	0
Day 7	0	0	0	0	0
Day first noted treatment performed: Suctioning (j2d)					
Never	100	99	95	99	99
Day 1	0	1	5	1	1
Day 3	0	0	0	0	0
Day 5	0	0	0	0	0
Day 7	0	0	0	0	0
Day first noted type of suctioning performed: Scheduled (j2d2a)					
Never	100	100	99	100	100
Day 1	0	0	1	0	0
Day 3	0	0	0	0	0
Day 5	0	0	0	0	0

Data Element	HHA (*n* = 629)	IRF (*n* = 762)	LTCH (*n* = 448)	SNF (*n* = 1,087)	Overall (*n* = 2,926)
Day 7	0	0	0	0	0
Day first noted type of suctioning performed: As needed (j2d3a)					
Never	100	99	95	99	99
Day 1	0	1	5	1	1
Day 3	0	0	0	0	0
Day 5	0	0	0	0	0
Day 7	0	0	0	0	0
Day first noted treatment performed: Tracheostomy Care (j2e)					
Never	100	99	95	100	99
Day 1	0	1	5	0	1
Day 3	0	0	0	0	0
Day 5	0	0	0	0	0
Day 7	0	0	0	0	0
Day first noted treatment performed: Invasive Mechanical Ventilator (j2f)					
Never	100	100	97	100	100
Day 1	0	0	3	0	0
Day 3	0	0	0	0	0
Day 5	0	0	0	0	0
Day 7	0	0	0	0	0
Day first noted treatment performed: Non-Invasive Mechanical Ventilator (j2g)					
Never	96	94	91	96	95
Day 1	4	6	6	4	5
Day 3	0	0	2	0	0
Day 5	0	1	0	0	0
Day 7	0	0	0	0	0
Day first noted type of NIMV performed: BiPAP (j2g2a)					
Never	99	99	93	99	98
Day 1	1	1	5	1	2
Day 3	0	0	2	0	0
Day 5	0	0	0	0	0
Day 7	0	0	0	0	0
Day first noted type of NIMV performed: CPAP (j2g3a)					
Never	98	94	98	97	97
Day 1	2	5	1	3	3
Day 3	0	0	1	0	0
Day 5	0	1	0	0	0
Day	0	0	0	0	0

Data Element	HHA (*n* = 629)	IRF (*n* = 762)	LTCH (*n* = 448)	SNF (*n* = 1,087)	Overall (*n* = 2,926)
Other treatments					
Day first noted other treatment performed: IV Meds (j2h)					
Never	85	83	23	84	75
Day 1	15	14	61	14	21
Day 3	0	1	12	1	3
Day 5	0	1	2	0	1
Day 7	0	1	2	0	1
Day first noted type of IV meds given: Antibiotics (j2h3a)					
Never	96	92	36	91	84
Day 1	4	6	50	8	13
Day 3	0	1	11	1	2
Day 5	0	0	2	0	0
Day 7	0	1	2	0	0
Day first noted type of IV meds given: Anticoagulation (j2h4a)					
Never	92	94	83	94	92
Day 1	8	6	16	5	8
Day 3	0	0	1	0	0
Day 5	0	0	0	0	0
Day 7	0	0	0	0	0
Day first noted type of IV meds given: Other (j2h10a)					
Never	94	95	80	96	93
Day 1	6	3	13	3	5
Day 3	0	1	4	0	1
Day 5	0	1	1	0	0
Day 7	0	0	2	0	0
Day first noted other treatment performed: Transfusions (j2i)					
Never	100	99	98	100	100
Day 1	0	0	0	0	0
Day 3	0	0	1	0	0
Day 5	0	0	0	0	0
Day 7	0	0	1	0	0
Day first noted other treatment performed: Dialysis (j2j)					
Never	97	95	85	97	95
Day 1	2	4	12	2	4
Day 3	0	1	3	1	1
Day 5	0	0	0	0	0
Day 7	0	0	0	0	0

Data Element	HHA (*n* = 629)	IRF (*n* = 762)	LTCH (*n* = 448)	SNF (*n* = 1,087)	Overall (*n* = 2,926)
Day first noted type of dialysis performed: Hemodialysis (j2j2a)					
Never	97	96	85	97	95
Day 1	2	3	12	2	4
Day 3	0	1	3	1	1
Day 5	0	0	0	0	0
Day 7	0	0	0	0	0
Day first noted type of dialysis performed: Peritoneal (j2j3a)					
Never	100	100	100	100	100
Day 1	0	0	0	0	0
Day 3	0	0	0	0	0
Day 5	0	0	0	0	0
Day 7	0	0	0	0	0
Day first noted other treatment performed: IV Access (j2k)					
Never	96	78	9	90	76
Day 1	4	17	81	9	21
Day 3	0	2	7	0	2
Day 5	0	2	0	0	1
Day 7	0	2	2	0	1
Day first noted type of IV access: Peripheral IV (j2k2a)					
Never	100	86	60	98	89
Day 1	0	10	33	2	8
Day 3	0	2	3	0	1
Day 5	0	1	1	0	1
Day 7	0	2	2	0	1
Day first noted type of IV access: Midline (j2k3a)					
Never	100	99	87	100	98
Day 1	0	1	6	0	1
Day 3	0	0	5	0	1
Day 5	0	0	1	0	0
Day 7	0	0	1	0	0
Day first noted type of IV access: Central line (j2k4a)					
Never	97	94	46	93	87
Day 1	3	5	46	7	12
Day 3	0	0	6	0	1
Day 5	0	0	1	0	0
Day 7	0	0	1	0	0
Day first noted type of IV access: Other (j2k10a)					
Never	100	98	97	99	99

Data Element	HHA (*n* = 629)	IRF (*n* = 762)	LTCH (*n* = 448)	SNF (*n* = 1,087)	Overall (*n* = 2,926)
Day 1	0	1	3	1	1
Day 3	0	0	0	0	0
Day 5	0	0	0	0	0
Day 7	0	0	0	0	0

Table A.54. Frequencies for IV Access by Patient/Resident Characteristics and Clinical Groups in the HHA Setting (percent)

Patient/Resident Characteristics and Clinical Groups	IV Access (Yes)
Gender (*n* = *594*)	
Male (*n* = 212)	4.7
Female (*n* = 382)	3.4
Age (*n* = 591)	
18–44 (*n* = 4)	25.0
45–64 (*n* = 57)	3.5
65–74 (*n* = 166)	5.4
75–89 (*n* = 296)	3.7
90+ (*n* = 68)	0.0
Length of stay (*n* = 480; mean, SD)	Yes: 31.1 (15.2) No: 31.2 (15.5)
Disposition at discharge (*n* = 586)	
Home (*n* = 441)	4.3
Hospital (*n* = 23)	0.0
Hospice (*n* = 12)	16.7
HHA (*n* = 14)	0.0
IRF (*n* = 4)	0.0
LTCH (*n* = 1)	0.0
SNF (*n* = 5)	0.0
Other (*n* = 86)	2.3
Clinical conditions *(n* = 402*)*	
Sepsis	
Yes (*n* = 7)	0.0
No (*n* = 395)	3.8
Heart failure	
Yes (*n* = 31)	3.2
No (*n* = 371)	3.8
Stroke	
Yes (*n* = 6)	0.0

Patient/Resident Characteristics and Clinical Groups	IV Access (Yes)
No (*n* = 396)	3.8
Mobility—Lying to sitting (*n* = 376[a])	
Independent (*n* = 28)	3.6
Setup or clean-up assistance (*n* = 57)	7.0
Supervision or touching assistance (*n* = 116)	2.6
Partial/moderate assistance (*n* = 122)	3.3
Substantial/maximal assistance (*n* = 47)	2.1
Dependent (*n* = 6)	33.3

[a] Significant ($p < 0.05$) associations with IV Access as indicated by chi-square tests of independence.

Table A.55. Frequencies for IV Access by Patient/Resident Characteristics and Clinical Groups in the IRF Setting (percent)

Patient/Resident Characteristics and Clinical Groups	IV Access (Yes)
Gender (*n* = 726)	
Male (*n* = 316)	23.1
Female (*n* = 410)	21.2
Age (*n* = 723)	
18–44 (*n* = 5)	40.0
45–64 (*n* = 57)	31.6
65–74 (*n* = 283)	25.1
75–89 (*n* = 325)	17.9
90+ (*n* = 53)	20.8
Length of stay (*n* = 709[a]) ; mean, SD	Yes: 14.8 (4.8) No: 13.9 (5.0)
Disposition at discharge (*n* = 723)	
Home (*n* = 311)	17.0
Hospital (*n* = 35)	28.6
Hospice (*n* = 7)	28.6
HHA (*n* = 248)	24.2
IRF (*n* = 1)	0.0
LTCH (*n* = 0)	—
SNF (*n* = 103)	30.1
Other (*n* = 18)	22.2
Clinical conditions *(n* = 564*)*	
Sepsis	
Yes (*n* = 24)	41.7
No (*n* = 540)	24.1

Patient/Resident Characteristics and Clinical Groups	IV Access (Yes)
Heart failure	
Yes (*n* = 125)	28.8
No (*n* = 439)	23.7
Stroke	
Yes (*n* = 98)	22.5
No (*n* = 466)	25.3
Hygiene—Toileting (*n* = 548)	
Independent (*n* = 5)	20.0
Setup or clean-up assistance (*n* = 21)	14.3
Supervision or touching assistance (*n* = 116)	20.7
Partial/moderate assistance (*n* = 133)	27.1
Substantial/maximal assistance (*n* = 135)	25.2
Dependent (*n* = 138)	26.8
Mobility—Lying to sitting (*n* = 561)	
Independent (*n* = 42)	31.0
Setup or clean-up assistance (*n* = 16)	12.5
Supervision or touching assistance (*n* = 182)	24.2
Partial/moderate assistance (*n* = 208)	26.4
Substantial/maximal assistance (*n* = 87)	18.4
Dependent (*n* = 26)	34.6

[a] Significant ($p < 0.05$) associations with IV Access as indicated by chi-square tests of independence.

Table A.56. Frequencies for IV Access by Patient/Resident Characteristics and Clinical Groups in the LTCH Setting (percent)

Patient/Resident Characteristics and Clinical Groups	IV Access (Yes)
Gender (*n* = 427)	
Male (*n* = 220)	90.5
Female (*n* = 207)	90.8
Age (*n* = 428)	
18–44 (*n* = 18)	88.9
45–64 (*n* = 108)	92.6
65–74 (*n* = 153)	92.8
75–89 (*n* = 135)	87.4
90+ (*n* = 14)	85.7
Length of stay (*n* = 380; mean, SD)	Yes: 24.4 (11.2) No: 20.7 (8.5)
Disposition at discharge (*n* = 416[a])	

Patient/Resident Characteristics and Clinical Groups	IV Access (Yes)
Home (*n* = 86)	81.4
Hospital (*n* = 29)	93.1
Hospice (*n* = 10)	100.0
HHA (*n* = 75)	98.7
IRF (*n* = 44)	90.9
LTCH (*n* = 1)	100.0
SNF (*n* = 114)	93.9
Other (*n* = 57)	86.0
Clinical conditions *(n* = 365*)*	
Sepsis	
Yes (*n* = 60)	93.3
No (*n* = 305)	89.5
Heart failure	
Yes (*n* = 11)	90.9
No (*n* = 354)	90.1
Stroke	
Yes (*n* = 26)	88.5
No (*n* = 339)	90.3
Hygiene—Toileting (*n* = 353[a])	
Independent (*n* = 42)	95.2
Setup or clean-up assistance (*n* = 32)	90.6
Supervision or touching assistance (*n* = 55)	83.6
Partial/moderate assistance (*n* = 48)	95.8
Substantial/maximal assistance (*n* = 59)	79.7
Dependent (*n* = 117)	94.0
Mobility—Lying to sitting (*n* = 322[a])	
Independent (*n* = 58)	94.8
Setup or clean-up assistance (*n* = 23)	91.3
Supervision or touching assistance (*n* = 58)	77.6
Partial/moderate assistance (*n* = 68)	89.7
Substantial/maximal assistance (*n* = 45)	97.8
Dependent (*n* = 70)	90.0

[a] Significant ($p < 0.05$) associations with IV Access as indicated by chi-square tests of independence.

Table A.57. Frequencies for IV Access by Patient/Resident Characteristics and Clinical Groups in the SNF Setting (percent)

Patient/Resident Characteristics and Clinical Groups	IV Access (Yes)
Gender (*n* = 1,052[a])	
Male (*n* = 407)	12.5
Female (*n* = 645)	8.2
Age (*n* = 1,047[a])	
18–44 (*n* = 9)	33.3
45–64 (*n* = 67)	37.3
65–74 (*n* = 277)	9.4
75–89 (*n* = 526)	7.8
90+ (*n* = 168)	4.8
Length of stay (*n* = 913[a]; mean, SD)	Yes: 24.7 (14.1) No: 21.1 (11.9)
Disposition at discharge (*n* = 1,035)	
Home (*n* = 461)	9.8
Hospital (*n* = 97)	14.4
Hospice (*n* = 9)	22.2
HHA (*n* = 275)	7.6
IRF (*n* = 1)	0.0
LTCH (*n* = 10)	0.0
SNF (*n* = 43)	16.3
Other (*n* = 139)	10.1
Clinical conditions *(n* = 822*)*	
Sepsis	
Yes (*n* = 51[a])	29.4
No (*n* = 771)	9.1
Heart failure	
Yes (*n* = 198)	9.6
No (*n* = 624)	10.6
Stroke	
Yes (*n* = 60)	5.0
No (*n* = 762)	10.8
Hygiene—Toileting (*n* = 550)	
Independent (*n* = 21)	28.6
Setup or clean-up assistance (*n* = 23)	8.7
Supervision or touching assistance (*n* = 137)	12.4
Partial/moderate assistance (*n* = 170)	10.0
Substantial/maximal assistance (*n* = 127)	12.6

Patient/Resident Characteristics and Clinical Groups	IV Access (Yes)
Dependent (*n* = 72)	15.3
Mobility—Lying to sitting (*n* = 542)	
Independent (*n* = 58)	20.7
Setup or clean-up assistance (*n* = 13)	15.4
Supervision or touching assistance (*n* = 159)	8.2
Partial/moderate assistance (*n* = 196)	12.8
Substantial/maximal assistance (*n* = 92)	14.1
Dependent (*n* = 24)	4.2

[a] Significant ($p < 0.05$) associations with IV Access as indicated by chi-square tests of independence.

Table A.58. Time to Complete Treatment Data Elements by Urbanicity (minutes)

		Urban (*n* = 1,455)	Nonurban (*n* = 99)	Overall (*n* = 1,554)
Cancer	Mean (SD)	0.44 (0.24)	0.47 (0.20)	0.44 (0.24)
Respiratory	Mean (SD)	1.1 (0.60)	1.2 (0.50)	1.1 (0.60)
Other	Mean (SD)	0.88 (0.48)	0.93 (0.40)	0.88 (0.48)
All	Mean (SD)	2.4 (1.3)	2.6 (1.1)	2.4 (1.3)

Table A.59. Time to Complete Treatment Data Elements by Region (minutes)

		Northeast (*n* = 438)	South (*n* = 544)	Midwest (*n* = 334)	West (*n* = 238)	Overall (*n* = 1,554)
Number of assessments						
Cancer	Mean (SD)	0.44 (0.24)	0.45 (0.25)	0.40 (0.21)	0.48 (0.25)	0.44 (0.24)
Respiratory	Mean (SD)	1.1 (.60)	1.1 (0.63)	1.0 (0.53)	1.2 (0.63)	1.1 (0.60)
Other	Mean (SD)	0.88 (0.48)	0.91 (0.51)	0.80 (0.43)	0.96 (0.51)	0.88 (0.48)
All	Mean (SD)	2.4 (1.3)	2.5 (1.4)	2.2 (1.2)	2.6 (1.4)	2.4 (1.3)

Table A.60. Time to Complete the Treatment Data Elements by Facility Ownership (minutes)

		For-Profit (*n* = 947)	Nonprofit (*n* = 599)	Overall (*n* = 1,554)
Cancer	Mean (SD)	0.4 (0.2)	0.4 (0.2)	0.4 (0.2)
Respiratory	Mean (SD)	1.1 (0.6)	1.1 (0.6)	1.1 (0.6)
Other	Mean (SD)	0.9 (0.5)	0.9 (0.5)	0.9 (0.5)
All	Mean (SD)	2.4 (1.4)	2.5 (1.3)	2.4 (1.3)

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

Table A.61. Time to Complete the Treatment Data Elements by Facility Size (minutes)

		Below Setting-Type Median (*n* = 647)	Above Setting-Type Median (*n* = 906)	Overall (*n* = 1,554)
Cancer	Mean (SD)	0.4 (0.2)	0.4 (0.2)	0.4 (0.2)
Respiratory	Mean (SD)	1.1 (0.6)	1.1 (0.6)	1.1 (0.6)
Other	Mean (SD)	0.9 (0.5)	0.9 (0.5)	0.9 (0.5)
All	Mean (SD)	2.5 (1.2)	2.4 (1.4)	2.4 (1.3)

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.62. Interrater Reliability Kappa or Weighted Kappa for Treatment Data Elements by Urbanicity

Data Element	Urban (*n* = 815)	Nonurban (*n* = 67)
Cancer treatments		
Treatment performed: Chemotherapy (j2a)	-	-
Chemo treatment performed: IV (j2a2a)	-	-
Chemo treatment performed: Oral (j2a3a)	-	-
Chemo treatment performed: Other (j2a10a)	-	-
Treatment performed: Radiation (j2b)	-	-
Respiratory treatments		
Treatment performed: Oxygen Therapy (j2c)	0.82	0.75
Type of oxygen therapy performed: Intermittent (j2c2a)	0.81	0.69
Type of oxygen therapy performed: Continuous (j2c3a)	0.52	0.84
Type of oxygen therapy performed: High-concentration (j2c4a)	-	-
Treatment performed: Suctioning (j2d)	-	-
Type of suctioning performed: Scheduled (j2d2a)	-	-
Type of suctioning performed: As needed (j2d3a)	-	-
Treatment performed: Tracheostomy Care (j2e)	-	-
Treatment performed: Invasive Mechanical Ventilator (j2f)	-	-
Treatment performed: Non-Invasive Mechanical Ventilator (NIMV) (j2g)	-	0.74
Type of NIMV performed: BiPAP (j2g2a)	-	-
Type of NIMV performed: CPAP (j2g3a)	-	-
Other treatments		
Other treatment performed: IV Meds (j2h)	0.72	0.26
Type of IV meds given: Antibiotics (j2h3a)	0.88	-
Type of IV meds given: Anticoagulation (j2h4a)	0.13	-
Type of IV meds given: Other (j2h10a)	0.46	-

Data Element	Urban (*n* = 815)	Nonurban (*n* = 67)
Other treatment performed: Transfusions (j2i)	-	-
Other treatment performed: Dialysis (j2j)	-	-
Type of dialysis performed: Hemodialysis (j2j2a)	-	-
Type of dialysis performed: Peritoneal (j2j3a)	-	-
Other treatment performed: IV Access (j2k)	0.91	0.68
Type of IV access: Peripheral IV (j2k2a)	0.81	-
Type of IV access: Midline (j2k3a)	-	-
Type of IV access: Central line (j2k4a)	0.86	0.70
Type of IV access: Other (j2k10a)	-	-

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.63. Interrater Reliability Kappa or Weighted Kappa for Treatment Data Elements by Region

Data Element	Northeast (*n* = 188)	South (*n* = 340)	Midwest (*n* = 201)	West (*n* = 153)
Cancer treatments				
Treatment performed: Chemotherapy (j2a)	-	-	-	-
Chemo treatment performed: IV (j2a2a)	-	-	-	-
Chemo treatment performed: Oral (j2a3a)	-	-	-	-
Chemo treatment performed: Other (j2a10a)	-	-	-	-
Treatment performed: Radiation (j2b)	-	-	-	-
Respiratory treatments				
Treatment performed: Oxygen therapy (j2c)	0.78	0.81	0.82	0.87
Type of oxygen therapy performed: Intermittent (j2c2a)	0.75	0.81	0.78	0.88
Type of oxygen therapy performed: Continuous (j2c3a)	-	0.55	0.55	-
Type of oxygen therapy performed: High-concentration (j2c4a)	-	-	-	-
Treatment performed: Suctioning (j2d)	-	-	-	-
Type of suctioning performed: Scheduled (j2d2a)	-	-	-	-
Type of suctioning performed: As needed (j2d3a)	-	-	-	-
Treatment performed: Tracheostomy Care (j2e)	-	-	-	-
Treatment performed: Invasive Mechanical Ventilator (j2f)	-	-	-	-
Treatment performed: Non-Invasive Mechanical Ventilator (NIMV) (j2g)	-	-	-	-
Type of NIMV performed: BiPAP (j2g2a)	-	-	-	-
Type of NIMV performed: CPAP (j2g3a)	-	-	-	-

Data Element	Northeast (*n* = 188)	South (*n* = 340)	Midwest (*n* = 201)	West (*n* = 153)
Other treatments				
Other treatment performed: IV Meds (j2h)	0.74	0.60	0.77	0.75
Type of IV meds given: Antibiotics (j2h3a)	0.95	0.85	0.93	0.76
Type of IV meds given: Anticoagulation (j2h4a)	-	-	-	-
Type of IV meds given: Other (j2h10a)	-	0.35	-	-
Other treatment performed: Transfusions (j2i)	-	-	-	-
Other treatment performed: Dialysis (j2j)	-	0.89	-	-
Type of dialysis performed: Hemodialysis (j2j2a)	-	0.87	-	-
Type of dialysis performed: Peritoneal (j2j3a)	-	-	-	-
Other treatment performed: IV Access (j2k)	0.94	0.92	0.79	0.85
Type of IV access: Peripheral IV (j2k2a)	0.89	0.80	-	0.87
Type of IV access: Midline (j2k3a)	-	-	-	-
Type of IV access: Central line (j2k4a)	0.96	0.80	0.87	-
Type of IV access: Other (j2k10a)	-	-	-	-

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.64. Interrater Reliability Kappa or Weighted Kappa for the Treatments Data Elements by Facility Ownership

Data Element	For-Profit (*n* = 552)	Nonprofit (*n* = 324)
Cancer treatments		
Treatment performed: Chemotherapy (j2a)	-	-
Chemo treatment performed: IV (j2a2a)	-	-
Chemo treatment performed: Oral (j2a3a)	-	-
Chemo treatment performed: Other (j2a10a)	-	-
Treatment performed: Radiation (j2b)	-	-
Respiratory treatments		
Treatment performed: Oxygen therapy (j2c)	0.86	0.73
Type of oxygen therapy performed: Intermittent (j2c2a)	-	-
Type of oxygen therapy performed: Continuous (j2c3a)	-	-
Type of oxygen therapy performed: High-concentration (j2c4a)	-	-
Treatment performed: Suctioning (j2d)	-	-
Type of suctioning performed: Scheduled (j2d2a)	-	-
Type of suctioning performed: As needed (j2d3a)	-	-
Treatment performed: Tracheostomy Care (j2e)	-	-
Treatment performed: Invasive Mechanical Ventilator (j2f)	-	-
Treatment performed: Non-Invasive Mechanical Ventilator (NIMV) (j2g)	-	-

Data Element	For-Profit (*n* = 552)	Nonprofit (*n* = 324)
Type of NIMV performed: BiPAP (j2g2a)	-	-
Type of NIMV performed: CPAP (j2g3a)	-	-
Other treatments		
Other treatment performed: IV Meds (j2h)	0.78	0.76
Type of IV meds given: Antibiotics (j2h3a)	0.89	-
Type of IV meds given: Anticoagulation (j2h4a)	-	-
Type of IV meds given: Other (j2h10a)	-	-
Other treatment performed: Transfusions (j2i)	-	-
Other treatment performed: Dialysis (j2j)	-	-
Type of dialysis performed: Hemodialysis (j2j2a)	-	-
Type of dialysis performed: Peritoneal (j2j3a)	-	-
Other treatment performed: IV Access (j2k)	0.92	0.84
Type of IV access: Peripheral IV (j2k2a)	-	-
Type of IV access: Midline (j2k3a)	-	-
Type of IV access: Central line (j2k4a)	0.84	-
Type of IV access: Other (j2k10a)	-	-

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.65. Interrater Reliability Kappa or Weighted Kappa for the Treatments Data Elements by Facility Size

Data Element	Below Setting-Type Median (*n* = 405)	Above Setting-Type Median (*n* = 476)
Cancer treatments		
Treatment performed: Chemotherapy (j2a)	-	-
Chemo treatment performed: IV (j2a2a)	-	-
Chemo treatment performed: Oral (j2a3a)	-	-
Chemo treatment performed: Other (j2a10a)	-	-
Treatment performed: Radiation (j2b)	-	-
Respiratory treatments		
Treatment performed: Oxygen Therapy (j2c)	0.84	0.80
Type of oxygen therapy performed: Intermittent (j2c2a)	-	-
Type of oxygen therapy performed: Continuous (j2c3a)	-	-
Type of oxygen therapy performed: High-concentration (j2c4a)	-	-
Treatment performed: Suctioning (j2d)	-	-
Type of suctioning performed: Scheduled (j2d2a)	-	-
Type of suctioning performed: As needed (j2d3a)	-	-

Data Element	Below Setting-Type Median (*n* = 405)	Above Setting-Type Median (*n* = 476)
Treatment performed: Tracheostomy Care (j2e)	-	-
Treatment performed: Invasive Mechanical Ventilator (j2f)	-	-
Treatment performed: Non-Invasive Mechanical Ventilator (NIMV) (j2g)	-	-
Type of NIMV performed: BiPAP (j2g2a)	-	-
Type of NIMV performed: CPAP (j2g3a)	-	-
Other treatments		
Other treatment performed: IV Meds (j2h)	0.71	0.70
Type of IV meds given: Antibiotics (j2h3a)	0.88	-
Type of IV meds given: Anticoagulation (j2h4a)	-	-
Type of IV meds given: Other (j2h10a)	-	-
Other treatment performed: Transfusions (j2i)	-	-
Other treatment performed: Dialysis (j2j)	-	-
Type of dialysis performed: Hemodialysis (j2j2a)	-	-
Type of dialysis performed: Peritoneal (j2j3a)	-	-
Other treatment performed: IV Access (j2k)	0.90	0.90
Type of IV access: Peripheral IV (j2k2a)	-	-
Type of IV access: Midline (j2k3a)	-	-
Type of IV access: Central line (j2k4a)	0.87	-
Type of IV access: Other (j2k10a)	-	-

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.66. Discharge Response Distributions for the Treatment Data Elements by Day First Noted (percent)

Data Element	HHA (*n* = 139)	IRF (*n* = 339)	LTCH (*n* = 84)	SNF (*n* = 228)	Overall (*n* = 790)
Cancer treatments					
Treatment performed: Chemotherapy (j2a)					
Never	99	98	99	98	98
Discharge	1	1	1	1	1
Discharge –2 days	0	0	0	0	0
Chemo treatment performed: IV (j2a2a)					
Never	99	100	100	99	99
Discharge	1	0	0	0	0
Discharge –2 days	0	0	0	0	0
Chemo treatment performed: Oral (j2a3a)					
Never	99	98	99	99	99

Data Element	HHA (*n* = 139)	IRF (*n* = 339)	LTCH (*n* = 84)	SNF (*n* = 228)	Overall (*n* = 790)
Discharge	1	1	1	1	1
Discharge –2 days	0	0	0	0	0
Chemo treatment performed: Other (j2a10a)					
Never	100	100	100	100	100
Discharge	0	0	0	0	0
Discharge –2 days	0	0	0	0	0
Treatment performed: Radiation (j2b)					
Never	100	100	100	100	100
Discharge	0	0	0	0	0
Discharge –2 days	0	0	0	0	0
Respiratory treatments					
Treatment performed: Oxygen Therapy (j2c)					
Never	89	89	63	90	87
Discharge	11	10	35	10	13
Discharge –2 days	0	1	2	0	1
Type of oxygen therapy performed: Intermittent (j2c2a)					
Never	94	95	75	92	92
Discharge	6	5	25	8	8
Discharge –2 days	0	0	0	0	0
Type of oxygen therapy performed: Continuous (j2c3a)					
Never	96	93	89	98	95
Discharge	4	6	8	2	5
Discharge –2 days	0	1	2	0	1
Type of oxygen therapy performed: High-concentration (j2c4a)					
Never	99	100	99	100	99
Discharge	1	0	1	0	1
Discharge –2 days	0	0	0	0	0
Treatment performed: Suctioning (j2d)					
Never	100	99	99	100	100
Discharge	0	1	1	0	0
Discharge –2 days	0	0	0	0	0
Type of suctioning performed: Scheduled (j2d2a)					
Never	100	100	100	100	100
Discharge	0	0	0	0	0
Discharge –2 days	0	0	0	0	0
Type of suctioning performed: As needed (j2d3a)					
Never	100	99	99	100	100
Discharge	0	1	1	0	0

Data Element	HHA (*n* = 139)	IRF (*n* = 339)	LTCH (*n* = 84)	SNF (*n* = 228)	Overall (*n* = 790)
Discharge –2 days	0	0	0	0	0
Treatment performed: Tracheostomy Care (j2e)					
Never	100	99	99	100	100
Discharge	0	1	1	0	0
Discharge –2 days	0	0	0	0	0
Treatment performed: Invasive Mechanical Ventilator (j2f)					
Never	100	100	100	100	100
Discharge	0	0	0	0	0
Discharge –2 days	0	0	0	0	0
Treatment performed: Non-Invasive Mechanical Ventilator (j2g)					
Never	93	97	89	98	96
Discharge	7	3	11	2	4
Discharge –2 days	0	0	0	0	0
Type of NIMV performed: BiPAP (j2g2a)					
Never	99	100	92	100	99
Discharge	1	0	8	0	1
Discharge –2 days	0	0	0	0	0
Type of NIMV performed: CPAP (j2g3a)					
Never	95	97	98	98	97
Discharge	5	3	2	2	3
Discharge –2 days	0	0	0	0	0
Other treatments					
Othertreatment performed: IV Meds (j2h)					
Never	88	91	52	92	87
Discharge	12	9	48	8	13
Discharge –2 days	0	1	0	0	0
Type of IV meds given: Antibiotics (j2h3a)					
Never	99	96	64	96	93
Discharge	1	4	36	4	7
Discharge –2 days	0	0	0	0	0
Type of IV meds given: Anticoagulation (j2h4a)					
Never	93	96	95	96	96
Discharge	7	4	5	4	4
Discharge –2 days	0	0	0	0	0
Type of IV meds given: Other (j2h10a)					
Never	96	98	89	100	97
Discharge	4	2	11	0	3
Discharge –2 days	0	0	0	0	0

Data Element	HHA (*n* = 139)	IRF (*n* = 339)	LTCH (*n* = 84)	SNF (*n* = 228)	Overall (*n* = 790)
Other treatment performed: Transfusions (j2i)					
Never	100	100	99	100	100
Discharge	0	0	1	0	0
Discharge –2 days	0	0	0	0	0
Other treatment performed: Dialysis (j2j)					
Never	98	97	86	100	97
Discharge	2	2	14	0	3
Discharge –2 days	0	1	0	0	0
Type of dialysis performed: Hemodialysis (j2j2a)					
Never	98	97	86	100	97
Discharge	2	2	14	0	3
Discharge –2 days	0	1	0	0	0
Type of dialysis performed: Peritoneal (j2j3a)					
Never	100	100	100	100	100
Discharge	0	0	0	0	0
Discharge –2 days	0	0	0	0	0
Other treatment performed: IV Access (j2k)					
Never	98	90	35	95	87
Discharge	2	9	63	4	12
Discharge –2 days	0	1	2	0	1
Type of IV access: Peripheral IV (j2k2a)					
Never	100	96	79	99	96
Discharge	0	4	20	1	4
Discharge –2 days	0	1	1	0	0
Type of IV access: Midline (j2k3a)					
Never	100	99	88	100	98
Discharge	0	1	11	0	1
Discharge –2 days	0	0	1	0	0
Type of IV access: Central line (j2k4a)					
Never	98	96	69	96	94
Discharge	2	4	31	3	6
Discharge –2 days	0	0	0	0	0
Type of IV access: Other (j2k10a)					
Never	100	99	99	100	99
Discharge	0	1	1	0	1
Discharge –2 days	0	0	0	0	0

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