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Specifications for HH QRP Quality Measures and Standardized Patient Assessment Data Elements (SPADEs)

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Chapter 1 IMPACT ACT Measures Beginning with the CY 2022 HH QRP

Section 1. Cross-Setting Measures Development Work: An Introduction

The Improving Medicare Post-Acute Care Transformation Act of 2014 (IMPACT Act), enacted October 6, 2014, directs the Secretary of Health and Human Services to "specify quality measures on which post-acute care (PAC) providers are required under the applicable reporting provisions to submit standardized patient assessment data" in several quality measure domains, including incidence of major falls, skin integrity and changes in skin integrity, medication reconciliation, functional status, transfer of health information and care preferences when an individual transitions, and resource use and other measures. The IMPACT Act requires the implementation of quality measures to address these measure domains in inpatient rehabilitation facilities (IRFs), Skilled Nursing Facilities (SNFs), Long-Term Care Hospitals (LTCHs), and Home Health Agencies (HHAs).

The IMPACT Act also requires, to the extent possible, the submission of such quality measure data through the use of a PAC assessment instrument and the modification of the instrument as necessary to enable such use. This requirement refers to the collection of such data by means of the IRF Patient Assessment Instrument (IRF-PAI) for IRFs, the LTCH Continuity Assessment Record and Evaluation Data Set (LTCH CARE Data Set or LCDS) for LTCHs, the Minimum Data Set (MDS) 3.0 for SNFs, and the Outcome and Assessment Information Set (OASIS) for HHAs.

For more information on the statutory history of the IRF, LTCH, or SNF Quality Reporting Program (QRP), please refer to the Fiscal Year (FY) 2016 final rules, and for the HH QRP, please refer to the Calendar Year 2016 final rules. More information on the IMPACT Act is available at Govtrack Webpage on the IMPACT Act: https://www.govtrack.us/congress/bills/113/hr4994.

In this document, we present specifications for the standardized patient assessment data elements (SPADEs) and two measures finalized for adoption for the HH QRP through the CY 2020 HH Prospective Payment System (PPS) final rule.

The Transfer of Health Information measure concept consists of two companion measures:

1. Transfer of Health Information to the Provider–Post-Acute Care Measure
2. Transfer of Health Information to the Patient–Post-Acute Care Measure

We also provide updated specifications for the previously adopted Discharge to Community measure.

Section 2. Cross-Setting Proposed Measure: Transfer of Health Information to the Provider–Post-Acute Care Measure

Measure Description

The proposed measure, the Transfer of Health Information to the Provider, assesses the timeliness of the transfer of health information, specifically transfer of a reconciled medication list. This measure evaluates for the transfer of information when a patient is transferred or discharged from their current setting to a subsequent provider. For this proposed measure, the subsequent provider is defined as a short-term general hospital, a SNF, intermediate care, home under care of an organized home health service organization or hospice, hospice in an institutional facility, an IRF, an LTCH, a Medicaid nursing facility, an inpatient psychiatric facility, or a critical access hospital.

This proposed measure, developed under the IMPACT Act, has been developed conceptually as a standardized measure for the IRF, LTCH, SNF, and HHA settings. This proposed measure is calculated by one standardized data element that asks at the time of transfer or discharge, "did the agency/facility provide the patient's current reconciled medication list to the subsequent provider?" It also includes one data element that asks the route of transmission of the reconciled medication list (Appendix A). In order to track discharge to a subsequent provider, the OASIS will be used to track discharge location status. Guidance for what is considered a reconciled medication list is discussed in greater detail in the section below. The measure is conceptualized uniformly across the PAC settings. The measure is calculated using data from the IRF-PAI for IRF patients, the LCDS for LTCH patients, the MDS 3.0 assessment instrument for SNF residents, and the OASIS for HHA patients. Data are collected and calculated separately in each of the four settings using standardized data elements. The collection of this measure and the components tied to the standardized data element used to calculate this measure are described in Chapter 1, Section 1.

The Reconciled Medication List

This proposed measure evaluates whether a reconciled medication list was sent to the subsequent provider upon a PAC transfer or discharge. To guide data collection efforts, the Centers for Medicare and Medicaid Services (CMS) outlines a general overview of what could be included in a reconciled medication list, but this is not exhaustive of all information that could be transferred. We would like to stress that this information is for guidance purposes only and is not a requirement for the types of information to be included in a PAC provider's reconciled medication list to meet the Transfer of Health Information to the Provider–Post-Acute Care measure criteria. Although the information for reconciled medication lists is guidance, we anticipate that the timely transfer of medication information should drive safer care coordination.

For the purpose of providing guidance for this measure, a reconciled medication list is a list of the current prescribed and over-the-counter medications, nutritional supplements, vitamins, and homeopathic and herbal products administered by any route to the patient/resident at the time of discharge or transfer. Medications may also include but are not limited to total parenteral nutrition and oxygen. The current medications should include those that are (1) active, including those that will be discontinued after discharge, and (2) those held during the stay and planned to be continued/resumed after discharge. If deemed relevant to the patient's/resident's care by the subsequent provider, medications discontinued during the stay may be included.

A reconciled medication list often includes important information about (1) the patient/resident - including their name, date of birth, information, active diagnoses, known medication and other allergies, and known drug sensitivities and reactions, and (2) each medication, including the name; strength; dose; route of medication administration; frequency or timing; purpose/indication; any special instructions (e.g., crush medications); and, for any held medications, the reason for holding the medication and when medication should resume. This information can improve medication safety. Additional information may be applicable and important to include in the medication list such as the patient's/resident's weight and date taken, height and date taken, preferred language, and ability to self-administer medication; when the last dose of the

medication was administered by the discharging/transferring provider; and when the final dose should be administered (e.g., end of treatment).

Documentation sources for reconciled medication list information include electronic and/or paper records; Some examples of such records are discharge summary records, a Medication Administration Record, an Intravenous Medication Administration Record, a home medication list, and physician orders.

The guidance on what to include in a reconciled medication list is aligned to the provisions in the proposed Discharge Planning for Hospitals, Critical Access Hospital, and HHA regulation, which outlines discharge planning and the documentation of medications (https://www.federalregister.gov/documents/2015/11/03/2015-27840/medicare-and-medicaid-programs-revisions-to-requirements-for-discharge-planning-for-hospitals). In addition, this guidance follows the requirements finalized in the Reform of Requirements for Long-Term Care Facilities (https://www.federalregister.gov/documents/2016/10/04/2016-23503/medicare-and-medicaid-programs-reform-of-requirements-for-long-term-care-facilities).

Purpose/Rationale for the Quality Measure

In 2013, 22.3 percent of all acute hospital discharges were discharged to PAC settings, including 11 percent who were discharged to home under the care of a home health agency (HHA), and 9 percent who were discharged to SNFs.[1] The proportion of patients being discharged from an acute care hospital to a PAC setting was greater among beneficiaries enrolled in fee-for-service (FFS) Medicare. Among FFS patients discharged from an acute hospital, 42 percent went directly to PAC settings. Of those, 20 percent were discharged to a SNF, 18 percent were discharged to an HHA, 3 percent were discharged to an IRF, and 1 percent were discharged to an LTCH.[2] Of the Medicare FFS beneficiaries with an HH episode in CYs 2016 and 2017, an estimated 54 percent were discharged without an assistive device, 16 percent were discharged with an assistive device, and 1 percent were discharged to a non-institutional hospice service.[3]

The transfer and/or exchange of health information from one provider to another takes several forms including verbal (e.g. clinician to clinician communication by telephone or in-person), paper-based (e.g. faxed or printed copies of records) and electronic communication (e.g. via health information exchange network, using an electronic health/medical record, secure messaging). Health information, such as medication information, that is incomplete or missing increases the likelihood of a patient/resident safety risk, often life-threatening.[4] [5] [6] [7] [8] [9] Poor communication and coordination across health care settings contributes to patient complications, hospital readmissions, emergency department visits, and medication

[1] Tian, W. "An all-payer view of hospital discharge to postacute care," May 2016. Available at: https://www.hcup-us.ahrq.gov/reports/statbriefs/sb205-Hospital-Discharge-Postacute-Care.jsp.

[2] *Ibid.*

[3] Abt Associates analysis of Medicare fee for service data for index episodes in HHA 2016/2017. .

[4] Kwan, J. L., Lo, L., Sampson, M., & Shojania, K. G. (2013). Medication reconciliation during transitions of care as a patient safety strategy: A systematic review. *Annals of Internal Medicine, 158*(5 Pt 2), 397–403. https://doi.org/10.7326/0003-4819-158-5-201303051-00006

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[8] Desai, R., Williams, C. E., Greene, S. B., Pierson, S., & Hansen, R. A. (2011). Medication errors during patient transitions into nursing homes: Characteristics and association with patient harm. *The American Journal of Geriatric Pharmacotherapy, 9*(6), 413–422. https://doi.org/10.1016/j.amjopharm.2011.10.005

[9] Boling, P. A. (2009). Care transitions and home health care. *Clinics in Geriatric Medicine, 25*(1), 135–148. https://doi.org/10.1016/j.cger.2008.11.005

errors.[10] [11] [12] [13] [14] [15] [16] [17] [18] [19] Communication has been cited as the third most frequent root cause in sentinel events, which The Joint Commission defines[20] as a patient safety event that results in death, permanent harm, or severe temporary harm. Failed or ineffective patient handoffs are estimated to play a role in 20 percent of serious preventable adverse events.[21] When care transitions are enhanced through care coordination activities, such as expedited patient information flow, these activities can reduce duplication of care services and costs of care, resolve conflicting care plans and prevent medical errors.[22] [23] [24] [25] [26] The rising incidence of preventable adverse events, complications and hospital readmissions have drawn national attention to the importance of the timely transfer of health information and care preferences at transitions. However, there is limited information about the route or mode (for example, paper-based, verbal, and electronic) of transmission used by PAC providers to transfer health information. PAC provider health information exchange supports the goals of: high quality, personalized, and efficient healthcare; care coordination and person-centered care; and real-time, data-driven, clinical decision making.

PAC patients often have complicated medication regimens and require efficient and effective communication and coordination of care between settings, including transfer of detailed medication

[10] Barnsteiner, J. H. (2005). Medication reconciliation: Transfer of medication information across settings-keeping it free from error. *The American Journal of Nursing*, *105*(3, Suppl), 31–36. https://doi.org/10.1097/00000446-200503001-00007

[11] Arbaje, A. I., Kansagara, D. L., Salanitro, A. H., Englander, H. L., Kripalani, S., Jencks, S. F., & Lindquist, L. A. (2014). Regardless of age: Incorporating principles from geriatric medicine to improve care transitions for patients with complex needs. *Journal of General Internal Medicine*, *29*(6), 932–939. https://doi.org/10.1007/s11606-013-2729-1

[12] Jencks, S. F., Williams, M. V., & Coleman, E. A. (2009). Rehospitalizations among patients in the Medicare fee-for-service program. *The New England Journal of Medicine*, *360*(14), 1418–1428. https://doi.org/10.1056/NEJMsa0803563

[13] Institute of Medicine. (2007). *Preventing Medication Errors.* Washington, DC: The National Academies Press. https://doi.org/10.17226/11623.

[14] Kitson, N. A., Price, M., Lau, F. Y., & Showler, G. (2013). Developing a medication communication framework across continuums of care using the Circle of Care Modeling approach. *BMC Health Services Research*, *13*(1), 418. https://doi.org/10.1186/1472-6963-13-418

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[16] Institute of Medicine. (2007). *Preventing Medication Errors.* Washington, DC: The National Academies Press. https://doi.org/10.17226/11623

[17] Kitson, N. A., Price, M., Lau, F. Y., & Showler, G. (2013). Developing a medication communication framework across continuums of care using the Circle of Care Modeling approach. *BMC Health Services Research*, *13*(1), 418. https://doi.org/10.1186/1472-6963-13-418

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[19] King, B. J., Gilmore-Bykovskyi, A. L., Roiland, R. A., Polnaszek, B. E., Bowers, B. J., & Kind, A. J. (2013). The consequences of poor communication during transitions from hospital to skilled nursing facility: A qualitative study. *Journal of the American Geriatrics Society*, *61*(7), 1095–1102. https://doi.org/10.1111/jgs.12328

[20] The Joint Commission. (2017, June 29). Sentinel event policy and procedures. Retrieved from https://www.jointcommission.org/sentinel_event_policy_and_procedures/

[21] The Joint Commission. (2016, March 2). Sentinel event statistics updated, released through end of 2015Retrieved from https://www.jointcommission.org/assets/1/23/jconline_Mar_2_2016.pdf

[22] Mor, Intrator, Feng, & Grabowski, 2010.

[23] Institute of Medicine, 2007.

[24] Starmer, A. J., Sectish, T. C., Simon, D. W., Keohane, C., McSweeney, M. E., Chung, E. Y., . . . Landrigan, C. P. (2013). Rates of medical errors and preventable adverse events among hospitalized children following implementation of a resident handoff bundle. *Journal of the American Medical Association*, *310*(21), 2262–2270. https://doi.org/10.1001/jama.2013.281961

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[26] Balaban, R. B., Weissman, J. S., Samuel, P. A., & Woolhandler, S. (2008). Redefining and redesigning hospital discharge to enhance patient care: A randomized controlled study. *Journal of General Internal Medicine*, *23*(8), 1228–1233. https://doi.org/10.1007/s11606-008-0618-9

information.[27] [28] [29] Individuals in PAC settings may be vulnerable to adverse health outcomes because of insufficient medication information on the part of their health care providers, and their higher likelihood for multiple comorbid chronic conditions, polypharmacy, and complicated transitions between care settings.[30] [31] Preventable adverse drug events (ADEs) occur after hospital discharge in a variety of settings including PAC.[32]

Patients in PAC settings are often taking multiple medications. Consequently, PAC providers regularly are in the position of starting complex new medication regimens with little knowledge of the patient or their medication history upon admission. Furthermore, inter-provider communication barriers delay resolving medication discrepancies during transitions of care.[33] The transfer of a medication list between providers is necessary for medication reconciliation interventions, which have been shown to be a cost-effective way to avoid ADEs by reducing errors,[34] [35] [36] especially when medications are reviewed by a pharmacist and when it is done in conjunction with the use of electronic medical records.[37]

Denominator

The target population is all patients discharged or transferred to a subsequent provider from a HHA.

HH Denominator

The denominator is the number of Medicare Part A, Medicare Part B, Medicare Advantage (Part C) and Medicaid covered home health quality episodes ending in discharge/transfer to a short-term general hospital, a SNF, intermediate care, home under care of another organized home health service organization or hospice, hospice in an institutional facility, a swing bed, an IRF, a LTCH, a Medicaid nursing facility, an inpatient psychiatric facility, or a critical access hospital.

Discharge to one of these providers is based on responses to M0100 Reason for Assessment (RFA 9) and M2420 Discharge Disposition (response 2 or 3), of the OASIS assessment shown below.

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[27] Starmer, A. J., Spector, N. D., Srivastava, R., West, D. C., Rosenbluth, G., Allen, A. D., . . . Landrigan, C. P., & the I-PASS Study Group. (2014). Changes in medical errors after implementation of a handoff program. *The New England Journal of Medicine*, *371*(19), 1803–1812. https://doi.org/10.1056/NEJMsa1405556

[28] Kruse, C. S., Marquez, G., Nelson, D., & Polomares, O. (2018). The use of health information exchange to augment patient handoff in long-term care: A systematic review. *Applied Clinical Informatics*, *9*(4), 752–771. https://doi.org/10.1055/s-0038-1670651

[29] Brody, A. A., Gibson, B., Tresner-Kirsch, D., Kramer, H., Thraen, I., Coarr, M. E., & Rupper, R. (2016). High prevalence of medication discrepancies between home health referrals and Centers for Medicare and Medicaid Services home health certification and plan of care and their potential to affect safety of vulnerable elderly adults. *Journal of the American Geriatrics Society*, *64*(11), e166–e170. https://doi.org/10.1111/jgs.14457

[30] Chhabra, P. T., Rattinger, G. B., Dutcher, S. K., Hare, M. E., Parsons, K. L., & Zuckerman, I. H. (2012). Medication reconciliation during the transition to and from long-term care settings: A systematic review. *Research in Social & Administrative Pharmacy*, *8*(1), 60–75. https://doi.org/10.1016/j.sapharm.2010.12.002

[31] Levinson, D. R. (2014). *Adverse events in skilled nursing facilities: national incidence among Medicare beneficiaries*. Washington, DC: U.S. Department of Health and Human Services, Office of the Inspector General. Retrieved from https://oig.hhs.gov/oei/reports/oei-06-11-00370.pdf

[32] Battles J., Azam I., Grady M., & Reback K. (2017, August). Advances in patient safety and medical liability. AHRQ Publication No. 17-0017-EF. Rockville, MD: Agency for Healthcare Research and Quality. Retrieved from https://www.ahrq.gov/sites/default/files/publications/files/advances-complete_3.pdf

[33] Patterson, M. E., Foust, J. B., Bollinger, S., Coleman, C., & Nguyen, D. (2019). Inter-facility communication barriers delay resolving medication discrepancies during transitions of care. *Research in Social and Administrative Pharmacy, 15*(4), 366–369. https://dx.doi.org/10.1016/j.sapharm.2018.05.124

[34] Boockvar, et al., 2011.

[35] Kwan, Lo, L., Sampson, & Shojania, 2013.

[36] Chhabra et al., 2012.

[37] Agrawal, A., & Wu, W. Y. (2009). Reducing medication errors and improving systems reliability using an electronic medication reconciliation system. *Joint Commission Journal on Quality and Patient Safety*, *35*(2), 106–114. https://doi.org/10.1016/S1553-7250(09)35014-X

Transfer to one of these providers is based on responses to M0100 Reason for Assessment (RFA 6 or RFA 7), of the OASIS assessment, shown below:

M0100. This Assessment is Currently Being Completed for the Following Reason
Start/Resumption of Care 1. **Start of care –** further visits planned 3. **Resumption of care** (after inpatient stay) **Follow-Up** 4. **Recertification (follow-up) reassessment** 5. **Other follow-up** **Transfer to an Inpatient Facility** 6. **Transferred to an inpatient facility –** patient not discharged from agency 7. **Transferred to an inpatient facility –** patient discharged from agency **Discharge from Agency – Not to an Inpatient Facility** 8. **Death at home** 9. **Discharge from agency**
M2420. Discharge Disposition Where is the patient after discharge from your agency? (Choose only one answer.)
1. **Patient remained in the community (without formal assistive services)** 2. **Patient remained in the community (with formal assistive services)** 3. **Patient transferred to a non-institutional hospice** 4. **Unknown because patient moved to a geographic location not served by this agency** UK **Other unknown**

HH Denominator Exclusion

Patients who die during the episode.

Numerator

HH Numerator: The numerator is the number of home health quality episodes for which the OASIS indicated that the following is true:

At the time of discharge/transfer, the agency provided a current reconciled medication list to the subsequent provider (A2121A/B= [1]).

Measure Time Window

The measure will be calculated quarterly for public reporting. All eligible HH episodes during the quarter will be included in the denominator and are eligible for inclusion in the numerator. For patients with multiple episodes during the quarter, each episode is eligible for inclusion in the measure.

Items Included in the Quality Measure

One data element with two time point-specific versions will be included to calculate the measure. One data element will be collected to inform the measure consistency logic of the proposed measure.

Provision of Current Reconciled Medication List to Subsequent Provider at Discharge

A2121A. Provision of Current Reconciled Medication List to Subsequent Provider at Discharge At the time of discharge to another provider, did your agency provide the patient's current reconciled medication list to the subsequent provider?	
Enter Code ☐	0. **No** – Current reconciled medication list not provided to the subsequent provider 1. **Yes** – Current reconciled medication list provided to the subsequent provider

Provision of Current Reconciled Medication List to Subsequent Provider at Transfer

A2121B. Provision of Current Reconciled Medication List to Subsequent Provider at Transfer At the time of transfer to another provider, did your agency provide the patient's current reconciled medication list to the subsequent provider?	
☐ Enter Code	0. **No– Current reconciled medication list not provided to the subsequent provider?** 1. **Yes – Current reconciled medication list provided to the subsequent provider** 2. **NA – The agency was not made aware of this transfer timely**

Route of Current Medication List Transmission

A2123. Route of Current Reconciled Medication List Transmission Indicate the route(s) of transmission of the current reconciled medication list to the subsequent provider and/or patient/family/caregiver.		
Route of Transmission	**1. To subsequent provider**	**2. To patient/family/ caregiver**
	↓ **Check all that apply** ↓	
A. Electronic Health Record	☐	☐
B. Health Information Exchange Organization	☐	☐
C. Verbal (e.g., in-person, telephone, video conferencing)	☐	☐
D. Paper-based (e.g., fax, copies, printouts)	☐	☐
E. Other Methods (e.g., texting, email, CDs)	☐	☐

Risk Adjustment

This measure is not risk-adjusted or stratified.

Quality Measure Calculation Steps

The following steps are used to calculate the measure:

Calculate the agency's observed score (steps 1 through 3).

Step 1. Calculate the denominator count
Calculate the total number of quality episodes with a discharge to a subsequent provider and the total number of quality episodes with a transfer to a subsequent provider based on the discharge/transfer location items in Appendix A.

Step 2. Calculate the numerator count

Calculate the total number of stays where a reconciled medication list was transferred:

A2121A/B = [1]

Step 3: Calculate the agency's observed score.

Divide the agency's numerator count by its denominator count to obtain the observed score; in other words, divide the results of Step 2 by the results of Step 1. Multiply by 100.

Quality Measure Coding Steps

The following steps are used to code the measure:

1. At discharge, identify discharge location with item M0100 RFA 9 and M2420 response 2 or 3.
2. At transfer, identify transfer to inpatient facility with item M0100 RFA 6 or 7.
3. At discharge, code for whether the agency provided the reconciled medication list to the subsequent provider with item A2121A.
4. At transfer, code for if the agency provided the reconciled medication list to the subsequent provider with item A2121B.

5. At discharge/transfer, code for the route of transmission with item A2123, category 1.

   A valid response for item A2121A/B [A2121A/B = 1] would progress the coder into item A2123. This item is used for measure consistency logic.

Section 3. Cross-Setting Proposed Measure: Transfer of Health Information to the Patient–Post-Acute Care Measure

Measure Description

This proposed measure assesses for and reports on the timely transfer of health information, i.e., a current reconciled medication list, to the patient/resident when discharged from their current setting of PAC to a private home/apartment, board and care home, assisted living, group home, or transitional living

This proposed measure, developed under the IMPACT Act, has been developed for the IRF, LTCH, SNF, and HHA settings. This proposed measure is calculated by one standard data element that asks at the time of discharge, "Did the agency provide the patient's/resident's current reconciled medication list to the patient, family, and/or caregiver?" It also includes one data element that asks how the reconciled medication list was transferred (Appendix A). The OASIS, which tracks discharge location status, will be used to track discharge at home. The measure is conceptualized uniformly across the PAC settings. The measure is calculated using data from the IRF-PAI for IRF patients, the LCDS for LTCH patients, the MDS 3.0 assessment instrument for SNF residents, and the OASIS for HHA patients. Data are collected and calculated separately in each of the four settings using standardized data elements. The collection of this measure and the components tied to the standardized data element used to calculate this measure are in Appendix A.

The Reconciled Medication List

The guidance related to a reconciled medication list for purposes of this measure, as well as the information that may be included for the patient/resident and for each of the medications, is in Chapter 1, Section 2. It is recommended that a reconciled medication list that is transferred to the patient, family, or caregiver using consumer-friendly terminology and plain language to ensure that the information given to patients and caregivers is clear and understandable, promoting transparent access to medical record information.[38]

Purpose/Rationale for the Quality Measure

In 2013, 22.3 percent of all acute hospital discharges were discharged to PAC settings, including 11 percent who were discharged to home under the care of an HHA.[39] The proportion of patients being discharged from an acute care hospital to a PAC setting was greater among beneficiaries enrolled in fee-for-service (FFS) Medicare. Of the Medicare FFS beneficiaries with an HH episode in CYs 2016 and 2017, an estimated 54 percent were discharged without an assistive device, 16 percent were discharged with an assistive device, and one percent were discharged to a non-institutional hospice service.[40]

The communication of health information, such as a reconciled medication list, is critical to ensuring safe and effective patient transitions from health care settings to home and other community settings. Incomplete or missing health information, such as medication information, increases the likelihood of a patient safety risk, often life-threatening.[41] [42] [43] [44] [45] Individuals who use PAC settings are particularly vulnerable to adverse health outcomes because of their higher likelihood of multiple comorbid chronic

[38] For an examples of plain language resources for healthcare information see: https://www.plainlanguage.gov/resources/content-types/healthcare/

[39] Tian, 2016.

[40] Abt Associates analysis of Medicare fee for service data for index episodes in HHA 2016/2017. .

[41] Kwan et al., 2013.

[42] Boockvar et al., 2011.

[43] Bell et al., 2011.

[44] Basey, Krska, Kennedy, & Mackridge, , 2014.

[45] Desai, Williams, Greene, Pierson& Hansen, , 2011.

conditions, polypharmacy, and complicated transitions between care settings.[46] [47] Upon discharge to home, individuals in PAC settings may be faced with numerous medication changes and follow-up details.[48] [49] [50] The efficient and effective communication and coordination of medication information may be critical to prevent potentially deadly adverse effects. When care coordination activities enhance care transitions, these activities can reduce duplication of care services and costs of care, resolve conflicting care plans, and prevent medical errors.[51] [52]

The transfer of a patient's medication information to the patient, family, or caregiver is common practice and supported by discharge planning requirements for participation in Medicare and Medicaid programs.[53] [54] However, there is limited information about the route or mode (for example, paper-based, verbal, and electronic) of transmission used by PAC providers to transfer health information. PAC provider health information exchange with patients, families and caregivers supports the goals of: high quality, personalized, and efficient healthcare; care coordination and person-centered care; and real-time, data-driven clinical decision making.

Some PAC electronic health record systems generate a discharge medication list. Interventions to promote patient participation in medication management have been shown to be acceptable and potentially useful for improving patient outcomes and reducing costs.[55] [56] Furthermore, provision of a reconciled medication list to patients/residents and their caregivers can improve transitional care.[57]

Some clinical practice guidelines state the importance of medication safety and communicating accurate medication information to the patient. For example, The Joint Commission's National Patient Safety Goals #4 and #5 for Home Care Accreditation (NPSG.03.06.01) are as follows:[58]

4. Provide the patient (or family as needed) with written information on the medications the patient should be taking when leaving the organization's care (for example, name, dose, route, frequency, purpose).
5. Explain the importance of managing medication information to the patient.

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[46] Brody et al., 2016.

[47] Chhabra et al., 2012.

[48] Brody et al., 2016.

[49] Bell et al., 2011.

[50] Sheehan, O. C., Kharrazi, H., Carl, K. J., Leff, B., Wolff, J. L., Roth, D. L., Gabbard, J., & Boyd, C. M., "Helping older adults improve their medication experience (HOME) by addressing medication regimen complexity in home healthcare," *Home Healthcare Now*. 2018, Vol. 36(1) pp. 10-19.

[51] Mor et al., 2010.

[52] Starmer et al., 2013.

[53] Director, Survey and Certification Group, CMS. (2013, May 17). Revision to state operations manual (SOM), Hospital Appendix A - Interpretive Guidelines for 42 CFR 482.43, Discharge Planning. Retrieved from https://www.cms.gov/Medicare/Provider-Enrollment-and-Certification/SurveyCertificationGenInfo/Downloads/Survey-and-Cert-Letter-13-32.pdf.

[54] The State Operations Manual Guidance to Surveyors for Long-Term Care Facilities (Guidance §483.21(c)(1) Rev. 11-22-17) for discharge planning.

[55] Greene, J., & Hibbard, J. H. (2012). Why does patient activation matter? An examination of the relationships between patient activation and health-related outcomes. *Journal of General Internal Medicine*, *27*(5), 520–526. https://doi.org/10.1007/s11606-011-1931-2

[56] Phatak, A., Prusi, R., Ward, B., Hansen, L. O., Williams, M. V., Vetter, E., . . . Postelnick, M. (2016). Impact of pharmacist involvement in the transitional care of high-risk patients through medication reconciliation, medication education, and postdischarge call-backs (IPITCH Study). *Journal of Hospital Medicine*, *11*(1), 39–44. https://doi.org/10.1002/jhm.2493

[57] Toles, M., Colón-Emeric, C., Naylor, M. D., Asafu-Adjei, J., & Hanson, L. C. (2017). Connect-home: Transitional care of skilled nursing facility patients and their caregivers. *Journal of the American Geriatric Society*, *65*(10), 2322–2328. https://doi.org/10.1111/jgs.15015

[58] The Joint Commission. (2018). National patient safety goals Effective January 2018: Home Care Accreditation Program. Retrieved from https://www.jointcommission.org/assets/1/6/NPSG_Chapter_OME_Jan2018.pdf

The Agency for Healthcare Research and Quality (AHRQ) Project Re-Engineered Discharge Toolkit includes several medication-related strategies (e.g., active medication reconciliation, medication teaching for patients and caregivers, development of medication list for patients and their health care providers).[59]

Denominator

HHA Denominator

The denominator for this measure is the number of Medicare Part A, Medicare Part B, Medicare Advantage (Part C) and Medicaid covered home health quality episodes ending in discharge to a private home/ apartment, board/care, assisted living, group home, or transitional living. Discharge to one of these locations is based on response to the discharge location item, M0100 Reason for Assessment, response 9 and M2420 Discharge Disposition (response 1,4, or UK) of the OASIS assessment, shown below:

M0100. This Assessment is Currently Being Completed for the Following Reason
Start/Resumption of Care
1. **Start of care** – further visits planned
3. **Resumption of care** (after inpatient stay)
Follow-Up
4. **Recertification (follow-up) reassessment**
5. **Other follow-up**
Transfer to an Inpatient Facility
6. **Transferred to an inpatient facility** – patient not discharged from agency
7. **Transferred to an inpatient facility** – patient discharged from agency
Discharge from Agency – Not to an Inpatient Facility
8. **Death at home**
9. **Discharge from agency**

HH Denominator Exclusion

Patients who die during the episode.

Numerator

HHA Numerator: The numerator is the number of quality episodes for which the OASIS indicated that the following is true:

At the time of discharge, the agency provided a current reconciled medication list to the patient, family, and/or caregiver (A2122= [1]).

Measure Time Window

The measure will be calculated quarterly for public reporting. All eligible HH episodes during the quarter will be included in the denominator and are eligible for inclusion in the numerator. For patients with multiple episodes during the quarter, each episode is eligible for inclusion in the measure.

Items Included in the Quality Measure

One data element will be included to calculate the measure. One data element will be collected to inform the internally consistent logic of the proposed measure.

Provision of Current Reconciled Medication List to Patient at Discharge

[59] Jack, B., Paasche-Orlow, M., Mitchell, S., Forsythe, S., Martin, J., & Brach, C. (n.d.). *Re-Engineered Discharge (RED) toolkit.* Rockville, MD: Agency for Healthcare Research and Quality. Retrieved from https://www.ahrq.gov/professionals/systems/hospital/red/toolkit/index.html, Last accessed November, 28, 2018.

A2122. Provision of Current Reconciled Medication List to Patient at Discharge At the time of discharge, did your agency provide the patient's current reconciled medication list to the patient, family and/or caregiver?	
Enter Code ☐	0. **No** – Current reconciled medication list not provided to the patient, family and/or caregiver 1. **Yes** – Current reconciled medication list provided to the patient, family and/or caregiver

Route of Current Medication List Transmission

A2123. Route of Current Reconciled Medication List Transmission Indicate the route(s) of transmission of the current reconciled medication list to the subsequent provider and/or patient/family/caregiver.		
Route of Transmission	**1. To subsequent provider**	**2. To patient/family/ caregiver**
	↓ Check all that apply ↓	
A. Electronic Health Record	☐	☐
B. Health Information Exchange Organization	☐	☐
C. Verbal (e.g., in-person, telephone, video conferencing)	☐	☐
D. Paper-based (e.g., fax, copies, printouts)	☐	☐
E. Other Methods (e.g., texting, email, CDs)	☐	☐

Risk Adjustment

This measure is not risk-adjusted or stratified.

Quality Measure Calculation Steps

The following steps are used to calculate the measure:

Calculate the agency observed score (Steps 1 through 3).

Step 1. Calculate the denominator count

Calculate the number of quality episodes with discharge to home using the discharge location item in Appendix A.

Step 2. Calculate the numerator count

Calculate the number of quality episodes where a reconciled medication list was transferred:

A2122 = [1]

Step 3: Calculate the agency observed score

Divide the agency's numerator count by its denominator count; in other words, divide the results of Step 2 by the results of Step 1. Multiply by 100.

Quality Measure Coding Steps

The following steps are used to code the measure:

1. At discharge, code for the patient's discharge location.

   Identify discharge location with item M0100, RFA 9 and M2420 Discharge Disposition (response 1, 4, or UK).

2. At discharge, code for whether the agency provided the reconciled medication list to the patient, family and/or caregiver with item A2122**.**

3. At discharge, code for the route of transmission with item A2123, category 2.

   A valid response for item A2122 [A2122 = 1] would progress the coder to item A2123. This item is used for measure consistency logic.

Section 4. Update to Discharge to Community-Post Acute Care (PAC) Home Health (HH) Quality Reporting Program (QRP)

Measure Description

Sections 1899B(d)(1)(B) and 1899B(a)(2)(E)(ii) of the Act require the Secretary to specify a measure to address the resource use and other measures domain of discharge to community by SNFs, LTCHs, and IRFs by October 1, 2016, and HHAs by January 1, 2017. We are proposing to adopt the measure, Discharge to Community PAC Home Health (HH) Quality Reporting Program (QRP) for the HH QRP as a Medicare FFS claims- based measure to meet this requirement.

This measure assesses successful discharge to the community from HHA, with successful discharge to the community including no unplanned hospitalizations and no death in the 31 days following discharge. Specifically, this measure reports a HHA's risk-standardized rate of Medicare FFS patients who are discharged to the community after a HH episode, do not have an unplanned admission to an acute care hospital or LTCH in the 31 days following discharge to community, and remain alive during those 31 days. Community, for this measure, is defined as home/self-care without HH services, based on Patient Discharge Status Codes 01 and 81 on the Medicare FFS claim.[60,61]

We have developed a discharge to community measure for the home health (HH) setting. This measures' definitions of the discharge to community outcome, approaches to risk adjustment, and measure calculations are mostly the same across PAC settings. It is important to note, though, that each measure is specific to the particular PAC setting (i.e., HH, IRF, SNF, or LTCH); we do not pool PAC patients/residents across settings in the measure development and calculation.

Purpose/Rationale for the Measure

Discharge to a community setting is an important health care outcome for many patients for whom the overall goals of post-acute care include optimizing functional improvement, returning to a previous level of independence, and avoiding institutionalization. Returning to the community is also an important outcome for many patients who are not expected to make functional improvement during their HH stay, and for patients who may be expected to decline functionally because of their medical condition. The discharge to community outcome offers a multidimensional view of preparation for community life, including the cognitive, physical, and psychosocial elements involved in a discharge to the community.[62,63]

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60 Further description of patient discharge status codes can be found, for example, at the following Web page: https://med.noridianmedicare.com/web/jea/topics/claim-submission/patient-status-codes.

62 El-Solh AA, Saltzman SK, Ramadan FH, Naughton BJ. Validity of an artificial neural network in predicting discharge destination from a postacute geriatric rehabilitation unit. Archives of physical medicine and rehabilitation. 2000;81(10):1388-1393.

63 Tanwir S, Montgomery K, Chari V, Nesathurai S. Stroke rehabilitation: availability of a family member as caregiver and discharge destination. European journal of physical and rehabilitation medicine. 2014;50(3):355- 362.

In addition to being an important outcome from a patient and family perspective, patients discharged to community settings, on average, incur lower costs over the recovery episode, compared with those discharged to institutional settings.[64,65] Given the high costs of care in institutional settings, encouraging PAC providers to prepare patients for discharge to community, when clinically appropriate, may have cost-saving implications for the Medicare program.[66]

Also, providers have found that successful discharge to community was a major driver of their ability to achieve savings, where capitated payments for PAC were in place.[67] For patients who require long-term care due to persistent disability, discharge to community could result in lower long-term care costs for Medicaid and for patients' out-of-pocket expenditures.[68]

Analyses conducted for the Assistant Secretary for Planning and Evaluation on PAC episodes, using a 5 percent sample of 2006 Medicare claims, revealed that relatively high average, unadjusted Medicare payments are associated with discharge to institutional settings from HHAs, as compared with payments associated with discharge to community settings.[69] Average, unadjusted Medicare payments associated with discharge to community settings ranged from $0 to $992 for HHA discharges. In contrast, payments associated with discharge to non- community settings were considerably higher, ranging from $7,981 to $35,192 for HHA discharges per episode of care.[70]

Measuring and comparing HH-level discharge to community rates is expected to help differentiate among HHAs with varying performance in this important domain, and to help avoid disparities in care across patient groups. Variation in discharge to community rates has been reported within and across PAC settings; across a variety of HH-level characteristics, such as geographic location (for example, regional location, urban or rural location), ownership (for example, for-profit or nonprofit), and freestanding or hospital-based units; and across patient- level characteristics, such as race and gender.[71,72,73,74,75,76]

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[64] Dobrez, D., Heinemann, A. W., Deutsch, A., Manheim, L., & Mallinson, T. (2010). Impact of Medicare's prospective payment system for inpatient rehabilitation facilities on stroke patient outcomes. *American Journal of Physical Medicine & Rehabilitation*, *89*(3), 198–204. https://doi.org/10.1097/PHM.0b013e3181c9fb40

[65] Gage B, Morley M, Spain P, Ingber M. Examining Post Acute Care Relationships in an Integrated Hospital System. Final Report. Research Triangle Park, NC: RTI International;2009.

[66] Gage, Morley, Spain, & Ingber, 2009.

[67] Doran, J. P., & Zabinski, S. J. (2015). Bundled payment initiatives for Medicare and non-Medicare total joint arthroplasty patients at a community hospital: Bundles in the real world. *The Journal of Arthroplasty*, *30*(3), 353–355. https://doi.org/10.1016/j.arth.2015.01.035

[68] Newcomer, R. J., Ko, M., Kang, T., Harrington, C., Hulett, D., & Bindman, A. B. (2016). Health care expenditures after initiating long-term services and supports in the community versus in a nursing facility. *Medical Care*, *54*(3), 221–228. https://doi.org/10.1097/MLR.0000000000000491

[69] Gage et al., 2009.

[70] Ibid.

[71] Reistetter, T. A., Karmarkar, A. M., Graham, J. E., Eschbach, K., Kuo, Y. F., Granger, C. V., . . . Ottenbacher, K. J. (2014). Regional variation in stroke rehabilitation outcomes. *Archives of Physical Medicine and Rehabilitation*, *95*(1), 29–38. https://doi.org/10.1016/j.apmr.2013.07.018

[72] El-Solh, A. A., Saltzman, S. K., Ramadan, F. H., & Naughton, B. J. (2000). Validity of an artificial neural network in predicting discharge destination from a postacute geriatric rehabilitation unit. *Archives of Physical Medicine and Rehabilitation*, *81*(10), 1388–1393. https://doi.org/10.1053/apmr.2000.16348

[73] March 2015 Report to the Congress: Medicare Payment Policy. Medicare Payment Advisory Commission;2015.

[74] Bhandari VK, Kushel M, Price L, Schillinger D. Racial disparities in outcomes of inpatient stroke rehabilitation.Archives of physical medicine and rehabilitation. 2005;86(11):2081-2086.

[75] Chang PF, Ostir GV, Kuo YF, Granger CV, Ottenbacher KJ. Ethnic differences in discharge destination among older patients with traumatic brain injury. Archives of physical medicine and rehabilitation. 2008;89(2):231-236.

[76] Berges IM, Kuo YF, Ostir GV, Granger CV, Graham JE, Ottenbacher KJ. Gender and ethnic differences in rehabilitation outcomes after hip-replacement surgery. American journal of physical medicine & rehabilitation / Association of Academic

Discharge to community rates in the IRF setting have been reported to range from about 60 to 80 percent.[77,78,79,80,81,82] Longer-term studies show that rates of discharge to community from IRFs have decreased over time as IRF length of stay has decreased.[83,84] Greater variation in discharge to community rates is seen in the SNF setting, with rates ranging from 31 to 65 percent.[85,86,87,88]

In the HH Medicare FFS population, using CY 2013 national claims data, we found that approximately 82 percent of episodes ended with a discharge to the community. A multi-center study of 23 LTCHs demonstrated that 28.8 percent of 1,061 patients who were ventilator-dependent on admission were discharged to home.[89] A single-center study found that 31 percent of LTCH hemodialysis patients were discharged to home.[90] One study noted that 64 percent of beneficiaries who were discharged from the HH episode did not use any other acute or post-acute services paid by Medicare in the 30 days after discharge[91] and a second study noted that between 58 percent and 63 percent of beneficiaries were

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Physiatrists. 2008;87(7):567-572 https://doi.org/10.1097/PHM.0b013e31817c143a

77 Galloway, R. V., Granger, C. V., Karmarkar, A. M., Graham, J. E., Deutsch, A., Niewczyk, P., . . . Ottenbacher, K. J. (2013). The Uniform Data System for Medical Rehabilitation: Report of patients with debility discharged from inpatient rehabilitation programs in 2000-2010. *American Journal of Physical Medicine & Rehabilitation*, *92*(1), 14–27. https://doi.org/10.1097/PHM.0b013e31827441bc

78 Morley, M. A., Coots, L. A., Forgues, A. L., & Gage, B. J. (2012). Inpatient rehabilitation utilization for Medicare beneficiaries with multiple sclerosis. *Archives of Physical Medicine and Rehabilitation*, *93*(8), 1377–1383. https://doi.org/10.1016/j.apmr.2012.03.008

79 Reistetter, T. A., Graham, J. E., Deutsch, A., Granger, C. V., Markello, S., & Ottenbacher, K. J. (2010). Utility of functional status for classifying community versus institutional discharges after inpatient rehabilitation for stroke. *Archives of Physical Medicine and Rehabilitation*, *91*(3), 345–350. https://doi.org/10.1016/j.apmr.2009.11.010

80 Gagnon, D., Nadeau, S., & Tam, V. (2005). Clinical and administrative outcomes during publicly-funded inpatient stroke rehabilitation based on a case-mix group classification model. *Journal of Rehabilitation Medicine*, *37*(1), 45–52. https://doi.org/10.1080/16501970410015055

81 DaVanzo, J., El-Gamil, A., Li, J., Shimer, M., Manolov, N., & Dobson, A. (2014). Assessment of patient outcomes of rehabilitative care provided in inpatient rehabilitation facilities (IRFs) and after discharge. Vienna, VA: Dobson DaVanzo & Associates, LLC.

82 Kushner, D. S., Peters, K. M., & Johnson-Greene, D. (2015a). Evaluating Siebens Domain Management Model for inpatient rehabilitation to increase functional independence and discharge rate to home in geriatric patients. *Archives of Physical Medicine and Rehabilitation*, *96*(7), 1310–1318. https://doi.org/10.1016/j.apmr.2015.03.011

83 Galloway et al., 2013.

84 Mallinson, T., Deutsch, A., Bateman, J., Tseng, H. Y., Manheim, L., Almagor, O., & Heinemann, A. W. (2014). Comparison of discharge functional status after rehabilitation in skilled nursing, home health, and medical rehabilitation settings for patients after hip fracture repair. *Archives of Physical Medicine and Rehabilitation*, *95*(2), 209–217. https://doi.org/10.1016/j.apmr.2013.05.031

85 El-Solh, Saltzman, Ramadan, & Naughton, 2000.

86 Hall, R. K., Toles, M., Massing, M., Jackson, E., Peacock-Hinton, S., O'Hare, A. M., & Colón-Emeric, C. (2015). Utilization of acute care among patients with ESRD discharged home from skilled nursing facilities. *Clinical Journal of the American Society of Nephrology (CJASN)*, *10*(3), 428–434. https://doi.org/10.2215/CJN.03510414

87 Stearns, S. C., Dalton, K., Holmes, G. M., & Seagrave, S. M. (2006). Using propensity stratification to compare patient outcomes in hospital-based versus freestanding skilled-nursing facilities. *Medical Care Research and Review: MCRR*, *63*(5), 599–622. https://doi.org/10.1177/1077558706290944

88 Wodchis, W. P., Teare, G. F., Naglie, G., Bronskill, S. E., Gill, S. S., Hillmer, M. P., . . . Fries, B. E. (2005). Skilled nursing facility rehabilitation and discharge to home after stroke. *Archives of Physical Medicine and Rehabilitation*, *86*(3), 442–448. https://doi.org/10.1016/j.apmr.2004.06.067

89 Scheinhorn, D. J., Hassenpflug, M. S., Votto, J. J., Chao, D. C., Epstein, S. K., Doig, G. S., . . . Petrak, R. A., & the Ventilation Outcomes Study Group. (2007). Post-ICU mechanical ventilation at 23 long-term care hospitals: A multicenter outcomes study. *Chest*, *131*(1), 85–93. https://doi.org/10.1378/chest.06-1081

90 Thakar, C. V., Quate-Operacz, M., Leonard, A. C., & Eckman, M. H. (2010). Outcomes of hemodialysis patients in a long-term care hospital setting: A single-center study. *American Journal of Kidney Diseases*, *55*(2), 300–306. https://doi.org/10.1053/j.ajkd.2009.08.021

91 Wolff, J. L., Meadow, A., Weiss, C. O., Boyd, C. M., & Leff, B. (2008). Medicare home health patients' transitions through acute and post-acute care settings. *Medical Care*, *46*(11), 1188–1193. https://doi.org/10.1097/MLR.0b013e31817d69d3

discharged to home with rates varying by admission site.[92] However, significant numbers of patients were admitted to hospitals (29 percent) and lesser numbers to SNFs (7.6 percent), IRFs (1.5 percent), HH (7.2 percent) or hospice (3.3 percent).[93]

Discharge to community is an actionable health care outcome, as targeted interventions have been shown to successfully increase discharge to community rates in a variety of post-acute settings.[94,95,96, 97] Many of these interventions involve discharge planning or specific rehabilitation strategies, such as addressing discharge barriers and improving medical and functional status.[98,99,100,101] The effectiveness of these interventions suggests that improvement in discharge to community rates among PAC patients is possible through modifying provider-led processes and interventions.

Denominator

The denominator for the discharge to community measure is the risk-adjusted expected number of discharges to community. This estimate includes risk adjustment for patient characteristics with the HHA effect removed. The "expected" number of discharges to community is the predicted number of risk-adjusted discharges to community if the same patients were treated at the average HHA appropriate to the measure.

The regression model used to calculate the denominator is developed using all non- excluded HH stays in the national data. The denominator is computed in the same way as the numerator, but the HHA effect is set at the average. The descriptions of the discharge to community outcome, patient stays included in the measure, and numerator calculation are provided below.

Numerator

The measure does not have a simple form for the numerator and denominator—that is, the risk adjustment method does not make the *observed* number of community discharges the numerator, and a *predicted* number the denominator. The measure numerator is the *risk-adjusted estimate* of the number of patients who are discharged to the community, do not have an unplanned admission to an acute care hospital or LTCH in the 31-day post-discharge observation window, and remain alive during the post-discharge observation window. This estimate starts with the observed discharges to community, and is risk adjusted for patient characteristics and a statistical estimate of the HHA effect beyond case mix.

The numerator uses a model estimated on full national data specific to the post-acute setting; it is applied to the HHA's patient stays included in the measure, and includes the estimated effect of that HHA. The prediction equation is based on a logistic statistical model with a two-level hierarchical structure. The patient stays in the model have an indicator of the HHA they are discharged from; the effect of the HHA is measured as a positive or negative shift in the intercept term of the equation. The HHA effects are modeled as belonging to a normal (Gaussian) distribution centered at 0, and are

92 Riggs JS, Madigan EA. Describing Variation in Home Health Care Episodes for Patients with Heart Failure. Home Health Care Management & Practice 2012; 24(3) 146-152.

93 *Ibid.*

94 Kushner, Peters, & Johnson-Greene2015a.

95 Wodchis et al., 2005.

96 Berkowitz et al., 2011.

97 Kushner, Peters, & Johnson-Greene, 2015b.

98 Kushner, Peters, & Johnson-Greene, 2015b.

99 Wodchis et al., 2005.

100 Berkowitz, R. E., Jones, R. N., Rieder, R., Bryan, M., Schreiber, R., Verney, S., & Paasche-Orlow, M. K. (2011). Improving disposition outcomes for patients in a geriatric skilled nursing facility. *Journal of the American Geriatrics Society*, *59*(6), 1130–1136. https://doi.org/10.1111/j.1532-5415.2011.03417.x

101 Kushner, Peters, & Johnson-Greene, 2015b.

estimated along with the effects of patient characteristics in the model. Numerator details are provided below.

Numerator Details: Discharge to Community

Discharge to community is determined based on the "Patient Discharge Status Code" from the PAC claim. Discharge to community is defined as discharge to home/self-care with or without home health services.[102] Table 1 below lists the Patient Discharge Status Codes used to define community.

Table 1-1. Patient Discharge Status Codes Used to Determine Discharge to Community

Code	Discharge Status Codes Indicating Community Discharge
01	Discharged to home/self-care (routine discharge)
81	Discharged to home or self-care with a planned acute care hospital readmission

Numerator Details: Unplanned Admissions in the 31-Day Post-Discharge Observation Window

A patient who is discharged to the community is considered to have an unfavorable outcome if they have a subsequent unplanned admission to an acute care hospital or LTCH in the post-discharge observation window, which includes the day of discharge and the 31 following days. We identify unplanned admissions based on the planned readmissions algorithm used in the following post-acute care readmission measures, endorsed by the National Quality Forum (NQF): (i) NQF #2510: Skilled Nursing Facility 30-Day All-Cause Readmission Measure (SNFRM); (ii) NQF #2502: All-Cause Unplanned Readmission Measure for 30 Days Post Discharge from Inpatient Rehabilitation Facilities; (iii) NQF #2512: All-Cause Unplanned Readmission Measure for 30 Days Post Discharge from Long Term Care Hospitals; and (iv) NQF #2380: Rehospitalization During the First 30 Days of Home Health.[103,104,105,106] These readmission measures are based on the Hospital-Wide All-Cause Readmission Measure (HWR) (CMS/Yale) (NQF #1789),[107] with some additions made for PAC settings. The planned admission definition is based on the claim from the admission having a code for a procedure that is frequently planned; however, if a principal diagnosis in a specified list of acute diagnoses is present, the admission is reclassified as unplanned. Admissions to psychiatric hospitals or units are classified as planned admissions.

Please note that this measure has been developed with International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9) procedure and diagnosis codes. The measure will be revised using the ICD-9 to ICD-10 cross-walk.

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[102] Further description of patient discharge status codes can be found, for example, at the following Web page: https://med.noridianmedicare.com/web/jea/topics/claim-submission/patient-status-codes.

[103] NQF #2510: Skilled Nursing Facility 30-Day All-Cause Readmission Measure (SNFRM). www.qualityforum.org/QPS/2510

[104] NQF #2502: All-Cause Unplanned Readmission Measure for 30 Days Post Discharge from Inpatient Rehabilitation Facilities. www.qualityforum.org/QPS/2502

[105] NQF #2512: All-Cause Unplanned Readmission Measure for 30 Days Post Discharge from Long Term Care Hospitals. www.qualityforum.org/QPS/2512

[106] NQF #2380: Rehospitalization During the First 30 Days of Home Health www.qualityforum.org/QPS/2380

[107] NQF #1789: Hospital-Wide All-Cause Readmission Measure (HWR) (CMS/Yale). www.qualityforum.org/QPS/1789

Numerator Details: Death in the 31-Day Post-Discharge Observation Window

Patients who are discharged to the community are also considered to have an unfavorable outcome if they die in the post-discharge window, which includes the day of discharge and the 31 following days. Death in the post-discharge window is identified using date of death from Medicare eligibility files.

Target Population and Measure Exclusions

The target population for the measure is the group of Medicare FFS patients who are not excluded for the reasons listed below.

Measure exclusions

Exclusions for the discharge to community measure are listed below, along with the rationale for each exclusion. The measure exclusion criteria are determined by processing Medicare claims and eligibility data to determine whether the individual exclusion criteria are met. All measure exclusion criteria are based on administrative data. Stays ending in transfers to the same level of care are excluded.

1. *Age under 18 years*

Rationale: There is limited literature on discharge destination outcomes in this age group. Patients in this age group represent a different cohort, likely living with their parents, and may be expected to have higher discharge-to-community rates than the rest of the Medicare population. Patients in this age group represent a small proportion of the post-acute Medicare FFS population.

2. *Discharges to a psychiatric hospital*

Rationale: Patients discharged to a psychiatric hospital are excluded from the measure because community living at the time of discharge may be potentially inappropriate or unsafe for them because of their mental health or psychiatric condition.

3. *Discharges against medical advice*

Rationale: Patients who discharge themselves against medical advice are excluded because their care plan may not have been fully implemented, and the discharge destination may not reflect the agency's discharge recommendation. Additionally, patients discharged against medical advice may be at higher risk of post- discharge admissions or death, depending on their medical condition, or because of potential non-adherence or non-compliance with care recommendations.

4. *Discharges to disaster alternative care sites or federal hospitals*

Rationale: Patients discharged to disaster alternative care sites are excluded because these discharges are likely influenced by external emergency conditions, and may not represent discretionary discharges by the PAC provider. Discharges to federal hospitals are also excluded.

5. *Discharges to court/law enforcement*

Rationale: Patients who are discharged to court or law enforcement are likely ineligible for discharge to the community because of legal restrictions.

6. *Patients discharged to hospice or enrolled in hospice during the post-discharge observation window*

Rationale:

a. Patients discharged to hospice care are terminally ill, and have very different goals of care than non-hospice patients. For non-hospice patients, the primary goal of the PAC

provider is to return to baseline, independent living in the community; death is an undesirable outcome in the non-hospice population. For patients discharged to hospice, the goal is to give them the opportunity to die comfortably, at home or in a hospice facility.

b. A large proportion of patients discharged to hospice care die in the 31-day window following discharge from the post-acute setting.

c. The hospice agency, not the PAC provider, makes the final decision of discharge to hospice-home or hospice-facility.

7. Patients not continuously enrolled in Parts A and B FFS Medicare (or those enrolled in Part C Medicare Advantage) for the 12 months prior to the post-acute admission date, and at least 31 days after post-acute discharge date

Rationale: Patients not continuously enrolled in Parts A and B FFS Medicare for the 12 months before the PAC admission date are excluded because risk adjustment for certain comorbidities requires information on acute inpatient, outpatient, and physician office bills for one year before post-acute admission. Patients not continuously enrolled in Part A FFS Medicare for at least 31 days after post-acute discharge are excluded because admissions must be observable in the 31-day post- discharge period. Patients without continuous Part A and B coverage, or those who are ever enrolled in a Part C Medicare Advantage plan during the pre- or post-PAC periods will not have complete claims in the system.

8. Patients who have a short-term acute care stay or psychiatric stay for non-surgical treatment of cancer in the 30 days prior to PAC admission.

Rationale: Patients with a prior short-term acute care stay for non-surgical treatment of cancer are excluded because they have a different trajectory for recovery after discharge, with a high mortality rate.[108] Exclusion of these patients is consistent with the hospital-wide and post-acute readmission measures.

9. Post-acute stays that end in transfer to the same level of care

Rationale: Post-acute stays that end in transfer to the same level of care are excluded from the measure because their post-acute episode has not ended. For a post-acute episode that involves transfer to the same level of care, only the final post-acute provider is included in the measure.

10.Post-acute stays with claims data that are problematic (e.g., anomalous records for stays that overlap wholly or in part, or are otherwise erroneous or contradictory)

Rationale: This measure requires accurate information from the post-acute stay and prior short-term acute care stay in the elements used for risk adjustment.

11. New proposed exclusion: Patients who had a long-term nursing facility stay in the 180 days preceding their hospitalization and IRF stay, with no intervening community discharge between the long-term nursing facility stay and qualifying hospitalization for measure inclusion (i.e., baseline nursing facility residents)

Rationale: Baseline NF residents did not live in the community prior to their IRF stay and discharge to a community setting may not be a safe or expected outcome for these residents.

Data source: We examine historical MDS data in the 180 days preceding the qualifying prior acute care admission and index IRF stay. Presence of an Omnibus Budget Reconciliation Act

[108] NQF #1789: Hospital-Wide All-Cause Readmission Measure (CMS/Yale), www.qualityforum.org/QPS/1789

(OBRA)-only assessment (not a SNF PPS assessment) with no intervening community discharge between the OBRA assessment and acute care admission date flags the index HHA episode as a baseline nursing facility resident.

Data Sources

This measure relies on data from Medicare's eligibility database as well as fee-for-service (FFS) claims from the home health, inpatient, outpatient, and physician office settings. The eligibility files provide beneficiary-level information such as date of birth, date of death, sex, reasons for Medicare eligibility, and enrollment histories in Medicare Parts A and B. The FFS claims files provide information about each home health and PAC stay, including dates of admission and discharge, diagnoses and procedures, and indicators for care received in the intensive care unit, coronary care unit, and emergency department. Furthermore, claims from all three file settings are used to construct for each patient a complete history of care before the index home health stay, which is used for constructing risk adjustment variables. No data beyond the bills submitted in the normal course of business are required from providers for the calculation of this measure. Below are links to documentation for each of the specific files for this measure.

HH Measure Data Sources

- Information about the Medicare enrollment database is available online at: https://aspe.hhs.gov/centers-medicare-medicaid-services
- Documentation for the Medicare claims data is provided online by Research Data Assistance Center. Data dictionaries are available for all three standard analytical files:
  - Home Health RIF - http://www.resdac.org/cms-data/files/hha-rif
  - Inpatient RIF- http://www.resdac.org/cms-data/files/ip-rif
  - Outpatient RIF- http://www.resdac.org/cms-data/files/op-rif
  - Carrier (Physician Office) RIF- http://www.resdac.org/cms-data/files/carrier-rif

Measure Time Window

HH Time Window: In the HH setting, the measure is calculated using 2 years of data. HH episodes during the 2-year time window, except those that meet the exclusion criteria, are included in the measure. For patients with multiple HH episodes during the two-year time window, each episode is eligible for inclusion in the measure. Data from Calendar Year 2012-2013 were used to develop this measure.

Statistical Risk Model and Risk Adjustment Covariates

We used a hierarchical logistic regression method to predict the probability of discharge to community. Patient characteristics related to discharge and a marker for the specific discharging HHA are included in the equation. The equation is hierarchical in that both individual patient characteristics are accounted for, as well as the clustering of patient characteristics by HHA. The statistical model estimates both the average predictive effect of the patient characteristics across all HHAs, and the degree to which each HHA has an effect on discharge to community that differs from that of the average HHA. The HHA effects are assumed to be randomly distributed around the average (according to a normal distribution).

When computing the HHA effect, hierarchical modeling accounts for the known predictors of discharge to community, on average, such as patient characteristics, the observed HH rate, and the number of HH stays eligible for inclusion in the measure. The estimated HHA effect is determined mostly by the HHA's own data if the number of patient discharges is relatively large (as the estimate would be relatively precise), but is adjusted toward the average if the number of patient discharges is small (as that would yield a less precise estimate).

We used the following model:

Let Y_{ij}, denote the outcome (equal to 1 if patient *i* is discharged to community, 0 otherwise) for a patient *i* at HHA *j*; Z_{ij} denotes a set of risk adjustment variables. We assume the outcome is related to the risk adjusters via a logit function with the following dispersion:

$$logit(Prob(Y_{ij} = 1)) = \alpha_j + \beta * Z_{ij} + \varepsilon_{ij}(1)$$

$$\alpha_j = \mu + \omega_j \; ; \; \omega_j \sim N(0, \tau^2)$$

where $Z_{ij} = (Z_1, Z_2, \ldots Z_k)$ is a set of *k* patient -level risk adjustment variables; α_j represents the HH - specific intercept; μ is the adjusted average outcome across all HHAs; τ^2 is the between- HHA variance component; and $\varepsilon \sim N(0,\sigma^2)$ is the error term. The hierarchical logistic regression model is estimated using SAS software (PROC GLIMMIX: SAS/STAT User's Guide, SAS Institute Inc.).

The estimated equation is used twice in the measure. The sum of the probabilities of discharge to community of all patients in the HH measure, including both the effects of patient characteristics and the HHA, is the "predicted number" of discharges to community after adjusting for the HH case mix.

The same equation is used without the HHA effect to compute the "expected number" of discharges to community for the same patients at the average HHA. The ratio of the predicted-to-expected number of discharges to community is a measure of the degree to which discharges to community are higher or lower than what would otherwise be expected. This standardized risk ratio is then multiplied by the mean discharge to community rate for all HH stays for the measure, yielding the risk-standardized discharge to community rate for each HHA. Please note that the estimation procedure is recalculated for each measurement period. Re-estimating the models for each measurement period allows the estimated effects of the patient characteristics to vary over time as patient case-mix and medical treatment patterns change.

Risk adjustment variables may include demographic and eligibility characteristics; principal diagnoses; types of surgery or procedures from a prior short-term acute care stay where applicable; comorbidities; length of stay and intensive care utilization from a prior short-term acute care stay; dialysis in the prior acute stay; and number of prior hospitalizations in the year preceding the PAC admission. Risk adjustment variable descriptions are provided below. See Appendix Table 1 for the full list of variables in the risk adjustment models.

1. Age and sex groups.
2. End stage renal disease (ESRD) or disability as original reason for entitlement.
3. Principal diagnosis (Clinical Classifications Software groups) when from a prior hospitalization, if that hospitalization took place during the 30 days before the HH start or resumption of care. The ICD-9 or ICD-10 codes from the prior acute claim are grouped clinically using the Clinical Classifications Software groupings for ICD-9 or ICD10 diagnoses developed by the AHRQ.[109]
4. Surgical procedure categories from a prior hospitalization, if that hospitalization took place during the 30 days before HH start or resumption of care. The procedures are grouped using the CCS classes for ICD-9 or ICD-10 procedures developed by AHRQ.
5. Length of prior acute hospital stay in days, for patients whose prior acute stay was in a non-psychiatric hospital (categorical variables are used to account for nonlinearity).

[109] Documentation of the AHRQ Clinical Classifications Software groupings of ICD-9 codes is available at http://www.hcup-us.ahrq.gov/toolssoftware/ccs/ccs.jsp.

6. Indicator for if a prior hospitalization during the 30 days before HH start or resumption of care took place in the intensive/cardiac care units. Comorbidities (Hierarchical Condition Categories) recorded during the 1 year prior to HH start or resumption of care are clustered using the Hierarchical Condition Categories (HCC) groups used by CMS.[110]
7. Number of prior acute hospital discharges during the one year prior to HH, not including those that took place during the 30 days before HH start or resumption of care.
8. Indicator for whether or not the patient had an outpatient emergency room visit, or a post-acute care visit, or an inpatient dialysis session during the year prior to HH start or resumption of care.
9. Activity of Daily Living (ADL) Severity Score, as calculated using responses on the patient's OASIS assessment.

Measure Calculation Algorithm

The following steps describe the calculation algorithm/measure logic for the discharge-to-community measure:

Step 1: Identify patients meeting the criteria for the target population, after applying measure exclusions.

Step 2: Identify patients meeting the numerator criteria (i.e., discharge to community, no unplanned admissions on the day of home health discharge or in the 31 days following home health discharge, and no death on the day of home health discharge or in the 31 days following home health discharge).

Step 3: Identify presence or absence of risk adjustment variables for each patient.

Step 4: Calculate the predicted and expected number of discharges to community for each agency using the hierarchical logistic regression model.

The predicted number of discharges to community for each HHA is calculated as the sum of the predicted probability of discharge to community for each patient discharged from the HHA and is included in the measure, including the HH -specific effect.

To calculate the predicted number of discharges to community, $pred_j$, for index HH stays at HHA $_j$, we used the following equation:

$$pred_j = \Sigma logit^{-1}(\mu + \omega_i + \beta * Z_{ij})(2)$$

where the sum is over all stays in HHA $_j$, and ω_i is the random intercept.

To calculate the expected number, exp_j, we used the following equation:

$$exp_j = \Sigma logit^{-1}(\mu + \beta * Z_{ij})(3)$$

Step 5: Calculate the standardized risk ratio for each HHA as the ratio of the predicted to expected number of discharges to community.

[110] CMS-HCC Mappings of ICD-9 Codes: Mappings are included in the software at the following website: http://www.cms.gov/Medicare/Health-Plans/MedicareAdvtgSpecRateStats/Risk-Adjustors.html

To calculate the HHA -wide standardized risk ratio, SRR_j, we used the following equation:

$$SRR_j = pred_j/exp_j \ (4)$$

Step 6: Calculate the risk-standardized discharge to community rate for each HHA.

To aid interpretation, the HHA -wide standardized risk ratio, SRR_j, obtained from equation (4) is then multiplied by the overall national raw discharge to community rate for all HH stays, $\bar{Y}$, to produce the HHA - wide risk-standardized discharge to community rate (RSR_j).

To calculate the risk-standardized discharge to community rate for each HHA, we used the following equation:

$$RSR\ j = SRR\ j * \bar{Y} (5)$$

NOTE: Because the statistic described in Step 6 is a complex function of parameter estimates, re-sampling and simulation techniques (e.g., bootstrapping) may be necessary to derive a confidence interval estimate for the final risk-standardized rate, to characterize the uncertainty of the estimate.

Chapter 2 Standardized Patient Assessment Data Elements

Section 1: Introduction

Introduction

The Improving Medicare Post-Acute Care Transformation Act of 2014 (IMPACT Act) requires CMS to develop, implement, and maintain standardized patient assessment data elements (SPADEs) for PAC settings. The four PAC settings specified in the IMPACT Act are HHAs, IRFs, LTCHs, and SNFs. The goals of implementing cross-setting SPADEs are to facilitate care coordination and interoperability, and to improve Medicare beneficiary outcomes.

Existing PAC assessment instruments (i.e., OASIS for HHAs, IRF-PAI for IRFs, LTCH CARE Data Set (LCDS) for LTCHs, and the Minimum Data Set MDS for SNFs) often collect data elements pertaining to similar concepts, but the individual data elements—questions and response options—vary by assessment instrument. With a few exceptions, the data elements collected in these assessment instruments are not currently standardized or interoperable; therefore, patient responses across the assessment instruments cannot be compared easily.

The IMPACT Act further requires that the assessment instruments described above be modified to include core data elements on health assessment categories and that such data be standardized and interoperable. Implementation of a core set of standardized assessment items across PAC settings has important implications for Medicare beneficiaries, families, providers, and policymakers. CMS is proposing SPADEs for five categories specified in the IMPACT Act:

1. Functional status, such as mobility and self-care
2. Cognitive function (e.g., able to express ideas and to understand normal speech) and mental status (e.g., depression and dementia)
3. Special services, treatments, and interventions (e.g., need for ventilator, dialysis, chemotherapy, and total parenteral nutrition)
4. Medical conditions and comorbidities (e.g., diabetes, heart failure, and pressure ulcers)
5. Impairments (e.g., incontinence; impaired ability to hear, see, or swallow)
6. Other categories as deemed necessary by the Secretary

Background

In the following sections, we present additional information on the SPADEs being finalized in the CY 2020 HH PPS rule. We include detailed specifications of the data elements along with a mockup of how the SPADE is proposed to appear in the OASIS. We outline how each SPADE is relevant to the care of patients receiving care from HHAs, review its current use in existing PAC assessment item sets, and summarize any prior testing of the data elements. For SPADEs that were included in the National Beta Test, which was conducted by RAND between November 2017 and August 2018, we present detailed information on data element performance.

Evidence supporting these SPADEs comes from several sources including the Post-Acute Care Payment Reform Demonstration (PAC PRD), MDS 3.0 testing, and the National Beta Test. The most relevant metrics for evaluation of SPADE performance (i.e., feasibility and reliability) include the amount of missing data, time to administer the data element, and interrater reliability (IRR). IRR is the level of agreement between two raters; that is, the extent to which two different individuals would code the same response when presented with the same information. Typically, percent agreement and the kappa statistic—or weighted kappas, for ordinal data—are used to represent IRR. The kappa statistic is preferred

in most cases because there are agreed-upon conventions for its interpretation and it corrects for chance agreement between raters. However, kappa is sensitive to prevalence rates; when prevalence rates are extremely high or low, the resulting kappa statistic does not accurately convey the level of agreement.[111] [112] [113] [114] In those cases, percent agreement is preferred. The evidence offered for the SPADEs in the sections below follow standard conventions in reporting both percent agreement and kappas or weighted kappas to describe IRR.

Post-Acute Care Payment Reform Demonstration (PAC PRD)

Some prior evidence for these SPADEs comes from the PAC PRD. The PAC PRD was mandated by the Deficit Reduction Act of 2005 to examine the relative costliness and outcomes of similar types of Medicare beneficiaries discharged to different PAC settings (i.e., HHAs, IRFs, LTCHs, and SNFs). To meet these aims, the study collected standardized assessment data, using the Continuity Assessment Record and Evaluation (CARE) across PAC settings to measure patient severity and case-mix across settings at more than200 providers in 11 geographically diverse markets. The standardized assessment data allowed cross-setting comparisons of the factors associated with costs and outcomes, as well as service substitution among post-acute providers, all else being equal about the patient. Further information on the design and methods of the PAC PRC can be found at the CMS PAC-PRD Website: https://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/Reports/Research-Reports-Items/PAC_Payment_Reform_Demo_Final.html.

Testing of the Minimum Data Set 3.0 (MDS 3.0)

Additional testing information comes from the national testing of the MDS 3.0.[115] During a 6-year period starting in 2003, CMS engaged in a national project to create an improved version of the MDS 2.0. A joint RAND/Harvard team employed an iterative development process that culminated in the national testing of the MDS 3.0 in 2006 and 2007. The national validation and evaluation testing of the MDS 3.0 included 71 community nursing homes (3,822 residents) and 19 Veterans Health Administration nursing homes (764 residents), distributed throughout the regions of the United States. The evaluation was designed to test and analyze IRR, validity of key items, response rates for interview items, feedback on changes from participating nurses, and time to complete the MDS assessment. In addition, the national test design allowed comparison of item distributions between MDS 3.0 and MDS 2.0. Further information on the design and methods of MDS 3.0 testing can be found at https://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/NursingHomeQualityInits/downloads/MDS30FinalReport.pdf.

National Beta Test

Purpose and goals

[111] Cicchetti, D. V., & Feinstein, A. R. (1990). High agreement but low kappa: II. Resolving the paradoxes. *Journal of Clinical Epidemiology*, *43*(6), 551–558. https://doi.org/10.1016/0895-4356(90)90159-M

[112] Xu, S., & Lorber, M. F. (2014). Interrater agreement statistics with skewed data: Evaluation of alternatives to Cohen's kappa. *Journal of Consulting and Clinical Psychology*, *82*(6), 1219–1227. https://doi.org/10.1037/a0037489

[113] Byrt, T., Bishop, J., & Carlin, J. B. (1993). Bias, prevalence and kappa. *Journal of Clinical Epidemiology*, *46*(5), 423–429. https://doi.org/10.1016/0895-4356(93)90018-V

[114] McHugh, M. L. (2012). Interrater reliability: The kappa statistic. *Biochemia Medica*, *22*(3), 276–282. https://doi.org/10.11613/BM.2012.031

[115] Saliba, D., & Buchanan, J. (2008). Development and validation of a revised nursing home assessment tool: MDS 3.0. Santa Monica, CA: RAND Corporation. 2008. Available at http://www.cms.hhs.gov/NursingHomeQualityInits/Downloads/MDS30FinalReport.pdf

The National Beta Test was conducted to evaluate the reliability and validity of candidate SPADEs and to support the identification of data elements for standardization across PAC settings, in accordance with the mandates of the IMPACT Act. To test SPADE performance within each setting, sufficient numbers of patients/residents needed to be included in each of the four settings to enable setting-specific performance estimates. Further, the participating patients/residents needed to represent adequate coverage of the clinical range of patients/residents receiving care nationally in each of the four PAC settings. To evaluate the suitability of the SPADEs for cross-setting use, sufficient numbers of facilities/agencies of each setting type needed to be included in the test. These facilities/agencies needed to reflect a reasonable range of geographic diversity relative to PAC settings nationally.

Many large national studies of patients and health conditions are designed to generate estimates and make comparisons of rates of conditions or severity of patients on one or more clinical characteristics (e.g., cognitive status). To do this, these studies seek to recruit a proportionally balanced representative sample, and employ case-mix models and/or sampling weights to the data. In contrast, the National Beta Test was designed to generate valid and robust national SPADE performance estimates (i.e., time to complete and IRR), which fundamentally requires acceptable geographic diversity, sufficient sample size, and reasonable coverage of the range of clinical characteristics. To meet these requirements, the National Beta Test was carefully designed so data could be collected from a wide range of environments, allowing for thorough evaluation of candidate SPADE performance in all PAC settings. These analyses included extensive checks on the sampling design (e.g., generating results by market and by urbanicity) to identify possible limitations to the generalizability of results. Results of these sensitivity analyses are not included in this document, but will be described in detail in the forthcoming volumes of the National Beta Test Final Report (see https://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/Post-Acute-Care-Quality-Initiatives/IMPACT-Act-of-2014/IMPACT-Act-Downloads-and-Videos.html).

To help readers interpret evidence from the National Beta Test that is included for some SPADEs, we include an abridged description of the National Beta Test design and methods below. An in-depth technical discussion of the design and methods of the National Beta Test can be in the document titled "Development and Evaluation Candidate Standardized Patient Assessment Data Elements: Findings from the National Beta Test (Volume 2)," available at https://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/Post-Acute-Care-Quality-Initiatives/IMPACT-Act-of-2014/IMPACT-Act-Downloads-and-Videos.html.

Design and sampling

The National Beta Test included PAC providers in 14 geographic/metropolitan areas, or "markets," across the country. This number was chosen to be similar to the design used for the PAC PRD. A multi-stage stratified random sampling plan was used to obtain the sample of 14 markets, in the United States, and then a sample of eligible PAC facilities was compiled from those markets. To be eligible for selection, markets had to meet the following criteria:

- Sampled markets would yield a predefined number of PAC facilities/agencies of each type for the sample (12 SNFs, 10 HHAs, at least four LTCHs *or* IRFs, *and* at least one LTCH)
- The predefined number of facilities/agencies within the markets were expected to have flow rates large enough to obtain the targeted number of assessments per facility
- The predefined number of facilities/agencies had to be located within 2 hours of one another to facilitate completion of assessments in a timely manner

Of 306 markets in the United States, 64 were deemed eligible. The random sampling of the 14 markets was stratified by U.S. Census division to enhance geographic representation yielding the following 14 markets: Boston, MA; Chicago, IL; Dallas, TX; Durham, NC; Fort Lauderdale, FL; Harrisburg, VA; Houston, TX; Kansas City, MO; Los Angeles, CA; Nashville, TN; Philadelphia, PA;

Phoenix, AZ; St. Louis, MO; and San Diego, CA. Because these markets are a random sample, they are expected to be representative of the set of 64 eligible facilities and findings are therefore generalizable to the set of eligible facilities.

The target numbers of providers by setting within these 14 markets were 28 IRFs, 28 LTCHs, 84 SNFs, and 70 HHAs, totaling 210 PAC providers. The number of settings was determined based on standard sample size calculations which included the numbers of facilities and patients rather than the proportions of the populations they represented. The power calculations indicated that 28 providers per setting type (two in each market) would yield enough admissions during the field period to obtain robust estimates of candidate SPADE performance. This minimum number was adopted as the recruitment target for IRFs and LTCHs; additional SNFs and HHAs were targeted to enhance sample diversity in light of the larger proportion of these setting types nationally. A total of 143 PAC facilities (35 HHAs, 22 IRFs, 26 LTCHs, 60 SNFs) were successfully recruited across 14 U.S. markets to participate in the National Beta Test. Although this number falls short of targets both overall and by setting this shortfall was offset by extending the field period, allowing for the accrual of more eligible patient/resident admissions and discharges.

Eligibility

The National Beta Test SPADEs included in this rule were evaluated for performance among a sample of communicative patients/residents (who could make themselves understood through any means). All communicative patients/residents who were admitted to a participating provider site during the field period and were Medicare beneficiaries covered under one of the PAC PPS were eligible for the admission assessment, and all those who completed an admission assessment and were discharged during the field period were eligible for the discharge assessment. National Beta Test enrollment of non-communicative patients/residents was not tied to an admission date so as to ensure availability of sufficient numbers within the field period for evaluation of three data elements developed specifically for non-communicative patients/residents (observational assessments of cognitive status, mood, and pain). Although this ensured availability of sufficient numbers of non-communicative patients/residents for testing of the non-communicative data elements, it precluded assessing these patients/residents with non-interview SPADEs at admission. The three data elements developed specifically for non-communicative patients/residents are not included in this rule; thus, the non-communicative sample from the National Beta Test is not described further here.

Section 1557 of the Patient Protection and Affordable Care Act[116] states that facilities that deliver PAC services under Medicare are required to provide qualified interpreters to their patients/residents with limited English proficiency. Facilities have discretion in how they furnish qualified interpreters, including the use of remote interpreters (i.e., high-quality telephone or video services). As described above, the focus of the National Beta Test was to establish the feasibility and validity of the data elements within and across PAC settings. Including limited English proficiency patients/residents in the sample would have required the National Beta Test facilities to engage or involve translators during the test assessments. In planning the National Beta Test, we anticipated that this would have added undue complexity to what facilities/agencies were being asked to do, and would have undermined the ability of facility/agency staff to complete the requested number of assessments within the assessment window (e.g., Admission Days 3-7) and within the study field period. In light of the strong existing evidence for the feasibility of all patient/resident interview SPADEs included in this rule (Brief Interview for Mental Status [BIMS], Pain Interference, Patient Health Questionnaire [PHQ]) when administered in other languages, either through standard PAC workflow (e.g., as tested and currently collected in the MDS 3.0) and/or through rigorous translation and testing (e.g., PHQ), the performance of translated versions of these patient/resident

[116] For more information, see https://www.hhs.gov/civil-rights/for-individuals/section-1557/index.html

interview SPADEs did not need to be further evaluated. In addition, because their exclusion did not threaten our ability to achieve acceptable geographic diversity, sufficient sample size, and reasonable coverage of the range of PAC patient/resident clinical characteristics, the exclusion of limited English proficiency patients/residents was not considered a limitation to interpretation of the National Beta Test results.

Data collection

Admission assessments were completed between admission days 3-7; discharge assessments could be completed from 2 days before discharge through the discharge date. Trained research nurses and/or staff at participating PAC facilities/agencies administered all assessments. A subset of the admission assessments was completed by research nurse/facility staff assessor pairs to allow for evaluation of IRR. Power analyses indicated that reliability estimates required a minimum of 194 paired assessments, time to complete estimates could be compared across settings for detection of small effect sizes with a minimum of 274 assessments per setting, and as few as 460 assessments would be sufficient to evaluate aspects of validity (e.g., group differences, associations with other clinical variables, etc.) with small to moderate effect sizes. Therefore average assessment contributions per participating facility/agency were calculated for each of these goals (i.e., paired assessments, assessments completed by facility/agency staff, total admission assessments) and communicated throughout the study period to guide the data collection and track progress. These minimums were more easily attainable in SNFs and HHAs because of the larger number of participating facilities/agencies. However, participating LTCHs and IRFs also were able to collectively meet these targets by the end of the field period. The total number of admission assessments is shown in Appendix 3, Table 1.1. This table also shows the number of assessments from which completion times were estimated, and the number of assessments that were conducted by paired raters and contributed to evaluation of IRR. In addition to meeting the minimum sample size requirements, the data collection yielded very small rates of missing data, speaking to the overall feasibility of the SPADEs. Table 1.2 in Appendix 3 shows completion rates by National Beta Test protocol module. Module completion rates ranged from 93.8 to 98.2 percent, and nearly 90 percent of the communicative admission sample completed all assessment modules. More information on the design and methods of the National Beta Test can be found at in the document "Development and Evaluation Candidate Standardized Patient Assessment Data Elements: Findings from the National Beta Test (Volume 2)," available at https://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/Post-Acute-Care-Quality-Initiatives/IMPACT-Act-of-2014/IMPACT-Act-Downloads-and-Videos.html.

Section 2: Cognitive Function

Impairments in cognitive function can result from many underlying conditions, including dementia, Alzheimer's Disease, stroke, brain injury, side effects of medication, metabolic and endocrine imbalances, and delirium.[117] Cognitive impairments may affect a patient or resident's ability to recover from illness or injury, or they may be a sign of an acute condition (e.g., hypoxia) that requires immediate intervention. Cognitive impairment that manifests with behavioral symptoms—or that impairs a patient's ability to communicate, prompting behavioral disturbances—may put the patient or resident or others in the care setting at risk for injury or assault, or may signal unmet patient or resident needs (e.g., pain management). Screening for the presence of impairment can help ensure appropriate and timely intervention.

A substantial proportion of PAC patients and residents experience cognitive impairment, delirium, communication impairment, or behavioral distress. Testing from the PAC PRD found that about one-third of patients and residents in PAC settings were classified as having moderately or severely impaired cognitive function.[118] About one-third exhibited disorganized thinking and altered level of consciousness, and about one-half exhibited inattention. Fewer than 7 percent of patients and residents exhibited signs and symptoms of behavioral distress in the PAC PRD.

Therapeutic interventions can improve patient outcomes, and evidence suggests that treatment (e.g., drugs, physical activity) can stabilize or delay symptom progression in some patients, thereby improving quality of life.[119] [120] [121] In addition, assessments help PAC providers better understand the needs of their patients by establishing a baseline for identifying changes in cognitive function and mental status (e.g., delirium), elucidating the patient's ability to understand and participate in treatments during their stay, highlighting safety needs (e.g., to prevent falls), and identifying appropriate support needs at the time of discharge. The standardized assessment of patient or resident cognition supports clinical decision-making, early clinical intervention, person-centered care, and improved care continuity and coordination. The use of valid and reliable standardized assessments can aid in the communication of information within and across providers, enabling the transfer of accurate health information.

CMS has identified several data elements as applicable for cross-setting use in standardized assessment of cognitive impairment.

1. The BIMS

2. The Confusion Assessment Method (CAM)

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[117] National Institute on Aging. (2013). *Assessing cognitive impairment in older patients*. Retrieved from https://www.nia.nih.gov/health/assessing-cognitive-impairment-older-patients

[118] This estimate is based on responses to the BIMS in a study of patient/residents in the PAC PRD: Gage, B., Morley, M., Smith, L., Ingber, M. J., Deutsch, A., Kline, T., ... & Kelleher, C. (2012). *Post-acute care payment reform demonstration: Final report* (Vol 4). Research Triangle Park, NC: RTI International. Retrieved from https://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/Reports/Research-Reports-Items/PAC_Payment_Reform_Demo_Final.html.

[119] Casey, D. A., Antimisiaris, D., & O'Brien, J. (2010). "Drugs for Alzheimer's disease: are they effective?" Pharmacy and Therapeutics 35(4): 208.

[120] Bherer, L., Erickson, K. I., & Liu-Ambrose, T. (2013). A review of the effects of physical activity and exercise on cognitive and brain functions in older adults. *Journal of Aging Research*, *2013*, 657508. https://doi.org/10.1155/2013/657508

[121] Langa, K. M., & Levine, D. A. (2014). The diagnosis and management of mild cognitive impairment: A clinical review. *Journal of the American Medical Association*, *312*(23), 2551–2561. https://doi.org/10.1001/jama.2014.13806

The data elements involve different aspects of cognition (e.g., short-term memory, comprehension) and types of data (e.g., interview, performance-based). They are collected by various modes (e.g., clinician assessed, patient reported).

Brief Interview for Mental Status (BIMS)

The BIMS is a performance-based cognitive assessment developed to be a brief cognition screener with a focus on learning and memory. The BIMS evaluates repetition, recall with and without prompting, and temporal orientation.

Relevance to HHAs

The OASIS does not include a performance-based cognitive assessment. The proposed performance-based cognitive assessment, the BIMS, would provide important baseline information about cognitive function when patients are discharged to the HH setting. In the PAC PRD, two-thirds of patients in the HH setting (67.5 percent) were cognitively intact or borderline functioning, but 18.6 percent were moderately impaired, and 11.2 percent fell into a severely impaired category.[122] Although patients treated in HHAs, when compared to those admitted to other settings, were least likely to have severe cognitive impairment, cognitive function predicts changes in functional status (i.e., activities of daily living) among patients receiving HH, and can affect the ability of HH patients to safely manage their medication regimens.[123 ,124] Cognitive impairment is also associated with re-hospitalization among elderly patients receiving home health care.[125] Therefore assessing cognitive function among patients in a home health setting is important.

Data Elements for the Assessment of Cognitive Function: The BIMS

C0100. Should Brief Interview for Mental Status (C0200-C0500) be Conducted? Attempt to conduct interview with all patients.	
Enter Code ☐	0. **No** (patient is rarely/never understood) → *Skip to C1310, Signs and Symptoms of Delirium (from CAM©)* 1. **Yes** → *Continue to C0200, Repetition of Three Words*
Brief Interview for Mental Status (BIMS)	
C0200. Repetition of Three Words	

[122] Gage, Morley, et al., 2012.
[123] Scharpf, T. P., & Madigan, E. A. (2010). Functional status outcome measures in home health care patients with heart failure. Home Health Care Services Quarterly 29(4): 155-170.
[124] Ellenbecker, C. H., Samia, L., Cushman, M. J., & Alster, K. (2008). Patient safety and quality in home health care. In R. G. Hughes (Ed.), Patient Safety and Quality: An Evidence-Based Handbook for Nurses. Rockville MD: Agency for Healthcare Research and Quality.
[125] Tao, H., & Ellenbecker, C. H. (2013). Is OASIS effective in predicting rehospitalization for home health care elderly patients? Home Health Care Management & Practice 25(6): 250-255.

Enter Code ☐	Ask patient: *"I am going to say three words for you to remember. Please repeat the words after I have said all three. The words are:* ***sock, blue and bed****. Now tell me the three words."* **Number of words repeated after first attempt** 0. **None** 1. **One** 2. **Two** 3. **Three** After the patient's first attempt, repeat the words using cues (*"sock, something to wear; blue, a color; bed, a piece of furniture"*). You may repeat the words up to two more times.
C0300. Temporal Orientation (orientation to year, month, and day)	
Enter Code ☐	Ask patient: *"Please tell me what year it is right now."* **A. Able to report correct year** 0. **Missed by > 5 years** or no answer 1. **Missed by 2-5 years** 2. **Missed by 1 year** 3. **Correct**
Enter Code ☐	Ask patient: *"What month are we in right now?"* **B. Able to report correct month** 0. **Missed by > 1 month** or no answer 1. **Missed by 6 days to 1 month** 2. **Accurate within 5 days**
Enter Code ☐	Ask patient: *"What day of the week is today?"* **C. Able to report correct day of the week** 0. **Incorrect** or no answer 1. **Correct**
C0400. Recall	
Enter Code ☐	Ask patient: *"Let's go back to an earlier question. What were those three words that I asked you to repeat?"* If unable to remember a word, give cue (something to wear; a color; a piece of furniture) for that word. **A. Able to recall "sock"** 0. **No** - could not recall 1. **Yes, after cueing** ("something to wear") 2. **Yes, no cue required**
Enter Code ☐	**B. Able to recall "blue"** 0. **No** - could not recall 1. **Yes, after cueing** ("a color") 2. **Yes, no cue required**
Enter Code ☐	**C. Able to recall "bed"** 0. **No** - could not recall 1. **Yes, after cueing** ("a piece of furniture") 2. **Yes, no cue required**
C0500. BIMS Summary Score	
Enter Score ☐☐	**Add scores** for questions C0200-C0400 and fill in total score (00-15) **Enter 99 if the patient was unable to complete the interview**

Current use

The BIMS data elements are currently used in the MDS and the IRF-PAI.

Prior evidence supporting use of the BIMS

The BIMS data elements were tested in the PAC PRD, where they showed substantial to almost perfect reliability of 0.71 to 0.91 (weighted kappas) when used across all four PAC settings. The lowest agreement was on the "repetition of three words" memory data element, with a kappa of 0.71, which still falls within the range of substantial agreement. PAC PRD testing also demonstrated the feasibility of the BIMS for use in all four PAC settings and found evidence of strong reliability of the BIMS data elements across the four PAC settings. In addition, the BIMS data elements were found to be predictive of higher patient cost.[126] The BIMS data elements were also included in the national MDS 3.0 test in nursing homes and showed almost perfect reliability.[127] Agreement ranged from 0.86 to 0.99 (standard kappa). The BIMS data elements were found to be highly correlated (0.906) with a gold-standard measure of cognitive function, the Modified Mini-Mental Status (3MS) exam.[128]

Evidence supporting use of the BIMS from the National Beta Test

Assessing impairment: In the National Beta Testing, the BIMS was administered at admission to 646 patients/residents in HHAs, 786 in IRFs, 496 in LTCHs, and 1,134 in SNFs (n = 3,062 overall). Overall, 5 percent of patients/residents met criteria for being severely impaired, 18 percent for being moderately impaired, and 76 percent for being intact. In the HHA setting, 4 percent were severely impaired, 17 percent were moderately impaired, and 80 percent were intact. Patients in the HHA setting showed similar impairment levels to those in IRF and somewhat lower impairment than those in an LTCH or SNF. Setting-specific admission frequencies for BIMS data elements and the overall impairment category at admission are shown in Appendix 3, Table 2.1.1.

Missing data: In general, there were low rates of missing data for BIMS items. Item-level missing data ranged from 0.4 to 1.7 percent overall and ranged from 0 to 2.8 percent in the HHA setting. For all settings, missing data rates were slightly higher for recall of current day of the week. In general, the low rate of missing data indicates feasibility of administration.

Time to complete: To assess feasibility of administration, the length of time to administer the BIMS was assessed among 445 patients/residents in HHAs, 537 in IRFs, 332 in LTCHs, and 494 in SNFs (n = 1,808 overall). Overall mean time to complete the BIMS was 2.2 minutes (standard deviation [SD] = 1.2 minutes). Time to complete in the HHA setting was 2.4 minutes (SD = 1.2 minutes).

Interrater reliability: The IRR was excellent for the BIMS, as measured by kappa and percent agreement of paired raters (n = 966 paired assessments across settings; n = 199 paired assessments in HHAs). Across all settings, the kappa for the BIMS Impairment Category classification (based on the BIMS total score) was 0.91; in the HHA setting, the kappa was 0.94. The kappas for individual items within the BIMS ranged from 0.83 to 0.93 across all settings and ranged from 0.84 to 0.93 in the HHA setting. Kappa was not estimated for two items within the BIMS across settings and for HHA because the proportion of patients across settings with correct responses was out of range for a stable kappa estimate. Percent agreement for the BIMS Impairment Category classification was 96 percent across all settings and 97 percent in the HHA setting. Percent agreement for the individual items ranged from 94 to 98

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[126] Gage, Morley, et al., 2012.

[127] Saliba, D., & Buchanan, J. (2008). *Development and validation of a revised nursing home assessment tool: MDS 3.0: Appendices.* Santa Monica, CA: RAND Corporation. Retrieved from https://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/NursingHomeQualityInits/downloads/MDS30FinalReportAppendix.pdf.

[128] Saliba, D., Buchanan, J., Edelen, M. O., Streim, J., Ouslander, J., Berlowitz, D., & Chodosh, J. (2012). "MDS 3.0: Brief interview for mental status." J of the Am Med Directors Association 13(7): 611-617.

percent across settings and in HHA. Please refer to Table 2.1.2 in Appendix 3 for kappa and percent agreement statistics for all BIMS items.

Confusion Assessment Method (CAM©)

The CAM is a widely used delirium screening tool.[129] Delirium, when undetected or untreated, can increase the likelihood of complications, rehospitalization, and death relative to patients/residents without delirium.[130]

Although multiple versions of the CAM have been developed, CMS is proposing that the Short version be adopted for SPADEs. The Short CAM contains only four items (i.e., items 1 to 4) from the original CAM (Long CAM). These items focus on an acute change in mental status, inattention, disorganized thinking, and altered level of consciousness.

Relevance to HHAs

The OASIS does not screen for delirium through use of assessments such as the CAM. However, it is important to do so in that delirium is common among home health populations; analyses of PAC PRD data have shown that HHAs have more patients with signs and symptoms of delirium than other PAC settings.[131] In PAC PRD testing, 52.9 percent of HH patients showed inattention, 37.0 percent showed disorganized thinking, and 14.0 percent showed altered level of consciousness as assessed by the CAM.[132] Among HHAs participating in the PAC PRD, the CAM demonstrated moderate-to-high inter-rater reliability for the inattention (kappa = 0.59), disorganized thinking (kappa = 0.79), and altered level of consciousness/alertness (kappa = 0.54) questions.[133] Delirium may interfere with a patient's ability to engage in self-care, medication management, therapeutic activities, and activities of daily living. As such, assessing patients for signs and symptoms of delirium is critical for care planning and decision making in the HH setting.

Proposed Data Elements for the Assessment of Cognitive Function: CAM

C1310. Signs and Symptoms of Delirium (from CAM©)	
Code **after completing** Brief Interview for Mental Status and reviewing medical record.	
A. **Acute Onset Mental Status Change**	
Enter Code ☐	**Is there evidence of an acute change in mental status** from the patient's baseline? 0. **No** 1. **Yes**

[129] De & Wand, 2015.

[130] Marcantonio, E. R., Kiely, D. K., Simon, S. E., John Orav, E., Jones, R. N., Murphy, K. M., & Bergmann, M. A. (2005). Outcomes of older people admitted to postacute facilities with delirium. *Journal of the American Geriatrics Society*, *53*(6), 963–969. https://doi.org/10.1111/j.1532-5415.2005.53305.x

[131] Unpublished data from the PAC PRD Public Comments sample, 2008-2010.

[132] *Ibid*

[133] Smith, L., Gage, B., Deutsch, A., Hand, L., Etlinger, A., Ross, J., … Barch, D. (2012). Continuity assessment record and evaluation (CARE) item set: Additional interrater provider-type specific reliability analyses. Research Triangle Park, NC: RTI International.

Coding: 0. Behavior not present 1. Behavior continuously present, does not fluctuate 2. Behavior present, fluctuates (comes and goes, changes in severity)	↓ Enter Code in Boxes
	☐ **B. Inattention** - Did the patient have difficulty focusing attention, for example being easily distractible or having difficulty keeping track of what was being said?
	☐ **C. Disorganized thinking** - Was the patient's thinking disorganized or incoherent (rambling or irrelevant conversation, unclear or illogical flow of ideas, or unpredictable switching from subject to subject)?
	☐ **D. Altered level of consciousness** - Did the patient have altered level of consciousness as indicated by any of the following criteria? ▪ **vigilant** - startled easily to any sound or touch ▪ **lethargic** - repeatedly dozed off when being asked questions, but responded to voice or touch ▪ **stuporous** - very difficult to arouse and keep aroused for the interview ▪ **comatose** - could not be aroused
Confusion Assessment Method. © 1988, 2003, Hospital Elder Life Program. All rights reserved. Adapted from: Inouye SK et al. Ann Intern Med. 1990; 113:941-8. Used with permission.	

Current use

The Short CAM data elements are currently collected in the MDS and the LCDS, and the scoring is based on staff observations of signs and symptoms of delirium. Although the Short CAM data elements are used in both assessment tools, the response options currently differ. The current version of the LCDS includes two response options (yes/no, indicating that the behavior is present or not present), whereas the MDS offers three response options (behavior continuously present, does not fluctuate; behavior present, fluctuates; behavior not present). The LCDS and MDS versions of the CAM also differ slightly in wording and criteria for the "Altered Level of Consciousness" item.

Prior evidence supporting use of the CAM

A version of the CAM, with an item added to assess psychomotor retardation, was tested in the national MDS 3.0 test in nursing homes. Reliabilities were substantial or almost perfect. Overall average kappa ranged from 0.85 to 0.89 and items ranged from 0.78 to 0.90 (standard kappa).[134] Based on a meta-analysis of diagnostic accuracy in nine studies, the CAM demonstrated moderate sensitivity (82 percent, 95% confidence interval: 69–91 percent) and high specificity (99 percent, 95% confidence interval: 87–100 percent), respectively, using a delirium diagnosis (Diagnostic and Statistical Manual of Mental Disorders IV) as the standard.[135]

Evidence supporting use of the CAM from the National Beta Test

Assessing impairment: In the National Beta Testing, we administered the version of the CAM that is currently collected in the MDS 3.0, that is, the version with three response options. The CAM was

[134] Saliba & Buchanan, 2008b.

[135] Shi, Q., Warren, L., Saposnik, G., & Macdermid, J. C. (2013). Confusion assessment method: A systematic review and meta-analysis of diagnostic accuracy. *Neuropsychiatric Disease and Treatment*, *9*, 1359–1370. https://doi.org/10.2147/NDT.S49520

administered at admission to 630 patients/residents in HHA, 771 in IRF, 471 in LTCH, and 1,101 in SNF (n = 2,973 overall). Overall, 5 percent of patients/residents had evidence of mental status change from baseline, 12 percent had difficulty focusing (3 percent continuously), 6 percent had disorganized thinking (1 percent continuously), and 4 percent had altered consciousness (1 percent continuously). In the HHA setting specifically, 5 percent of patients/residents had evidence of mental status change from baseline, 11 percent had difficulty focusing (2 percent continuously), 5 percent had disorganized thinking (1 percent continuously), and 3 percent had altered consciousness (1 percent continuously). Setting-specific frequencies for CAM data elements at admission are shown in Appendix 3, Table 2.2.1.

Missing data: Overall, there were very low rates of missing data for the CAM. Across all settings, item-level missing data did not exceed 0.4 percent for any of the four CAM items. In the HHA setting, item-level missing data did not exceed 0.5 percent. For all settings, missing data rates were slightly higher for the change in mental status from baseline item. In general, the low rate of missing data indicates feasibility of administration.

Time to complete: To assess feasibility of administration, time to complete was assessed for 375 patients/residents in HHAs, 472 in IRFs, 284 in LTCHs, and 405 in SNFs (n = 1,536 overall). Overall the mean time to complete the CAM was 1.4 minutes (SD = 0.7 minutes). In the HHA setting, the mean time to complete the CAM was 1.5 minutes (SD = 0.7 minutes).

Interrater reliability: The IRR was good for the CAM as measured by kappa and percent agreement of paired raters (n = 914 paired assessments across settings; n = 189 paired assessments in HHAs). The kappa for the focusing attention item was good both overall (0.66) and in the HHA setting (0.66). Kappa was not estimated for the other three items within the CAM because the proportion of patients across settings as well as within HHAs with correct responses was out of range for a stable kappa estimate. Percent agreement for the CAM across settings was high for all four CAM items: evidence of change of mental status from baseline (96 percent) and whether the patient had difficulty focusing attention (91 percent), had disorganized thinking (94 percent), and had altered consciousness (96 percent). Percent agreement in the HHA setting was similarly high for the four CAM items (97 percent, 91 percent, 94 percent, and 98 percent, respectively). Please refer to Table 2.2.2 in Appendix 3 for kappa and percent agreement statistics for all CAM items.

Mental Status (Depressed Mood)

Depression is the most common mental health condition in older adults, yet underrecognized and thus under-treated. Existing data show that depressed mood is relatively common in patients and residents receiving PAC services. The PAC PRD found that about 9 percent of individuals in PAC were classified as likely to have depression.[136] The prevalence varied from a low of 7 percent of beneficiaries in SNFs to a high of 11 percent of patients in IRFs.[137] Almost half of nursing home residents in the United States with an active diagnosis of depression at the time of admission are not receiving psychiatric treatment (medication or psychological therapy) for the condition.[138]

Older adults with depression may exhibit different symptoms than younger adults, including fatigue, insomnia, irritable mood, confusion, and lack of focus.[139] Some medications and medical

[136] This estimate is based on patient responses to a question about being sad in the two weeks before the assessment interview in a study of patient/residents in the PAC PRD (Gage, Morley et al., 2012). If they responded "often" or "always," they were considered to have depression.

[137] Gage, Morley, et al., 2012.

[138] Ulbricht, C. M., Rothschild, A. J., Hunnicutt, J. N., & Lapane, K. L. (2017). Depression and cognitive impairment among newly admitted nursing home residents in the USA. *International Journal of Geriatric Psychiatry*, *32*(11), 1172–1181. https://doi.org/10.1002/gps.4723

[139] National Institute on Aging. (2011). Depression and Older Adults. Retrieved from https://www.nia.nih.gov/health/depression-and-older-adults

conditions, such as heart disease, stroke, or cancer, may also cause depressive symptoms in older adults.[26] Diagnosis and treatment of depression can lead to significant improvement of symptoms, as measured on depression assessment scales. Depressive symptoms improve in 60 to 80 percent of elderly patients taking an antidepressant medication.[140] Psychosocial treatments of depression in older adults have been shown to be more effective than no treatment, according to self-rated and clinician-rated measures of depression.[141] [142]

Assessments of the signs and symptoms of depression help PAC providers better understand the needs of their patients and residents by prompting further evaluation (i.e., to establish a diagnosis of depression); elucidating the patient's or resident's ability to participate in therapies for conditions other than depression during their stay; and identifying appropriate ongoing treatment and support needs at the time of discharge. The standardized assessment of depression among PAC patients and residents supports clinical decision-making, early clinical intervention, person-centered care, and improved care continuity and coordination. The use of valid and reliable standardized assessments can aid in the communication of information within and across providers, further enabling the transfer of accurate health information.

Standardized Data Elements to Assess Depressed Mood

CMS has identified the Patient Health Questionnaire-2 to 9 (PHQ-2 to 9) data elements for standardized assessment of depressed mood.

Patient Health Questionnaire-2 to 9 (PHQ-2 to 9)

The PHQ-2 to 9 data elements use a summed-item scoring approach to first screen for signs and symptoms of depressed mood in patients and residents by assessing the two cardinal criteria for depression: depressed mood and anhedonia (inability to feel pleasure).[143] At least one of the two must be present for a determination of probable depression, which signals the need for continued assessment of the additional seven PHQ symptoms. The interview is concluded if a respondent screens negative for the first two symptoms.

Relevance to HHAs

The PHQ-2 is currently included in OASIS. Assessors are required to report on whether or not patients have been screened for the signs and symptoms of depression. The PHQ-2 items are included on the assessment form as an optional aide to complete the screening during the assessment process, but HHAs are not required to use this particular assessment of the signs and symptoms of depression. However, the PHQ-2 to 9 is now being proposed as a required assessment instrument for the purposes of standardization.

Depression is common among HH patients. According to PAC PRD data, 9.2 percent of HH patients screened positive for signs and symptoms depression.[144] Identifying and treating depression in home care can decrease short-term risk of re-hospitalization. A study conducted with 477 patients newly admitted to home care found that, although depression was not associated with overall hospitalization rates, the hospitalization

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[140] Lebowitz, B. D., Pearson, J. L., Schneider, L. S., Reynolds, C. F., III, Alexopoulos, G. S., Bruce, M. L., . . . Parmelee, P. (1997). Diagnosis and treatment of depression in late life. Consensus statement update. *Journal of the American Medical Association*, *278*(14), 1186–1190. https://doi.org/10.1001/jama.1997.03550140078045

[141] Scogin, F., & McElreath, L. (1994). Efficacy of psychosocial treatments for geriatric depression: A quantitative review. *Journal of Consulting and Clinical Psychology*, *62*(1), 69–74. https://doi.org/10.1037/0022-006X.62.1.69

[142] Wei, W., Sambamoorthi, U., Olfson, M., Walkup, J. T., & Crystal, S. (2005). Use of psychotherapy for depression in older adults. *The American Journal of Psychiatry*, *162*(4), 711–717. https://doi.org/10.1176/appi.ajp.162.4.711

[143] American Psychiatric Association. (1980). *Diagnostic and statistical manual of mental disorders* (3rd ed.). Washington, DC: American Psychiatric Association.

[144] Gage, Morley, et al., 2012.

rate for depressed patients was more than twice as high as the rate for non-depressed patients during the first two weeks of home care.[145] Depression in HH patients has also been associated with an increased risk of falls.[146] In addition, a two-year panel study found that potential depression at year 1, as assessed by PHQ-2, was associated with greater health care expenditures from home health services during the second year.[147] Among HHAs participating in the PAC PRD, the PHQ-2 demonstrated moderate to high inter-rater reliability.[148] Given the prevalence of depression among HH patients and its effect on patient outcomes, assessment of depression is clinically relevant in the home health setting.

Data Elements for the Assessment of Cognitive Function: PHQ-2 to 9

D0150. Patient Mood Interview (PHQ-2 to 9)			
Say to patient: *"Over the last 2 weeks, have you been bothered by any of the following problems?"* If symptom is present, enter 1 (yes) in column 1, Symptom Presence. If yes in column 1, then ask the patient: *"About **how often** have you been bothered by this?"* Read and show the patient a card with the symptom frequency choices. Indicate response in column 2, Symptom Frequency.			
1. Symptom Presence 0. **No** (enter 0 in column 2) 1. **Yes** (enter 0-3 in column 2) 9. **No response** (leave column 2 blank)	**2. Symptom Frequency** 0. **Never or 1 day** 1. **2-6 days** (several days) 2. **7-11 days** (half or more of the days) 3. **12-14 days** (nearly every day)	**1. Symptom Presence**	**2. Symptom Frequency**
		↓ Enter Scores in Boxes ↓	
A. *Little interest or pleasure in doing things*		☐	☐

[145] Sheeran, T., Byers, A. L., & Bruce, M. L. (2010). Depression and increased short-term hospitalization risk among geriatric patients receiving home health care services. Psychiatric Services 61(1): 78-80.
[146] Byers AL, Sheeran T, Mlodzianowski AE, Meyers, BS, Nassisi, P., & Bruce, ML. (2008). Depression and risk for adverse falls in older home health care patients. Research in Gerontological Nursing 1(4): 245–251.
[147] Choi, S., Hasche, L., & Nguyen, D. (2015). Effects of depression on the subsequent year's healthcare expenditures among older adults: Two-year panel study. Psychiatric Quarterly 86: 225–241.
[148] Gage, B., Morley, M., Smith, L., Ingber, M. J., Deutsch, A., Kline, T., ... & Kelleher, C. (2012). Post-acute care payment reform demonstration: Final report. Research Triangle Park, NC: RTI International. Available at https://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/Reports/Research-Reports-Items/PAC_Payment_Reform_Demo_Final.html.

B. *Feeling down, depressed, or hopeless*	☐	☐
If either D0150A2 or D0150B2 is coded 2 or 3, CONTINUE asking the questions below. If not, END the PHQ interview and SKIP to D0700 Social Isolation.		
C. *Trouble falling or staying asleep, or sleeping too much*	☐	☐
D. *Feeling tired or having little energy*	☐	☐
E. *Poor appetite or overeating*	☐	☐
F. *Feeling bad about yourself – or that you are a failure or have let yourself or your family down*	☐	☐
G. *Trouble concentrating on things, such as reading the newspaper or watching television*	☐	☐
H. *Moving or speaking so slowly that other people could have noticed. Or the opposite – being so fidgety or restless that you have been moving around a lot more than usual*	☐	☐
I. *Thoughts that you would be better off dead, or of hurting yourself in some way*	☐	☐
D0160. Total Severity Score		
Enter Score ☐☐	**Add scores for all frequency responses in column 2**, Symptoms Frequency. Total score must be between 02 and 27. Enter 99 if unable to complete interview (i.e., Symptom Frequency is blank for 3 or more required items)	

Current use

The PHQ-2 data elements are currently in use in the OASIS. The PHQ-9 data elements, which include the two questions used in the PHQ-2 plus additional items, are in use in MDS.

Prior evidence supporting use of PHQ-2

The PHQ-2 is a brief, reliable screening tool for assessing signs and symptoms of depression. Among studies conducted in primary care centers with large samples of adults, the PHQ-2 has performed well as both a screening tool for identifying depression and an assessment of depression severity. [149] [150] It has also been shown to be sensitive to changes in a patient's mood. Across 15 studies that assessed the diagnostic accuracy of the PHQ-2 against a recognized gold-standard instrument for the diagnosis of major depression in adults, sensitivity estimates (based on the summed-item approach to scoring and a cutoff score of 3) have varied, ranging from 39 percent to 97 percent (median value = 77 percent); specificity estimates (based on the summed-item approach to scoring and a cutoff score of three) have been higher and more stable (kappas ranged from 0.74 to 0.91).[151] It is thus a viable option for standardization, with the benefits of the shorter assessment counterbalancing the limitation of the lower sensitivity.

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[150] Löwe, B., Kroenke, K., & Gräfe, K. (2005). Detecting and monitoring depression with a two-item questionnaire (PHQ-2). *Journal of Psychosomatic Research*, *58*(2), 163–171. https://doi.org/10.1016/j.jpsychores.2004.09.006

[151] Gage, B, Smith, L, Ross, J, Coots, L, Kline, T, Shamsuddin, K, … Gage-Croll, Z (2012). The development and testing of the Continuity Assessment Record and Evaluation (CARE) item set: final report on reliability testing. Volume 2 of 3. Research Triangle Park, NC: RTI International. Available at: https://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/Post-Acute-Care-Quality-Initiatives/Downloads/The-Development-and-Testing-of-the-Continuity-Assessment-Record-and-Evaluation-CARE-Item-Set-Final-Report-on-Reliability-Testing-Volume-2-of-3.pdf

The PHQ-9 was also tested in the national MDS 3.0 test in nursing homes. For the two presence items in the PHQ-2 (little interest in doing things; feeling down, depressed, or hopeless), kappa statistics were almost perfect and ranged from 0.98 to 0.99.[152] The PHQ-9 was also found to have agreement with Modified Schedule for Affective Disorders and Schizophrenia (m-SADS), a gold-standard measure for mood disorder, in residents without severe cognitive impairment (weighted kappa = 0.69) and with the Cornell Depression Scale, a gold-standard measure for mood disorder, in residents with severe cognitive impairment (correlation = 0.63).[153] In addition, the Staff Time and Resource Intensity Verification (STRIVE) study conducted in a national sample of nursing homes by CMS concluded that the PHQ-9 used in the MDS 3.0 was the "best measure" for identifying individuals with higher wage-weighted staff time, defined as the time that nursing home staff spent caring for residents.[154]

Evidence supporting use of PHQ-2 to 9 from the National Beta Test

Assessing depressed mood: The PHQ-2 to 9 was administered to assess depressed mood in the National Beta Test. As a hybrid measure, the PHQ-2 to 9 uses the first two elements (PHQ-2) as a gateway item for the longer PHQ-9. The assessor only administers the full PHQ-9 if the initial score on the PHQ-2 passes a threshold indicating possible depression. A patient/resident who did not show signs of depression based in the PHQ-2 would not receive the seven additional elements contained in the PHQ-9. In the National Beta Test, the PHQ-2 to 9 was administered to 646 patients/residents in HHAs, 786 in IRFs, 496 in LTCHs, and 1,134 in SNFs (n = 3,062 overall).

Across settings, 38 percent of patients/residents reported having little interest in doing things and 43 percent reported feeling down, depressed, or hopeless at some point in the last 14 days. Among HHA patients, 35 percent reported having little interest in doing things, and 38 percent reported feeling down, depressed, or hopeless. For each of these two symptoms, about 1 in 12 HHA patients had experienced them nearly every day over the past 2 weeks. About 1 in 6 experienced these symptoms on half or more of the days.

More than one in four patients/residents (28 percent) across settings passed the PHQ-2 to 9 threshold based on one or both of these symptoms, and continued to complete the remaining seven data elements. This positive screen rate was lower in the HHA setting (24 percent). Detailed symptom endorsement and frequency for the PHQ– 2 to 9 is shown in Appendix 3, Table 3.1.1. The average PHQ-2-only score across settings was 2.4 (SD = 1.7), and 2.2 (SD = 1.6) in the HHA setting. The average full PHQ-9 score across settings was 11.9 (SD = 5.3), and 11.4 (SD = 5.0) in the HHA setting. The PHQ-9 has thresholds to indicate the severity of probable depression.[155] Across settings, the largest group of patients/residents screening positive on the PHQ-2 and continuing on to complete the full PHQ-9 were the mild (31 percent) and moderate (32 percent) severity group. The same trend was noted in HHA, with most patients/residents being classified in the mild (27 percent) or moderate (37 percent) severity group. The mean scores and severity threshold proportions are shown in Table 3.1.1 of Appendix 3.

Missing data: Overall, there were low rates of missing data for the PHQ-2 to 9. Across all settings, item-level missing data did not exceed 5.2 percent for any of the items. In the HHA setting, item-level missing data did not exceed 4.6 percent for any of the items. Missing data rates across settings and in HHA were greatest for the moving and speaking slowly item. In general, the low rate of missing data indicates feasibility of administration

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[152] Saliba & Buchanan, 2008b.

[153] *Ibid.*

[154] Centers for Medicare & Medicaid Services. (2013). Analyses of data collected in CMS national nursing home time study used to establish RUG-IV model. Retrieved from https://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/SNFPPS/TimeStudy.html

[155] Kroenke, K., Spitzer, R., & Williams, J. (2001). The PHQ-9 validity of a brief depression severity measure. Journal of General Internal Medicine, 16, 606–13.

Time to complete: Time to complete was examined among 428 assessments in HHAs, 515 in IRFs, 305 in LTCHs, and 479 in SNFs (n = 1,727 overall). Among patients/residents who only received the PHQ-2, time to complete was an average of 1.7 minutes (SD = 1.1). The average time to complete the PHQ-2 in the HHA setting was 1.8 minutes (SD = 1.2). Among patients receiving the full PHQ-9, the time to complete was an average of 4.0 minutes (SD = 1.2). In the HHA setting, the time to complete the PHQ-9 was 4.2 minutes on average (SD = 1.2). Without regard for PHQ-2 versus PHQ-9 stratification, the mood data elements took an average of 2.3 minutes (SD = 1.5) to complete across settings, and 2.3 minutes (SD = 1.5) in the HHA setting.

Interrater reliability: IRR was assessed for 196 patients/residents in HHAs, 254 in IRFs, 231 in LTCHs, and 267 in SNFs (n = 948 overall). IRR for all symptom presence and frequency items was excellent: kappas ranged from 0.95 to 1.00 overall, and from 0.90 to 1.00 in HHAs. IRR regarding eligibility for the full PHQ-9 based on PHQ-2 responses was nearly perfect: kappa for whether to continue from the PHQ-2 to the full PHQ-9 was 0.98 across settings and 0.96 in HHA. Finally, for patients/residents who received the full PHQ-9, the IRR for sum of symptom frequencies was nearly perfect (0.96 overall and 0.97 in HHAs).

Percent agreement was also nearly perfect, ranging from 97 percent to 100 percent overall and 93 percent to 100 percent in HHAs. For eligibility to complete the full PHQ-9, percent agreement was 99 percent across settings, and 98 percent in HHA. For the sum of symptom frequencies, percent agreement was 95 percent across settings and 96 percent in HHAs. Please refer to Table 3.1.2 in Appendix 3 for kappa and percent agreement statistics for all PHQ items.

Section 3: Special Services, Treatments, and Interventions (Including Nutritional Approaches)

Some medical conditions require complex clinical care, consisting of special services, treatments, and interventions. The implementation of these interventions typically indicates conditions of a more serious nature and can be life-sustaining. Patients and residents who need them may have few clinical alternatives. Conditions requiring the use of special services, treatments, and interventions can have a profound effect on an individual's health status, self-image, and quality of life. Providers should be aware of the patient or resident's clinical needs to plan the provision of these important therapies, ensure the continued appropriateness of care, and support care transitions. The assessment of special services, treatments, and interventions may also help identify resource use intensity by capturing the medical complexity of patients/residents.

Standardized Data Elements to Assess for Special Services, Treatments, and Interventions

CMS has identified data elements for cross-setting standardization of assessment for special services, treatments, and interventions in the areas of cancer, respiratory, and other treatments, as well as nutritional approaches.

1. Chemotherapy (IV, Oral, Other)
2. Radiation
3. Oxygen therapy (Intermittent, Continuous, High-concentration oxygen delivery system);
4. Suctioning (Scheduled, As needed)
5. Tracheostomy Care
6. Non-invasive Mechanical Ventilator (Bilevel Positive Airway Pressure [BiPAP]; Continuous Positive Airway Pressure [CPAP])
7. Invasive Mechanical Ventilator
8. IV Medications (Antibiotics, Anticoagulation, Vasoactive Medications, Other)
9. Transfusions
10. Dialysis (Hemodialysis, Peritoneal dialysis)

11. IV Access (Peripheral IV, Midline, Central line)
12. Parenteral/IV Feeding
13. Feeding Tube
14. Mechanically Altered Diet
15. Therapeutic Diet
16. High-Risk Drug Classes: Use and Indication

Chemotherapy (IV, Oral, Other)

Chemotherapy is a type of cancer treatment that uses medications to destroy cancer cells. Receipt of this treatment indicates that a patient has a malignancy (cancer) and therefore has a serious, often life-threatening or life-limiting condition. Both IV and oral chemotherapy have serious side effects, including nausea/vomiting, extreme fatigue, risk of infection (due to a suppressed immune system), anemia, and an increased risk of bleeding (due to low platelet counts). Oral chemotherapy can be as potent as chemotherapy given by IV but can be significantly more convenient and less resource intensive to administer. Because of the toxicity of these agents, special care must be exercised in handling and transporting chemotherapy drugs. IV chemotherapy may be given by peripheral IV but is more commonly given via an indwelling central line, which raises the risk of bloodstream infections. The need for chemotherapy predicts resource intensity, both because of the complexity of administering these potent, because of toxic drug combinations following specific protocols, and because of what the need for chemotherapy signals about the patient's underlying medical condition. Furthermore, the resource intensity of IV chemotherapy is higher than for oral chemotherapy, as the protocols for administration and the care of the central line (if present) require significant resources.

Relevance to HHAs

Neither chemotherapy in general, nor specific routes of chemotherapy administration, are currently assessed in the OASIS. However, cancer is fairly common among HH patients. According to data from the National Home and Hospice Care Survey (NHHCS), 9 percent of HH patients aged 65 and older had malignant neoplasms.[156] Another study of elderly patients newly admitted to HHAs found that 11 percent had a referral diagnosis of cancer.[157] Oral and intravenous chemotherapy in the home for patients being treated for cancer has become increasingly common due to patient preference, its cost-effectiveness, and increasing demand for oncology services.[158] Further, there is some evidence for the benefits of oncology home care; one study found that lung cancer patients who received oncology home care reported less distress and greater social independence compared to those who received usual outpatient care.[159] Assessing the receipt of chemotherapy is important in the HH setting for care planning and defining case mix.

Data Element for the Assessment of Special Services, Treatments, and Interventions: Chemotherapy

[156] Jones, A. L., Harris-Kojetin, L., & Valverde, R. (2012). Characteristics and use of home health care by men and women aged 65 and over. National health statistics reports; no. 52. Hyattsville, MD: National Center for Health Statistics.
[157] Bruce, M. L., McAvay, G. J., Raue, P. J., Brown, E. L., Meyers, B. S., … Weber, C. (2002). Major depression in elderly home health care patients. American Journal of Psychiatry 159(8): 1367-1374.
[158] Chavis-Parker, P. (2015). Safe chemotherapy in the home environment. Home Health Care Now 33(5): 246-251.
[159] McCorkle, R., Benoliel, J. Q., Donaldson, G., Georgiadou, F., Moinpour, C., & Goodell, B. (1989). A randomized clinical trial of home nursing care for lung cancer patients. Cancer 64(6): 1375-1382.

O0110. Special Treatments, Procedures, and Programs Check all of the following treatments, procedures, and programs that apply on admission	a. On Admission Check all that apply ↓
Cancer Treatments	
A1. Chemotherapy	☐
A2. IV	☐
A3. Oral	☐
A10. Other	☐

Current use

Chemotherapy is currently assessed in the MDS. It first assesses whether the resident received chemotherapy while not a resident of the assessing facility and within the last 14 days, and then whether the resident has received chemotherapy while a resident and within the last 14 days while a resident. The MDS data element does not assess the route of chemotherapy.

Prior evidence supporting use of Chemotherapy (IV, Oral, Other)

An IV Chemotherapy data element was found to be feasible for cross-setting use in the PAC PRD.[160] In nursing homes, a checkbox for chemotherapy during the last 5 days was shown to have perfect agreement (100 percent) among rater pairs in the national MDS 3.0 test.[161]

Evidence supporting use of Chemotherapy (IV, Oral, Other) from the National Beta Test

Assessing Chemotherapy: One item assessed whether chemotherapy was performed during the assessment period. If indicated, three follow-up items assessed whether the chemotherapy was administered intravenously, orally, or by another route. In the National Beta Test, the principal data element and sub elements were administered to 629 patients/residents in HHAs, 762 in IRFs, 448 in LTCHs, and 1,087 in SNFs (n = 2,926 overall). Across settings, the overwhelming majority of patients/residents (99 percent) did not receive chemotherapy. In the HHA specifically, only 1 percent had chemotherapy treatment noted. More detailed rates of chemotherapy implementation across settings are shown in Appendix 3, Table 4.1.1.

Missing data: Overall, rates of missing responses for the Chemotherapy items were very low. Across all settings, missingness did not exceed 0.7 percent for each of the four items. In the HHA setting, missingness was 0.8 percent for each of the four items. The low rate of missing data indicates feasibility of administration.

Time to complete: Time to complete was examined among 422 assessments in HHAs, 457 in IRFs, 244 in LTCHs, and 431 in SNFs (n = 1,554 overall). The average time to complete the

[160] Gage, B, Constantine, R, Aggarwal, J, Morley, M, Kurlantzick, VG, Bernard, S, …Ehrlich-Jones, L. The development and testing of the Continuity Assessment Record and Evaluation (CARE) item set: Final report on the development of the CARE item set. Volume 1 of 3. Research Triangle Park, NC: RTI International. 2012. Available at: https://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/Post-Acute-Care-Quality-Initiatives/Downloads/The-Development-and-Testing-of-the-Continuity-Assessment-Record-and-Evaluation-CARE-Item-Set-Final-Report-on-the-Development-of-the-CARE-Item-Set-Volume-1-of-3.pdf

[161] Saliba & Buchanan, 2008b.

Chemotherapy items was 0.22 minutes overall (SD = 0.1) and 0.19 minutes in the HHA setting (SD = 0.1).

Interrater reliability: The IRR was excellent for the Chemotherapy principal data element and sub elements as measured by percent agreement of paired raters (n = 882 paired assessments across settings; n = 187 paired assessments in HHA). Kappas were not estimated for the Chemotherapy principal data element and sub-elements because the proportion of patients and residents receiving chemotherapy was out of range for stable kappa estimates. Percent agreement for the principal data element and sub elements was perfect (100 percent) for all four chemotherapy items across settings and ranged from 99 to 100 percent in the HHA setting. Please refer to Table 4.1.2 in Appendix 3 for percent agreement statistics for the Chemotherapy items.

Radiation

Radiation is a type of cancer treatment that uses high-energy radiation to shrink tumors and kill cancer cells by damaging their DNA. However, it can also damage normal cells, leading to side effects such as fatigue, skin irritation or damage, hair loss, nausea, and delayed side effects such as fibrosis (scar tissue formation), damage to the bowels if radiation was delivered to the abdominal region, memory loss, and, infrequently, a second cancer due to radiation exposure. Radiation is a mainstay of cancer treatment; about half to two-thirds of all patients with cancer receive radiation therapy at some point in their treatment course.[162] [163] The indications range from early-stage cancer treated with curative intent to palliative radiation therapy, such as to treat metastatic cancer; tumors that are pressing on the spine or growing within bones, causing severe pain; or shrinking a tumor near the esophagus, which can inhibit swallowing. There are many types of radiation, such as external-beam radiation therapy, internal radiation therapy (brachytherapy that is delivered from sources placed inside or on the body), and systemic radiation therapy (in which the patient swallows or receives an injection of a radioactive substance).

Relevance to HHAs

Radiation treatment is not currently assessed in the OASIS. However, as mentioned above, cancer is fairly common among HH patients. According to data from the National Home and Hospice Care Survey (NHHCS), 9 percent of HH patients aged 65 and older had malignant neoplasms.[164] Another study of elderly patients newly admitted to HHAs found that 11 percent had a referral diagnosis of cancer.[165] A 2006 study of home health utilization among older adults with cancer found that approximately 29 percent of older patients' access home health care following a cancer diagnosis.[166] Thus, assessing the receipt of radiation treatment for cancer is important in the HH setting for care planning and defining case mix.

Data Element for the Assessment of Special Services, Treatments, and Interventions: Radiation

[162] Yamada, Y. (2009). Principles of radiotherapy (pp. 73–80). In Stubblefield, Michael D. & W. O'Dell, Michael W. (Eds.), *Cancer rehabilitation: principles and practice*. New York, NY: Demos Medical Publishing.
[163] National Cancer Institute. (2019). *Radiation therapy to treat cancer*. Retrieved from https://www.cancer.gov/about-cancer/treatment/types/radiation-therapy
[164] Jones, A. L., Harris-Kojetin, L., & Valverde, R. (2012). Characteristics and use of home health care by men and women aged 65 and over. National health statistics reports; no. 52. Hyattsville, MD: National Center for Health Statistics.
[165] Bruce, M. L., McAvay, G. J., Raue, P. J., Brown, E. L., Meyers, B. S., … Weber, C. (2002). Major depression in elderly home health care patients. American Journal of Psychiatry 159(8): 1367-1374.
[166] Locher, J. L., Kilgore, M. L,. Morrisey, M. A., Ritchie, C. S. (2006). Patterns and predictors of home health and hospice use by older adults with cancer. Journal of the American Geriatric Society 54(8): 1206-1211.

O0110. Special Treatments, Procedures, and Programs Check all of the following treatments, procedures, and programs that apply on admission	a. On Admission Check all that apply ↓
B1. Radiation	☐

Current use

Radiation is currently assessed in the MDS. It first assesses whether the resident received radiation while not a resident of the assessing facility and within the last 14 days, and then whether the resident received radiation while a resident and within the last 14 days.

Prior evidence supporting use of Radiation

In nursing homes, a checkbox for radiation during the last 5 days was shown to have perfect agreement (100 percent) among rater pairs in the national MDS 3.0 test.[167]

Evidence supporting use of Radiation from the National Beta Test

Assessing Radiation: One item assessed whether radiation was performed during the assessment period. In the National Beta Test, the data element was administered to 629 patients/residents in HHAs, 762 in IRFs, 448 in LTCHs, and 1,087 in SNFs (n = 2,926 overall). Across settings, only 3 patients/residents (one in SNF, two in HHA; zero percent after rounding) received radiation. Detailed radiation data are shown in Appendix 3, Table 4.2.1.

Missing data: Overall, there were very low rates of missing responses for the Radiation item. Across all settings, missingness was 0.7 percent. Similarly, in the HHA setting, missingness was 0.8 percent. The low rate of missing data indicates feasibility of administration.

Time to complete: Time to complete was examined among 422 assessments in HHAs, 457 in IRFs, 244 in LTCHs, and 431 in SNFs (n = 1,554, overall). The average time to complete the Radiation item was 0.22 minutes overall (SD = 0.1) and 0.19 minutes in the HHA setting (SD = 0.1).

Interrater reliability: IRR was examined for 187 assessments in HHAs, 236 in IRFs, 203 in LTCHs, and 256 in SNFs (n = 882). Kappas are not reported for the Radiation data element because its proportion was out of range for a stable kappa estimate. Percent agreement for the Radiation data element was perfect across settings and 99 percent in the HHA specifically. Please refer to Table 4.2.2 in Appendix 3 for percent agreement statistics for the Radiation items.

Oxygen Therapy (Intermittent, Continuous, High-Concentration Oxygen Delivery System)

Oxygen therapy provides a patient/resident with supplemental oxygen when medical conditions (e.g., chronic obstructive pulmonary disease [COPD], pneumonia, severe asthma) prevent the patient or resident from adequately oxygenating their bloodstream. Oxygen administration is a resource-intensive intervention, as it requires specialized equipment: a reliable source of oxygen, various delivery systems (e.g., oxygen concentrator, liquid oxygen containers, and high-pressure systems), and the patient interface (e.g., nasal cannula, various types of masks). Accessories are also required (regulators, filters, tubing, etc.). The equipment is generally the same for both sub-elements of this data element (continuous vs. intermittent). The main differences between delivering oxygen intermittently versus continuously are the severity of the underlying illness (which often requires more hours per day of oxygen therapy) and the

[167] Saliba & Buchanan, 2008b.

bedside nursing care to set up the oxygen delivery system if the patient is unable (whether physically or cognitively) to do so independently.

The proposed Oxygen (Continuous, Intermittent) data element assesses if the patient received oxygen therapy and whether the oxygen was delivered continuously (typically defined as >=14 hours per day) or intermittently.

Relevance to HHAs

The OASIS currently asks about oxygen therapy, but does not differentiate between intermittent and continuous oxygen. Assessing the receipt of intermittent and continuous oxygen therapy is important in the HH setting for care planning and resource allocation. HH patients may have a medical condition that requires supplemental oxygen. A study by Dwyer et al. found that 2.4 percent of individuals receiving home health care had pneumonia.[168] Data from the National Home and Hospice Care Survey (NHHCS) indicated that 15 percent of home health patients aged 65 and older had chronic obstructive pulmonary disease (COPD) and allied conditions.[169] Pneumonia and COPD are the fourth and fifth most common diagnoses of Medicare beneficiaries discharged to the home health setting.[170] According to a RAND analysis of 2013 OASIS data, 13.9 percent of patients in the home health setting were receiving oxygen therapy.[171]

Data Element for the Assessment of Special Services, Treatments, and Interventions: Oxygen Therapy

O0110. Special Treatments, Procedures, and Programs Check all of the following treatments, procedures, and programs that apply on admission	**a. On Admission** **Check all that apply** ↓
Respiratory Therapies	

[168] Dwyer, L. L., Harris-Kojetin, L. D., Valverde, R. H., Frazier, J. M., Simon, A. E., Stone, N. D., & Thompson, N. D. (2013). Infections in long-term care populations in the United States. Journal of the American Geriatric Society 61(3): 341-349.

[169] Jones, A. L., Harris-Kojetin, L., & Valverde, R. (2012). Characteristics and use of home health care by men and women aged 65 and over. National health statistics reports; no. 52. Hyattsville, MD: National Center for Health Statistics.

[170] The National Association for Home Care & Hospice (2010). Basic statistics about home care. Washington DC: Author.

[171] RAND analysis of 2013 OASIS data.

O0110. Special Treatments, Procedures, and Programs Check all of the following treatments, procedures, and programs that apply on admission	a. On Admission Check all that apply ↓
C1. Oxygen Therapy	☐
C2. Continuous	☐
C3. Intermittent	☐
C4. High-concentration	☐

Current use

Oxygen therapy is currently assessed in the MDS. It first assesses whether the resident received oxygen therapy while not a resident of the assessing facility and within the last 14 days, and then whether the resident has received oxygen therapy while a resident and within the last 14 days. The MDS data element does not assess the type of oxygen therapy.

Prior evidence supporting use of Oxygen Therapy (Continuous, Intermittent, High-Concentration Oxygen Delivery System)

A related data element on high-concentration oxygen use (FiO2 > 40 percent) was used and found feasible for cross-setting use in the PAC PRD.[172] In nursing homes, a checkbox for oxygen therapy during the last 5 days was shown to have reliability ranging from 0.93 to 0.96 (kappas) in the national MDS 3.0 test.[173]

Evidence supporting use of Oxygen Therapy from the National Beta Test

Assessing Oxygen Therapy: One item assessed whether oxygen therapy was performed during the assessment period. If indicated, three follow-up items assessed therapy type: intermittent, continuous, and use of a high-concentration oxygen delivery system. In the National Beta Test, the principal data element and sub-elements were administered to 629 patients/residents in HHAs, 762 in IRFs, 448 in LTCHs, and 1,087 in SNFs(n = 2,926 overall). Across settings, one in five patients/residents (20 percent), received oxygen therapy. Oxygen therapy was less common in the HHA than in all other settings, with 13 percent receiving oxygen therapy.

Across settings, the most common type of oxygen therapy was intermittent therapy (14 percent). Only 6 percent of patients/residents had continuous therapy, and 1 percent of patients/residents had a high-concentration oxygen delivery system, respectively. This pattern was similar in the HHA setting: Intermittent Therapy (7 percent), Continuous therapy (6 percent), and High-concentration Delivery (0 percent). Detailed Oxygen Therapy implementation data are shown in Appendix 3, Table 4.3.1.

Missing data: Overall, there were very low rates of missing responses for the Oxygen Therapy items. Across all settings, missingness was less than 0.9 percent. In the HHA setting specifically, missingness less than 1.0 percent. The low rate of missing data indicates feasibility of administration.

Time to complete: Time to complete was examined among 422 assessments in HHAs, 457 in IRFs, 244 in LTCHs, and 431 in SNFs (n = 1,554, overall). The average time to complete the Oxygen

[172] Gage, Constantine, et al., 2012.
[173] Saliba & Buchanan, 2008b.

Therapy principal data element and sub elements was 0.22 minutes overall (SD = 0.1). The average time to complete in the HHA setting was 0.19 minutes (SD = 0.1).

Interrater reliability: IRR was examined for 187 assessments in HHAs, 236 in IRFs, 203 in LTCHs, and 256 in SNFs (n = 882 overall). Across settings, the kappa for the principal oxygen therapy data element was substantial/good overall (0.82) and in the HHA setting (0.82). The kappa for the intermittent therapy sub-element was 0.81 and 0.55 for the continuous therapy sub-element, overall. Kappas are not reported for the High-concentration Oxygen Therapy sub-element overall and for the three sub elements in HHA, because their proportions were out of range for a stable kappa estimate. Percent agreement for the principal data element and sub elements was excellent/almost perfect. Across settings, percent agreement ranged from 93 to 99 percent. Percent agreement in the HHA setting was also excellent/almost perfect, ranging from 96 to 100 percent. Please refer to Table 4.3.2 in Appendix 3 for kappa and percent agreement statistics for all Oxygen Therapy items.

Suctioning (Scheduled, As Needed)

Suctioning is used to clear secretions from the airway when a person cannot clear those secretions on his or her own for a variety of reasons, including excess production of secretions from a pulmonary infectious process or neurological deficits that inhibit the ability to cough, swallow, and so on. Suction is done by aspirating secretions through a catheter connected to a suction source.

Types of suctioning include oropharyngeal and nasopharyngeal suctioning; nasotracheal suctioning; and suctioning through an artificial airway, such as a tracheostomy tube. Oropharyngeal and nasopharyngeal suctioning are a key part of many patients' care plans, both to prevent the accumulation of secretions that can lead to aspiration pneumonias (a common condition in patients with inadequate gag reflexes) and to relieve obstructions from mucus plugging during an acute or chronic respiratory infection, which often lead to desaturations and increased respiratory effort. Suctioning can be done on a scheduled basis, if the patient is judged to clinically benefit from regular interventions, or can be done as needed, such as when secretions become so prominent that gurgling or choking is noted, or a sudden desaturation occurs from a mucus plug. As suctioning is generally performed by a care provider rather than independently, this intervention can be quite resource intensive if it occurs every hour, for example, rather than once a shift. It also signifies an underlying medical condition that prevents patients from clearing their secretions effectively, which also means they need increased nursing care more generally (such as after a stroke or during an acute respiratory infection).

Relevance to HHAs

The OASIS does not currently assess suctioning, although many HH patients have medical conditions that may necessitate this procedure. As mentioned above, a cross-sectional study by Dwyer et al. found that 2.4 percent of individuals receiving home health care had pneumonia.[174] According to data from the National Home and Hospice Care Survey (NHHCS), 15 percent of home health patients aged 65 and older had chronic obstructive pulmonary disease (COPD) and allied conditions.[175] Pneumonia and COPD are the fourth and fifth most common diagnoses of Medicare beneficiaries discharged to the home health setting.[176] These conditions may require suctioning to clear secretions from the patient's airway

[174] Dwyer, L. L., Harris-Kojetin, L. D., Valverde, R. H., Frazier, J. M., Simon, A. E., Stone, N. D., & Thompson, N. D. (2013). Infections in long-term care populations in the United States. Journal of the American Geriatric Society 61(3): 341-349.

[175] Jones, A. L., Harris-Kojetin, L., & Valverde, R. (2012). Characteristics and use of home health care by men and women aged 65 and over. National health statistics reports; no. 52. Hyattsville, MD: National Center for Health Statistics.

[176] The National Association for Home Care & Hospice (2010). Basic statistics about home care. Washington DC: Author.

that they are not able to clear themselves. As such, assessing the receipt of suctioning is important in the HH setting for care planning and defining case mix.

Data Element for the Assessment of Special Services, Treatments, and Interventions: Suctioning

O0110. Special Treatments, Procedures, and Programs Check all of the following treatments, procedures, and programs that apply on admission	**a. On Admission** **Check all that apply** ↓
Respiratory Therapies	
D1. Suctioning	☐
D2. Scheduled	☐
D3. As Needed	☐

Current use

Suctioning is currently assessed in the MDS. It first assesses whether the resident received suctioning while not a resident of the assessing facility and within the last 14 days, and then whether the resident received suctioning while a resident and within the last 14 days. The MDS data element does not assess whether the suctioning is scheduled or as needed.

Prior evidence supporting use of Suctioning (Scheduled, As Needed)

In the PAC PRD, suctioning was assessed as part of Trach Tube with Suctioning data element, which evaluated whether patients or residents had a tracheostomy tube or needed suctioning. This related data element was found feasible for cross-setting use in the PAC PRD.[177] In nursing homes, a checkbox for suctioning during the last 5 days was shown to have perfect agreement (100 percent) among rater pairs in the national MDS 3.0 test.[178]

Evidence supporting use of Suctioning (Scheduled, As Needed) from the National Beta Test

Assessing Suctioning: One item assessed whether suctioning was provided during the assessment period. If indicated, two follow-up items assessed therapy type: Scheduled or As Needed. In the National Beta Test, the principal data element and sub-elements were administered to 629 patients/residents in HHAs, 762 in IRFs, 448 in LTCHs, and 1,087 in SNFs (n = 2,926 overall).

Across settings, most patients/residents (99 percent) did not have suctioning noted, and those that did, noted "as needed" suctioning (1 percent). In HHAs, only three patients (zero percent after rounding) had suctioning, which were always noted "as needed" (zero percent after rounding). Detailed suctioning findings are shown in Appendix 3, Table 4.4.1.

Missing data: Overall, there were very low rates of missing responses for the Suctioning items. Across all settings, missingness was less than 0.9 percent. In the HHA setting specifically, missingness for any Suctioning item was less than 1.0 percent. The low rate of missing data indicates feasibility of administration.

[177] Gage, Constantine, et al., 2012.
[178] Saliba & Buchanan, 2008b.

Time to complete: Time to complete was examined among 422 assessments in HHAs, 457 in IRFs, 244 in LTCHs, and 431 in SNFs (n = 1,554 overall). The average time to complete the Suctioning items was 0.22 minutes overall (SD = 0.1) and 0.19 minutes in the HHA setting (SD = 0.1).

Interrater reliability: IRR was examined for 187 assessments in HHAs, 236 in IRFs, 203 in LTCHs, and 256 in SNFs (n = 882 overall). The IRR was excellent for the Suctioning principal data element and sub-elements as measured by percent agreement of paired raters. Kappas were not estimated for the Suctioning principal data element and sub elements because the proportion of patients and residents receiving suctioning was out of range for stable kappa estimates. Percent agreement for the principal data element and sub elements ranged from 98 to 99 percent across settings and 99 to 100 in the HHA setting. Please refer to Table 4.4.2 in Appendix 3 for kappa and percent agreement statistics for all suctioning items.

Tracheostomy Care

A tracheotomy is a surgical procedure that consists of making a direct airway opening (tracheostomy) into the trachea (windpipe). Tracheostomies are created primarily to bypass an obstructed upper airway; in chronic cases, to enable the removal of secretions from the airway; and to deliver oxygen to the patient's lungs. For example, some indications for tracheostomy include a need for long-term ventilation (such as those in a persistent vegetative state or those who require long-term ventilator weaning but are alert and oriented); tumors of the upper airway; severe neck, mouth, or chest wall injuries; degenerative neuromuscular diseases such as amyotrophic lateral sclerosis (ALS); spinal cord injuries; and airway burns. Generally, suctioning is necessary to ensure that the tracheostomy is clear of secretions, which can inhibit successful oxygenation. Often, individuals with tracheostomies also receive supplemental oxygenation. The presence of a tracheostomy, permanent or temporary, warrants careful monitoring and immediate intervention if the tracheostomy becomes occluded or, in the case of a temporary tracheostomy, if the devices used become dislodged.

For patients with a tracheostomy, tracheostomy care, which primarily consists of cleaning, dressing changes, and replacement of the tracheostomy cannula (tube), is a critical part of their care plans. Regular cleaning is important to prevent infection, such as pneumonia, and to prevent any occlusions, which create the risk of inadequate oxygenation. Although in rare cases, the presence of a tracheostomy is not associated with increased care demands (and in some of those instances, the care of the tracheostomy is performed by the patient), in general, the presence of such a device is associated with increased patient risk, and clinical care services will necessarily include close monitoring to ensure that no life-threatening events occur because of the tracheostomy.

Relevance to HHAs

Tracheostomy care is not currently assessed in OASIS. However, tracheostomy care is becoming more routinely performed in the home.[179, 180] Caring for a tracheostomy, including suctioning and cleaning, preserves patency and prevents infection. In general, use of a tracheostomy care protocol for patients with a tracheostomy lead to decreased morbidity and mortality.[181,182] Effective management of a tracheostomy in the hospital and PAC settings has a significant positive impact on the quality of life. Patients with deficits in respiratory drive or in respiratory muscle strength, such as those with stroke,

[179] Gershon, R. R. M., Pearson, J. M., Sherman, M. F., Samar, S. M., Canton, A. N., & Stone, P. W. (2009). The prevalence and risk factors for percutaneous injuries in registered nurses in the home health care sector. American Journal of Infection Control 37(7): 525-533.

[180] Lewarski, J. S. (2005). Long-term care of the patient with a tracheostomy. Respiratory Care 50(4): 534 –537.

[181] Garrubba, M., Turner, T., & Grieveson, C. (2009). Multidisciplinary care for tracheostomy patients: a systematic review. Critical Care 13(6): R177.

[182] Cetto, R., Arora, A., Hettige, R., Nel, M., Benjamin, L., Gomez, C. M., … & Narula, A. A. (2011). Improving tracheostomy care: a prospective study of the multidisciplinary approach. Clinical Otolaryngology 36(5): 482-488.

could require extended ventilation and tracheostomy care. One study of home care clients in Canada found approximately 17 percent of patients had a diagnosis of stroke.[183] This data element is relevant in facilitating care coordination and supporting care transitions. The tracheostomy care element will ensure those receiving services continue to receive appropriate care and support throughout care transitions, including the transition from another PAC setting into HH.

Data Element for the Assessment of Special Services, Treatments, and Interventions: Tracheostomy Care

O0110. Special Treatments, Procedures, and Programs Check all of the following treatments, procedures, and programs that apply on admission	**a. On Admission** **Check all that apply** ↓
Respiratory Therapies	
E1. Tracheostomy care	☐

Current use

Tracheostomy care is currently assessed in the MDS. The data element first assesses whether the resident received tracheostomy care while not a resident of the assessing facility and within the last 14 days, and then assesses whether the resident received tracheostomy care while a resident and within the last 14 days.

Prior evidence supporting use of Tracheostomy Care

In nursing homes, a checkbox for tracheostomy care during the last 5 days was shown to have perfect agreement (100 percent) among rater pairs in the national MDS 3.0 test.[184]

Evidence supporting use of Tracheostomy Care from the National Beta Test

Assessing Tracheostomy Care: One item assessed whether tracheostomy care was performed during the assessment period. In the National Beta Test, the data element was administered to 629 patients/residents in HHA settings, 762 in IRFs, 448 in LTCHs, and 1,087 in SNFs (n = 2,926 overall). Across settings, 1 percent of patients received tracheostomy care. In the HHA setting specifically, only one patient (zero percent after rounding) had tracheostomy care noted. Detailed tracheostomy care findings across settings are shown in Appendix 3, Table 4.5.1.

Missing data: Overall, there were very low rates of missing responses for the Tracheostomy Care item. Across all settings, missingness was 1.2 percent. In the HHA setting, missingness was 2.7 percent. The low rate of missing data indicates feasibility of administration.

Time to complete: Time to complete was examined among 422 assessments in HHAs, 457 in IRFs, 244 in LTCHs, and 431 in SNFs (n = 1,554 overall). The average time to complete the Tracheostomy Care item was 0.22 minutes overall (SD = 0.1) and 0.19 minutes in the HHA setting (SD = 0.1).

[183] Mitchell, L. A., Hirdes, J., Poss, J. W., Siegers-Boyd, C., Caldarelli, H., & Martin, L. (2015). Informal caregivers of clients with neurological conditions: profiles, patterns and risk factors for distress from a home care prevalence study. BMC health services research, 15(1), 350.
[184] Saliba, & Buchanan, 2008b.

Interrater reliability: IRR was examined for 187 assessments in HHAs, 236 in IRFs, 203 in LTCHs, and 256 in SNFs (n = 882 overall). The IRR was excellent for the Tracheostomy Care data element, as measured by percent agreement of paired raters. The kappa was not estimated for the Tracheostomy Care data element because the proportion of patients and residents receiving tracheostomy care was out of range for a stable kappa estimate. Percent agreement for the data element was 100 percent across settings and in the HHA setting. Please refer to Table 4.5.2 in Appendix 3 for percent agreement statistics for the Tracheostomy Care item.

Non-invasive Mechanical Ventilation (Bilevel Positive Airway Pressure [BiPAP], Continuous Positive Airway Pressure [CPAP])

BiPAP and CPAP are respiratory support devices that prevent the airways from closing by delivering slightly pressurized air through a mask continuously or via electronic cycling throughout the breathing cycle. A BiPAP/CPAP mask supports breathing by providing positive airway pressure that prevents airways from collapsing during the respiratory cycle. Non-invasive mechanical ventilation differs from invasive mechanical ventilation because the interface with the patient is a mask rather than an endotracheal tube in the windpipe. BiPAP and CPAP have a variety of clinical indications, from obstructive sleep apnea, to acute respiratory infections, to progressive neuromuscular decline leading to respiratory failure. The key difference between BiPAP and CPAP is that BiPAP, as the name implies, delivers two different pressure levels (a higher pressure to support inhalation and a lower pressure to prevent the airways from collapsing during exhalation), whereas CPAP delivers the same amount of positive airway pressure throughout the breathing cycle. These interventions signify underlying medical conditions in the patient who requires their use.

Relevance to HHAs

The OASIS currently assesses BiPAP/CPAP treatment. However, it does not differentiate between BiPAP treatment and CPAP treatment. According to 2013 OASIS data, 2.6 percent of HH patients were on either BiPAP or CPAP treatment.[185] CPAP or BiPAP masks enable individuals to support their own breathing cycle. They can be used for sleep apnea or more serious conditions like COPD or respiratory failure. Non-invasive ventilation is a common tool in the management of acute and chronic respiratory failure in home settings. Complications related to mask use may include mask discomfort and skin rashes; other complications include pressure and blood flow issues, such as general discomfort, ear or sinus pain, gastric insufflation, nasal dryness, congestion, and obstruction. More serious complications include aspiration and hemodynamic compromise, the latter in patients with compromised cardiac output.[186] Non-invasive mechanical ventilation can be more difficult for patients who rely on long-term ventilator support when compared to invasive mechanical ventilation.[187] Considering the use of noninvasive mechanical ventilation is therefore important to assess in HHAs for purposes of case mix adjustment and care planning.

Data Element for the Assessment of Special Services, Treatments, and Interventions: Non-invasive Mechanical Ventilation

[185] RAND analysis of 2013 OASIS data.

[186] Gay, P. C. (2009). Complications of noninvasive ventilation in acute care. Respiratory Care 54(2): 246-257.

[187] King, A. C. (2012). Long-term home mechanical ventilation in the United States. Respiratory Care 57(6): 921-932.

O0110. Special Treatments, Procedures, and Programs Check all of the following treatments, procedures, and programs that apply on admission	a. On Admission Check all that apply ↓
Respiratory Therapies	
G1. Non-Invasive Mechanical Ventilator	☐
G2. BiPAP	☐
G3. CPAP	☐

Current use

Non-Invasive mechanical ventilation is currently assessed in the LCDS and the MDS. The LCDS uses a checklist format, including an item asking whether the patient has non-invasive ventilator (BIPAP, CPAP) treatment at admission. The MDS first assesses whether the resident received non-invasive mechanical ventilation while not a resident of the assessing facility and within the last 14 days, and then whether the resident received non-invasive mechanical ventilation while a resident and within the last 14 days. The LCDS and MDS data elements do not assess whether the non-invasive mechanical ventilation is BiPAP or CPAP.

Prior evidence supporting use of Non-invasive Mechanical Ventilation (BiPAP, CPAP)

A checkbox item for non-invasive ventilation (CPAP) was tested in the PAC PRD and was found to be feasible for cross-setting use.[188]

Evidence supporting use of Non-invasive Mechanical Ventilation (BiPAP, CPAP) from the National Beta Test

Assessing Non-invasive Mechanical Ventilation: One item assessed whether a non-invasive mechanical ventilator was noted during the assessment period. If indicated, two follow-up items assessed whether this non-invasive mechanical ventilator was BiPAP or CPAP. In the National Beta Test, the principal data element and sub elements were administered to 629 patients/residents in HHAs, 762 in IRFs, 448 in LTCHs, and 1,087 in SNFs (n = 2,926 overall). Across settings, 5 percent of assessments noted use of a non-invasive mechanical ventilator. In the HHA setting specifically, 4 percent of assessments noted use of a non-invasive mechanical ventilator. With regard to specific types of non-invasive mechanical ventilator across settings, 2 percent of assessments noted BiPAP and 3 percent CPAP. Similarly, in HHA, 1 percent noted BiPAP and 2 percent CPAP. Detailed findings regarding non-invasive mechanical ventilators are shown in Appendix 3, Table 4.7.1.

Missing data: Overall, there were very low rates of missing responses for the Non-Invasive Mechanical Ventilator items. Across all settings, missingness was less than 1.2 percent. In the HHA setting specifically, missingness was 2.7 percent. The low rate of missing data indicates feasibility of administration.

Time to complete: Time to complete was examined among 422 assessments in HHAs, 457 in IRFs, 244 in LTCHs, and 431 in SNFs (n = 1,554 overall). The average time to complete the Non-invasive Mechanical Ventilator items was 0.22 minutes overall (SD = 0.1) and 0.19 minutes in the HHA setting (SD = 0.1).

Interrater reliability: IRR was examined for 187 assessments in HHAs, 236 in IRFs, 203 in LTCHs, and 256 in SNFs (n = 882 overall). Most kappas for the Non-invasive Mechanical Ventilator

[188] Gage, Constantine, et al., 2012.

items are not reported because their proportions were out of range for stable kappa estimates. Percent agreement for the principal data element and sub elements ranged from 97 to 98 percent across settings and from 96 to 98 percent in the HHA setting. Please refer to Table 4.7.2 in Appendix 3 for percent agreement statistics for all Non-invasive Mechanical Ventilator items across settings.

Invasive Mechanical Ventilator

Invasive mechanical ventilator includes any type of electrically or pneumatically powered closed-system mechanical support devices, to ensure adequate ventilation of patients who are unable to support their own respiration. Patients receiving closed-system ventilation include those receiving ventilation via a tracheostomy and patients with an endotracheal tube (e.g., nasally or orally intubated). Depending on the patient's underlying diagnosis, clinical condition, and prognosis, the patient may not be a candidate for weaning off the ventilator. For instance, certain medical conditions such as lung infections are expected to improve or resolve to a point where patients can support their own respiration, whereas chronic neurodegenerative diseases are likely to progress over time and therefore preclude patients from weaning and eventually having the tube removed.

Ventilation in this manner is a resource-intensive therapy associated with life-threatening conditions in which the patient would not survive without invasive ventilation. However, ventilator use has inherent risks requiring close monitoring, and failure to adequately care for ventilator-dependent patients can lead to death, pneumonia, sepsis, and other iatrogenic events. Mechanical ventilation further signifies the complexity of the patient's underlying medical and/or surgical condition.

Relevance to HHAs

The OASIS currently assesses respiratory treatments used at home, with "ventilator (continually or at night)" as one response option. This data element will provide more specific information on whether the HH patient is receiving invasive mechanical ventilation specifically. Since there is no national registry for home ventilation in the United States, it is difficult to account for the number of patients using invasive mechanical ventilation in the HH setting, but estimates suggest that the number of patients receiving home ventilation is increasing in the United States.[189, 190] Goals of home invasive mechanical ventilation include sustaining and extending life, enhancing the quality of life, reducing morbidity, improving or sustaining physical and psychological functioning, and providing cost-effective care.[191,192] However, invasive mechanical ventilation is one of the most advanced and complicated types of medical treatment provided outside a hospital setting.[193,194] Potential major complications include pneumonia, injury to the lung due to excessive air pressure, fluid overload, and blood clot in a lung artery.[195] Assessing the use of invasive mechanical ventilation in the HH setting is important for care planning,

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[189] Divo, M. J., Murray, S., Cortopassi, F., & Celli, B. R. (2010). Prolonged mechanical ventilation in Massachusetts: the 2006 prevalence survey. Respiratory care, 55(12), 1693-1698.

[190] King, A. C. (2012). Long-term home mechanical ventilation in the United States. Respiratory care, 57(6), 921-932.

[191] AARC Clinical Practice Guideline (2007). Long-Term Invasive Mechanical Ventilation in the Home - 2007 Revision & Update. Respiratory Care 52(1): 1056-1062.

[192] King, A. C. (2012). Long-term home mechanical ventilation in the United States. Respiratory care, 57(6), 921-932.

[193] Dybwik, K., Nielsen, E. W., & Brinchmann, B. S. (2011). Home mechanical ventilation and specialised health care in the community: Between a rock and a hard place. BMC Health Services Research, 11: 115. doi: 10.1186/1472-6963-11-115

[194] Lewarski, J. S., & Gay, P. C. (2007). Current issues in home mechanical ventilation. Chest. 132(2): 671–676.

[195] Klompas, M., Khan, Y., Kleinman, K., Evans, R. S., Lloyd, J. F., Stevenson, K., . . . CDC Prevention Epicenters Program. (2011). Multicenter evaluation of a novel surveillance paradigm for complications of mechanical ventilation. PLoS One, 6(3), e18062. doi:10.1371/journal.pone.0018062

clinical decision support, care coordination, understanding of medical complexity, and resource use planning.

Data Element for the Assessment of Special Services, Treatments, and Interventions: Invasive Mechanical Ventilator

O0110. Special Treatments, Procedures, and Programs Check all of the following treatments, procedures, and programs that apply on admission	**a. On Admission** **Check all that apply** ↓
Respiratory Therapies	
F1. Invasive Mechanical Ventilator (ventilator or respirator)	☐

Current use

Invasive mechanical ventilator use is currently assessed in the LCDS and MDS. The MDS first assesses whether the resident received invasive mechanical ventilation while not a resident of the assessing facility and within the last 14 days, and then whether the resident received invasive mechanical ventilation while a resident and within the last 14 days. The LCDS includes an items that assess use and type of invasive mechanical ventilator support (e.g., weaning or non-weaning).

Prior evidence supporting use of Invasive Mechanical Ventilator

Checkbox items for ventilator (weaning and non-weaning) were tested in the PAC PRD and were found to be feasible for cross-setting use.[196] A version of the item was tested in the MDS 3.0 National Evaluation Study and had perfect agreement (100 percent).[197]

Evidence supporting use of Invasive Mechanical Ventilator from the National Beta Test

Assessing Invasive Mechanical Ventilator: One item assessed whether an invasive mechanical ventilator was noted during the assessment period. In the National Beta Test, the data element was administered to 629 patients/residents in HHAs, 762 in IRFs, 448 in LTCHs, and 1087 in SNFs (n = 2,926 overall). Across settings overall, only 13 assessments (zero percent after rounding) noted use of an invasive mechanical ventilator. In HHA, no patients had an invasive mechanical ventilator noted. Detailed invasive mechanical ventilator findings across settings are shown in Appendix 3, Table 4.6.1.

Missing data: Overall, there were very low rates of missing responses for the Invasive Mechanical Ventilator item. Across all settings, missingness was 1.2 percent for the item. In the HHA setting specifically, missingness was 2.7 percent. The low rate of missing data indicates feasibility of administration.

Time to complete: Time to complete was examined among 422 assessments in HHAs, 457 in IRFs, 244 in LTCHs, and 431 in SNFs (n = 1,554, overall). The average time to complete the Invasive Mechanical Ventilator item was 0.22 minutes overall (SD = 0.1) and 0.19 minutes in the HHA setting (SD = 0.1).

Interrater reliability: IRR was examined for 187 assessments in HHAs, 236 in IRFs, 203 in LTCHs, and 256 in SNFs (n = 882 overall). The IRR was excellent for the Invasive Mechanical

[196] Gage, Constantine, et al., 2012.
[197] Saliba, & Buchanan, 2008b.

Ventilator data element as measured by percent agreement of paired raters. The kappa was not estimated for the Invasive Mechanical Ventilator data element because the proportion was out of range for a stable kappa estimate. Percent agreement for the data element was 100 percent across settings and in the HHA setting. Please refer to Table 4.6.2 in Appendix 3 for percent agreement statistics for the Invasive Mechanical Ventilator item across all settings.

IV Medications (Antibiotics, Anticoagulation, Vasoactive Medications, Other)

IV medications are drugs or biologics that are administered via intravenous push (bolus), single, intermittent, or continuous infusion through a tube placed into the vein, including one that allows the fluids to enter the circulation through one of the larger heart vessels or more peripherally through a vein, e.g., commonly referred to as central midline, or peripheral ports.

This data element is important to collect, as IV medications are more resource intensive to administer than oral medications and signify a higher patient complexity (and often higher severity of illness). The clinical indications for each of the subtypes of IV medications (antibiotics, anticoagulants, vasoactive, and other) are very different. IV antibiotics are used for severe infections when 1) the bioavailability of the oral form of the medication would be inadequate to kill the pathogen, 2) an oral form of the medication does not exist, or 3) the patient is unable to take the medication by mouth. Because of growing concern about antimicrobial resistance, antibiotic stewardship initiatives are aimed at increasing evidence-based antibiotic prescribing and decreasing antibiotic overuse. Although data on which antibiotic are used not be collected, collecting data on the use of IV antibiotics overall in the four PAC settings would assist with monitoring the implementation of evidence-based prescribing guidelines moving forward.

IV anticoagulants refer to anti-clotting medications (that is, "blood thinners"). IV anticoagulants are commonly used for hospitalized patients who have deep venous thrombosis, pulmonary embolism, or myocardial infarction, as well as those undergoing interventional cardiac procedures.

Vasoactive medications affect blood pressure and/or heart rate by causing dilation or constricting of the blood vessels. Vasoactive medications are used to treat septic shock, cardiac arrest, and other cardiac function issues. Continuous infusions of vasoactive medications require close observation of the patient, including constant monitoring of blood pressure and heart rate, in order to respond quickly to any changes.

Relevance to HHAs

The OASIS currently assesses intravenous or infusion therapy in a single item, but does not assess specific types of IV medications. However, IV antibiotic use in the HH setting is becoming increasingly common due to patient placement difficulties and costs associated with skilled facilities.[198] Further, there is evidence that an IV medication adjunct to treatment can reduce the likelihood of hospital readmission for HH patients with heart failure.[199] Thus, it is important to assess the fact of IV administration in addition to the type of IV medications being administered within the HH setting for care planning and defining case mix.

Data Element for the Assessment of Special Services, Treatments, and Interventions: IV Medications

[198] Bossaer, J. B. & Lewis, P. O. (2012). Antibiotic use in home health: A primer. Home Health Care Management & Practice 24(1): 50-55.

[199] Sherrod, M. M., Graulty, R., Crawford, M., & Cheek, D. J. (2009). Intravenous heart failure medications: An update for home health clinicians. Home Healthcare Nurse 27(10): 610-619.

O0110. Special Treatments, Procedures, and Programs Check all of the following treatments, procedures, and programs that apply on admission	a. On Admission Check all that apply ↓
Other	
H1. IV Medications	☐
H2. Vasoactive medications	☐
H3. Antibiotics	☐
H4. Anticoagulation	☐
H10. Other	☐

Current use

The item IV Medications is currently assessed in the LCDS and MDS. The LCDS uses a checklist format, including an item at admission asking whether the patient is receiving any IV medications. The MDS first assesses whether the resident received IV medications while not a resident of the assessing facility and within the last 14 days, and then whether the resident received IV medications while a resident and within the last 14 days. The MDS data element does not assess the type of IV medications.

Prior evidence supporting use of IV Medications

A similar but more focused data element, IV Vasoactive Medications, was tested in the PAC PRD and found to be feasible across PAC settings. This data element was specific to the IV administration of vasoactive drugs (e.g., pressors, dilators, continuous medication for pulmonary edema) that increase or decrease blood pressure and/or heart rate.

In nursing homes, a checkbox for IV medications during the last 5 days was shown to have reliability of 0.95 (kappa) in the national MDS 3.0 test.[200]

Evidence supporting use of IV Medications from the National Beta Test

Assessing IV Medications: One item assessed whether IV medications were noted during the assessment period. If indicated, three follow-up items assessed specific types of IV medications (antibiotics, anticoagulation, or other). The category of Vasoactive Medications was not included in the National Beta Test. In the National Beta Test, the principal data element and sub-elements were administered to 629 patients/residents in HHAs, 762 in IRFs, 448 in LTCHs, and 1,087 in SNFs (n = 2,926 overall).

Across settings, one in four assessments (25 percent) had IV medications noted. For specific types of IV medication, 16 percent had antibiotics noted, 8 percent had anticoagulation noted, and 7 percent had other IV medications noted. In HHA specifically, 15 percent had IV medications noted. For the specific types of IV medication, 4 percent had antibiotics noted, 8 percent had anticoagulation noted, and 6 percent had other IV medications noted. Detailed IV medications findings across settings are shown in Appendix 3, Table 4.8.1.

[200] Saliba, & Buchanan, 2008b.

Missing data: Overall, there were very low rates of missing responses for the IV Medications items. Across all settings, missingness was less than 0.9 percent. In the HHA setting, missingness for the IV Medication items was 0.3 percent. The low rate of missing data indicates feasibility of administration.

Time to complete: Time to complete was examined among 422 assessments in HHAs, 457 in IRFs, 244 in LTCHs, and 431 in SNFs (n = 1,554, overall). The average time to complete the IV Medications items was 0.22 minutes overall (SD = 0.1) and 0.19 minutes in the HHA setting (SD = 0.1).

Interrater reliability: IRR was examined for 187 assessments in HHAs, 236 in IRFs, 203 in LTCHs, and 256 in SNFs (n = 882 overall). With the exception of the anticoagulation sub-element, the IRRs were fair to good across settings for the IV Medications principal data element and sub elements as measured by kappa and percent agreement of paired raters. The kappa for the principal IV Medications data element was 0.70 across settings and 0.15 in the HHA setting. The kappa for the Antibiotics sub-element was 0.88 across settings. The kappa for the Anticoagulation sub-element was 0.13 across settings, placing it in the "slight/poor" range. The kappa for the Other sub-element was 0.46 across settings. Consultation with assessors suggested that these low kappas (0.15 and 0.13) were likely caused by inconsistent interpretation of the coding instructions, which will be improved in the future with more-comprehensive guidance. In HHA, kappas for the IV Medications sub-elements were not computed because proportions were out of range for stable kappa estimates. Percent agreement for the principal data element and sub elements ranged from 88 to 96 percent across settings and from 83 to 98 percent in the HHA setting. Please refer to Table 4.8.2 in Appendix 3 for IRR statistics for all IV Medications items.

Transfusions

Transfusions are the administration of blood or blood products (e.g., platelets, synthetic blood products) into the bloodstream. Blood transfusions are highly protocolized, with multiple safety checks and monitoring required during and after the infusion to avoid adverse events. Coordination with the facility's blood bank is necessary, as well as documentation by clinical staff to ensure compliance with regulatory requirements. In addition, the need for transfusions signifies underlying patient complexity that is likely to require additional nursing staff and care coordination, and affects planning for transitions of care, as transfusions are not performed in all PAC settings. Receipt of transfusions is also important to assess for case mix adjustment because of the need for added resources and to the extent that receipt of transfusions indicates a more medically complex patient.

Relevance to HHAs

The OASIS currently assesses intravenous or infusion therapy in a single item, but does not assess blood transfusions specifically. Blood transfusions can be safely administered in the home. Common diagnoses for patients receiving home transfusions are cancer, chronic anemia, AIDS, and bone marrow transplantation.[201] Further, as the population continues to age and more adults require care in the HH setting it is likely that the demand for these services will continue to rise.[202] Advantages for home transfusion include offering patients the physical and psychological comfort of receiving services in their home, lower costs, fewer clerical errors, minimizing the need of the patient to travel for care, and no risk of nosocomial infection.[203,204,205] Noted concerns in the past, specifically distance from emergency

[201] Benson, K., Popovsky, M. A., Hines, D., Hume, H., Oberman, H. A., Glassman, A. B., …& Anderson, K. C. (1998). Nationwidel survey of home transfusion practices. Transfusion 38(1): 90-96.
[202] *Ibid*
[203] *Ibid*
[204] Benson, K. (2006). Home is where the heart is: Do blood transfusions belong there too? Transfusion Medicine Reviews 20(3): 218-229.
[205] Niscola, P., Tendas, A., Giovannini, M., Cupelli, L., Trawinska, M. M. Palombi, M., … Perrotti, A. (2012).Transfusions at home in patients with myelodysplastic syndromes. Leukemia Research 36(6): 684-688.

services in the event of an adverse event, appear to be minimized as evidenced by recent studies; work to date suggests that transfusions at home can be administered safely to maximize benefits for patients in this PAC setting.[206] Assessing transfusion therapy with the HH setting is important for care planning and defining case mix.

Data Element for the Assessment of Special Services, Treatments, and Interventions: Transfusions

O0110. Special Treatments, Procedures, and Programs Check all of the following treatments, procedures, and programs that apply on admission	**a. On Admission** **Check all that apply** ↓
Other	

O0110. Special Treatments, Procedures, and Programs Check all of the following treatments, procedures, and programs that apply on admission	**a. On Admission** **Check all that apply** ↓
I1. Transfusions	☐

Current use

Transfusions are currently assessed in the MDS. It first assesses whether the resident received transfusions while not a resident of the assessing facility and within the last 14 days, and then whether the resident received transfusions while a resident and within the last 14 days.

Prior evidence supporting use of Transfusions

In nursing homes, a checkbox for transfusions in the past five days was shown to have reliability of 0.67 (kappa) in the national MDS 3.0 test.[207]

Evidence supporting use of Transfusions from the National Beta Test

Assessing Transfusions: One item assessed whether Transfusions were performed during the assessment period. In the National Beta Test, the data element was administered to 629 patients/residents in HHAs, 762 in IRFs, 448 in LTCHs, and 1,087 in SNFs (n = 2,926 overall). Across settings, only 14 patient/resident assessments (zero percent after rounding) noted transfusions. In HHA, only one patient (0 percent after rounding) had transfusions noted. Detailed transfusion findings across settings are shown in Appendix 3, Table 4.9.1.

Missing data: Overall, there were very low rates of missing responses for the Transfusions item. Across all settings, missingness was 1.0 percent for the item. In the HHA setting specifically, missingness was 0.3 percent. The low rate of missing data indicates feasibility of administration.

Time to complete: Time to complete was examined among 422 assessments in HHAs, 457 in IRFs, 244 in LTCHs, and 431 in SNFs (n = 1,554, overall). The average time to complete the Transfusion item was 0.22 minutes overall (SD = 0.1) and 0.19 minutes in the HHA setting (SD = 0.1).

Interrater reliability: IRR was examined for 187 assessments in HHAs, 236 in IRFs, 203 in LTCHs, and 256 in SNFs (n = 882 overall). Kappas are not reported for the Transfusions data element

[206] Benson, K. (2006). Home is where the heart is: Do blood transfusions belong there too? Transfusion Medicine Reviews 20(3): 218-229.
[207] Saliba, & Buchanan, 2008b.

because the proportion was out of range for a stable kappa estimate. Percent agreement for the Transfusions data element was perfect overall and in the HHA setting. Please refer to Table 4.9.2 in Appendix 3 for setting-specific percent agreement statistics for the Transfusion item.

Dialysis (Hemodialysis, Peritoneal dialysis)

Dialysis is used primarily in the case of end-stage kidney failure. It is a process by which waste, salt, and excess water are removed from the body and key electrolytes such as sodium, potassium, and bicarbonate are maintained at a safe level. Hemodialysis is conducted using an artificial kidney, an external hemodialyzer, which filters the blood. During peritoneal dialysis, the dialysate is injected into the peritoneal (abdominal) cavity, excess fluid and waste products are drawn out of the blood and into the dialysate, and the fluid is then drained. Hemodialysis sessions are typically performed three times a week and last up to 4 hours each. Peritoneal dialysis can be performed continuously overnight or intermittently during the day.

Both forms of dialysis (hemodialysis and peritoneal dialysis) are resource intensive, not only during the actual dialysis process but before, during, and after. Patients who need and undergo dialysis procedures are at high risk for physiologic and hemodynamic instability from fluid shifts and electrolyte disturbances, as well as infections that can lead to sepsis. Further, patients receiving hemodialysis are often transported to a different facility, or, at a minimum, to a different part of the same facility if adjacent to a dialysis center. Close monitoring for fluid shifts, blood pressure abnormalities, and other adverse effects is required before, during, and after each dialysis session. Nursing staff typically perform peritoneal dialysis at the bedside, and, as with hemodialysis, close monitoring is required.

Relevance to HHAs

The OASIS does not currently have a separate item assessing dialysis. Rather, it is included in a more general category of "Intravenous or infusion therapy (excludes TPN)." An analysis of PAC PRD data suggests that 1.3 percent of patients in the home health setting were receiving hemodialysis.[208] Including an item specifically assessing dialysis therapy with the HH setting is important for care planning and defining case mix.

Data Element for the Assessment of Special Services, Treatments, and Interventions: Dialysis

O0110. Special Treatments, Procedures, and Programs Check all of the following treatments, procedures, and programs that apply on admission	**a. On Admission** **Check all that apply** ↓
Other	
J1. Dialysis	☐
J2. Hemodialysis	☐
J3. Peritoneal dialysis	☐

[208] Gage, Morley, et al., 2012.

Current use

The data element Dialysis is currently assessed in the LCDS and MDS. The LCDS uses a checklist format, including an item asking whether the patient receives dialysis as part of the patient's treatment plan. The MDS first assesses whether the resident received dialysis while not a resident of the assessing facility and within the last 14 days, and then whether the resident received dialysis while a resident and within the last 14 days. The LCDS and MDS data elements do not assess the type of dialysis.

Prior evidence supporting use of Dialysis (Hemodialysis, Peritoneal dialysis)

In nursing homes, a data element assessing dialysis in the past 5 days was tested in the national MDS 3.0 test and shown to have almost perfect reliability (kappas of 0.91 to 0.93).[209]

Evidence supporting use of Dialysis (Hemodialysis, Peritoneal dialysis) from the National Beta Test

Assessing Dialysis: One item assessed whether dialysis was noted during the assessment period. If indicated, two follow-up items assessed whether the dialysis was hemodialysis or peritoneal dialysis. In the National Beta Test, the principal data element and sub elements were administered to 629 patients/residents in HHAs, 762 in IRFs, 448 in LTCHs, and 1,087 in SNFs(n = 2,926 overall). Across settings overall, 5 percent of assessments noted use of dialysis. In the HHA setting specifically, 3 percent of patients had dialysis noted. With regard to specific forms of dialysis, the vast majority of noted dialysis was hemodialysis. Only seven assessments overall, and one in HHA (both 0 percent after rounding) indicated peritoneal dialysis. Detailed findings regarding Dialysis are shown in Appendix 3, Table 4.10.1.

Missing data: Overall, there were very low rates of missing responses for the Dialysis items. Across all settings, missingness was less than 1 percent. In the HHA setting specifically, missingness was 0.3 percent. The low rate of missing data indicates feasibility of administration.

Time to complete: Time to complete was examined among 422 assessments in HHAs, 457 in IRFs, 244 in LTCHs, and 431 in SNFs (n = 1,554, overall). The average time to complete the Dialysis item was 0.22 minutes overall (SD = 0.1) and 0.19 minutes in the HHA setting (SD = 0.1).

Interrater reliability: IRR was examined for 187 assessments in HHAs, 236 in IRFs, 203 in LTCHs, and 256 in SNFs (n = 882 overall). Most kappas are not reported for the Dialysis principal data element and sub elements because the proportions both overall and for each setting were out of range for a stable kappa estimate. Percent agreement for dialysis principal data element was nearly perfect overall and in the HHA specifically (98 percent). The same was true for the two types of dialysis sub elements across settings and in HHA specifically (98 percent and 100 percent, respectively). Please refer to Table 4.10.2 in Appendix 3 for percent agreement statistics for all Dialysis items.

IV Access (Peripheral IV, Midline, Central line)

IV access refers to a catheter inserted into a vein for a variety of clinical reasons, including long-term medication treatment; hemodialysis; large volumes of blood or fluid; frequent access for blood samples; intravenous fluid administration; total parenteral nutrition; or, in some instances, the measurement of central venous pressure.

The data elements associated with IV access distinguish between peripheral access and central access. In addition, different types of central access are specified. The rationale for distinguishing between a peripheral IV and central IV access is that central lines confer higher risks associated with life-threatening events such as pulmonary embolism, infection, and bleeding. Patients with central lines, including those peripherally inserted or who have subcutaneous central line "port" access, always require vigilant nursing care to ensure patency of the lines and, importantly, to ensure that such invasive lines are

[209] Saliba, & Buchanan, 2008b.

free from any potentially life-threatening events such as infection, air embolism, and bleeding from an open lumen.

Relevance to HHAs

The OASIS currently only has an option for "Intravenous or infusion therapy (excludes TPN)." The proposed data element includes additional detail about the type of IV access, such as distinguishing between peripheral IV and central IV access. As noted above, this distinction is important in that central lines confer higher risks associated with life threatening events. Analyses of PAC PRD data suggest that 1.5 percent of patients in the home health setting were receiving care for central line.[210] Furthermore, a study of patients receiving home health care found that 3 percent were receiving IV therapy or parenteral nutrition.[211] Adding this data element will provide important information on different types of IV access, which is important for resource planning and care transitions.

Data Element for the Assessment of Special Services, Treatments, and Interventions: IV Access

O0110. Special Treatments, Procedures, and Programs Check all of the following treatments, procedures, and programs that apply on admission	**a. On Admission** **Check all that apply** ↓
Other	
O1. IV Access	☐
O2. Peripheral	☐
O3. Midline	☐
O4. Central (e.g., PICC, tunneled, port)	☐

Current use

The IV Access data element is not currently included in any of the PAC assessments.

Prior evidence supporting use of IV Access

The IV Access data element was not tested in the PAC PRD, but that study did test a related data element, Central Line Management, which was found feasible for cross-setting use.

Evidence supporting use of IV Access from the National Beta Test

Assessing IV Access: One item assessed whether IV access was noted during the assessment period. If indicated, four follow-up items assessed whether the IV was a peripheral line, midline catheter, central line, or other form of IV access. In the National Beta Test, the principal data element and sub elements were administered to 629 patients/residents in HHAs, 762 in IRFs, 448 in LTCHs, and 1,087 in SNFs (n = 2,926 overall). Across settings, 24 percent of assessments noted use of IV access. The rate in HHA specifically was much lower (4 percent) than in any other setting. For the specific type of IV access noted, a central line was most common across settings (13 percent) followed closely by peripheral IV (11

[210] Gage, Morley, et al., 2012.

[211] Shang, J., Larson, E., Liu, J., & Stone, P. (2015). Infection in home health care: Results from national Outcome and Assessment Information Set data. American Journal of Infection Control 43(5): 454-459.

percent). Midline catheter (2 percent), and other (1 percent) were less common. In the HHA setting, a central line was also most common (3 percent) with peripheral IV noted for only two patients (0 percent after rounding), and other noted for only three patients (0 percent after rounding). No patients in HHA had midline catheter noted. Detailed findings regarding IV access are shown in Appendix 3, Table 4.11.1.

Missing data: Overall, there were very low rates of missing responses for the IV Access items. Across all settings, missingness was less than 1.4 percent. In the HHA setting specifically, missingness was 2.5 percent. The low rates of missing data indicate feasibility of administration.

Time to complete: Time to complete was examined among 422 assessments in HHAs, 457 in IRFs, 244 in LTCHs, and 431 in SNFs (n = 1,554, overall). The average time to complete the IV Access item was 0.22 minutes overall (SD = 0.1) and 0.19 minutes in HHAs (SD = 0.1).

Interrater reliability: IRR was examined for 187 assessments in HHAs, 236 in IRFs, 203 in LTCHs, and 256 in SNFs (n = 882 overall). IRR was excellent across settings for the IV Access item (kappa = 0.90) and the peripheral and central types of access (kappa = 0.81 and kappa = 0.85, respectively). In HHA specifically, kappas are not reported for the IV Access principal data element and sub elements because the proportions were out of range for stable kappa estimates Percent agreement for the principal data element and sub elements was almost perfect. Across settings, percent agreement was 96 percent for the IV Access principal data element, as well as the type of IV Access sub elements (96 to 98 percent). In the HHA specifically, percent agreement was 97 percent for the IV Access principal data element, and the sub elements were also excellent to perfect (97 to 100 percent). Please refer to Table 4.11.2 in Appendix 3 for kappa and percent agreement statistics for all IV Access items.

Parenteral/IV Feeding

Patients can be fed parenterally (i.e., intravenously) to bypass the usual process of eating and digestion. The person receives nutritional formulas containing salts, glucose, amino acids, lipids, and added vitamins. Parenteral/IV feeding is often used after surgery, when feeding by mouth or digestive system is not possible, when a patient's digestive system cannot absorb nutrients because of chronic disease, or if a patient's nutritional requirement cannot be met by tube feeding and supplementation. The need for parenteral/IV feeding indicates a clinical complexity that prevents the patient from meeting nutritional needs enterally. Overall, parenteral/IV feeding is a form of nutritional support that can be used to prevent or address malnutrition.[212] Without treatment, malnutrition can lead to a host of negative consequences, including a decline in health, poorer physical and cognitive function, increased use of health care services, earlier institutionalization, and increased risk of death.[213]

Malnutrition is prevalent among older adults, a population commonly served in PAC settings. A study showed that 58.3 percent of hospitalized patients diagnosed with malnutrition in the U.S. in 2010 were more than 65 years of age.[214] Additionally, as mentioned above, parenteral/IV feeding is often used

[212] National Collaborating Centre for Acute Care (UK). (2006). Nutrition support for adults: oral nutrition support, enteral tube feeding and parenteral nutrition. Methods, Evidence & Guidance. London, UK: National Collaborating Centre for Acute Care. Retrieved from https://www.nice.org.uk/guidance/cg32/evidence/full-guideline-194889853

[213] Evans, C. (2005). Malnutrition in the elderly: A multifactorial failure to thrive. *The Permanente Journal*, *9*(3), 38–41. https://doi.org/10.7812/TPP/05-056

[214] Corkins, M. R., Guenter, P., DiMaria-Ghalili, R. A., Jensen, G. L., Malone, A., Miller, S., . . . Resnick, H. E., & the American Society for Parenteral and Enteral Nutrition. (2014). Malnutrition diagnoses in hospitalized patients: United States, 2010. *Journal of Parenteral and Enteral Nutrition*, *38*(2), 186–195. https://doi.org/10.1177/0148607113512154

to provide nutrition for patients with specific diseases. For example, parenteral/IV feeding can be used for individuals with inflammatory bowel disease, a condition that is common in older adults.[215] [216] [217]

Parenteral/IV feeding is more resource intensive than other forms of nutrition, as it often involves monitoring of blood chemistries and maintenance of a central line. Therefore, assessing a patient's need for parenteral feeding is important for care planning and case mix adjustment. In addition to the risks associated with central and peripheral intravenous access, parenteral/IV feeding is associated with significant risks such as embolism and sepsis.

Relevance to HHAs

The OASIS currently assesses whether a patient receives parenteral nutrition at home. Analysis of 2013 OASIS data, 0.2 percent of patients in the home health setting were receiving total parenteral nutrition treatment.[218] Home parenteral nutrition is needed when patients do not have adequate or functional gastrointestinal tract to maintain fluids, electrolytes, and nutrition. Similar to enteral nutrition, patients receiving it rely on the intervention as a life-sustaining effort in and out of the hospital.[219] However, home parenteral nutrition is a complex method of feeding that has been associated with a host of short- and long-term complications.[220] Assessing receipt of parenteral nutrition would provide important information for resource use and care planning in the HH setting.

A nutritional assessment of older adults receiving Medicare home health services found that 12.0 percent of patients were malnourished and 51.0 percent were at risk for malnourishment.[221] Malnourished/ at-risk malnourished individuals are more likely to experience hospitalization, emergency room and home health aide utilization, and mortality.[222] A study by Corkins et al. found that discharges to home health care were twice as likely among malnourished hospitalized patients.[223] When a patient is unable to receive enteral nutrition, parenteral nutrition is a beneficial treatment of malnutrition in the HH setting.[224]

Data Element for the Assessment of Special Services, Treatments, and Interventions: Parenteral/IV Feeding

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[215] Semrad, C. E. (2012). Use of parenteral nutrition in patients with inflammatory bowel disease. *Gastroenterology & Hepatology*, *8*(6), 393–395.

[216] Mullady, D. K., & O'Keefe, S. J. (2006). Treatment of intestinal failure: Home parenteral nutrition. *Nature Reviews. Gastroenterology & Hepatology*, *3*(9), 492–504. https://doi.org/10.1038/ncpgasthep0580

[217] Taleban, S., Colombel, J. F., Mohler, M. J., & Fain, M. J. (2015). Inflammatory bowel disease and the elderly: A review. *Journal of Crohn's and Colitis*, *9*(6), 507–515. https://doi.org/10.1093/ecco-jcc/jjv059

[218] RAND analysis 2013 OASIS data.

[219] Jeejeebhoy, K. N. (2001). Total parenteral nutrition: potion or poison?. The American Journal of Clinical Nutrition, 74(2), 160-163.

[220] Kumpf, V. J., & Tillman, E. M. (2012). Home parenteral nutrition: Safe transition from hospital to home. Nutrition in clinical practice, 27(6), 749-757.

[221] Yang, Y., Brown, C. J., Burgio, K. L., Kilgore, M. L., Ritchie, C. S., Roth, D. L., & West, D. S. (2011). Undernutrition at baseline and health services utilization and mortality over a 1-year period in older adults receiving medicare home health services. Journal of the American Medical Directors Association 12(4): 287-294.

[222] *Ibid*

[223] Corkins et al., 2014.

[224] Jeejeebhoy, K. N. (2001). Total parenteral nutrition: potion or poison?. The American Journal of Clinical Nutrition, 74(2), 160-163.

K0520. Nutritional Approaches Check all of the following nutritional approaches that apply on admission.	
↓ Check all that apply	
☐	A. Parenteral/IV feeding

Current use

Different versions of the Parenteral/IV Feeding data element are currently collected in the OASIS, IRF-PAI, LCDS, and MDS. The OASIS data element assesses whether the patient is receiving parenteral nutrition at home. The IRF-PAI includes a check box data element to assess total parenteral nutrition with a 3-day look-back period. The LCDS includes a checklist to assess whether the patient receives total parenteral nutrition at admission. The MDS first assesses whether the patient received parental/IV feeding while not a resident of the assessing facility and within the last 7 days, and then whether the patient received parental/IV feeding while a resident and within the last 7 days.

Prior evidence supporting use of Parenteral/IV Feeding

A similar data element, Total Parenteral Nutrition, was tested in the PAC PRD and found to be feasible across PAC settings. Parental/IV feeding in the last 5 days was shown to have almost perfect reliability (kappa of 0.95) in the national MDS 3.0 test in nursing homes.[225]

Evidence supporting use of Parenteral/IV Feeding from the National Beta Test

Assessing Parenteral/IV Feeding: The Parenteral/IV Feeding data element was included in the National Beta Test. This data element was administered to 629 patients/residents in HHAs, 762 in IRFs, 448 in LTCHs, and 1,087 in SNFs (n = 2,926 overall). Across settings, only 1 percent of assessments indicated parenteral/IV feeding. In the HHA setting, no patients had parenteral/IV feeding noted. Detailed parenteral/IV feeding implementation is shown in Appendix 3, Table 5.1.1 for all four settings.

Missing data: Low levels of missing data (1.3 percent for this data element across settings and 1.4 percent in HHAs) inform the feasibility of administering this data element across PAC provider settings.

Time to complete: Time to complete was examined among 422 assessments in HHAs, 457 in IRFs, 244 in LTCHs, and 431 in SNFs (n = 1,554, overall). The average time to complete the Parenteral/IV Feeding item was 0.22 minutes overall (SD = 0.1) and 0.19 minutes in the HHA setting (SD = 0.1).

Interrater reliability: IRR was examined for 187 assessments in HHAs, 236 in IRFs, 203 in LTCHs, and 256 in SNFs (n = 882 overall). Kappas are not reported for the parenteral/IV feeding data element because its proportion was too low for a stable kappa estimate. Percent agreement was perfect (100 percent) for the Parenteral/IV feeding data element across settings and in the HHA setting. Please refer to Table 5.1.2 in Appendix 3 for setting-specific percent agreement statistics for the Parenteral/IV Feeding item.

Feeding Tube

The Feeding Tube data element refers to enteral nutrition, which is the delivery of a nutritionally complete diet containing protein, carbohydrate, fat, water, minerals, and vitamins directly into the stomach, duodenum, or jejunum. It is typically used for patients/residents who have a functional

[225] Saliba, D., & Buchanan, J. Development and validation of a revised nursing home assessment tool: MDS 3.0. Appendices. Santa Monica, CA: RAND Corporation. 2008. Available at https://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/NursingHomeQualityInits/downloads/MDS30FinalReportAppendix.pdf

gastrointestinal tract but are unable to maintain an adequate or safe oral intake. This data element assesses whether the patient/resident received enteral nutrition during the assessment period.

Enteral nutrition is a form of nutritional support that can be used to prevent or address malnutrition.[226] Without treatment, malnutrition can lead to a host of negative consequences, including a decline in health, poorer physical and cognitive function, increased use of health care services, earlier institutionalization, and increased risk of death.[227]

Malnutrition is prevalent among older adults, a population commonly served in PAC settings. A study showed that 58.3 percent of hospitalized patients diagnosed with malnutrition in the U.S. in 2010 were over 65 years of age.[228] Additionally, enteral nutrition can be used to provide nutrition for patients with specific diseases. For example, tube feeding can be used for individuals with stroke[229] and those with head and neck cancer,[230] conditions that are common in older adults.[231] [232]

Assessing use of a feeding tube can inform resource use, care planning, and care transitions.

[226] National Alliance for Infusion Therapy and the American Society for Parenteral and Enteral Nutrition Public Policy Committee and Board of Directors. (2010). Disease-related malnutrition and enteral nutrition therapy: a significant problem with a cost-effective solution. Nutrition in Clinical Practice, 25(5), 548-554. https://doi.org/10.1177/0884533610378524

[227] Evans, 2005..

[228] Corkins et al., 2014.

[229] Corrigan, M. L., Escuro, A. A., Celestin, J., & Kirby, D. F. (2011). Nutrition in the stroke patient. *Nutrition in Clinical Practice*, *26*(3), 242–252. https://doi.org/10.1177/0884533611405795

[230] Raykher, A., Russo, L., Schattner, M., Schwartz, L., Scott, B., & Shike, M. (2007). Enteral nutrition support of head and neck cancer patients. *Nutrition in Clinical Practice*, *22*(1), 68–73. https://doi.org/10.1177/011542650702200168

[231] Centers for Disease Control and Prevention (CDC). (2012). Prevalence of stroke—United States, 2006-2010. *MMWR. Morbidity and Mortality Weekly Report*, *61*(20), 379–382.

[232] VanderWalde, N. A., Fleming, M., Weiss, J., & Chera, B. S. (2013). Treatment of older patients with head and neck cancer: A review. *The Oncologist*, *18*(5), 568–578. https://doi.org/10.1634/theoncologist.2012-0427

Relevance to HHAs

This data element is currently collected in the OASIS, with a question asking if the patient is receiving enteral nutrition at home. Analysis of 2013 OASIS data found that 1.4 percent of patients in the home health setting received enteral nutrition treatment.[233] While the proportion of patients who received enteral tube feeding is not high, patients receiving it rely on the intervention as a life-sustaining effort in and out of the hospital.[234] Home enteral nutrition is also expected to become more popular, due to increased awareness of therapeutic nutrition, developments in artificial nutrition, higher proportions of elderly people in the population, and a reduction in the number of hospital beds.[235,236] While inserting feeding tubes is usually related to minor morbidity, long-term use can contribute to various complications and impact quality of life.[237]

A nutritional assessment of older adults receiving Medicare home health services found that 12 percent of patients were malnourished and 51 percent were at risk for malnourishment.[238] Malnourished/ at-risk malnourished individuals are more likely to experience hospitalization, emergency room and home health aide utilization, and mortality.[239] A study by Corkins et al. found that discharges to home health care were twice as likely among malnourished hospitalized patients.[240] Enteral tube feeding is an effective method for providing nutrients to individuals across PAC settings, including in the HH setting.[241]

Data Element for the Assessment of Special Services, Treatments, and Interventions: Feeding Tube

K0520. Nutritional Approaches Check all of the following nutritional approaches that apply on admission.	
↓ **Check all that apply**	
☐	**B. Feeding tube** (e.g., nasogastric or abdominal (PEG))

Current use

[233] RAND analysis of 2013 OASIS data.

[234] Majka, A. J., Wang, Z., Schmitz, K. R., Niesen, C. R., Larsen, R. A., Kinsey, G. C., ... & Murad, M. H. (2014). Care coordination to enhance management of long-term enteral tube feeding: a systematic review and meta-analysis. Journal of Parenteral and Enteral Nutrition, 38(1), 40-52.

[235] Alivizatos, V., Gavala, V., Alexopoulos, P., Apostolopoulos, A., & Bajrucevic, S. (2012). Feeding tube-related complications and problems in patients receiving long-term home enteral nutrition. Indian Journal of Palliative Care, 18(1), 31.

[236] Majka, A. J., Wang, Z., Schmitz, K. R., Niesen, C. R., Larsen, R. A., Kinsey, G. C., ... & Murad, M. H. (2014). Care coordination to enhance management of long-term enteral tube feeding: a systematic review and meta-analysis. Journal of Parenteral and Enteral Nutrition, 38(1), 40-52.

[237] Alivizatos, V., Gavala, V., Alexopoulos, P., Apostolopoulos, A., & Bajrucevic, S. (2012). Feeding tube-related complications and problems in patients receiving long-term home enteral nutrition. Indian Journal of Palliative Care, 18(1), 31.

[238] Yang, Y., Brown, C. J., Burgio, K. L., Kilgore, M. L., Ritchie, C. S., Roth, D. L., & West, D. S. (2011). Undernutrition at baseline and health services utilization and mortality over a 1-year period in older adults receiving medicare home health services. Journal of the American Medical Directors Association 12(4): 287-294.

[239] *Ibid*

[240] Corkins et al., 2014.

[241] Ojo, O. (2015). The challenges of home enteral tube feeding: a global perspective. Nutrients, 7(4), 2524-2538.

A version of the Feeding Tube data element is currently assessed in three existing PAC assessments. The data element Enteral Nutrition is currently collected in the OASIS, with a question asking whether the patient is receiving enteral nutrition at home. In the IRF-PAI, a Swallowing Status data element captures some information related to enteral nutrition through the response option "Tube/Parenteral Feeding." The MDS data element, Feeding Tube – Nasogastric or Abdominal (PEG), first assesses whether a resident used a feeding tube while not a resident of the assessing facility and within the last 7 days and then whether the resident used a feeding tube while a resident and within the last 7 days.

Prior evidence supporting use of Feeding Tube

In the national MDS 3.0 test in nursing homes, the Feeding Tube data element, collected for the last 5 days, was shown to have almost perfect reliability (kappa of 0.89). [242]

Evidence supporting use of Feeding Tube from the National Beta Test

Assessing Feeding Tube: The Feeding Tube data element was included in the National Beta Test. This data element was administered to 629 patients/residents in HHAs, 762 in IRFs, 448 in LTCHs, and 1,087 in SNFs (n = 2,926 overall). Across settings, 3 percent of assessments indicated use of a feeding tube. In the HHA setting, only two assessments (0 percent after rounding) noted use of a feeding tube. Detailed feeding tube implementation is shown in Appendix 3, Table 5.2.1 for all four settings.

Missing data: There were very low rates of missing data for the Feeding Tube data element both overall (1.3 percent) and in the HHA setting (1.4 percent).

Time to complete: Time to complete was examined among 422 assessments in HHAs, 457 in IRFs, 244 in LTCHs, and 431 in SNFs (n = 1,554 overall). The average time to complete the Feeding Tube item was 0.22 minutes overall (SD = 0.1) and 0.19 minutes in the HHA setting (SD = 0.1).

Interrater reliability: IRR was examined for 187 assessments in HHAs, 236 in IRFs, 203 in LTCHs, and 256 in SNFs (n = 882 overall). Kappas are not reported for the Feeding Tube data element because its proportions were out of range for a stable kappa estimate. Percent agreement was 100 percent across settings and in the HHA setting. Please refer to Table 5.2.2 in Appendix 3 for setting-specific percent agreement statistics for the Feeding Tube item.

Mechanically Altered Diet

A mechanically altered diet is one that is specifically prepared to alter the texture or consistency of food to facilitate oral intake. Examples include soft solids, pureed foods, ground meat, and thickened liquids. A mechanically altered diet should not automatically be considered a therapeutic diet.

The provision of a mechanically altered diet is resource intensive, as it signifies difficulty swallowing/eating safely (dysphagia). Often, nurses are required to slowly feed patients meals consisting of a mechanically altered diet rather than having them eat independently. Dysphagia is frequently associated with various health conditions, including: nervous system-related diseases (e.g., cerebral palsy and Parkinson's disease); stroke; head injury; head, neck, and esophagus cancers; head, neck, and chest injuries; and dementia.[243] In the absence of treatment, swallowing disorders can lead to malnutrition, dehydration, aspiration pneumonia, poor overall health, chronic lung disease, choking, and death.[244]

[242] Saliba, & Buchanan, 2008b.

[243] National Institute on Deafness and Other Communication Disorders. (2017). Dysphagia. Retrieved from https://www.nidcd.nih.gov/health/dysphagia

[244] American Speech-Language-Hearing Association. (Undated). Adult Dysphagia. Retrieved from https://www.asha.org/PRPSpecificTopic.aspx?folderid=8589942550&section=Overview

Other consequences can include lack of interest and enjoyment related to eating or drinking, and embarrassment or isolation tied to social situations involving eating.[245]

Dysphagia is highly prevalent in older adults, a population commonly served in PAC settings. A study of a geriatric population living independently found that the lifetime prevalence of a swallowing disorder was 38 percent, and current prevalence of a swallowing disorder was 33 percent.[246] Additionally, increasing age has been shown to be associated with a higher likelihood of swallowing problems in the previous year.[247] Beyond general aging effects on swallowing physiology, age-related disease is the main risk factor for dysphagia in older adults.[248] Stroke and dementia are examples of common conditions among the elderly that may contribute to issues with swallowing.[249]

Furthermore, discharge to a PAC setting is more likely among those with dysphagia. A study examining burden among inpatients diagnosed with dysphagia found that individuals with dysphagia had a 33.2 percent higher likelihood of being discharged to a PAC facility than patients without dysphagia.[250]

Assessing whether a patient requires a mechanically altered diet is important in ensuring patient safety and can inform care planning, care transitions, and resource utilization.

Relevance to HHAs

The OASIS currently collects data on a patient's ability to feed him- or herself independently, but requires a liquid, pureed, or ground meat diet. However, the OASIS does not have a more general item on whether the patient receives a mechanically altered diet. There is some evidence that dysphagia, which is difficulty or discomfort in swallowing, may affect many HH patients. The prevalence of dysphagia is high among dementia and stroke patients.[251] Data from the 2013-2014 National Study of Long-Term Care Providers showed that 31.4 percent of home health patients had a diagnosis of Alzheimer's disease or other dementias.[252] Further, a large study of stroke patients aged 18 years and older found that 11.5 percent were discharged to the home health setting.[253] This speaks to the importance of assessing whether HH patients receive a mechanically altered diet.

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[245] *Ibid*

[246] Roy, N., Stemple, J., Merrill, R. M., & Thomas, L. (2007). Dysphagia in the elderly: Preliminary evidence of prevalence, risk factors, and socioemotional effects. *The Annals of Otology, Rhinology, and Laryngology*, *116*(11), 858–865. https://doi.org/10.1177/000348940711601112

[247] Bhattacharyya, N. (2014). The prevalence of dysphagia among adults in the United States. *Otolaryngology—Head and Neck Surgery*, *151*(5), 765–769. https://doi.org/10.1177/0194599814549156

[248] Sura, L., Madhavan, A., Carnaby, G., & Crary, M. A. (2012). Dysphagia in the elderly: Management and nutritional considerations. *Clinical Interventions in Aging*, *7*, 287–298.

[249] *Ibid*

[250] Patel, D. A., Krishnaswami, S., Steger, E., Conover, E., Vaezi, M. F., Ciucci, M. R., & Francis, D. O. (2018). Economic and survival burden of dysphagia among inpatients in the United States. *Diseases of the Esophagus*, *31*(1), 1–7. https://doi.org/10.1093/dote/dox131

[251] Sura, L., Madhavan, A., Carnaby, G., & Crary, M. A. (2012). Dysphagia in the elderly: Management and nutritional considerations. Clinical Interventions in Aging, 7, 287-298.

[252] Harris-Kojetin, L., Sengupta, M., Park-Lee, E., et al. (2016). Long-term care providers and services users in the United States: Data from the National Study of Long-Term Care Providers, 2013–2014. National Center for Health Statistics. Vital and Health Statistics, 3(38).

[253] Bettger, J. P., McCoy, L., Smith, E. E., Fonarow, G. C., Schwamm, L. H. & Peterson, E. D. (2015) Contemporary trends and predictors of postacute service use and routine discharge home after stroke. Journal of the American Heart Association 4(2): e001038.

Data Element for the Assessment of Special Services, Treatments, and Interventions: Mechanically Altered Diet

K0520. Nutritional Approaches Check all of the following nutritional approaches that apply on admission.	
↓ **Check all that apply**	
☐	**C. Mechanically altered diet** - require change in texture of food or liquids (e.g., pureed food, thickened liquids)

Current use

Mechanically Altered Diet is currently assessed in the MDS. It first assesses whether the resident received a mechanically altered diet while not a resident and within the last 7 days, and then whether the resident received a mechanically altered diet while a resident and within the last 7 days.

Prior evidence supporting use of Mechanically Altered Diet

In the national MDS 3.0 test in nursing homes, the Mechanically Altered Diet data element was shown to have almost perfect reliability (kappas from 0.90 to 0.96).[254]

Evidence supporting use of Mechanically Altered Diet from the National Beta Test

Assessing Mechanically Altered Diet: The Mechanically Altered Diet data element was included in the National Beta Test. The data element was administered to 629 patients/residents in HHAs, 762 in IRFs, 448 in LTCHs, and 1,087 in SNFs(n = 2,926 overall). Across settings, 10 percent of assessments indicated mechanically altered diet. In the HHA setting, 2 percent of assessments noted mechanically altered diet. Detailed implementation is shown in Appendix 3, Table 5.3.1, for all four settings.

Missing data: There were very low rates of missing data for the Mechanically Altered Diet data element both overall (1.2 percent) and in the HHA setting (1.4 percent).

Time to complete: Time to complete was examined among 422 assessments in HHAs, 457 in IRFs, 244 in LTCHs, and 431 in SNFs (n = 1,554, overall). The average time to complete the Mechanically Altered Diet item was 0.22 minutes overall (SD = 0.1) and 0.19 minutes in the HHA setting (SD = 0.1).

Interrater reliability: IRR was examined for 187 assessments in HHAs, 236 in IRFs, 203 in LTCHs, and 256 in SNFs (n = 882 overall). IRR for the Mechanically Altered Diet data element was substantial/good across settings. In HHA, kappa is not reported for the Mechanically Altered Diet data element because its proportions were out of range for a stable kappa estimate. Percent agreement for the data element was 93 percent across settings and 100 percent in the HHA setting. Please refer to Table 5.3.2 in Appendix 3 for setting-specific kappa and percent agreement statistics for the Mechanically Altered Diet item.

<u>Therapeutic Diet</u>

A therapeutic diet is a diet intervention ordered by a health care practitioner as part of the treatment for a disease or clinical condition manifesting an altered nutritional status. This diet will eliminate, decrease, or increase certain substances in the diet (e.g., sodium or potassium). Therapeutic

[254] Saliba, & Buchanan, 2008b.

diets can include low cholesterol, renal, diabetic, and low salt diets,[255] the latter of which are most commonly used.[256]

Certain conditions, including diabetes,[257] chronic kidney disease,[258] hypertension,[259] and heart disease[260] are highly prevalent among older adults who may receive services in a PAC setting. For example, the percentage of adults with diabetes is 25.2 percent among individuals 65 years of age or older.[261] Additionally, 61.7 percent of adults 65 years of age or older have hypertension.[262] These conditions may be treated with a therapeutic diet.

The Therapeutic Diet data element is important to collect for patients receiving HH care to distinguish therapeutic diet from various other nutritional approaches. It is less resource intensive from the bedside nursing perspective but does signify one or more underlying clinical conditions that preclude the patient from eating a regular diet. Communication among PAC settings on whether a patient is receiving a particular therapeutic diet is critical to ensure safe transitions of care.

Relevance to HHAs

Therapeutic diet is not currently assessed in OASIS. However, the standardized assessment of therapeutic diets is relevant to patients in HH settings due to an aging population and high prevalence of chronic diseases that will result in increased need for this type of diet. In particular, as the population ages, and the HH population grows, greater demand for therapeutic diets can be expected.[263] Physiological changes of aging can affect food intake, in addition to chronic disease conditions.[264] Many disease specific-conditions could necessitate therapeutic diet. These include diabetes mellitus, cardiovascular disease, chronic kidney disease, and obesity, among others.[265] According to data from the National Home and Hospice Care Survey (NHHCS), 32 percent of home health patients aged 65 and older had diabetes mellitus and 39 percent had heart disease.[266] Similarly, data from the 2013-2014

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[255] Kamel, H. K., Malekgoudarzi, B., & Pahlavan, M. (2000). Inappropriate use of therapeutic diets in the nursing home. *Journal of the American Geriatrics Society*, *48*(7), 856–857. https://doi.org/10.1111/j.1532-5415.2000.tb04771.x

[256] Crogan, N. L., Corbett, C. F., & Short, R. A. (2002). The minimum data set: Predicting malnutrition in newly admitted nursing home residents. *Clinical Nursing Research*, *11*(3), 341–353. https://doi.org/10.1177/105477380201100308

[257] Centers for Disease Control and Prevention. (2017a). *National Diabetes Statistics Report, 2017: Estimates of diabetes and its burden in the United States.* Retrieved from https://www.cdc.gov/diabetes/pdfs/data/statistics/national-diabetes-statistics-report.pdf

[258] Centers for Disease Control and Prevention. (n.d.). *Chronic kidney disease initiative* [website]. Last reviewed March 12, 2019. Retrieved fromhttp://www.cdc.gov/ckd.

[259] Fang, J., Gillespie, C., Ayala, C., & Loustalot, F. (2018). Prevalence of self-reported hypertension and antihypertensive medication use among adults aged ≥18 years - United States, 2011-2015. *MMWR. Morbidity and Mortality Weekly Report*, *67*(7), 219–224. https://doi.org/10.15585/mmwr.mm6707a4

[260] Centers for Disease Control and Prevention. (2017b). *National Center for Health Statistics: Older persons' health*. Retrieved from https://www.cdc.gov/nchs/fastats/older-american-health.htm

[261] Centers for Disease Control and Prevention, 2017a.

[262] Fang, Gillespie, Ayala, & Loustalot, 2018.

[263] Jones, A. L., Harris-Kojetin, L., & Valverde, R. (2012). Characteristics and use of home health care by men and women aged 65 and over. National health statistics reports; no. 52. Hyattsville, MD: National Center for Health Statistics.

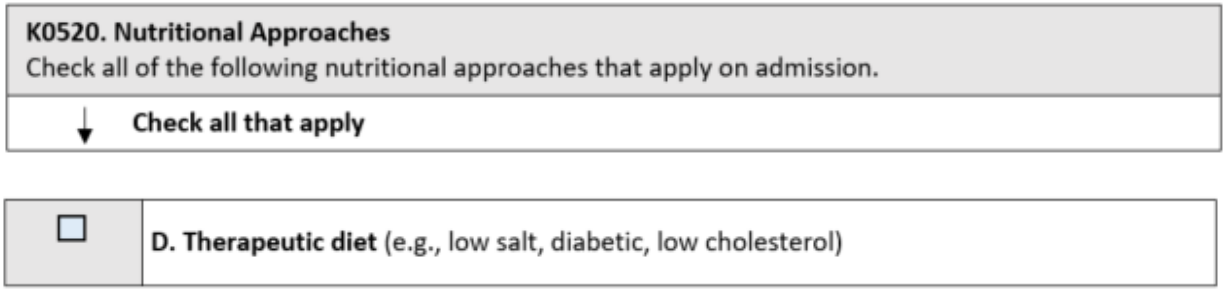
[264] Dorner, B. (2010). Position of the American Dietetic Association: individualized nutrition approaches for older adults in health care communities. Journal of the American Dietetic Association, 110(10), 1549-1553.

[265] *Ibid*

[266] Jones, A. L., Harris-Kojetin, L., & Valverde, R. (2012). Characteristics and use of home health care by men and women aged 65 and over. National health statistics reports; no. 52. Hyattsville, MD: National Center for Health

National Study of Long-Term Care Providers showed that 45.2 percent of home health patients had a diagnosis of diabetes.[267] Because management of these common conditions typically necessitates some type of therapeutic diet, receipt of a therapeutic diet is important to assess in HH settings.

Data Element for the Assessment of Special Services, Treatments, and Interventions: Therapeutic Diet



Current use

Therapeutic Diet is currently assessed in the MDS. It first assesses whether the resident received a therapeutic diet while not a resident and within the last 7 days, and then whether the resident received a therapeutic diet while a resident and within the last 7 days.

Prior evidence supporting use of Therapeutic Diet

In the national MDS 3.0 test in nursing homes, the Therapeutic Diet data element was shown to have substantial to almost perfect reliability (kappas from 0.89 to 0.93).[268]

Evidence supporting use of Therapeutic Diet from the National Beta Test

Assessing Therapeutic Diet: The Therapeutic Diet data element was included in the National Beta Test. This data element was administered to 629 patients/residents in HHAs, 762 in IRFs, 448 in LTCHs, and 1,087 in SNFs settings (n = 2,926 overall).

Across settings, more than half of assessments (52 percent) indicated therapeutic diet. In the HHA setting, 54 percent of assessments noted therapeutic diet. Detailed therapeutic diet implementation is shown in Appendix 3, Table 5.4.1, for all four settings.

Missing data: There were low levels of missing data for the Therapeutic Diet data element across settings (0.6 percent) and in the HHA setting specifically (0.6 percent).

Time to complete: Time to complete was examined among 422 assessments in HHAs, 457 in IRFs, 244 in LTCHs, and 431 in SNFs (n = 1,554 overall). The average time to complete the Therapeutic Diet item was 0.22 minutes overall (SD = 0.1) and 0.19 minutes in the HHA setting (SD = 0.1).

Interrater reliability: IRR was examined for 187 assessments in HHAs, 236 in IRFs, 203 in LTCHs, and 256 in SNFs (n = 882 overall). The kappa for the Therapeutic Diet data element was moderate both across settings (0.60) and in the HHA setting (0.43). Percent agreement for the data element was 80 percent across settings and 71 percent in the HHA setting. Please refer to Table 5.4.2 in Appendix 3 for setting-specific kappa and percent agreement statistics for the Therapeutic Diet item.

Statistics.

[267] Harris-Kojetin, L., Sengupta, M., Park-Lee, E., et al. (2016). Long-term care providers and services users in the United States: Data from the National Study of Long-Term Care Providers, 2013–2014. National Center for Health Statistics. Vital and Health Statistics, 3(38).

[268] Saliba, & Buchanan, 2008b.

High-Risk Drug Classes: Use and Indication

Most patients receiving PAC services depend on short- and long-term medications to manage their medical conditions. However, medications are a leading cause of adverse events. A study by the U.S. Department of Health and Human Services (HHS) found that 31 percent of adverse events in 2008 among hospitalized Medicare beneficiaries were related to medication.[269] Adverse drug events (ADEs) may be caused by medication errors such as drug omissions, errors in dosage, and errors in dosing frequency.[270] In addition, approximately half of all hospital-related medication errors and 20 percent of ADEs occur during transitions within, admission to, transfer to, or discharge from a hospital.[271] [272] [273] ADEs are more common among older adults, who make up most patients receiving PAC services. The rate of emergency department visits for ADEs is three times higher among adults 65 years of age and older than that among those younger than age 65.[274]

Some classes of drugs are associated with more risk than others.[275] The six medication class response options in the High-Risk Drug Classes: Use and Indications data element are anticoagulants, antiplatelets, hypoglycemics (including insulin), opioids, antipsychotics, and antibiotics. These drug classes are considered high-risk because of the adverse effects that may result from use. In particular, anticoagulants and antiplatelets are associated with bleeding risk;[276] [277] hypoglycemics are associated with fluid retention, heart failure, and lactic acidosis;[278] opioids are associated with misuse;[279] antipsychotics are associated with fractures and strokes;[280] [281] and antimicrobials, the category of medications that includes antibiotics, are associated with various adverse events such as central nervous

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[269] U.S. Department of Health and Human Services. Office of Inspector General. Daniel R. Levinson. Adverse Events in Hospitals: National Incidence Among Medicare Beneficiaries. OEI-06-09-00090. November 2010.

[270] Boockvar, K. S., Liu, S., Goldstein, N., Nebeker, J., Siu, A., & Fried, T. (2009). Prescribing discrepancies likely to cause adverse drug events after patient transfer. *Quality & Safety in Health Care*, *18*(1), 32–36. https://doi.org/10.1136/qshc.2007.025957

[271] Barnsteiner, 2005.

[272] Rozich, J., Roger, R. (2001). Medication safety: one organization's approach to the challenge. Journal of Clinical Outcomes Management, 2001(8):27-34.

[273] Gleason, K. M., Groszek, J. M., Sullivan, C., Rooney, D., Barnard, C., & Noskin, G. A. (2004). Reconciliation of discrepancies in medication histories and admission orders of newly hospitalized patients. *American Journal of Health-System Pharmacy*, *61*(16), 1689–1695. https://doi.org/10.1093/ajhp/61.16.1689

[274] Shehab, N., Lovegrove, M. C., Geller, A. I., Rose, K. O., Weidle, N. J., & Budnitz, D. S. (2016). US emergency department visits for outpatient adverse drug events, 2013–2014. *Journal of the American Medical Association*, *316*(20), 2115–2125. https://doi.org/10.1001/jama.2016.16201

[275] *Ibid*.

[276] Shoeb, M., & Fang, M. C. (2013). Assessing bleeding risk in patients taking anticoagulants. *Journal of Thrombosis and Thrombolysis*, *35*(3), 312–319. https://doi.org/10.1007/s11239-013-0899-7

[277] Melkonian, M., Jarzebowski, W., Pautas, E., Siguret, V., Belmin, J., & Lafuente-Lafuente, C. (2017). Bleeding risk of antiplatelet drugs compared with oral anticoagulants in older patients with atrial fibrillation: A systematic review and meta-analysis. *Journal of Thrombosis and Haemostasis (JTH)*, *15*(7), 1500–1510. https://doi.org/10.1111/jth.13697

[278] Hamnvik, O. P., & McMahon, G. T. (2009). Balancing risk and benefit with oral hypoglycemic drugs. *The Mount Sinai Journal of Medicine, New York*, *76*(3), 234–243. https://doi.org/10.1002/msj.20116

[279] Naples, J. G., Gellad, W. F., & Hanlon, J. T. (2016). The role of opioid analgesics in geriatric pain management. *Clinics in Geriatric Medicine*, *32*(4), 725–735. https://doi.org/10.1016/j.cger.2016.06.006

[280] Rigler, S. K., Shireman, T. I., Cook-Wiens, G. J., Ellerbeck, E. F., Whittle, J. C., Mehr, D. R., & Mahnken, J. D. (2013). Fracture risk in nursing home residents initiating antipsychotic medications. *Journal of the American Geriatrics Society*, *61*(5), 715–722. https://doi.org/10.1111/jgs.12216

[281] Wang, S., Linkletter, C., Dore, D., Mor, V., Buka, S., & Maclure, M. (2012). Age, antipsychotics, and the risk of ischemic stroke in the Veterans Health Administration. *Stroke*, *43*(1), 28–31. https://doi.org/10.1161/STROKEAHA.111.617191

systems effects and gastrointestinal intolerance.[282] Moreover, some medications in the six drug classes in this group of data elements are included in the 2019 Updated Beers Criteria® list as potentially inappropriate medications for use in older adults.[283] Although a complete medication list should record several important attributes of each medication (e.g., dosage, route, stop date), recording an indication for the drug is crucial.[284]

Relevance to HHAs

Many older adults receiving care through an HHA have one or more conditions that require treatment with a medication in a high-risk drug class. Almost 100,000 emergency hospitalizations for adverse drug events occurred annually among adults 65 years or older in the United States from 2007 through 2009.[285] About a third of the emergency hospitalizations involved the anticoagulant warfarin; 14 percent involved insulins; 13 percent involved antiplatelet drugs; and 11 percent involved oral hypoglycemic agents. More than two-thirds of the emergency hospitalizations were attributed to these four commonly prescribed medications, taken alone or in combination.

Assessing use of high-risk medications by HH patients and indications for each medication would provide important information related to patient safety in HH setting and care transitions between HHAs and other settings. The OASIS does not currently contain data elements that document the use of any medication or the indication or reason for the patient taking the medication. The standardized assessment of high-risk medication use and ensuring that indications are noted in the medical record are important steps toward overall medication safety within and between PAC provider settings.

Data Element for the Assessment of High-risk Drug Classes: Use and Indication

[282] Faulkner, C. M., Cox, H. L., & Williamson, J. C. (2005). Unique aspects of antimicrobial use in older adults. *Clinical Infectious Diseases*, *40*(7), 997–1004. https://doi.org/10.1086/428125

[283] American Geriatrics Society 2019 Beers Criteria® Update Expert Panel. (2019). American Geriatrics Society 2019: Updated Beers Criteria® for Potentially Inappropriate Medication Use in Older Adults. *Journal of the American Geriatrics Society, 67*(4), 674–694. https://doi.org/10.1111/jgs.15767

[284] Li, Y., Salmasian, H., Harpaz, R., Chase, H., & Friedman, C. (2011). Determining the reasons for medication prescriptions in the EHR using knowledge and natural language processing. *AMIA Annual Symposium Proceedings, 2011*, 768–776.

[285] Budnitz, D.S., Lovegrove, M.C., Shehab, N., Richards, C.L. (2011). Emergency hospitalizations for adverse drug events in older Americans. New England Journal of Medicine 365: 2002-2012.

N0415. High-Risk Drug Classes: Use and Indication		
	1. Is taking	2. Indication noted
1. Is taking Check if the patient is taking any medications by pharmacological classification, not how it is used, in the following classes **2. Indication noted** If Column 1 is checked, check if there is an indication noted for all medications in the drug class	Check all that apply ↓	Check all that apply ↓
A. Antipsychotic	☐	☐
E. Anticoagulant	☐	☐
F. Antibiotic	☐	☐
H. Opioid	☐	☐
I. Antiplatelet	☐	☐
J. Hypoglycemic (including insulin)	☐	☐
Z. None of the above	☐	☐

Current use

The MDS currently assesses what classes of medication residents receive. The number of days the resident received medications is assessed by category for antipsychotic, antianxiety, antidepressant, hypnotic, anticoagulant, antibiotic, diuretic, and opioid medications.

Prior evidence supporting use of High-Risk Drug Classes: Use and Indication

The High-Risk Drug Classes: Use and Indication data element was not tested in prior demonstration efforts. However, the use of similar data elements in the MDS 3.0 speak to the feasibility of collecting data on patient medications in a standardized assessment.

Evidence supporting use of High-Risk Drug Classes: Use and Indication from the National Beta Test

Assessing High-Risk Drug Classes: Use and Indication: As part of the assessment of the medication reconciliation process, the National Beta Test included a data elements that assesses whether the patient/resident was taking any medications in each of the six high-risk drug classes, and for each medication, whether there was a corresponding indication noted. The six classes are: anticoagulants, antiplatelets (excluding low-dose aspirin), hypoglycemics (including insulin), opioids, antipsychotics, and antimicrobials (excluding topicals). In the National Beta Test, the data element was administered to 627 patients/residents in HHAs, 769 in IRFs, 459 in LTCHs, and 1,096 in SNFs (n = 2,951 overall).

In the four settings combined, the percentage of patients/residents taking medications in each of the six classes ranged from 12 percent (antipsychotics) to 51 percent (opioids). In the HHA setting, these percentages ranged from 9 percent (antipsychotics) to 39 percent (opioids). The presence of indications

for noted medications in the various classes ranged from 45 percent (for both anticoagulants and antiplatelets) to 92 percent (opioids) in the four settings combined, and in the HHA setting the indication percentages ranged from 47 percent (for both anticoagulants and hypoglycemics) to 87 percent (opioids). The overall and setting-specific findings for each high-risk drug class are detailed in Table 6.1.1 in Appendix 3.

Missing data: There were very low rates of missing responses for the medication use items. In the four settings combined, missingness rates did not exceed 4.2 percent for any of the six drug class items. Similarly, in the HHA setting, missingness rates did not exceed 5.9 percent for the six drug class items. Missing data was also very low for indication items. Missingness rates did not exceed 1.2 percent in the four settings combined and did not exceed 1.3 percent in the HHA setting. In general, the low rate of missing data indicates feasibility of administration.

Time to complete: Time to complete was examined among 406 assessments in HHAs, 446 in IRFs, 271 in LTCHs, and 421 in SNFs (n = 1,544 overall). Average time to complete the High-Risk Drug Classes: Use and Indication items was approximately 1.0 minute (SD = 0.6 minutes) in the four settings combined and 0.9 minute (SD = 0.6 minutes) in the HHA setting.

Interrater reliability: IRR was examined for 187 assessments in HHAs, 240 in IRFs, 212 in LTCHs, and 261 in SNFs (n = 900 overall). Kappas were not estimated within or across settings for items assessing antipsychotic use and indication of opioids or, in the HHA setting, items assessing antimicrobials. These proportions were out of range for stable kappa estimates.

In the four settings combined, IRRs across settings ranged from substantial/good to excellent/almost perfect (kappas = 0.72 to 0.89) for medication use items. In the HHA setting, kappas for medication use were substantial/good to excellent/almost perfect (kappas = 0.69 to 0.84). For indication items, kappas ranged from substantial/good to excellent/almost perfect across settings (kappa = 0.65 to 0.87) and fair to substantial/good in the HHA setting (0.33 to 0.74).

Percent agreement was high for the medication use items, both across settings (92 to 95 percent) and in the HHA setting (91 to 96 percent). Percent agreement for indication items were lower across settings (82 to 94 percent) and in the HHA setting (63 to 88 percent). More-detailed IRR statistics are shown in Appendix 3, Table 6.1.2.

Section 4: Medical Conditions and Co-Morbidities

Pain Interference

Pain is highly prevalent and undertreated in older adults.[286] Vulnerable populations such as those with cognitive impairment, surgical patients, cancer patients, and people at the end of life experience pain frequently and often do not receive adequate treatment.[287] Pain in older adults occurs in conjunction with many acute and chronic conditions, such as osteoarthritis, leg pain during the night, cancer and associated treatment, neuralgia from diabetes mellitus, infections such as herpes zoster/shingles, and peripheral vascular disease.[288] Conditions causing pain in older adults may be associated with depression,[289] sleep disturbance,[290] [291] and lower participation in rehabilitation activities. [292] [293] [294]

A substantial percentage of older adults receiving services in a PAC setting experience pain. According to assessment testing performed in the PAC PRD, more than half of patients in the PAC settings reported having experienced "pain or hurting at any time during the last two days", with 55 percent in LTCHs, 65 percent in SNFs, 68 percent in IRFs, and 70 percent of patients receiving HHA services responding "yes" to this question.[295] According to the 2009 Medicare Current Beneficiary Survey, the prevalence of moderate-to-severe pain[296] among residents of skilled and non-skilled nursing facilities was 22 percent, and the prevalence of persistent pain—defined as the same or worse pain over time—was 65 percent.[297]

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[286] American Geriatrics Society Panel on Pharmacological Management of Persistent Pain in Older Persons. (2009). Pharmacological management of persistent pain in older persons. Journal of the American Geriatrics Society, 57(8), 1331-1346. https://doi.org/10.1111/j.1532-5415.2009.02376.x.

[287] Institute of Medicine (IOM). (2011). Relieving Pain in America: A Blueprint for Transforming Prevention, Care, Education, and Research. Washington, DC, The National Academies Press.

[288] American Geriatrics Society Panel on Pharmacological Management of Persistent Pain in Older Persons. (2009). Pharmacological management of persistent pain in older persons. *Journal of the American Geriatrics Society*, *57*(8), 1331–1346. https://doi.org/10.1111/j.1532-5415.2009.02376.x

[289] Sullivan-Singh, S. J., Sawyer, K., Ehde, D. M., Bell, K. R., Temkin, N., Dikmen, S., . . . Hoffman, J. M. (2014). Comorbidity of pain and depression among persons with traumatic brain injury. *Archives of Physical Medicine and Rehabilitation*, *95*(6), 1100–1105. https://doi.org/10.1016/j.apmr.2014.02.001

[290] Eslami, V., Zimmerman, M. E., Grewal, T., Katz, M., & Lipton, R. B. (2016). Pain grade and sleep disturbance in older adults: Evaluation the role of pain, and stress for depressed and non-depressed individuals. *International Journal of Geriatric Psychiatry*, *31*(5), 450–457. https://doi.org/10.1002/gps.4349

[291] Blytt, K. M., Bjorvatn, B., Husebo, B., & Flo, E. (2018). Effects of pain treatment on sleep in nursing home patients with dementia and depression: A multicenter placebo-controlled randomized clinical trial. *International Journal of Geriatric Psychiatry*, *33*(4), 663–670. https://doi.org/10.1002/gps.4839

[292] Chin, R. P. H., Ho, C. H., & Cheung, L. P. C. (2013). Scheduled analgesic regimen improves rehabilitation after hip fracture surgery. *Clinical Orthopaedics and Related Research*, *471*(7), 2349–2360. https://doi.org/10.1007/s11999-013-2927-5

[293] Brenner, I. & Marsella, A. (2008). Factors influencing exercise participation by clients in long-term care. *Perspectives (Pre-2012), 32*(4), 5.

[294] Zanca, J. M., Dijkers, M. P., Hammond, F. M., & Horn, S. D. (2013). Pain and its impact on inpatient rehabilitation for acute traumatic spinal cord injury: Analysis of observational data collected in the SCIRehab study. *Archives of Physical Medicine and Rehabilitation*, *94*(4, Suppl), S137–S144. https://doi.org/10.1016/j.apmr.2012.10.035

[295] Gage, B. (2016). Data from the PAC PRD study, 2008-2010 [data file]. Available from Barbara Gage, August 16, 2016.

[296] In this study, pain was measured based on two MDS items that assess pain frequency and intensity, with "moderate pain…defined as having daily mild to moderate pain" and "severe pain … as having daily pain at times horrible or excruciating."

[297] Shen, X., Zuckerman, I. H., Palmer, J. B., & Stuart, B. (2015). Trends in prevalence for moderate-to-severe pain and persistent pain among Medicare beneficiaries in nursing homes, 2006-2009. *Journals of Gerontology. Series A,*

Pain in older adults can be treated with medications, complementary and alternative approaches, or physical therapy.[298] Treatment of pain in older adults may be complicated by factors such as dementia; high rates of polypharmacy; end-of-life care; and patient expectations, attitudes, and fears related to pain treatment.[299] Untreated pain is an often-debilitating condition that is associated with a host of adverse physical consequences, including loss of function, poor quality of life, disruption of sleep and appetite, inactivity, and weakness, as well as psychological effects such as depression, anxiety, fear, and anger.[300] [301]

Relevance to HHAs

Many patients receiving care from HHAs report having pain and experiencing it often. From the 2018 National Beta Test, 76 percent of patients in the HH setting reported having "pain or hurting." Of those who reported pain, 60 percent experienced pain "frequently" or "almost constantly."

Pain among HH patients can interfere with rehabilitation and has potential secondary complications. The potential effects of pain on patient health are myriad, and it is critical to assess pain during hospitalization and after discharge. Assessing pain in HH patients can lead to appropriate treatment and improved quality of life, reduce complications associated with immobility such as skin breakdown and infection, and facilitate rehabilitation efforts and returning to community settings. Pain assessment post-discharge can also be used to plan appropriate treatment and may reduce readmissions.

Data Elements for Assessment of Pain Interference

Biological Sciences and Medical Sciences, *70*(5), 598–603. https://doi.org/10.1093/gerona/glu226.

[298] National Institute on Aging. (2018, February 28). *Pain: You Can Get Help*. Retrieved from https://www.nia.nih.gov/health/pain-you-can-get-help

[299] Molton, I. R., & Terrill, A. L. (2014). Overview of persistent pain in older adults. *The American Psychologist*, *69*(2), 197–207. https://doi.org/10.1037/a0035794

[300] Institute of Medicine (IOM). (2011). Relieving Pain in America: A Blueprint for Transforming Prevention, Care, Education, and Research. Washington, DC, The National Academies Press.

[301] American Geriatrics Society Panel on Pharmacological Management of Persistent Pain in Older Persons, 2009.

J0510. Pain Effect on Sleep	
Enter Code ☐	*Ask patient: "Over the past 5 days,* ***how much of the time has pain made it hard for you to sleep at night?"*** 0. **Does not apply – I have not had any pain or hurting in the past 5 days** → *Skip to XXXX* 1. **Rarely or not at all** 2. **Occasionally** 3. **Frequently** 4. **Almost Constantly** 8. **Unable to answer**
J0520. Pain Interference with Therapy Activities	
Enter Code ☐	*Ask patient: "Over the past 5 days,* ***how often have you limited your participation in rehabilitation therapy sessions due to pain?"*** 0. **Does not apply – I have not received rehabilitation therapy in the past 5 days** 1. **Rarely or not at all** 2. **Occasionally** 3. **Frequently** 4. **Almost Constantly** 8. **Unable to answer**
J0530. Pain Interference with Day-to-Day Activities	
Enter Code ☐	*Ask patient: "Over the past 5 days,* ***how often have you limited your day-to-day activities (excluding rehabilitation therapy sessions) because of pain?"*** 1. **Rarely or not at all** 2. **Occasionally** 3. **Frequently** 4. **Almost Constantly** 8. **Unable to answer**

Current use

Data elements on the topic of pain are currently assessed in OASIS and MDS. The OASIS assesses the frequency of pain interfering with patient's activity or movement. A pain assessment interview is included in MDS and has questions on whether pain has made it hard for the resident to sleep at night and whether pain has limited day-to-day activities.

Prior evidence supporting use of Pain Interference data elements

Two interview-based data elements, pain effect on sleep and pain effect on activities, were included in the PAC PRD testing of IRR, and showed strong IRR (weighted kappas of 0.836 and 0.789, respectively).[302]

In a national test to develop and validate the MDS 3.0, two items (pain made it hard to sleep, pain limited day-to-day activities) were validated for measuring the effect of pain on function.[303]

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[302] Gage, B., Smith, L., Ross, J., Coots, L., Kline, T., Shamsuddin, K., , ... & Gage-Croll, Z. (2012). The Development and Testing of the Continuity Assessment Record and Evaluation (CARE) Item Set: Final Report on Reliability Testing. Volume 2 of 3. Research Triangle Park, NC: RTI International. Retrieved from https://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/Post-Acute-Care-Quality-Initiatives/Downloads/The-Development-and-Testing-of-the-Continuity-Assessment-Record-and-Evaluation-CARE-Item-Set-Final-Report-on-Reliability-Testing-Volume-2-of-3.pdf

[303] Saliba & Buchanan, 2008a.

Evidence supporting use of Pain from the National Beta Test

Assessing Pain: In the National Beta Test, three pain interference data elements were assessed; Effect of Pain on Sleep, Pain Interference with Rehabilitation Therapies (if applicable), and Pain Interference with Daily Activities. A total of 489 patients/residents in HHAs, 618 in IRFs, 375 in LTCHs, and 872 in SNFs (n = 2,354 overall) reported experiencing any pain and were administered the three pain interference items. Setting-specific frequencies are shown in Appendix 3, Table 7.1.1.

Across settings, pain interfered with sleep more often than rarely for two of three patients/residents (65 percent); 37 percent of patients/residents had pain that made it difficult to sleep "frequently" or "almost constantly." In the HHA setting, pain interfered with sleep more than "rarely" for three of five patients (60 percent); 31 percent of patients experienced pain that interfered with sleep "frequently" or "almost constantly."

Most patients had been offered rehabilitation therapies (e.g., physical therapy, occupational therapy, speech therapy), both across settings (89 percent) and in the HHA (78 percent). Among these patients/residents, 73 percent reported that pain rarely interfered with rehabilitation. Within the HHA setting, 74 percent reported that pain rarely interfered with rehabilitation; about one in eight (12 percent) had pain that interfered "frequently" or "almost constantly" with rehabilitation.

Fifty-five percent of patients/residents across settings reported limiting their daily activities (not including rehabilitation) more often than "rarely or not at all." About one in three patients/residents (33 percent) had pain that limited activities "frequently" or "almost constantly." In the HHA setting, 60 percent of patients had pain that interfered more often than rarely. About one of three HHA patients (33 percent) had limited activities "frequently" or "almost constantly."

Missing data: Overall, there were low rates of missing data for pain data elements. Across all settings, missing data did not exceed 2.4 percent for any data element. Similarly, in the HHA setting, missing data did not exceed 3.9 percent for any data element. In general, the low rate of missing data indicates feasibility of administration.

Time to complete: The length of time to administer the pain data elements was examined as another indicator of feasibility among 440 patients/residents in HHAs, 533 in IRFs, 321 in LTCHs, and 483 in SNFs (n = 1,777 overall). Across settings, the average time to complete the three interference items was 1.3 minutes (SD = 0.6). In the HHA setting, time to complete was similar, at 1.4 minutes (SD = 0.6).

Interrater reliability: IRR was assessed for 197 patients/residents in HHAs, 256 in IRFs, 232 in LTCHs, and 268 in SNFs (n = 953 overall). IRR statistics were generally excellent/perfect, indicating high levels of agreement. For the pain interference data elements across settings, kappas were excellent/almost perfect, with values of either 0.97 or 0.98. The same was true in the HHA setting, where excellent/almost perfect kappas ranged from 0.95 to 0.97. Percent agreement was similarly high, with nearly perfect agreement for all items across settings (98 percent) and in HHAs (95 to 97 percent). More detailed IRR statistics are shown in Appendix 3, Table 7.1.2.

Section 5: Impairments

Hearing and Vision Impairments

Hearing and vision impairments are common conditions that, if unaddressed, affect patients' and residents' activities of daily living, communication, physical functioning, rehabilitation outcomes, and overall quality of life. Sensory limitations can lead to confusion in new settings, increase isolation, contribute to mood disorders, and impede accurate assessment of other medical conditions, such as cognition. Hearing impairments may cause difficulty in communication of important information concerning the patient's or resident's condition, preferences, and care transitions; vision impairments have been associated with increased risk of falls. Both types of impairment can also interfere with comprehension of and adherence to discharge plans. Onset of hearing and vision impairments can be gradual, so accurate screening tools and follow-up evaluations are essential to determining which patients and residents need hearing- or vision-specific medical attention or assistive devices, and to ensuring that person-directed care plans are developed to accommodate patients' and residents' needs during PAC and at discharge.

Assessments pertaining to sensory status aid PAC providers in understanding the needs of their patients and residents by establishing a diagnosis of hearing or vision impairment, elucidating the patients' and residents' ability and willingness to participate in treatments or use assistive devices during their stays, and identifying appropriate ongoing therapy and support needs at the time of discharge. The standardized assessment of vision impairment among PAC patients and residents supports clinical decision making, early clinical intervention, person-centered care, and improved care continuity and coordination. The use of valid and reliable standardized assessments can aid in the communication of information within and across providers, further enabling the transfer of accurate health information.

Standardized Data Elements to Assess Hearing and Vision Impairments

CMS has identified two data elements for cross-setting standardized assessment of hearing and vision impairment.

1. Hearing
2. Vision

Hearing

Hearing impairment is one of the most common complaints in adults over the age of 60 and is a major contributor to difficulties in speech comprehension.[304] Causes of hearing loss can include noise, earwax or fluid buildup, a punctured ear drum, viruses and bacteria, certain health conditions (e.g., stroke, cardiac conditions, and brain injury), medications, heredity, and aging.[305] Age-related hearing loss is caused by presbycusis and occurs gradually over time as an individual ages. It is typically hereditary and usually affects both ears. Hearing impairment in older adults has been associated with a myriad of

[304] Peelle, J. E., Troiani, V., Grossman, M., & Wingfield, A. (2011). Hearing loss in older adults affects neural systems supporting speech comprehension. *The Journal of Neuroscience: The Official Journal of the Society for Neuroscience*, *31*(35), 12638–12643. https://doi.org/10.1523/JNEUROSCI.2559-11.2011

[305] National Institute on Aging. (2018). *Hearing Loss: A Common Problem for Older Adults.* Retrieved from https://www.nia.nih.gov/health/hearing-loss-common-problem-older-adults

outcomes,[306] including falls,[307] dementia,[308] [309] [310] cognitive impairment,[311] anxiety,[312] emotional vitality,[313] and various medical conditions (e.g., arthritis, cancer, cardiovascular disease, diabetes, emphysema, high blood pressure, and stroke).[314]

A high proportion of older adults receiving services in a PAC setting experience hearing impairment. About 51 percent of nursing facility patients and residents are estimated to have moderate to severe hearing impairment.[315] Data from the PAC PRD suggest that severe hearing impairment affects 1 to 2 percent of Medicare FFS beneficiaries in the four types of PAC.[316] Among older adults more generally, reports on the prevalence of hearing loss vary. The National Institute on Deafness and Other Communication Disorders has stated that one third of people between ages 65 and 74 have hearing loss and roughly half of those older than 75 are hearing-impaired.[317] Additionally, a study found that two-thirds of individuals aged 70 years or older have bilateral hearing loss and approximately three-quarters have hearing loss in at least one ear.[318]

Assessing hearing impairment is critical to improving patient outcomes, safety, and quality of life. In addition, assessment can inform future care planning and care transitions.

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[306] Contrera, K. J., Wallhagen, M. I., Mamo, S. K., Oh, E. S., & Lin, F. R. (2016). Hearing loss health care for older adults. *Journal of the American Board of Family Medicine*, *29*(3), 394–403. https://doi.org/10.3122/jabfm.2016.03.150235

[307] Jiam, N. T. L., Li, C., & Agrawal, Y. (2016). Hearing loss and falls: A systematic review and meta-analysis. *The Laryngoscope*, *126*(11), 2587–2596. https://doi.org/10.1002/lary.25927

[308] Thomson, R. S., Auduong, P., Miller, A. T., & Gurgel, R. K. (2017). Hearing loss as a risk factor for dementia: A systematic review. *Laryngoscope Investigative Otolaryngology*, *2*(2), 69–79. https://doi.org/10.1002/lio2.65

[309] Deal, J. A., Betz, J., Yaffe, K., Harris, T., Purchase-Helzner, E., Satterfield, S., . . . Lin, F. R., & the Health ABC Study Group. (2017). Hearing impairment and incident dementia and cognitive decline in older adults: The health ABC study. *Journals of Gerontology, Series A, Biological Sciences and Medical Sciences*, *72*(5), 703–709.

[310] Wei, J., Hu, Y., Zhang, L., Hao, Q., Yang, R., Lu, H., . . . Chandrasekar, E. K. (2017). Hearing impairment, mild cognitive impairment, and dementia: A meta-analysis of cohort studies. *Dementia and Geriatric Cognitive Disorders. Extra*, *7*(3), 440–452. https://doi.org/10.1159/000485178

[311] Wei et al., 2017.

[312] Contrera, K. J., Betz, J., Deal, J., Choi, J. S., Ayonayon, H. N., Harris, T., . . . Lin, F. R., & the Health ABC Study. (2017). Association of hearing impairment and anxiety in older adults. *Journal of Aging and Health*, *29*(1), 172–184. https://doi.org/10.1177/0898264316634571

[313] Contrera, K. J., Betz, J., Deal, J. A., Choi, J. S., Ayonayon, H. N., Harris, T., . . . Lin, F. R., & the Health ABC Study. (2016). Association of hearing impairment and emotional vitality in older adults. *The Journals of Gerontology. Series B, Psychological Sciences and Social Sciences*, *71*(3), 400–404. https://doi.org/10.1093/geronb/gbw005

[314] McKee, M. M., Stransky, M. L., & Reichard, A. (2018). Hearing loss and associated medical conditions among individuals 65 years and older. *Disability and Health Journal*, *11*(1), 122–125. https://doi.org/10.1016/j.dhjo.2017.05.007

[315] Garahan, M. B., Waller, J. A., Houghton, M., Tisdale, W. A., & Runge, C. F. (1992). Hearing loss prevalence and management in nursing home residents. *Journal of the American Geriatrics Society*, *40*(2), 130–134. https://doi.org/10.1111/j.1532-5415.1992.tb01932.x

[316] Hearing impairments were classified into categories from mildly impaired to severely impaired. The percentages reported here refer to severe impairment of hearing, defined as "Absence of useful hearing." (Gage, Morley, et al., 2012).

[317] National Institute on Deafness and Other Communication Disorders. (2018). *Hearing Loss and Older Adults*. Retrieved from https://www.nidcd.nih.gov/health/hearing-loss-older-adults

[318] Goman, A. M., & Lin, F. R. (2016). Prevalence of hearing loss by severity in the United States. *American Journal of Public Health*, *106*(10), 1820–1822. https://doi.org/10.2105/AJPH.2016.303299

Relevance to HHAs

Hearing impairment among HH patients[319] can adversely affect their ability to follow the instructions of HH health care providers. This may be due directly to the hearing loss (i.e., not being able to hear the instructions) and/or due indirectly to cognitive impairments associated with hearing loss (i.e., not being able to understand or remember the instructions). Among HHAs participating in the PAC PRD, the Ability to Hear item demonstrated moderate inter-rater reliability (weighted kappa = 0.73).[320] In a sample of community-dwelling older adults, hearing loss was associated with lower scores on measures of mental status, memory, and executive functioning.[321] In a nationally representative sample, hearing loss was independently associated with past-year hospitalization and having more hospitalizations.[322] This suggests that severe hearing impairment may increase the likelihood of rehospitalization among HH patients. Possible mechanisms include the effects of hearing loss on social isolation, health-related oral literacy, and cognitive decline. In addition, severe hearing impairment can adversely affect HH patients' ability to function safely within their home environment (e.g., respond to warnings, or hear doorbells and alarms). It has also been associated with increased likelihood of falls.[323,324] Therefore, assessing HH patients' ability to hear—and treatment of hearing loss symptoms—can help improve quality of life and care planning.

Data Element for the Assessment of Impairments: Hearing

B0200. Hearing	
Enter Code ☐	**Ability to hear** (with hearing aid or hearing appliances 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

Current use

The Hearing data element is currently collected in the MDS, and is assessed with the use of a hearing aid, if applicable.

Prior evidence supporting use of Hearing

[319] Gage B., Ingber, M. J., Morley M., Smith L., Deutsch, A., Kline, T., … & Manning, J. (2012). Post-acute care payment reform demonstration: Final report (Volume 4 of 4). Research Triangle Park, NC: RTI International.
[320] Smith, L., Gage, B., Deutsch, A., Hand, L., Etlinger, A., Ross, J., … Barch, D. (2012). Continuity assessment record and evaluation (CARE) item set: Additional interrater provider-type specific reliability analyses. Research Triangle Park, NC: RTI International.
[321] Lin, F. R., Ferrucci, L., Metter, E. J., An, Y., Zonderman, A. B., & Resnick, S. M. (2011). Hearing loss and cognition in the Baltimore Longitudinal Study of Aging. Neuropsychology 25(6): 763-770.
[322] Genther, D. J., Frick, K. D., Chen, D., Betz, J., & Lin, F. R. (2013). Association of hearing loss with hospitalization and burden of disease in older adults. JAMA 309(22): 2322-2324.
[323] Lin, F. R., & Ferrucci, L. (2012). Hearing loss and falls among older adults in the United States. Archives of Internal Medicine 172(4): 369-371.
[324] Kamil, R. J., Betz, J., Power, B. B., Pratt, S., Kritchevsky, S., Ayonayon, H. N., … Health ABC Study (2016). Associations of hearing impairment with incident frailty and falls in older adults. Journal of Aging and Health 28(4): 644-660.

The Hearing data element tested in the PAC PRD includes one question regarding hearing ability, which showed high reliability across PAC settings (unweighted kappa = 0.78). The MDS 3.0 version of the Hearing data element also had almost perfect agreement in the MDS 3.0 national test in nursing homes (weighted kappas = 0.94 and 0.89).[325]

Evidence supporting use of Hearing from the National Beta Test

Assessing Hearing: In the National Beta Test, a Hearing assessment item (with hearing aids, when applicable) was administered to 643 patients/residents in HHAs, 783 in IRFs, 498 in LTCHs, and 1141 in SNFs (n=3,065 overall). Overall, 74 percent of patients/residents had adequate hearing, 17 percent had minimal difficulty hearing, 8 percent had moderate difficulty hearing and 1 percent were highly impaired. In the HHA setting, 65 percent of patients had adequate hearing, 24 percent had minimal difficulty hearing, 11 percent had moderate difficulty hearing and 0 percent were highly impaired. See Appendix 3, Table 8.1.1, for setting-specific response frequencies for the Hearing data element.

Missing data: There were very low rates of missing responses for the Hearing data element both overall (0.3 percent) and in the HHA setting (0.2 percent), indicating feasibility of administration.

Time to complete: Time to complete was assessed among 396 patients/residents in HHAs, 499 in IRFs, 301 in LTCHs, and 456 in SNFs (n = 1,652 overall). Across all settings, the mean time to complete the Hearing item was 0.3 minutes (SD=0.2 minutes). Likewise, in the HHA setting, mean time to complete the hearing item was 0.4 minutes (SD=0.2 minutes).

Interrater reliability: IRR was assessed for the Hearing item for 197 patients/residents in HHAs, 258 in IRFs, 237 in LTCHs, and 268 in SNFs (n=960 overall). Across all settings, kappa for the Hearing item was substantial/good (0.65). In the HHA setting, kappa for the Hearing item also was substantial/good (0.71). Percent agreement was high for the Hearing item both across settings (84 percent) and in the HHA setting (83 percent). More-detailed IRR statistics are shown in Appendix 3, Table 8.1.2.

Vision

Visual impairment can be caused by not only age-related diseases (e.g., age-related macular degeneration, cataracts, glaucoma, and diabetic retinopathy) but also nearsightedness, farsightedness, loss of near vision with age, and/or untreated disease.[326] In addition to conditions affecting the eye itself, visual deficits can be caused by other conditions such as stroke and traumatic brain injury. Visual impairment in older adults has been associated with depression and anxiety,[327] lower cognitive function,[328] and poorer quality of life.[329]

The PAC PRD study found that between 1 and 3 percent of Medicare FFS beneficiaries among the four types of PAC providers had the most extreme category of visual impairment assessed, "No vision or object identification questionable." [330] Although most patients and residents in the PAC settings do not

[325] Saliba, & Buchanan, 2008b.

[326] Cimarolli, V. R., Boerner, K., Brennan-Ing, M., Reinhardt, J. P., & Horowitz, A. (2012). Challenges faced by older adults with vision loss: A qualitative study with implications for rehabilitation. *Clinical Rehabilitation*, *26*(8), 748–757. https://doi.org/10.1177/0269215511429162

[327] Heesterbeek, T. J., van der Aa, H. P. A., van Rens, G. H. M. B., Twisk, J. W. R., & van Nispen, R. M. A. (2017). The incidence and predictors of depressive and anxiety symptoms in older adults with vision impairment: A longitudinal prospective cohort study. *Ophthalmic & Physiological Optics*, *37*(4), 385–398. https://doi.org/10.1111/opo.12388

[328] Chen, S. P., Bhattacharya, J., & Pershing, S. (2017). Association of vision loss with cognition in older adults. *JAMA Ophthalmology*, *135*(9), 963–970. https://doi.org/10.1001/jamaophthalmol.2017.2838

[329] Tseng, Y. C., Liu, S. H. Y., Lou, M. F., & Huang, G. S. (2018). Quality of life in older adults with sensory impairments: A systematic review. *Quality of Life Research*, *27*(8), 1957–1971. https://doi.org/10.1007/s11136-018-1799-2

[330] Gage, Morley, et al., 2012.

exhibit severely impaired vision, visual impairment affects a substantial proportion of older adults and is predicted to increase substantially over time. A study examining visual impairment among adults in the United States found that in 2015, among the 3.22 million persons in the United States who were visually impaired, the largest proportions comprised those in older age categories: 80 years of age and older (50 percent), 70–79 years (24 percent), and 60–69 years (16 percent).[331] By 2050, the proportion of adults with visual impairment will increase to 64 percent among individuals aged 80 years and older.[332]

Assessing visual impairment is critical to improving patient outcomes, safety, and quality of life. Additionally, assessment can inform future care planning and care transitions.

Relevance to HHAs

Severe vision impairment can adversely affect HH patients' mobility and their ability to function safely within their home environment (e.g., ability to see obstacles in their path), including risk of falls.[333] According to PAC PRD data, 2.1 percent of HH patients have severe vision impairment.[334] A study by Jaffee et al. (2016) of 1,900 adult medicine inpatients at an urban hospital found that insufficient vision was associated with post-discharge falls among participants aged 65 years or older (adjusted odds ratio [AOR] 3.38, 95% confidence interval [CI] 1.42–8.05), but not among participants younger than 65 years (AOR 1.44, 95% CI 0.89–2.32).[335] Severe vision impairment can also adversely impact many aspects of HH patients' self-care (e.g., reading medication labels; performing certain ADLs/IADLs, mobility). For example, patients with visual impairment have more difficulty reading medication labels and instructions and likely need more assistance managing their medications. Assessing the ability to see among HH patients is important to support care management and planning.

Data Element for the Assessment of Impairments: Vision

B1000. Vision	
Enter Code ☐	**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

Current use

[331] Varma, R., Vajaranant, T. S., Burkemper, B., Wu, S., Torres, M., Hsu, C., . . . McKean-Cowdin, R. (2016). Visual impairment and blindness in adults in the United States: Demographic and geographic variations from 2015 to 2050. *JAMA Ophthalmology*, *134*(7), 802–809. https://doi.org/10.1001/jamaophthalmol.2016.1284

[332] *Ibid*

[333] Jaffee, E. G., Arora, V. M., Matthiesen, M. I., Hariprasad, S. M., Meltzer, D. O., & Press, V. G. (2016). Postdischarge falls and readmissions: Associations with insufficient vision and low health literacy among hospitalized seniors. Journal of Health Communication 21 (Suppl 2): 135-140.

[334] Gage B., Ingber, M. J., Morley M., Smith L., Deutsch, A., Kline, T., … & Manning, J. (2012). Post-acute care payment reform demonstration: Final report (Volume 4 of 4). Research Triangle Park, NC: RTI International.

[335] Jaffee, E. G., Arora, V. M., Matthiesen, M. I., Hariprasad, S. M., Meltzer, D. O., & Press, V. G. (2016). Postdischarge falls and readmissions: Associations with insufficient vision and low health literacy among hospitalized seniors. Journal of Health Communication 21 (Suppl 2): 135-140.

Vision is currently assessed in the OASIS and MDS, with corrective lenses when applicable. Vision is assessed in OASIS with three response options ranging from 0 (normal vision) to 2 (severely impaired). The Vision data element (Ability to See in Adequate Light) in the MDS contains five response options ranging from 0 (adequate) to 4 (severely impaired).

Prior evidence supporting use of Vision

The MDS 3.0 Vision data element has been shown to perform reliably in screening for vision impairment (weighted kappa = 0.917) in the national MDS 3.0 test in nursing homes[336]. The Vision data element is also linked to performance with readily available materials (i.e., newspaper). In addition, the Vision data element was tested in the PAC PRD assessment. The PAC PRD found substantial agreement for IRR across settings for this data element (kappa of 0.74).[337]

Evidence supporting use of Vision from the National Beta Test

Assessing Vision: In the National Beta Test, the Vision assessment item, with corrective lenses when applicable, was administered to 643 patients/residents in HHAs, 783 in IRFs, 498 in LTCHs, and 1141 in SNFs (n=3,065 overall).

Overall, 78 percent of patients/residents had adequate vision, 16 percent had impaired vision and 6 percent had moderately to severely impaired vision. In the HHA setting, 73 percent of patients had adequate vision, 21 percent had impaired vision and 6 percent had moderately to severely impaired vision. Setting-specific frequencies are shown in Appendix 3, Table 9.2.1.

Missing data: There were very low rates of missing responses for the Vision item both overall (0.6 percent) and in the HHA setting (0.5 percent), indicating feasibility of administration.

Time to complete: Time to complete was assessed among 396 patients/residents in HHAs, 499 in IRFs, 301 in LTCHs, and 456 in SNFs (n = 1,652 overall). Across all settings, the mean time to complete the Vision item was 0.3 minutes (SD=0.2 minutes). Likewise, in the HHA setting, mean time to complete the Vision item was 0.4 minutes (SD=0.2 minutes).

Interrater reliability: IRR was assessed for the Vision item for 197 patients/residents in HHAs, 258 in IRFs, 237 in LTCHs, and 268 in SNFs (n=960). Across all settings, kappa for the Vision item was moderate (0.56). In the HHA setting, kappa for the Vision item was substantial/good (0.67). Percent agreement was high for the Vision item both across settings (83 percent) and in HHA (83 percent). More-detailed IRR statistics are shown in Appendix 3, Table 9.2.2.

[336] Saliba, & Buchanan, 2008b.
[337] Gage, Smith, et al., 2012.

Section 6: Proposed New Category: Social Determinants of Health

Standardized Data Elements to Assess for Social Determinants of Health

CMS has identified data elements for cross-setting standardization of assessment for seven social determinants of health (SDOH). The proposed data elements are as follows:

1. Race
2. Ethnicity
3. Preferred Language
4. Interpreter Services
5. Health Literacy
6. Transportation
7. Social Isolation

Race and Ethnicity

Relevance to HHAs

The persistence of racial and ethnic disparities in health and health care is widely documented, including in PAC settings.[338,339,340,341,342] Although racial and ethnic disparities decrease when social factors are controlled for, they often remain. The root cause of these disparities is not always clear because data on many SDOH are not collected. Measuring SDOH in HH settings is an important step to addressing these avoidable differences in health outcomes. Collecting data on race and ethnicity supports patient-centered care, and informs understanding of patient complexity and risk factors that may affect payment, quality measurement, and care outcomes for HHAs. Improving how race and ethnicity data are collected is an important component of improving quality by identifying and addressing health disparities that affect Medicare beneficiaries.

Proposed Data Elements for the Assessment of SDOH: Race and Ethnicity

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[338] 2017 National Healthcare Quality and Disparities Report. Rockville, MD: Agency for Healthcare Research and Quality; September 2018. AHRQ Pub. No. 18-0033-EF.

[339] Fiscella, K., & Sanders, M. R. (2016). Racial and ethnic disparities in the quality of health care. *Annual Review of Public Health*, *37*(1), 375–394. https://doi.org/10.1146/annurev-publhealth-032315-021439

[340] 2018 National Impact Assessment of the Centers for Medicare & Medicaid Services (CMS) Quality Measures Reports. Baltimore, MD: US Department of Health and Human Services, Centers for Medicare and Medicaid Services; February 28, 2018.

[341] Smedley, B.D., Stith, A.Y., & Nelson, A.R. (2003). Unequal treatment: confronting racial and ethnic disparities in health care. Washington, D.C., National Academy Press.

[342] Chase, J. D., Huang, L., Russell, D., Hanlon, A., O'Connor, M., Robinson, K. M., & Bowles, K. H. (2018). Racial/ethnic disparities in disability outcomes among post-acute home care patients. *Journal of Aging and Health*, *30*(9), 1406–1426. https://doi.org/10.1177/0898264317717851

Ethnicity

A1005. Ethnicity Are you Hispanic, Latino/a, or Spanish origin?	
↓	**Check all that apply**
☐	**A.** No, not of Hispanic, Latino/a, or Spanish origin
☐	**B.** Yes, Mexican, Mexican American, Chicano/a
☐	**C.** Yes, Puerto Rican
☐	**D.** Yes, Cuban
☐	**E.** Yes, Another Hispanic, Latino, or Spanish origin
☐	**X.** Patient unable to respond

Race

A1010. Race What is your race?	
↓	**Check all that apply**
☐	**A.** White
☐	**B.** Black or African American
☐	**C.** American Indian or Alaska Native
☐	**D.** Asian Indian
☐	**E.** Chinese
☐	**F.** Filipino
☐	**G.** Japanese
☐	**H.** Korean
☐	**I.** Vietnamese
☐	**J.** Other Asian
☐	**K.** Native Hawaiian
☐	**L.** Guamanian or Chamorro
☐	**M.** Samoan
☐	**N.** Other Pacific Islander
☐	**X.** Patient unable to respond

Current use

A Race and Ethnicity data element is currently collected in the MDS, LCDS, IRF-PAI, and OASIS. The data element consists of a single question, which aligns with the 1997 Office of Management and Budget (OMB) minimum data standards for federal data collection efforts.[343] The 1997 OMB Standard lists five minimum categories of race: (1) American Indian or Alaska Native, (2) Asian, (3)

[343] "Revisions to the Standards for the Classification of Federal Data on Race and Ethnicity (Notice of Decision)". Federal Register 62:210 (October 30, 1997) pp. 58782-58790. Available from: https://www.govinfo.gov/content/pkg/FR-1997-10-30/pdf/97-28653.pdf.

Black or African American, (4) Native Hawaiian or Other Pacific Islander, and, (5) White. The 1997 OMB Standard also lists two minimum categories of ethnicity: (1) Hispanic or Latino, and (2) Not Hispanic or Latino.[344] The current version uses a "Mark all that apply" response option.

Evidence supporting use of Race and Ethnicity

The proposed modification would result in two stratified data elements, one for race and one for ethnicity, that would conform with the 2011 HHS Data Standards for person-level data collection and the 1997 OMB Standards. The 2011 HHS Data Standards permit the collection of more-detailed information on population groups provided additional categories can be aggregated into the OMB minimum standard set of categories. The 2011 HHS Data Standards require a two-question format when self-identification is used to collect data on race and ethnicity. Large federal surveys, such as the National Health Interview Survey, the Behavioral Risk Factor Surveillance System, and the National Survey on Drug Use and Health have implemented the 2011 HHS Data Standards. CMS has similarly updated the Medicare Current Beneficiary Survey, the Medicare Health Outcomes Survey, and the Health Insurance Marketplace Application for Health Coverage with the 2011 HHS data standards.

Preferred Language and Interpreter Services

Relevance to HHAs

More than 64 million people in the United States speak a language other than English at home, and nearly 40 million of those individuals have limited English proficiency (LEP).[345] Individuals with LEP have been shown to receive worse care and have poorer health outcomes, including higher readmission rates.[346,347,348] Communication with individuals with LEP is an important component of quality health care, which starts by understanding the population in need of language services. Unaddressed language barriers between a patient and provider care team negatively affects the ability to identify and address individual medical and non-medical care needs, to convey and understand clinical information, and to convey and understand discharge and follow-up instructions, all of which are necessary for providing high-quality care. Understanding the communication assistance needs of residents and patients with LEP, including individuals who are deaf or hard of hearing, is critical for ensuring good outcomes.

Proposed Data Elements for the Assessment of SDOH: Preferred Language and Interpreter Services

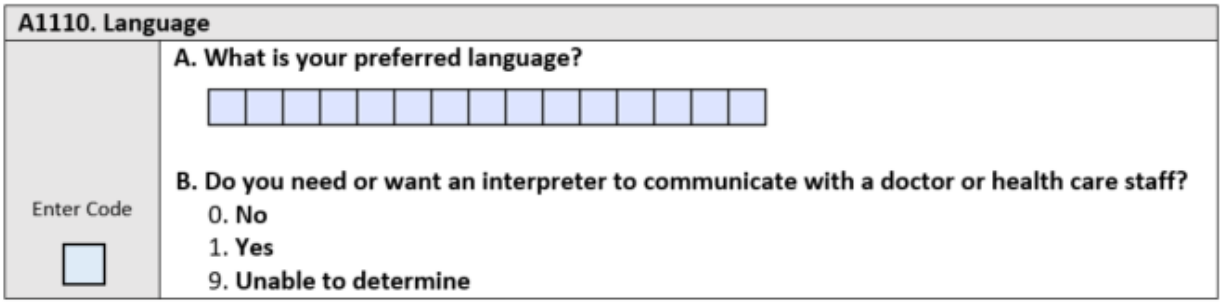
[344] Office of Management and Budget. (1997, October 30). Revisions to the Standards for the Classification of Federal Data on Race and Ethnicity (Notice of Decision). *Federal Register*, *62*(210), 58782–58790. Retrieved from https://www.govinfo.gov/content/pkg/FR-1997-10-30/pdf/97-28653.pdf

[345] U.S. Census Bureau, 2009-2013 American Community Survey.

[346] Karliner, L. S., Kim, S. E., Meltzer, D. O., & Auerbach, A. D. (2010). Influence of language barriers on outcomes of hospital care for general medicine inpatients. *Journal of Hospital Medicine*, *5*(5), 276–282. https://doi.org/10.1002/jhm.658

[347] Kim, E. J., Kim, T., Paasche-Orlow, M. K., Rose, A. J., & Hanchate, A. D. (2017). Disparities in hypertension associated with limited English proficiency. *Journal of General Internal Medicine*, *32*(6), 632–639. https://doi.org/10.1007/s11606-017-3999-9

[348] National Academies of Sciences, Engineering, and Medicine. 2016. Accounting for social risk factors in Medicare payment: Identifying social risk factors. Washington, DC: The National Academies Press.



Current use

The preferred language of residents and patients and the need for interpreter services are assessed in two PAC assessment tools. The LCDS and the MDS use the same two data elements to assess preferred language and whether a patient or resident needs or wants an interpreter to communicate with health care staff. The current preferred language data element in LCDS and MDS is open-ended, allowing the patient or resident to identify their preferred language, including American Sign Language. The MDS initially implemented preferred language and interpreter services data elements to assess the needs of SNF residents and patients and inform care planning. For alignment purposes, the LCDS later adopted the same data elements for LTCHs.

Evidence supporting use of Preferred Language and Interpreter Services

The 2009 National Academies of Sciences, Engineering, and Medicine (NASEM) report on standardizing data for health care quality improvement emphasizes that language and communication needs should be assessed as a standard part of health care delivery and quality improvement strategies.[349] Although the 2011 HHS Primary Language Data Standard recommends a two-part question to assess spoken language, the need to improve the assessment of language preferences and communication needs across PAC settings should be balanced with the provider and patient assessment burden. In addition, preferred spoken language would not allow information to be collected on American Sign Language, as is accounted for by the preferred language and interpreter services data elements currently in the MDS and LCDS.

Health Literacy

Relevance to HHAs

Similar to language barriers, low health literacy can interfere with communication between the provider and resident or patient and the ability for residents and patients or their caregivers to understand and follow treatment plans, including medication management. Poor health literacy is linked to lower levels of knowledge about health, worse health outcomes, receipt of fewer preventive services, higher medical costs, and higher rates of emergency department use.[350]

Proposed Data Element for the Assessment of SDOH: Health Literacy

[349] Institute of Medicine. (2009). *Race, ethnicity, and language data: Standardization for health care quality improvement.* Washington, DC: The National Academies Press.
[350] National Academies of Sciences, Engineering, and Medicine, 2016.

B1300. Health Literacy How often do you need to have someone help you when you read instructions, pamphlets, or other written material from your doctor or pharmacy?	
Enter Code ☐	0. **Never** 1. **Rarely** 2. **Sometimes** 3. **Often** 4. **Always** 9. **Patient unable to respond**

Current use

A health literacy data element is not currently used in any of the PAC assessment tools.

Evidence supporting use of Health Literacy

Health literacy is prioritized by Healthy People 2020 as an SDOH.[351] NASEM's 2016 report on accounting for social risk factors in Medicare payment considers health literacy an individual risk factor affected by other social risk factors.[352] The Single Item Literacy Screener (SILS) question, which assesses reading ability (a primary component of health literacy), tested reasonably well against the 36-item Short Test of Functional Health Literacy in Adults (S-TOFHLA), a thoroughly vetted and widely adopted health literacy test, in assessing the likelihood of low health literacy in an adult sample from primary care practices participating in the Vermont Diabetes Information System.[353,354] SILS is publicly available, and shorter and easier to administer than the S-TOFHLA. Research found that a positive result on the SILS demonstrates an increased likelihood that an individual has low health literacy,

Transportation

Relevance to HHAs

Transportation barriers can affect access to needed health care, causing missed appointments, delayed care, and unfilled prescriptions, all of which can have a negative impact on health outcomes.[355] Access to transportation for ongoing health care and medication access needs, particularly for those with

[351] Healthy People 2020. (2019, February). *Social determinants of health*. Retrieved from https://www.healthypeople.gov/2020/topics-objectives/topic/social-determinants-of-health.

[352] U.S. Department of Health & Human Services, Office of the Assistant Secretary for Planning and Evaluation. (2016, December). *Report to Congress: Social risk factors and performance under Medicare's value-based purchasing programs*. Washington, DC: Author. Retrieved from https://aspe.hhs.gov/pdf-report/report-congress-social-risk-factors-and-performance-under-medicares-value-based-purchasing-programs.

[353] Morris, N. S., MacLean, C. D., Chew, L. D., & Littenberg, B. (2006). The Single Item Literacy Screener: Evaluation of a brief instrument to identify limited reading ability. *BMC Family Practice*, *7*(1), 21. https://doi.org/10.1186/1471-2296-7-21

[354] Brice, J. H., Foster, M. B., Principe, S., Moss, C., Shofer, F. S., Falk, R. J., . . . DeWalt, D. A. (2014). Single-item or two-item literacy screener to predict the S-TOFHLA among adult hemodialysis patients. *Patient Education and Counseling*, *94*(1), 71–75. https://doi.org/10.1016/j.pec.2013.09.020

[355] Syed, S. T., Gerber, B. S., & Sharp, L. K. (2013). Traveling towards disease: Transportation barriers to health care access. *Journal of Community Health*, *38*(5), 976–993. https://doi.org/10.1007/s10900-013-9681-1

chronic diseases, is essential to successful chronic disease management. Adopting a data element to collect and analyze information regarding transportation needs across PAC settings would facilitate the connection to programs that can address identified needs.

Proposed Data Element for the Assessment of SDOH: Transportation

A1250. Transportation Has lack of transportation kept you from medical appointments, meetings, work, or from getting things needed for daily living?	
↓	**Check all that apply**
☐	**A.** Yes, it has kept me from medical appointments or from getting my medications
☐	**B.** Yes, it has kept me from non-medical meetings, appointments, work, or from getting things that I need
☐	**C.** No
☐	**D.** Patient is unable to respond.

Current use

A transportation data element is not currently used in any of the PAC assessment tools.

Evidence supporting use of Transportation

The proposed data element uses the Transportation item from the Protocol for Responding to and Assessing Patient Assets, Risks, and Experiences (PRAPARE) tool and is responsive to research on the importance of addressing transportation as a critical SDOH. The national PRAPARE SDOH assessment protocol is developed and owned by the National Association of Community Health Centers, in partnership with the Association of Asian Pacific Community Health Organization, the Oregon Primary Care Association, and the Institute for Alternative Futures. More information about development of the PRAPARE tool can be found at https://protect2.fireeye.com/url?k=7cb6eb44-20e2f238-7cb6da7b-0cc47adc5fa2-1751cb986c8c2f8c&u=http://www.nachc.org/prapare. Items in the assessment tool are consistent with Healthy People 2020 priorities and ICD-10 coding.[356]

Social Isolation

Relevance to HHAs

Distinct from loneliness, social isolation refers to an actual or perceived lack of contact with other people, such as living alone or residing in a remote area. [357,358] Social isolation tends to increase with age,

[356] National Association of Community Health Centers. (2018, December). *PRAPARE.* Retrieved from http://www.nachc.org/research-and-data/prapare/.

[357] Tomaka, J., Thompson, S., & Palacios, R. (2006). The relation of social isolation, loneliness, and social support to disease outcomes among the elderly. *Journal of Aging and Health*, *18*(3), 359–384. https://doi.org/10.1177/0898264305280993

[358] Leading Age. (2019). Social Connectedness and Engagement Technology for Long-Term and Post-Acute Care: A Primer and Provider Selection Guide. Washington, DC: Author. Available at https://www.leadingage.org/white-papers/social-connectedness-and-engagement-technology-long-term-and-post-acute-care-primer-and

is a risk factor for physical and mental illness, and a predictor of mortality.[359,360,361] PAC providers are well-suited to design and implement programs to increase social engagement of patients while accounting for individual needs and preferences. Adopting a data element to collect and analyze information about social isolation in HH and across PAC settings would facilitate the identification of patients who are socially isolated and who may benefit from engagement efforts.

Proposed Data Element for the Assessment of SDOH: Social Isolation

D0700. Social Isolation How often do you feel lonely or isolated from those around you?	
Enter Code ☐	0. **Never** 1. **Rarely** 2. **Sometimes** 3. **Often** 4. **Always** 9. **Patient unable to respond**

Current use

A social isolation data element is not currently used in any of the PAC assessment tools.

Evidence supporting use of Social Isolation

The proposed data element uses the social isolation item from the Accountable Health Communities (AHC) Screening Tool, which was selected from the Patient-Reported Outcomes Measurement Information System (PROMIS) Item Bank on Emotional Distress. The AHC Screening Tool was developed by a panel of interdisciplinary experts that looked at evidence-based ways to measure SDOH, including social isolation. More information about the AHC Screening Tool can be found at: https://innovation.cms.gov/Files/worksheets/ahcm-screeningtool.pdf.

[359] Landeiro, F., Barrows, P., Nuttall Musson, E., Gray, A. M., & Leal, J. (2017). Reducing social isolation and loneliness in older people: A systematic review protocol. *BMJ Open*, *7*(5), e013778. https://doi.org/10.1136/bmjopen-2016-013778

[360] Ong, A. D., Uchino, B. N., & Wethington, E. (2016). Loneliness and health in older adults: A mini-review and synthesis. *Gerontology*, *62*(4), 443–449. https://doi.org/10.1159/000441651

[361] Leigh-Hunt, N., Bagguley, D., Bash, K., Turner, V., Turnbull, S., Valtorta, N., & Caan, W. (2017). An overview of systematic reviews on the public health consequences of social isolation and loneliness. *Public Health*, *152*, 157–171. https://doi.org/10.1016/j.puhe.2017.07.035

APPENDIX A. TRANSFER OF HEALTH INFORMATION: SETTING-SPECIFIC LANGUAGE

Tables A-1 and A-2 below summarize the setting specific language used to describe the resident or patient within each PAC setting. There are no other differences in the content or language within each Transfer of Health Information to the Provider-Post-Acute Care quality measure data element and within each Transfer of Health Information to the Patient–Post-Acute Care quality measure data element.

Table A-1
Transfer of Health Information to the Provider–Post-Acute Care: Setting-Specific Language

IRF Discharge	LTCH Discharge	HHA Discharge/Transfer	SNF Discharge
A2121. Provision of Current Reconciled Medication List to Subsequent Provider at Discharge	**A2121. Provision of Current Reconciled Medication List to Subsequent Provider at Discharge**	**A2121A. Provision of Current Reconciled Medication List to Subsequent Provider at Discharge**	**A2121. Provision of Current Reconciled Medication List to Subsequent Provider at Discharge**
At the time of discharge to another provider, did your facility provide the patient's current reconciled medication list to the subsequent provider? Enter Code: □ 0. No - Current reconciled medication list not provided to the subsequent provider 1. Yes - Current reconciled medication list provided to the subsequent provider	At the time of discharge to another provider, did your facility provide the patient's current reconciled medication list to the subsequent provider? Enter Code: □ 0. No - Current reconciled medication list not provided to the subsequent provider 1. Yes - Current reconciled medication list provided to the subsequent provider	At the time of discharge to another provider, did your agency provide the patient's current reconciled medication list to the subsequent provider? Enter Code: □ 0. No - Current reconciled medication list not provided to the subsequent provider 1. Yes - Current reconciled medication list provided to the subsequent provider	At the time of discharge to another provider, did your facility provide the resident's current reconciled medication list to the subsequent provider? Enter Code: □ 0. No - Current reconciled medication list not provided to the subsequent provider 1. Yes - Current reconciled medication list provided to the subsequent provider

IRF Discharge	LTCH Discharge	HHA Discharge/Transfer	SNF Discharge
A2123. Route of Current Reconciled Medication List Transmission (column 1)	**A2123. Route of Current Reconciled Medication List Transmission (column 1)**	**A2121B. Provision of Current Reconciled Medication List to Subsequent Provider at Transfer**	**A2123. Route of Current Reconciled Medication List Transmission (column 1)**
Indicate the route(s) of transmission of the current reconciled medication list to the subsequent provider and/or patient/family/caregiver. A. Electronic Health Record B. Health Information Exchange Organization C. Verbal (e.g., in-person, telephone, video conferencing) D. Paper-based (e.g., fax, copies, printouts) E. Other Methods (e.g., texting, email, CDs)	Indicate the route(s) of transmission of the current reconciled medication list to the subsequent provider and/or patient/family/caregiver. A. Electronic Health Record B. Health Information Exchange Organization C. Verbal (e.g., in-person, telephone, video conferencing) D. Paper-based (e.g., fax, copies, printouts) E. Other Methods (e.g., texting, email, CDs)	At the time of transfer to another provider, did your agency provide the patient's current reconciled medication list to the subsequent provider? Enter Code: □ 0. No - Current reconciled medication list not provided to the subsequent provider 1. Yes - Current reconciled medication list provided to the subsequent provider 2. NA – The agency has not made aware of this transfer timely	Indicate the route(s) of transmission of the current reconciled medication list to the subsequent provider and/or patient/family/caregiver. A. Electronic Health Record B. Health Information Exchange Organization C. Verbal (e.g., in-person, telephone, video conferencing) D. Paper-based (e.g., fax, copies, printouts) E. Other Methods (e.g., texting, email, CDs)

IRF Discharge	LTCH Discharge	HHA Discharge/Transfer	SNF Discharge
-	-	**A2123. Route of Current Reconciled Medication List Transmission (column 1)**	-
-	-	Indicate the route(s) of transmission of the current reconciled medication list to the subsequent provider and/or patient/family/caregiver. A. Electronic Health Record B. Health Information Exchange Organization C. Verbal (e.g., in-person, telephone, video conferencing) D. Paper-based (e.g., fax, copies, printouts) E. Other Methods (e.g., texting, email, CDs)	-
-	-	**Discharge Location Items** **M0100. This Assessment is Currently Being Completed for the Following Reason**	-

IRF Discharge	LTCH Discharge	HHA Discharge/Transfer	SNF Discharge
-	-	Start/Resumption of Care 1. Start of care – further visits planned 3. Resumption of care (after inpatient stay) Follow-Up 4. Recertification (follow-up) reassessment 5. Other follow-up Transfer to an Inpatient Facility 6. Transferred to an inpatient facility – patient not discharged from agency 7. Transferred to an inpatient facility – patient discharged from agency Discharge from Agency – Not to an Inpatient Facility 8. Death at home 9. Discharge from agency	-
-	-	**M2420. Discharge Disposition**	-
-	-	Where is the patient after discharge from your agency? (Choose only one answer.) 1. Patient remained in the community (without formal assistive services) 2. Patient remained in the community (with formal assistive services) 3. Patient transferred to a non-institutional hospice 4. Unknown because patient moved to a geographic location not served by this agency UK Other unknown	-

Table 2
Transfer of Health Information to the Patient–Post-Acute Care - Setting-Specific Language

IRF Discharge	LTCH Discharge	HHA Discharge/Transfer	SNF Discharge
A2122. Provision of Current Reconciled Medication List to Patient at Discharge	**A2122. Provision of Current Reconciled Medication List to Patient at Discharge**	**A2122. Provision of Current Reconciled Medication List to Patient at Discharge**	**A2122. Provision of Current Reconciled Medication List to Resident at Discharge**
At the time of discharge, did your facility provide the patient's current reconciled medication list to the patient, family and/or caregiver? Enter Code: □ 0. No - Current reconciled medication list not provided to the patient, family and/or caregiver 1. Yes - Current reconciled medication list provided to the patient, family and/or caregiver	At the time of discharge, did your facility provide the patient's current reconciled medication list to the patient, family and/or caregiver? Enter Code: □ 0. No - Current reconciled medication list not provided to the patient, family and/or caregiver 1. Yes - Current reconciled medication list provided to the patient, family and/or caregiver	At the time of discharge, did your agency provide the patient's current reconciled medication list to the patient, family and/or caregiver? Enter Code: □ 0. No - Current reconciled medication list not provided to the patient, family and/or caregiver 1. Yes - Current reconciled medication list provided to the patient, family and/or caregiver	At the time of discharge, did your facility provide the resident's current reconciled medication list to the resident, family and/or caregiver? Enter Code: □ 0. No - Current reconciled medication list not provided to the resident, family and/or caregiver 1. Yes - Current reconciled medication list provided to the resident, family and/or caregiver?

IRF Discharge	LTCH Discharge	HHA Discharge/Transfer	SNF Discharge
A2123. Route of Current Reconciled Medication List Transmission (column 2)	**A2123. Route of Current Reconciled Medication List Transmission (column 2)**	**A2123. Route of Current Reconciled Medication List Transmission (column 2)**	**A2123. Route of Current Reconciled Medication List Transmission (column 2)**
Indicate the route(s) of transmission of the current reconciled medication list to the subsequent provider and/or patient/family/caregiver. A. Electronic Health Record B. Health Information Exchange Organization C. Verbal (e.g., in-person, telephone, video conferencing) D. Paper-based (e.g., fax, copies, printouts) E. Other Methods (e.g., texting, email, CDs)	Indicate the route(s) of transmission of the current reconciled medication list to the subsequent provider and/or patient/family/caregiver. A. Electronic Health Record B. Health Information Exchange Organization C. Verbal (e.g., in-person, telephone, video conferencing) D. Paper-based (e.g., fax, copies, printouts) E. Other Methods (e.g., texting, email, CDs)	Indicate the route(s) of transmission of the current reconciled medication list to the subsequent provider and/or patient/family/caregiver. A. Electronic Health Record B. Health Information Exchange Organization C. Verbal (e.g., in-person, telephone, video conferencing) D. Paper-based (e.g., fax, copies, printouts) E. Other Methods (e.g., texting, email, CDs)	Indicate the route(s) of transmission of the current reconciled medication list to the subsequent provider and/or patient/family/caregiver. A. Electronic Health Record B. Health Information Exchange Organization C. Verbal (e.g., in-person, telephone, video conferencing) D. Paper-based (e.g., fax, copies, printouts) E. Other Methods (e.g., texting, email, CDs)
-	-	**Discharge Location Items** **M0100. This Assessment is Currently Being Completed for the Following Reason**	-
-	-	Start/Resumption of Care 1. Start of care – further visits planned 3. Resumption of care (after inpatient stay) Follow-Up 4. Recertification (follow-up) reassessment 5. Other follow-up Transfer to an Inpatient Facility 6. Transferred to an inpatient facility – patient not discharged from agency 7. Transferred to an inpatient facility – patient discharged from agency	-

IRF Discharge	LTCH Discharge	HHA Discharge/Transfer	SNF Discharge
		Discharge from Agency – Not to an Inpatient Facility 8. Death at home 9. Discharge from agency	

APPENDIX B. DISCHARGE TO COMMUNITY–PAC HH QRP ANALYSES

Table B-1. Preliminary Logistic Regression Model Results for Discharge to Community-Post Acute Care (PAC) Home Health Quality Reporting Program, 2012–2013

Number of stays included in the model = 6,325,578

Observed number (percentage) of stays that resulted in a discharge to the community = 4,954,906 (78.3%) Model c-statistic = 0.741

Variable Name in Model	VariableGroup	Covariate	Count	Percent Total	Estimate	Std. Error	P value	Odds Ratio	OR 95% Lower CL	OR 95% Upper CL
age_18_34_f	Age-Sex (Reference group Male 65-69)	18-34, Female	16,057	0.3	-0.024	0.021	0.2355	0.98	0.94	1.02
age_18_34_m	Age-Sex(Reference group Male 65-69)	18-34, Male	15,671	0.2	0.091	0.021	<.0001	1.10	1.05	1.14
age_35_44_f	Age-Sex(Reference group Male 65-69)	35-44, Female	41,289	0.7	0.034	0.014	0.0140	1.03	1.01	1.06
age_35_44_m	Age-Sex(Reference group Male 65-69)	35-44, Male	36,514	0.6	0.067	0.014	<.0001	1.07	1.04	1.10
age_45_54_f	Age-Sex(Reference group Male 65-69)	45-54, Female	122,663	1.9	0.056	0.009	<.0001	1.06	1.04	1.08
age_45_54_m	Age-Sex(Reference group Male 65-69)	45-54, Male	108,304	1.7	0.022	0.010	0.0200	1.02	1.00	1.04
age_55_59_f	Age-Sex(Reference group Male 65-69)	55-59, Female	113,158	1.8	0.032	0.009	0.0007	1.03	1.01	1.05
age_55_59_m	Age-Sex(Reference group Male 65-69)	55-59, Male	91,873	1.5	0.003	0.010	0.7683	1.00	0.98	1.02
age_60_64_f	Age-Sex(Reference group Male 65-69)	60-64, Female	146,476	2.3	0.032	0.009	0.0002	1.03	1.02	1.05
age_60_64_m	Age-Sex(Reference group Male 65-69)	60-64, Male	109,694	1.7	0.008	0.009	0.3956	1.01	0.99	1.03
age_65_69_f	Age-Sex(Reference group Male 65-69)	65-69, Female	395,410	6.3	0.027	0.007	<.0001	1.03	1.01	1.04
age_65_69_m	Age-Sex(Reference group Male 65-69)	65-69, Male (Reference)	272,322	4.3	-	-	-	-	-	-
age_70_74_f	Age-Sex(Reference group Male 65-69)	70-74, Female	530,436	8.4	0.012	0.007	0.0753	1.01	1.00	1.02
age_70_74_m	Age-Sex(Reference group Male 65-69)	70-74, Male	343,284	5.4	-0.043	0.007	<.0001	0.96	0.94	0.97
age_75_79_f	Age-Sex(Reference group Male 65-69)	75-79, Female	621,830	9.8	-0.023	0.006	0.0004	0.98	0.97	0.99
age_75_79_m	Age-Sex(Reference group Male 65-69)	75-79, Male	369,320	5.8	-0.093	0.007	<.0001	0.91	0.90	0.92
age_80_84_f	Age-Sex(Reference group Male 65-69)	80-84, Female	739,781	11.7	-0.069	0.006	<.0001	0.93	0.92	0.95

Variable Name in Model	VariableGroup	Covariate	Count	Percent Total	Estimate	Std. Error	P value	Odds Ratio	OR 95% Lower CL	OR 95% Upper CL
age_80_84_m	Age-Sex(Reference group Male 65-69)	80-84, Male	399,155	6.3	-0.153	0.007	<.0001	0.86	0.85	0.87
age_85_89_f	Age-Sex(Reference group Male 65-69)	85-89, Female	734,322	11.6	-0.125	0.006	<.0001	0.88	0.87	0.89
age_85_89_m	Age-Sex(Reference group Male 65-69)	85-89, Male	342,655	5.4	-0.236	0.007	<.0001	0.79	0.78	0.80
age_90_94_f	Age-Sex(Reference group Male 65-69)	90-94, Female	427,177	6.8	-0.186	0.007	<.0001	0.83	0.82	0.84
age_90_94_m	Age-Sex(Reference group Male 65-69)	90-94, Male	172,711	2.7	-0.339	0.008	<.0001	0.71	0.70	0.72
age_95_pl_f	Age-Sex(Reference group Male 65-69)	95+, Female	134,441	2.1	-0.274	0.009	<.0001	0.76	0.75	0.77
age_95_pl_m	Age-Sex(Reference group Male 65-69)	95+, Male	41,035	0.6	-0.441	0.013	<.0001	0.64	0.63	0.66
orig_aged	Original Reason for Medicare Enrollment (Reference group: Age)	Age (Reference)	4,743,629	75.0	-	-	-	-	-	-
orig_disabled	Original Reason for Medicare Enrollment (Reference group: Age)	Disability	1,525,287	24.1	-0.126	0.003	<.0001	0.88	0.88	0.89
orig_esrd	Original Reason for Medicare Enrollment (Reference group: Age)	ESRD	56,662	0.9	-0.183	0.011	<.0001	0.83	0.81	0.85
adl_1	Activities of Daily Living Score (Continuous, standardized variables)	ADL Score 1	6,325,578	100	0.014	0.012	0.2416	1.01	0.99	1.04
adl_2	Activities of Daily Living Score (Continuous, standardized variables)	ADL Score 2	6,325,578	100	-0.275	0.006	<.0001	0.76	0.75	0.77
adl_3	Activities of Daily Living Score (Continuous, standardized variables)	ADL Score 3	6,325,578	100	0.075	0.010	<.0001	1.08	1.06	1.10

Variable Name in Model	VariableGroup	Covariate	Count	Percent Total	Estimate	Std. Error	P value	Odds Ratio	OR 95% Lower CL	OR 95% Upper CL
adl_4	Activities of Daily Living Score (Continuous, standardized variables)	ADL Score 4	6,325,578	100	-0.033	0.004	<.0001	0.97	0.96	0.98
-	Length of Prior Proximal Hospitalization (Reference group: 0-30 Days)	0-30 Days (Reference)	6,308,321	99.7	-	-	-	-	-	-
prior_proximal_31_plus	Length of Prior Proximal Hospitalization (Reference group: 0-30 Days)	≥ 31 Days	17,257	0.3	-0.274	0.018	<.0001	0.76	0.73	0.79
n_priors_00	Number of Prior Acute Discharges within One Year of Stay (Excluding Prior Proximal) (Reference group: 0)	0 (Reference)	4,217,052	66.7	-	-	-	-	-	-
n_priors_01	Number of Prior Acute Discharges within One Year of Stay (Excluding Prior Proximal) (Reference group: 0)	1	1,088,654	17.2	-0.166	0.003	<.0001	0.85	0.84	0.85
n_priors_02	Number of Prior Acute Discharges within One Year of Stay (Excluding Prior Proximal) (Reference group: 0)	2	494,253	7.8	-0.320	0.004	<.0001	0.73	0.72	0.73
n_priors_03	Number of Prior Acute Discharges within One Year of Stay (Excluding Prior Proximal) (Reference group: 0)	3	241,309	3.8	-0.458	0.005	<.0001	0.63	0.63	0.64
n_priors_04	Number of Prior Acute Discharges within One Year of Stay (Excluding Prior Proximal) (Reference group: 0)	4	124,023	2.0	-0.595	0.007	<.0001	0.55	0.54	0.56

Variable Name in Model	VariableGroup	Covariate	Count	Percent Total	Estimate	Std. Error	P value	Odds Ratio	OR 95% Lower CL	OR 95% Upper CL
n_priors_05	Number of Prior Acute Discharges within One Year of Stay (Excluding Prior Proximal) (Reference group: 0)	5	66,223	1.0	-0.736	0.009	<.0001	0.48	0.47	0.49
n_priors_06	Number of Prior Acute Discharges within One Year of Stay (Excluding Prior Proximal) (Reference group: 0)	6	36,858	0.6	-0.877	0.012	<.0001	0.42	0.41	0.43
n_priors_07	Number of Prior Acute Discharges within One Year of Stay (Excluding Prior Proximal) (Reference group: 0)	7	21,378	0.3	-0.982	0.015	<.0001	0.37	0.36	0.39
n_priors_08	Number of Prior Acute Discharges within One Year of Stay (Excluding Prior Proximal) (Reference group: 0)	8	12,859	0.2	-1.135	0.019	<.0001	0.32	0.31	0.33
n_priors_09	Number of Prior Acute Discharges within One Year of Stay (Excluding Prior Proximal) (Reference group: 0)	9	7,869	0.1	-1.276	0.025	<.0001	0.28	0.27	0.29
n_priors_10	Number of Prior Acute Discharges within One Year of Stay (Excluding Prior Proximal) (Reference group: 0)	10+	15,100	0.2	-1.677	0.019	<.0001	0.19	0.18	0.19
-	Number of Outpatient Emergency Department Visits within One Year of Stay (Reference group: 0)	0 (Reference)	3,180,258	50.3	-	-	-	-	-	-

Variable Name in Model	VariableGroup	Covariate	Count	Percent Total	Estimate	Std. Error	P value	Odds Ratio	OR 95% Lower CL	OR 95% Upper CL
prior_er	Number of Outpatient Emergency Department Visits within One Year of Stay (Reference group: 0)	≥ 1	3,145,320	49.7	-0.117	0.002	<.0001	0.89	0.89	0.89
-	Number of Skilled Nursing Home Visits within One Year of Stay (Reference group: 0)	0 (Reference)	4,512,399	71.3	-	-	-	-	-	-
prior_snf	Number of Skilled Nursing Home Visits within One Year of Stay (Reference group: 0)	≥ 1	1,813,179	28.7	-0.080	0.003	<.0001	0.92	0.92	0.93
-	Number of Long-Term Care Hospital Visits within One Year of Stay (Reference group: 0)	0 (Reference)	6,210,423	98.2	-	-	-	-	-	-
prior_ltch	Number of Long-Term Care Hospital Visits within One Year of Stay (Reference group: 0)	≥ 1	115,155	1.8	-0.053	0.007	<.0001	0.95	0.94	0.96
prc_001	CCS Procedure Groups (Reference group: Composite of all other CCS procedure groups)	1 - Incision and excision of CNS	8,411	0.1	0.132	0.033	<.0001	1.14	1.07	1.22
prc_002	CCS Procedure Groups (Reference group: Composite of all other CCS procedure groups)	2 - Insertion; replacement; or removal of extracranial ventricular shunt	3,144	0.0	0.180	0.050	0.0003	1.20	1.09	1.32
prc_003	CCS Procedure Groups (Reference group: Composite of all other CCS procedure groups)	3 - Laminectomy; excision intervertebral disc	58,724	0.9	0.354	0.020	<.0001	1.42	1.37	1.48

Variable Name in Model	VariableGroup	Covariate	Count	Percent Total	Estimate	Std. Error	P value	Odds Ratio	OR 95% Lower CL	OR 95% Upper CL
prc_004	CCS Procedure Groups (Reference group: Composite of all other CCS procedure groups)	4 - Diagnostic spinal tap	15,965	0.3	0.155	0.021	<.0001	1.17	1.12	1.22
prc_009	CCS Procedure Groups (Reference group: Composite of all other CCS procedure groups)	9 - Other OR therapeutic nervous system procedures	15,455	0.2	0.055	0.027	0.0398	1.06	1.00	1.11
prc_032	CCS Procedure Groups (Reference group: Composite of all other CCS procedure groups)	32 - Other non-OR therapeutic procedures on nose; mouth and pharynx	1,714	0.0	0.274	0.072	0.0001	1.32	1.14	1.51
prc_033	CCS Procedure Groups (Reference group: Composite of all other CCS procedure groups)	33 - Other OR therapeutic procedures on nose; mouth and pharynx	1,909	0.0	0.298	0.066	<.0001	1.35	1.18	1.53
prc_034	CCS Procedure Groups (Reference group: Composite of all other CCS procedure groups)	34 - Tracheostomy; temporary and permanent	4,593	0.1	0.188	0.038	<.0001	1.21	1.12	1.30
prc_036	CCS Procedure Groups (Reference group: Composite of all other CCS procedure groups)	36 - Lobectomy or pneumonectomy	3,517	0.1	0.500	0.050	<.0001	1.65	1.49	1.82
prc_037	CCS Procedure Groups (Reference group: Composite of all other CCS procedure groups)	37 - Diagnostic bronchoscopy and biopsy of bronchus	33,814	0.5	-0.054	0.014	<.0001	0.95	0.92	0.97
prc_039	CCS Procedure Groups (Reference group: Composite of all other CCS procedure groups)	39 - Incision of pleura; thoracentesis; chest drainage	54,871	0.9	-0.080	0.011	<.0001	0.92	0.90	0.94

Variable Name in Model	VariableGroup	Covariate	Count	Percent Total	Estimate	Std. Error	P value	Odds Ratio	OR 95% Lower CL	OR 95% Upper CL
prc_042	CCS Procedure Groups (Reference group: Composite of all other CCS procedure groups)	42 - Other OR Rx procedures on respiratory system and mediastinum	10,549	0.2	0.264	0.028	<.0001	1.30	1.23	1.38
prc_043	CCS Procedure Groups (Reference group: Composite of all other CCS procedure groups)	43 - Heart valve procedures	46,616	0.7	0.260	0.028	<.0001	1.30	1.23	1.37
prc_044	CCS Procedure Groups (Reference group: Composite of all other CCS procedure groups)	44 - Coronary artery bypass graft (CABG)	67,681	1.1	0.452	0.021	<.0001	1.57	1.51	1.64
prc_048	CCS Procedure Groups (Reference group: Composite of all other CCS procedure groups)	48 - Insertion; revision; replacement; removal of cardiac pacemaker or cardioverter/defibrillator	54,507	0.9	0.253	0.013	<.0001	1.29	1.26	1.32
prc_050	CCS Procedure Groups (Reference group: Composite of all other CCS procedure groups)	50 - Extracorporeal circulation auxiliary to open heart procedures	87,610	1.4	0.368	0.021	<.0001	1.44	1.39	1.51
prc_051	CCS Procedure Groups (Reference group: Composite of all other CCS procedure groups)	51 - Endarterectomy; vessel of head and neck	9,388	0.1	0.244	0.044	<.0001	1.28	1.17	1.39
prc_052	CCS Procedure Groups (Reference group: Composite of all other CCS procedure groups)	52 - Aortic resection; replacement or anastomosis	8,969	0.1	0.278	0.046	<.0001	1.32	1.21	1.45
prc_054	CCS Procedure Groups (Reference group: Composite of all other CCS procedure groups)	54 - Other vascular catheterization; not heart	253,836	4.0	-0.047	0.006	<.0001	0.95	0.94	0.96

Variable Name in Model	VariableGroup	Covariate	Count	Percent Total	Estimate	Std. Error	P value	Odds Ratio	OR 95% Lower CL	OR 95% Upper CL
prc_055	CCS Procedure Groups (Reference group: Composite of all other CCS procedure groups)	55 - Peripheral vascular bypass	14,803	0.2	0.155	0.024	<.0001	1.17	1.11	1.22
prc_058	CCS Procedure Groups (Reference group: Composite of all other CCS procedure groups)	58 - Hemodialysis	100,074	1.6	-0.154	0.009	<.0001	0.86	0.84	0.87
prc_061	CCS Procedure Groups (Reference group: Composite of all other CCS procedure groups)	61 - Other OR procedures on vessels other than head and neck	109,036	1.7	0.014	0.010	0.1579	1.01	0.99	1.03
prc_062	CCS Procedure Groups (Reference group: Composite of all other CCS procedure groups)	62 - Other diagnostic cardiovascular procedures	9,465	0.1	0.098	0.027	0.0003	1.10	1.05	1.16
prc_063	CCS Procedure Groups (Reference group: Composite of all other CCS procedure groups)	63 - Other non-OR therapeutic cardiovascular procedures	61,581	1.0	0.102	0.012	<.0001	1.11	1.08	1.13
prc_065	CCS Procedure Groups (Reference group: Composite of all other CCS procedure groups)	65 - Bone marrow biopsy	5,623	0.1	-0.172	0.031	<.0001	0.84	0.79	0.90
prc_069	CCS Procedure Groups (Reference group: Composite of all other CCS procedure groups)	69 - Esophageal dilatation	6,104	0.1	-0.033	0.032	0.3008	0.97	0.91	1.03
prc_070	CCS Procedure Groups (Reference group: Composite of all other CCS procedure groups)	70 - Upper gastrointestinal endoscopy; biopsy	112,254	1.8	-0.038	0.008	<.0001	0.96	0.95	0.98

Variable Name in Model	VariableGroup	Covariate	Count	Percent Total	Estimate	Std. Error	P value	Odds Ratio	OR 95% Lower CL	OR 95% Upper CL
prc_071	CCS Procedure Groups (Reference group: Composite of all other CCS procedure groups)	71 - Gastrostomy; temporary and permanent	16,004	0.3	-0.210	0.019	<.0001	0.81	0.78	0.84
prc_073	CCS Procedure Groups (Reference group: Composite of all other CCS procedure groups)	73 - Ileostomy and other enterostomy	5,858	0.1	-0.300	0.033	<.0001	0.74	0.69	0.79
prc_074	CCS Procedure Groups (Reference group: Composite of all other CCS procedure groups)	74 - Gastrectomy; partial and total	1,654	0.0	0.241	0.071	0.0007	1.27	1.11	1.46
prc_075	CCS Procedure Groups (Reference group: Composite of all other CCS procedure groups)	75 - Small bowel resection	12,789	0.2	0.132	0.027	<.0001	1.14	1.08	1.20
prc_078	CCS Procedure Groups (Reference group: Composite of all other CCS procedure groups)	78 - Colorectal resection	28,480	0.5	0.134	0.019	<.0001	1.14	1.10	1.19
prc_080	CCS Procedure Groups (Reference group: Composite of all other CCS procedure groups)	80 - Appendectomy	6,910	0.1	0.144	0.047	0.0023	1.15	1.05	1.27
prc_084	CCS Procedure Groups (Reference group: Composite of all other CCS procedure groups)	84 - Cholecystectomy and common duct exploration	25,737	0.4	0.502	0.024	<.0001	1.65	1.58	1.73
prc_085	CCS Procedure Groups (Reference group: Composite of all other CCS procedure groups)	85 - Inguinal and femoral hernia repair	5,164	0.1	0.308	0.048	<.0001	1.36	1.24	1.50

Variable Name in Model	VariableGroup	Covariate	Count	Percent Total	Estimate	Std. Error	P value	Odds Ratio	OR 95% Lower CL	OR 95% Upper CL
prc_086	CCS Procedure Groups (Reference group: Composite of all other CCS procedure groups)	86 - Other hernia repair	23,197	0.4	0.233	0.028	<.0001	1.26	1.20	1.33
prc_087	CCS Procedure Groups (Reference group: Composite of all other CCS procedure groups)	87 - Laparoscopy (GI only)	2,427	0.0	0.160	0.059	0.0068	1.17	1.05	1.32
prc_088	CCS Procedure Groups (Reference group: Composite of all other CCS procedure groups)	88 - Abdominal paracentesis	18,719	0.3	-0.335	0.018	<.0001	0.72	0.69	0.74
prc_090	CCS Procedure Groups (Reference group: Composite of all other CCS procedure groups)	90 - Excision; lysis peritoneal adhesions	31,192	0.5	0.187	0.019	<.0001	1.21	1.16	1.25
prc_091	CCS Procedure Groups (Reference group: Composite of all other CCS procedure groups)	91 - Peritoneal dialysis	4,250	0.1	-0.438	0.034	<.0001	0.65	0.60	0.69
prc_094	CCS Procedure Groups (Reference group: Composite of all other CCS procedure groups)	94 - Other OR upper GI therapeutic procedures	7,801	0.1	0.271	0.034	<.0001	1.31	1.23	1.40
prc_096	CCS Procedure Groups (Reference group: Composite of all other CCS procedure groups)	96 - Other OR lower GI therapeutic procedures	27,073	0.4	0.130	0.020	<.0001	1.14	1.10	1.18
prc_097	CCS Procedure Groups (Reference group: Composite of all other CCS procedure groups)	97 - Other gastrointestinal diagnostic procedures	4,798	0.1	-0.233	0.037	<.0001	0.79	0.74	0.85

Variable Name in Model	VariableGroup	Covariate	Count	Percent Total	Estimate	Std. Error	P value	Odds Ratio	OR 95% Lower CL	OR 95% Upper CL
prc_098	CCS Procedure Groups (Reference group: Composite of all other CCS procedure groups)	98 - Other non-OR gastrointestinal therapeutic procedures	20,735	0.3	0.050	0.020	0.0124	1.05	1.01	1.09
prc_099	CCS Procedure Groups (Reference group: Composite of all other CCS procedure groups)	99 - Other OR gastrointestinal therapeutic procedures	17,199	0.3	0.097	0.022	<.0001	1.10	1.06	1.15
prc_103	CCS Procedure Groups (Reference group: Composite of all other CCS procedure groups)	103 - Nephrotomy and nephrostomy	5,375	0.1	-0.285	0.033	<.0001	0.75	0.70	0.80
prc_104	CCS Procedure Groups (Reference group: Composite of all other CCS procedure groups)	104 - Nephrectomy; partial or complete	1,211	0.0	0.330	0.078	<.0001	1.39	1.19	1.62
prc_110	CCS Procedure Groups (Reference group: Composite of all other CCS procedure groups)	110 - Other diagnostic procedures of urinary tract	2,948	0.0	-0.270	0.042	<.0001	0.76	0.70	0.83
prc_111	CCS Procedure Groups (Reference group: Composite of all other CCS procedure groups)	111 - Other non-OR therapeutic procedures of urinary tract	9,184	0.1	-0.211	0.025	<.0001	0.81	0.77	0.85
prc_113	CCS Procedure Groups (Reference group: Composite of all other CCS procedure groups)	113 - Transurethral resection of prostate (TURP)	3,477	0.1	0.295	0.052	<.0001	1.34	1.21	1.49
prc_114	CCS Procedure Groups (Reference group: Composite of all other CCS procedure groups)	114 - Open prostatectomy	562	0.0	0.977	0.166	<.0001	2.66	1.92	3.68

Variable Name in Model	VariableGroup	Covariate	Count	Percent Total	Estimate	Std. Error	P value	Odds Ratio	OR 95% Lower CL	OR 95% Upper CL
prc_117	CCS Procedure Groups (Reference group: Composite of all other CCS procedure groups)	117 - Other non-OR therapeutic procedures; male genital	1,725	0.0	0.215	0.068	0.0017	1.24	1.08	1.42
prc_119	CCS Procedure Groups (Reference group: Composite of all other CCS procedure groups)	119 - Oophorectomy; unilateral and bilateral	3,606	0.1	0.159	0.070	0.0239	1.17	1.02	1.35
prc_124	CCS Procedure Groups (Reference group: Composite of all other CCS procedure groups)	124 - Hysterectomy; abdominal and vaginal	2,725	0.0	0.358	0.090	<.0001	1.43	1.20	1.70
prc_129	CCS Procedure Groups (Reference group: Composite of all other CCS procedure groups)	129 - Repair of cystocele and rectocele; obliteration of vaginal vault	1,594	0.0	0.316	0.147	0.0313	1.37	1.03	1.83
prc_130	CCS Procedure Groups (Reference group: Composite of all other CCS procedure groups)	130 - Other diagnostic procedures; female organs	656	0.0	-0.298	0.094	0.0016	0.74	0.62	0.89
prc_132	CCS Procedure Groups (Reference group: Composite of all other CCS procedure groups)	132 - Other OR therapeutic procedures; female organs	3,521	0.1	0.171	0.059	0.0035	1.19	1.06	1.33
prc_142	CCS Procedure Groups (Reference group: Composite of all other CCS procedure groups)	142 - Partial excision bone	53,253	0.8	0.019	0.017	0.2632	1.02	0.99	1.05
prc_143	CCS Procedure Groups (Reference group: Composite of all other CCS procedure groups)	143 - Bunionectomy or repair of toe deformities	691	0.0	0.493	0.134	0.0002	1.64	1.26	2.13

Variable Name in Model	VariableGroup	Covariate	Count	Percent Total	Estimate	Std. Error	P value	Odds Ratio	OR 95% Lower CL	OR 95% Upper CL
prc_145	CCS Procedure Groups (Reference group: Composite of all other CCS procedure groups)	145 - Treatment; fracture or dislocation of radius and ulna	7,617	0.1	0.193	0.040	<.0001	1.21	1.12	1.31
prc_146	CCS Procedure Groups (Reference group: Composite of all other CCS procedure groups)	146 - Treatment; fracture or dislocation of hip and femur	68,683	1.1	0.404	0.018	<.0001	1.50	1.45	1.55
prc_147	CCS Procedure Groups (Reference group: Composite of all other CCS procedure groups)	147 - Treatment; fracture or dislocation of lower extremity (other than hip or femur)	22,163	0.4	0.335	0.028	<.0001	1.40	1.32	1.48
prc_148	CCS Procedure Groups (Reference group: Composite of all other CCS procedure groups)	148 - Other fracture and dislocation procedure	22,870	0.4	0.164	0.023	<.0001	1.18	1.12	1.23
prc_152	CCS Procedure Groups (Reference group: Composite of all other CCS procedure groups)	152 - Arthroplasty knee	291,705	4.6	0.672	0.016	<.0001	1.96	1.90	2.02
prc_153	CCS Procedure Groups (Reference group: Composite of all other CCS procedure groups)	153 - Hip replacement; total and partial	182,857	2.9	0.663	0.015	<.0001	1.94	1.88	2.00
prc_154	CCS Procedure Groups (Reference group: Composite of all other CCS procedure groups)	154 - Arthroplasty other than hip or knee	25,051	0.4	0.473	0.026	<.0001	1.60	1.53	1.69
prc_155	CCS Procedure Groups (Reference group: Composite of all other CCS procedure groups)	155 - Arthrocentesis	13,320	0.2	0.042	0.024	0.0729	1.04	1.00	1.09

Variable Name in Model	VariableGroup	Covariate	Count	Percent Total	Estimate	Std. Error	P value	Odds Ratio	OR 95% Lower CL	OR 95% Upper CL
prc_157	CCS Procedure Groups (Reference group: Composite of all other CCS procedure groups)	157 - Amputation of lower extremity	23,720	0.4	0.277	0.017	<.0001	1.32	1.27	1.36
prc_158	CCS Procedure Groups (Reference group: Composite of all other CCS procedure groups)	158 - Spinal fusion	66,508	1.1	0.439	0.022	<.0001	1.55	1.49	1.62
prc_160	CCS Procedure Groups (Reference group: Composite of all other CCS procedure groups)	160 - Other therapeutic procedures on muscles and tendons	39,072	0.6	0.049	0.015	0.0011	1.05	1.02	1.08
prc_162	CCS Procedure Groups (Reference group: Composite of all other CCS procedure groups)	162 - Other OR therapeutic procedures on joints	24,411	0.4	0.091	0.021	<.0001	1.10	1.05	1.14
prc_164	CCS Procedure Groups (Reference group: Composite of all other CCS procedure groups)	164 - Other OR therapeutic procedures on musculoskeletal system	3,293	0.1	0.247	0.044	<.0001	1.28	1.17	1.39
prc_168	CCS Procedure Groups (Reference group: Composite of all other CCS procedure groups)	168 - Incision and drainage; skin and subcutaneous tissue	28,504	0.5	0.227	0.017	<.0001	1.25	1.21	1.30
prc_170	CCS Procedure Groups (Reference group: Composite of all other CCS procedure groups)	170 - Excision of skin lesion	5,375	0.1	0.084	0.037	0.0225	1.09	1.01	1.17
prc_171	CCS Procedure Groups (Reference group: Composite of all other CCS procedure groups)	171 - Suture of skin and subcutaneous tissue	19,350	0.3	0.077	0.020	0.0001	1.08	1.04	1.12

Variable Name in Model	VariableGroup	Covariate	Count	Percent Total	Estimate	Std. Error	P value	Odds Ratio	OR 95% Lower CL	OR 95% Upper CL
prc_173	CCS Procedure Groups (Reference group: Composite of all other CCS procedure groups)	173 - Other diagnostic procedures on skin and subcutaneous tissue	3,385	0.1	-0.262	0.040	<.0001	0.77	0.71	0.83
prc_174	CCS Procedure Groups (Reference group: Composite of all other CCS procedure groups)	174 - Other non-OR therapeutic procedures on skin and breast	22,713	0.4	-0.087	0.016	<.0001	0.92	0.89	0.95
prc_175	CCS Procedure Groups (Reference group: Composite of all other CCS procedure groups)	175 - Other OR therapeutic procedures on skin and breast	3,949	0.1	0.146	0.049	0.0031	1.16	1.05	1.27
prc_176	CCS Procedure Groups (Reference group: Composite of all other CCS procedure groups)	176 - Organ transplantation (other than bone marrow, corneal or kidney)	1,541	0.0	0.392	0.064	<.0001	1.48	1.30	1.68
prc_177	CCS Procedure Groups (Reference group: Composite of all other CCS procedure groups)	177 - Computerized axial tomography (CT) scan head	27,512	0.4	0.014	0.017	0.3968	1.01	0.98	1.05
prc_190	CCS Procedure Groups (Reference group: Composite of all other CCS procedure groups)	190 - Contrast arteriogram of femoral and lower extremity arteries	25,747	0.4	-0.159	0.017	<.0001	0.85	0.83	0.88
prc_193	CCS Procedure Groups (Reference group: Composite of all other CCS procedure groups)	193 - Diagnostic ultrasound of heart (echocardiogram)	139,468	2.2	0.029	0.008	0.0002	1.03	1.01	1.05
prc_198	CCS Procedure Groups (Reference group: Composite of all other CCS procedure groups)	198 - Magnetic resonance imaging	23,978	0.4	0.037	0.018	0.0443	1.04	1.00	1.08

Variable Name in Model	VariableGroup	Covariate	Count	Percent Total	Estimate	Std. Error	P value	Odds Ratio	OR 95% Lower CL	OR 95% Upper CL
prc_199	CCS Procedure Groups (Reference group: Composite of all other CCS procedure groups)	199 - Electroencephalogram (EEG)	8,653	0.1	0.067	0.028	0.0173	1.07	1.01	1.13
prc_202	CCS Procedure Groups (Reference group: Composite of all other CCS procedure groups)	202 - Electrocardiogram	7,806	0.1	0.009	0.030	0.7521	1.01	0.95	1.07
prc_203	CCS Procedure Groups (Reference group: Composite of all other CCS procedure groups)	203 - Electrographic cardiac monitoring	8,272	0.1	-0.025	0.029	0.4005	0.98	0.92	1.03
prc_204	CCS Procedure Groups (Reference group: Composite of all other CCS procedure groups)	204 - Swan-Ganz catheterization for monitoring	10,242	0.2	-0.132	0.028	<.0001	0.88	0.83	0.93
prc_211	CCS Procedure Groups (Reference group: Composite of all other CCS procedure groups)	211 - Radiation therapy	2,846	0.0	-0.438	0.047	<.0001	0.65	0.59	0.71
prc_214	CCS Procedure Groups (Reference group: Composite of all other CCS procedure groups)	214 - Traction; splints; and other wound care	14,466	0.2	0.018	0.023	0.4197	1.02	0.97	1.06
prc_218	CCS Procedure Groups (Reference group: Composite of all other CCS procedure groups)	218 - Psychological and psychiatric evaluation and therapy	4,002	0.1	0.071	0.041	0.0821	1.07	0.99	1.16
prc_221	CCS Procedure Groups (Reference group: Composite of all other CCS procedure groups)	221 - Nasogastric tube	12,648	0.2	0.050	0.024	0.0381	1.05	1.00	1.10

Variable Name in Model	VariableGroup	Covariate	Count	Percent Total	Estimate	Std. Error	P value	Odds Ratio	OR 95% Lower CL	OR 95% Upper CL
prc_222	CCS Procedure Groups (Reference group: Composite of all other CCS procedure groups)	222 - Blood transfusion	383,923	6.1	-0.109	0.005	<.0001	0.90	0.89	0.91
prc_224	CCS Procedure Groups (Reference group: Composite of all other CCS procedure groups)	224 - Cancer chemotherapy	2,261	0.0	-0.531	0.046	<.0001	0.59	0.54	0.64
prc_227	CCS Procedure Groups (Reference group: Composite of all other CCS procedure groups)	227 - Other diagnostic procedures	41,170	0.7	0.016	0.013	0.2364	1.02	0.99	1.04
prc_231	CCS Procedure Groups (Reference group: Composite of all other CCS procedure groups)	231 - Other therapeutic procedures	160,499	2.5	-0.002	0.007	0.7405	1.00	0.98	1.01
hcc_2	HCC Comorbidities	2 - Septicemia/Shock	616,672	9.7	0.010	0.004	<.0001	1.01	1.02	1.04
hcc_5	HCC Comorbidities	5 - Opportunistic Infections	70,460	1.1	-0.081	0.009	<.0001	0.92	1.02	1.07
hcc_7	HCC Comorbidities	7 - Metastatic Cancer and Acute Leukemia	178,814	2.8	-0.551	0.006	<.0001	0.58	0.89	0.90
hcc_8	HCC Comorbidities	8 - Lung, Upper Digestive Tract, and Other Severe Cancers	131,592	2.1	-0.255	0.007	<.0001	0.77	0.95	0.96
hcc_9	HCC Comorbidities	9 - Lymphatic, Head and Neck, Brain, and Other Major Cancers	185,596	2.9	-0.141	0.006	<.0001	0.87	0.74	0.86
hcc_10	HCC Comorbidities	10 - Breast, Prostate, Colorectal and Other Cancers and Tumors	665,679	10.5	0.029	0.004	<.0001	1.03	0.85	0.86
hcc_15	HCC Comorbidities	15 - Diabetes with Renal or Peripheral Circulatory Manifestation	758,357	12.0	-0.162	0.004	<.0001	0.85	1.02	1.05
hcc_16	HCC Comorbidities	16 - Diabetes with Neurologic or Other Specified Manifestation	563,175	8.9	-0.120	0.004	<.0001	0.89	0.93	0.96
hcc_18	HCC Comorbidities	18 - Diabetes with Ophthalmologic or Unspecified Manifestation	129,150	2.0	-0.069	0.007	<.0001	0.93	0.76	0.78
hcc_19	HCC Comorbidities	19 - Diabetes without Complication	1,412,823	22.3	-0.036	0.003	<.0001	0.96	0.86	0.87
hcc_21	HCC Comorbidities	21 - Protein-Calorie Malnutrition	570,416	9.0	-0.116	0.004	<.0001	0.89	0.75	0.76
hcc_25	HCC Comorbidities	25 - End-Stage Liver Disease	75,942	1.2	-0.272	0.009	<.0001	0.76	0.82	0.84
hcc_26	HCC Comorbidities	26 - Cirrhosis of Liver	68,733	1.1	-0.150	0.009	<.0001	0.86	0.84	0.86
hcc_27	HCC Comorbidities	27 - Chronic Hepatitis	51,118	0.8	-0.077	0.011	0.0566	0.93	1.00	1.16
hcc_31	HCC Comorbidities	31 - Intestinal Obstruction/Perforation	393,003	6.2	0.048	0.005	<.0001	1.05	1.03	1.06
hcc_38	HCC Comorbidities	38 - Rheumatoid Arthritis and Inflammatory Connective Tissue Disease	744,800	11.8	-0.030	0.003	<.0001	.97	0.93	0.95
hcc_44	HCC Comorbidities	44 - Severe Hematological Disorders	125,317	2.0	-0.173	0.007	<.0001	0.84	1.17	1.19
hcc_45	HCC Comorbidities	45 - Disorders of Immunity	145,896	2.3	-0.093	0.007	<.0001	0.91	0.88	0.89
hcc_52	HCC Comorbidities	52 - Drug/Alcohol Dependence	187,084	3.0	-0.104	0.006	<.0001	0.90	1.10	1.14

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hcc_54	HCC Comorbidities	54 - Schizophrenia	152,307	2.4	-0.144	0.007	<.0001	0.87	0.91	0.96
hcc_67	HCC Comorbidities	67 - Quadriplegia, Other Extensive Paralysis	61,915	1.0	-0.167	0.010	<.0001	0.85	0.87	0.89
hcc_68	HCC Comorbidities	68 - Paraplegia	54,000	0.9	-0.169	0.010	<.0001	0.84	0.93	0.96
hcc_70	HCC Comorbidities	70 - Muscular Dystrophy	9,293	0.1	0.039	0.026	<.0001	1.04	0.92	0.95
hcc_71	HCC Comorbidities	71 - Polyneuropathy	1,227,244	19.4	-0.022	0.003	<.0001	0.98	0.96	0.97
hcc_72	HCC Comorbidities	72 - Multiple Sclerosis	72,083	1.1	-0.117	0.009	0.0123	0.89	1.00	1.02
hcc_73	HCC Comorbidities	73 - Parkinsons and Huntingtons Diseases	294,613	4.7	-0.092	0.005	<.0001	0.91	0.88	0.90
hcc_74	HCC Comorbidities	74 - Seizure Disorders and Convulsions	483,024	7.6	-0.037	0.004	<.0001	0.96	0.75	0.78
hcc_77	HCC Comorbidities	77 - Respirator Dependence/Tracheostomy Status	87,002	1.4	0.036	0.009	<.0001	1.04	0.85	0.88
hcc_78	HCC Comorbidities	78 - Respiratory Arrest	22,117	0.3	-0.062	0.016	<.0001	0.94	0.91	0.95
hcc_79	HCC Comorbidities	79 - Cardio-Respiratory Failure and Shock	1,269,195	20.1	-0.076	0.003	<.0001	0.93	1.04	1.06
hcc_80	HCC Comorbidities	80 - Congestive Heart Failure	2,526,406	39.9	-0.206	0.003	<.0001	0.81	0.96	0.98
hcc_82	HCC Comorbidities	82 - Unstable Angina and Other Acute Ischemic Heart Disease	368,220	5.8	0.005	0.004	<.0001	1.00	0.83	0.85
hcc_92	HCC Comorbidities	92 - Specified Heart Arrhythmias	2,188,883	34.6	-0.106	0.002	<.0001	0.90	0.90	0.92
hcc_95	HCC Comorbidities	95 - Cerebral Hemorrhage	153,499	2.4	0.069	0.008	<.0001	1.07	0.91	0.94
hcc_96	HCC Comorbidities	96 - Ischemic or Unspecified Stroke	871,583	13.8	-0.005	0.003	<.0001	1.00	0.89	0.91
hcc_101	HCC Comorbidities	101 - Cerebral Palsy and Other Paralytic Syndromes	46,764	0.7	0.047	0.012	<.0001	1.05	0.85	0.88
hcc_104	HCC Comorbidities	104 - Vascular Disease with Complications	561,336	8.9	-0.111	0.004	<.0001	0.90	0.83	0.86
hcc_105	HCC Comorbidities	105 - Vascular Disease	2,128,556	33.6	-0.047	0.002	<.0001	0.95	0.83	0.86
hcc_107	HCC Comorbidities	107 - Cystic Fibrosis	3,965	0.1	-0.224	0.039	<.0001	0.80	0.57	0.58
hcc_108	HCC Comorbidities	108 - Chronic Obstructive Pulmonary Disease	2,205,324	34.9	-0.156	0.002	0.1332	0.86	0.99	1.09
hcc_112	HCC Comorbidities	112 - Pneumococcal Pneumonia, Emphysema, Lung Abscess	86,331	1.4	0.035	0.008	<.0001	1.04	0.97	0.98
hcc_119	HCC Comorbidities	119 - Proliferative Diabetic Retinopathy and Vitreous Hemorrhage	108,745	1.7	-0.057	0.008	<.0001	0.94	0.87	0.91
hcc_130	HCC Comorbidities	130 - Dialysis Status	149,414	2.4	-0.261	0.008	<.0001	0.77	0.90	0.92
hcc_131	HCC Comorbidities	131 - Renal Failure	2,059,048	32.6	-0.141	0.002	<.0001	0.87	0.96	0.97
hcc_148	HCC Comorbidities	148 - Decubitus Ulcer of Skin	464,596	7.3	-0.287	0.004	<.0001	0.75	1.02	1.05
hcc_149	HCC Comorbidities	149 - Chronic Ulcer of Skin, Except Decubitus	400,818	6.3	-0.186	0.004	<.0001	0.83	0.91	0.97
hcc_154	HCC Comorbidities	154 - Severe Head Injury	4,293	0.1	0.074	0.039	<.0001	1.08	0.92	0.93
hcc_155	HCC Comorbidities	155 - Major Head Injury	173,207	2.7	0.047	0.007	<.0001	1.05	0.76	0.79
hcc_157	HCC Comorbidities	157 - Vertebral Fractures without Spinal Cord Injury	331,489	5.2	-0.063	0.005	<.0001	0.94	0.81	0.82
hcc_158	HCC Comorbidities	158 - Hip Fracture/Dislocation	495,738	7.8	0.167	0.004	0.2630	1.18	1.00	1.01
hcc_161	HCC Comorbidities	161 - Traumatic Amputation	53,199	0.8	0.114	0.011	<.0001	1.12	0.86	0.88
hcc_174	HCC Comorbidities	174 - Major Organ Transplant Status	31,233	0.5	-0.071	0.014	<.0001	0.93	0.90	0.90
hcc_176	HCC Comorbidities	176 - Artificial Openings for Feeding or Elimination	211,522	3.3	-0.129	0.006	<.0001	0.88	1.06	1.09
hcc_177	HCC Comorbidities	177 - Amputation Status, Lower Limb/Amputation Complications	101,968	1.6	-0.053	0.008	0.1225	0.95	0.99	1.00

Table B-1. Home Health Agency Level Observed and Risk Standardized Discharge to Community Rates 2012-2013

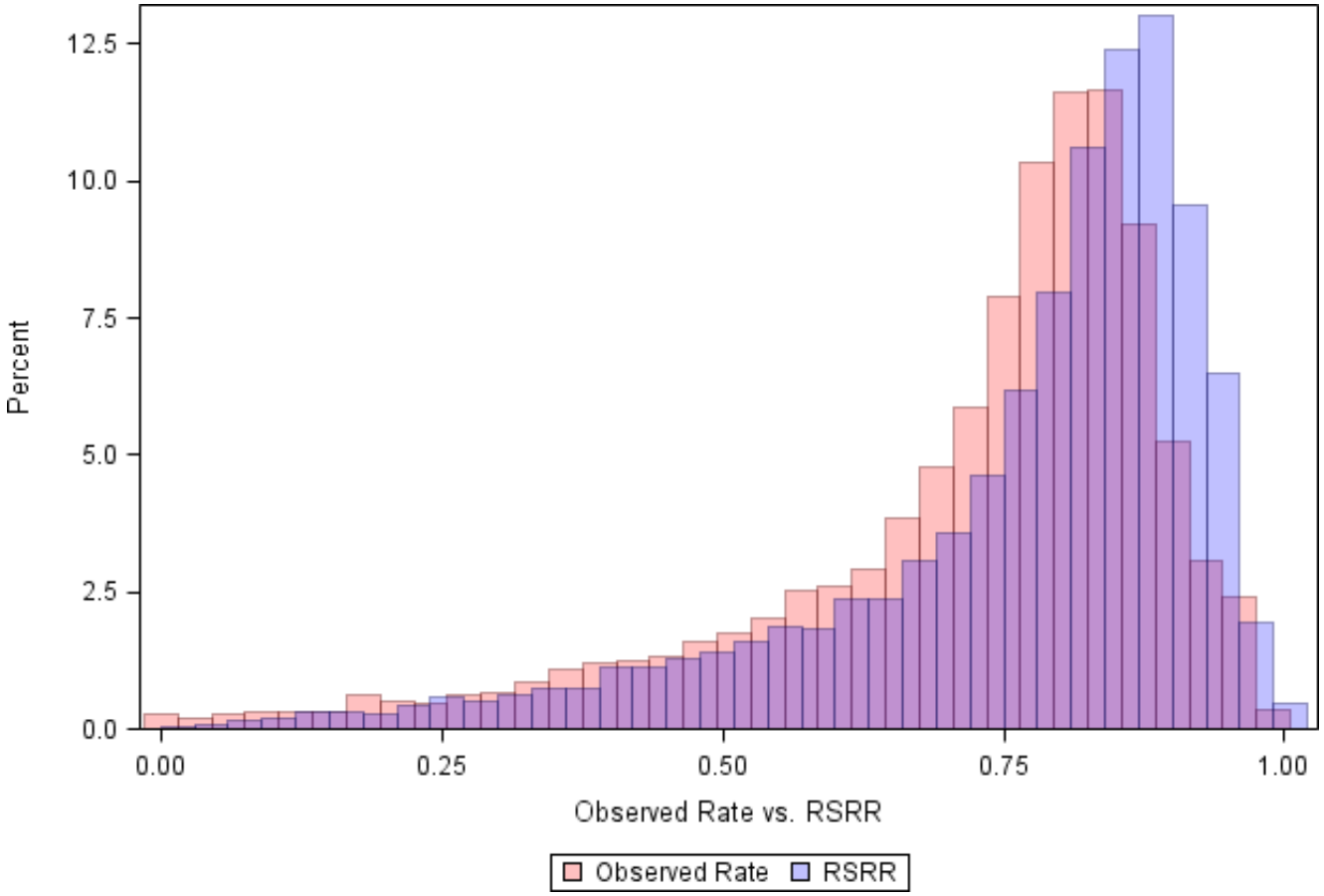
Discharge to Community Rate	Mean	SD	Min	1st pctl	5th pctl	10th pctl	25th pctl	50th pctl (Median)	75th pctl	90th pctl	95th pctl	99th pctl	Max
Observed	0.72	0.18	0.00	0.10	0.33	0.46	0.65	0.78	0.84	0.89	0.92	0.97	1.00
Risk-Standardized	0.77	0.17	0.01	0.17	0.39	0.51	0.71	0.82	0.88	0.93	0.95	0.97	1.00

NOTE: SD = standard deviation, pctl = percentile.

Figure B-1. Home Health: Agency-Level Observed and Risk-Standardized Discharge to Community Rates, 2012-2013

Observed N = 10,952; Mean (StD) = 0.722 (0.182)

RSRR N = 10,952; Mean (StD) = 0.767 (0.175)



APPENDIX C. NATIONAL BETA TEST SUPPLEMENTARY TABLES

The reference tables in this appendix refer to the SPADEs tested in the National Field Test. Alphanumeric item numbers (Example: b1a, b1b, b1c) refer to the items as labeled in the assessment protocols, which are available for download here: https://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/Post-Acute-Care-Quality-Initiatives/IMPACT-Act-of-2014/-IMPACT-Act-Standardized-Assessment-National-Testing-.html

Table 1.2: Assessment Counts for National Beta Test Results

Assessment type **# of facilities**	**HHA** N=35	**IRF** N=22	**LTCH** N=26	**SNF** N=60	**Overall** **N=143**
Communicative Admission	653	794	507	1167	**3121**
Communicative Time to Complete (Facility/Agency Staff only)	469	549	386	565	**1969**
Communicative IRR	198	261	242	274	**976**

Table 1.3: Frequency and Percentage of Assessments Completed of Each Module

Module	**Domains**	**Frequency (Communicative, N=3121)**	**Percent**
A1-A2	Hearing and Vision	3065	98.2
B1	Brief Interview for Mental Status (BIMS)	3062	98.1
D	Pain Interview	3031	97.1
E1	PHQ-2 to 9	3010	96.4
B2	Confusion Assessment Method (CAM)	2973	95.3
I	Medication Reconciliation Protocol	2951	94.6
J	Special Services, Treatments, and Interventions (SSTI)	2926	93.8
All modules	At least one response in each module	2795	89.2

NOTE: Percentage of assessments are based on assessments used in the frequency tables where "completed" means responded to at least one data element.

COGNITIVE STATUS: Brief Interview for Mental Status (BIMS)

Table 2.1.1: Admission Response Distributions (in Percentages) for BIMS Items

Items	HHA	IRF	LTCH	SNF	Overall
# of assessments	646	786	496	1134	**3062**
# of words repeated after 1st attempt (b1a)	-	-	-	-	**-**
Three	94	96	91	94	**94**
Two	4	3	4	4	**4**
One	1	1	2	1	**1**
None or no answer	0	1	3	1	**1**
Recalls current year (b1b)	-	-	-	-	**-**
Correct	89	94	88	87	**89**
Missed by 1 year	2	1	4	2	**2**
Missed by 2-5 years	1	1	1	2	**1**
Missed by >5 years or no answer	7	4	8	9	**7**
Recalls current month (b1c)	-	-	-	-	**-**
Accurate within 5 days	94	93	90	90	**91**
Missed by 6 days - 1 mo	3	3	2	4	**3**
Missed by >1 mo or no answer	4	4	8	6	**5**
Recalls current day of week (b1d)	-	-	-	-	**-**
Accurate	88	84	77	76	**81**
Incorrect or no answer	12	16	23	24	**19**
Recalls 'sock' (b1e)	-	-	-	-	**-**
Yes, no cue required	80	84	78	76	**79**
Yes, after cue	9	5	9	9	**8**
No recall or answer	11	11	13	15	**13**
Recalls 'blue' (b1f)	-	-	-	-	**-**
Yes, no cue required	84	85	78	79	**81**
Yes after cue	11	11	12	13	**12**
No recall or answer	6	5	10	8	**7**
Recalls 'bed' (b1g)	-	-	-	-	**-**
Yes, no cue required	73	75	64	66	**70**
Yes, after cue	12	10	12	14	**12**
No recall or answer	14	14	24	19	**18**
BIMS Impairment Category					

Items	HHA	IRF	LTCH	SNF	Overall
Intact	80	82	73	72	**76**
Moderately impaired	17	15	19	22	**18**
Severely impaired	4	3	7	7	**5**

Table 2.1.2: IRR Kappa/Weighted Kappa and Percent Agreement for BIMS Items

Items	HHA	IRF	LTCH	SNF	Overall
# of patients	199	259	238	270	**966**
Kappa/weighted kappa					
# of words repeated after 1st attempt (b1a)	-	-	-	-	**-**
Recalls current year (b1b)	0.88	-	0.90	0.93	**0.90**
Recalls current month (b1c)	-	-	0.89	0.86	**-**
Recalls current day of week (b1d)	0.92	0.81	0.91	0.86	**0.88**
Recalls 'sock' (b1e)	0.87	0.91	0.91	0.91	**0.91**
Recalls 'blue' (b1f)	0.84	0.82	0.87	0.78	**0.83**
Recalls 'bed' (b1g)	0.93	0.90	0.93	0.93	**0.93**
BIMS Impairment Category	0.94	0.85	0.91	0.91	**0.91**
Percent agreement	-	-	-	-	**-**
# of words repeated after 1st attempt (b1a)	96	97	96	96	**96**
Recalls current year (b1b)	97	98	97	97	**98**
Recalls current month (b1c)	98	99	97	96	**98**
Recalls current day of week (b1d)	98	94	97	95	**96**
Recalls 'sock' (b1e)	94	97	95	96	**95**
Recalls 'blue' (b1f)	95	95	93	91	**94**
Recalls 'bed' (b1g)	96	95	95	96	**96**
BIMS Impairment Category	97	95	95	95	**96**

NOTE: 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: slight/poor; 0.21-0.40: fair; 0.41-0.60: moderate; 0.61-0.80: substantial/good; 0.81-1.00: excellent/almost perfect.

COGNITIVE STATUS: Confusion Assessment Method (CAM)

Table 2.2.1: Admission Response Distributions (in Percentages) for CAM Items

Items	HHA	IRF	LTCH	SNF	Overall
# of assessments	630	771	471	1101	**2973**
Evidence of change in mental status from baseline (b2a)					
Yes	5	6	5	4	**5**
Did patient have difficulty focusing attn (b2b)					
Behavior not present	89	85	89	90	**88**
Behavior continuously present	2	3	3	3	**3**
Behavior present, fluctuates	9	11	8	8	**9**
Was patient thinking disorganized (b2c)					
Behavior not present	95	94	93	94	**94**
Behavior continuously present	1	2	2	1	**1**
Behavior present, fluctuates	4	5	4	6	**5**
Did patient have altered consciousness (b2d)					
Behavior not present	98	95	94	96	**96**
Behavior continuously present	1	1	2	1	**1**
Behavior present, fluctuates	2	3	3	3	**3**

Table 2.2.2: IRR Kappa/Weighted Kappa and Percent Agreement for CAM items

Items	HHA	IRF	LTCH	SNF	Overall
# of patients	189	245	223	257	**914**
Kappa/weighted kappa					
Evidence of change in mental status from baseline (b2a)	-	0.60	-	-	**-**
Did patient have difficulty focusing attn (b2b)	0.66	0.55	0.75	0.70	**0.66**
Was patient thinking disorganized (b2c)	-	-	-	0.68	**-**
Did patient have altered consciousness (b2d)	-	-	-	-	**-**
Percent agreement	-	-	-	-	**-**
Evidence of change in mental status from baseline (b2a)	97	93	98	97	**96**
Did patient have difficulty focusing attn (b2b)	91	89	93	93	**91**
Was patient thinking disorganized (b2c)	94	93	96	94	**94**
Did patient have altered consciousness (b2d)	98	97	95	96	**96**

NOTE: 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: slight/poor; 0.21-0.40: fair; 0.41-0.60: moderate: 0.61-0.80: substantial/good; 0.81-1.00: excellent/almost perfect.

Mental Status: PHQ-2 to 9

Table 3.1.1: Admission Response Distribution (in Percentages) for PHQ-2 to 9 Items

Items	HHA	IRF	LTCH	SNF	Overall
# of assessments	639	776	479	1116	**3010**
Symptom presence & frequency: little interest or pleasure (e1a)	-	-	-	-	**-**
No	65	61	56	65	**62**
0-1 day	4	4	5	3	**4**
2-6 days	15	16	13	13	**14**
7-11 days (half or more)	9	10	11	9	**10**
12-14 days (nearly all)	8	10	16	10	**11**
Symptom presence & frequency: feeling down, depressed, hopeless (e1b)	-	-	-	-	**-**
No	62	57	49	58	**57**
0-1 day	3	6	4	5	**4**
2-6 days	20	19	19	19	**19**
7-11 days (half or more)	7	9	13	8	**9**
12-14 days (nearly all)	8	8	16	11	**10**
PHQ-2	-	-	-	-	**-**
Mean (SD)	2.2 (1.6)	2.3 (1.7)	2.7 (1.8)	2.4 (1.7)	**2.4 (1.7)**
Eligible for PHQ-9 per PHQ-2	-	-	-	-	**-**
Yes	24	27	38	27	**28**
# of assessments eligible for PHQ-9 per PHQ-2	153	209	182	306	**850**
Symptom presence & frequency: too little/too much sleep (e1c)	-	-	-	-	**-**
No	30	34	34	33	**33**
0-1 day	2	3	1	2	**2**
2-6 days	15	15	13	16	**15**
7-11 days (half or more)	19	16	20	16	**17**
12-14 days (nearly all)	34	31	32	34	**33**
Symptom presence & frequency: tired / no energy (e1d)	-	-	-	-	-
No	10	11	13	10	**11**

Items	HHA	IRF	LTCH	SNF	Overall
0-1 day	1	0	1	1	**1**
2-6 days	9	17	13	17	**15**
7-11 days (half or more)	27	26	23	28	**26**
12-14 days (nearly all)	52	46	50	44	**48**
Symptom presence & frequency: poor appetite or overeating (e1e)	-	-	-	-	**-**
No	50	43	34	46	**44**
0-1 day	1	2	2	1	**1**
2-6 days	9	11	10	9	**10**
7-11 days (half or more)	17	13	16	15	**15**
12-14 days (nearly all)	22	31	39	29	**30**
Symptom presence & frequency: feel bad about self (e1f)	-	-	-	-	**-**
No	55	52	51	58	**55**
0-1 day	1	2	1	1	**1**
2-6 days	12	12	12	10	**12**
7-11 days (half or more)	15	16	10	12	**13**
12-14 days (nearly all)	17	17	26	18	**19**
Symptom presence & frequency: trouble concentrating (e1g)	-	-	-	-	**-**
No	54	47	44	48	**48**
0-1 day	1	1	1	1	**1**
2-6 days	15	16	9	16	**14**
7-11 days (half or more)	11	11	12	13	**12**
12-14 days (nearly all)	19	25	34	22	**25**
Symptom presence & frequency: moving or speaking slowly (e1h)	-	-	-	-	**-**
No	64	62	50	68	**62**
0-1 day	1	0	2	1	**1**
2-6 days	9	9	10	7	**9**
7-11 days (half or more)	8	13	13	10	**11**
12-14 days (nearly all)	18	16	25	14	**18**
Symptom presence & frequency: suicidal thoughts (e1i)	-	-	-	-	**-**
No	82	78	77	80	**79**

Items	HHA	IRF	LTCH	SNF	Overall
0-1 day	2	4	3	2	**3**
2-6 days	9	7	7	9	**8**
7-11 days (half or more)	5	3	5	5	**4**
12-14 days (nearly all)	3	7	7	4	**5**
PHQ-9	-	-	-	-	**-**
Mean (SD)	11.4 (5.0)	11.8 (5.3)	13.0 (5.8)	11.5 (5.1)	**11.9 (5.3)**
Depression categorization (PHQ-9)	-	-	-	-	**-**
None (0 – 4)	10	4	6	7	**6**
Mild (5 – 9)	27	36	27	33	**31**
Moderate (10 – 14)	37	32	25	34	**32**
Moderately severe (15 – 19)	20	19	28	18	**21**
Severe (20 – 27)	6	9	14	8	**9**

Table 3.1.2: IRR Kappa/Weighted Kappa and Percent Agreement for PHQ-2 to 9 Items

Items	HHA	IRF	LTCH	SNF	Overall
# of patients	196	254	231	267	**948**
Kappa/weighted kappa	-	-	-	-	**-**
Symptom present: little interest or pleasure (e1a1)	0.95	0.99	0.99	0.98	**0.98**
Symptom frequency: little interest or pleasure (e1a2)	0.98	1.00	0.98	0.98	**0.99**
Symptom present: feeling down, depressed, hopeless (e1b1)	0.99	0.98	1.00	0.99	**0.99**
Symptom frequency: feeling down, depressed, hopeless (e1b2)	0.93	0.98	0.98	0.99	**0.98**
Eligible for PHQ-9 per PHQ-2	0.96	0.98	0.98	0.98	**0.98**
Symptom present: too little/too much sleep (e1c1)	0.90	1.00	1.00	1.00	**0.98**
Symptom frequency: too little/too much sleep (e1c2)	1.00	0.98	0.90	0.96	**0.96**
Symptom present: tired / no energy (e1d1)	1.00	0.91	0.95	0.94	**0.95**
Symptom frequency: tired / no energy (e1d2)	1.00	0.93	0.98	1.00	**0.98**
Symptom present: poor appetite or overeating (e1e1)	0.96	0.93	0.95	1.00	**0.96**
Symptom frequency: poor appetite or overeating (e1e2)	1.00	1.00	1.00	1.00	**1.00**

Items	HHA	IRF	LTCH	SNF	Overall
Symptom present: feel bad about self (e1f1)	1.00	1.00	1.00	1.00	**1.00**
Symptom frequency: feel bad about self (e1f2)	1.00	1.00	0.95	1.00	**0.98**
Symptom present: trouble concentrating (e1g1)	1.00	1.00	1.00	0.97	**0.99**
Symptom frequency: trouble concentrating (e1g2)	0.96	0.97	0.94	1.00	**0.97**
Symptom present: moving or speaking slowly (e1h1)	1.00	0.94	0.90	1.00	**0.95**
Symptom frequency: moving or speaking slowly (e1h2)	1.00	0.87	1.00	1.00	**0.97**
Symptom present: suicidal thoughts (e1i1)	1.00	1.00	0.94	1.00	**0.98**
Symptom frequency: suicidal thoughts (e1i2)	0.93	1.00	0.95	1.00	**0.97**
Sum of all symptom frequencies (PHQ-9) *	0.97	0.95	0.95	0.97	**0.96**
Percent Agreement	-	-	-	-	**-**
Symptom present: little interest or pleasure (e1a1)	97	100	100	99	**99**
Symptom frequency: little interest or pleasure (e1a2)	99	100	98	98	**99**
Symptom present: feeling down, depressed, hopeless (e1b1)	99	99	100	100	**100**
Symptom frequency: feeling down, depressed, hopeless (e1b2)	95	98	98	99	**98**
Eligible for PHQ-9 per PHQ-2	98	99	99	99	**99**
Symptom present: too little/too much sleep (e1c1)	96	100	100	100	**99**
Symptom frequency: too little/too much sleep (e1c2)	100	98	94	96	**97**
Symptom present: tired / no energy (e1d1)	100	98	99	99	**99**
Symptom frequency: tired / no energy (e1d2)	100	96	99	100	**99**
Symptom present: poor appetite or overeating (e1e1)	98	97	97	100	**98**
Symptom frequency: poor appetite or overeating (e1e2)	100	100	100	100	**100**
Symptom present: feel bad about self (e1f1)	100	100	100	100	**100**
Symptom frequency: feel bad about self (e1f2)	100	100	95	100	**98**
Symptom present: trouble concentrating (e1g1)	100	100	100	99	**100**
Symptom frequency: trouble concentrating (e1g2)	96	97	97	100	**98**
Symptom present: moving or speaking slowly (e1h1)	100	97	95	100	**98**
Symptom frequency: moving or speaking slowly (e1h2)	100	93	100	100	**98**
Symptom present: suicidal thoughts (e1i1)	100	100	98	100	**99**
Symptom frequency: suicidal thoughts (e1i2)	93	100	95	100	**97**

Items	HHA	IRF	LTCH	SNF	Overall
Sum of all symptom frequencies (PHQ-9)*	96	94	94	96	**95**

NOTE: As classified into the five categories shown in Table 3.1.1. Interpretation of kappa or weighted kappa is as follows: 0.00-0.20: slight/poor; 0.21-0.40: fair; 0.41-0.60: moderate: 0.61-0.80: substantial/good; 0.81-1.00: excellent/almost perfect.

Special Services, Treatments and Interventions (SSTI)

Table 4.1.1: Admission Response Distributions (in Percentages) for SSTI Chemotherapy Items

Items	HHA	IRF	LTCH	SNF	Overall
# of assessments	629	762	448	1087	**2926**
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**

Table 4.1.2: IRR Kappa and Percent Agreement for SSTI Chemotherapy Items

Items	HHA	IRF	LTCH	SNF	Overall
# of patients	187	236	203	256	**882**
Kappa/Weighted kappa	-	-	-	-	**-**
Noted treatment performed: Chemotherapy (j2a)	-	-	-	-	-
Noted chemo treatment performed: IV (j2a2a)	-	-	-	-	-
Noted chemo treatment performed: oral (j2a3a)	-	-	-	-	-
Noted chemo treatment performed: other (j2a10a)	-	-	-	-	-
Percent Agreement	-	-	-	-	**-**
Noted treatment performed: Chemotherapy (j2a)	99	100	100	99	**100**
Noted chemo treatment performed: IV (j2a2a)	100	100	100	99	**100**
Noted chemo treatment performed: oral (j2a3a)	100	100	100	100	**100**
Noted chemo treatment performed: other (j2a10a)	100	100	100	100	**100**

NOTE: Based on dichotomized never noted vs. noted any day. 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: slight/poor; 0.21-0.40: fair; 0.41-0.60: moderate: 0.61-0.80: substantial/good; 0.81-1.00: excellent/almost perfect.

Table 4.2.1: Admission Response Distributions (in Percentages) for SSTI Radiation

Items	HHA	IRF	LTCH	SNF	Overall
# of assessments	629	762	448	1087	**2926**
Treatment performed: Radiation (j2b)	0	0	0	0	**0**

Table 4.2.2: IRR Kappa and Percent Agreement for SSTI – Radiation Item

Items	HHA	IRF	LTCH	SNF	Overall
# of patients	187	236	203	256	**882**
Kappa/Weighted kappa	-	-	-	-	**-**
Noted treatment performed: Radiation (j2b)	-	-	-	-	-
Percent Agreement	-	-	-	-	**-**
Noted treatment performed: Radiation (j2b)	99	100	100	100	**100**

NOTE: Based on dichotomized never noted vs. noted any day. 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: slight/poor; 0.21-0.40: fair; 0.41-0.60: moderate: 0.61-0.80: substantial/good; 0.81-1.00: excellent/almost perfect.

Table 4.3.1: Admission Response Distributions (in Percentages) for SSTI – Oxygen Therapy Items

Items	HHA	IRF	LTCH	SNF	Overall
# of assessments	629	762	448	1087	**2926**
Treatment performed: Oxygen Therapy (j2c)	13	17	44	16	**20**
Type of O2 therapy performed: intermittent (j2c2a)	7	11	37	11	**14**
Type of O2 therapy performed: continuous (j2c3a)	6	8	5	5	**6**
Type of O2 therapy performed: high-concentration (j2c4a)	0	1	6	0	**1**

Table 4.3.2: IRR Kappa and Percent Agreement for SSTI – Oxygen Therapy Items

Items	HHA	IRF	LTCH	SNF	Overall
# of patients	187	236	203	256	**882**
Kappa	-	-	-	-	**-**
Treatment performed: Oxygen Therapy (j2c)	0.82	0.80	0.86	0.71	**0.82**
Type of O2 therapy performed: intermittent (j2c2a)	-	0.76	0.82	0.75	**0.81**
Type of O2 therapy performed: continuous (j2c3a)	-	0.68	0.35	-	0.55
Type of O2 therapy performed: high-concentration (j2c4a)	-	-	-	-	-
Percent Agreement	-	-	-	-	**-**
Treatment performed: Oxygen Therapy (j2c)	96	94	93	91	**93**
Type of O2 therapy performed: intermittent (j2c2a)	98	95	92	95	**95**
Type of O2 therapy performed: continuous (j2c3a)	97	95	92	93	**94**
Type of O2 therapy performed: high-concentration (j2c4a)	100	100	97	100	**99**

NOTE: Based on dichotomized never noted vs. noted any day. 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: slight/poor; 0.21-0.40: fair; 0.41-0.60: moderate: 0.61-0.80: substantial/good; 0.81-1.00: excellent/almost perfect.

Table 4.4.1: Admission Response Distributions (in Percentages) for SSTI – Suctioning Items

Items	HHA	IRF	LTCH	SNF	Overall
# of assessments	629	762	448	1087	**2926**
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**

Table 4.4.2: IRR Kappa/Weighted Kappa and Percent Agreement for SSTI – Suctioning Items

Items	HHA	IRF	LTCH	SNF	Overall
# of patients	187	236	203	256	**882**
Kappa	-	-	-	-	**-**
Treatment performed: Suctioning (j2d)	-	-	-	-	-
Type of suctioning performed: scheduled (j2d2a)	-	-	-	-	-
Type of suctioning performed: as needed (j2d3a)	-	-	-	-	-
Percent Agreement	-	-	-	-	**-**
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**

NOTE: Based on dichotomized never noted vs. noted any day. 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: slight/poor; 0.21-0.40: fair; 0.41-0.60: moderate: 0.61-0.80: substantial/good; 0.81-1.00: excellent/almost perfect.

Table 4.5.1: Admission Response Distributions (in Percentages) for SSTI – Tracheostomy Care Item

Items	HHA	IRF	LTCH	SNF	Overall
# of assessments	629	762	448	1087	**2926**
Treatment performed: Tracheostomy Care (j2e)	0	1	5	0	**1**

Table 4.5.2: IRR Kappa and Percent Agreement for SSTI – Tracheostomy Care Item

Items	HHA	IRF	LTCH	SNF	Overall
# of patients	187	236	203	256	**882**
Kappa/Weighted kappa	-	-	-	-	**-**
Treatment performed: Tracheostomy Care (j2e)	-	-	-	-	-
Percent Agreement	-	-	-	-	**-**
Treatment performed: Tracheostomy Care (j2e)	100	100	99	100	**100**

NOTE: Based on dichotomized never noted vs. noted any day. 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: slight/poor; 0.21-0.40: fair; 0.41-0.60: moderate: 0.61-0.80: substantial/good; 0.81-1.00: excellent/almost perfect.

Table 4.6.1: Admission Response Distributions (in Percentages) for SSTI - Non-invasive Mechanical Ventilator (NIMV)

Items	HHA	IRF	LTCH	SNF	Overall
# of assessments	629	762	448	1087	**2926**
Treatment performed: Non-invasive Mechanical Ventilator (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**

Table 4.6.2: IRR Kappa/Weighted Kappa and Percent Agreement for SSTI – Non-invasive Mechanical Ventilator (NIMV) Items

Items	HHA	IRF	LTCH	SNF	Overall
# of patients	187	236	203	256	**882**
Kappa	-	-	-	-	**-**
Treatment performed: Non-invasive Mechanical Ventilator (j2g)	-	-	0.77	-	-
Type of NIMV performed: BiPAP (j2g2a)	-	-	-	-	-
Type of NIMV performed: CPAP (j2g3a)	-	-	-	-	-
Percent Agreement	-	-	-	-	**-**
Treatment performed: Non-invasive Mechanical Ventilator (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**

NOTE: Based on dichotomized never noted vs. noted any day. 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: slight/poor; 0.21-0.40: fair; 0.41-0.60: moderate: 0.61-0.80: substantial/good; 0.81-1.00: excellent/almost perfect.

Table 4.7.1: Admission Response Distributions (in Percentages) for SSTI - Invasive Mechanical Ventilator Item

Items	HHA	IRF	LTCH	SNF	Overall
# of assessments	629	762	448	1087	**2926**
Treatment performed: Invasive Mechanical Ventilator (j2f)	0	0	3	0	**0**

Table 4.7.2: IRR Kappa and Percent Agreement for SSTI – Invasive Mechanical Ventilator Item

Items	HHA	IRF	LTCH	SNF	Overall
# of patients	187	236	203	256	**882**
Kappa	-	-	-	-	**-**
Treatment performed: Invasive Mechanical Ventilator (j2f)	-	-	-	-	-
Percent Agreement	-	-	-	-	**-**
Treatment performed: Invasive Mechanical Ventilator (j2f)	100	100	100	100	**100**

NOTE: Based on dichotomized never noted vs. noted any day. 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: slight/poor; 0.21-0.40: fair; 0.41-0.60: moderate: 0.61-0.80: substantial/good; 0.81-1.00: excellent/almost perfect.

Table 4.8.1: Admission Response Distributions (in Percentages) for SSTI – IV Meds Items

Items	HHA	IRF	LTCH	SNF	Overall
# of assessments	629	762	448	1087	**2926**
Other treatment 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**

Table 4.8.2: IRR Kappa/Weighted Kappa and Percent Agreement for SSTI – IV Meds Items

Items	HHA	IRF	LTCH	SNF	Overall
# of patients	187	236	203	256	**882**
Kappa	-	-	-	-	**-**
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**
Percent Agreement	-	-	-	-	**-**
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**

NOTE: Based on dichotomized never noted vs. noted any day. 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: slight/poor; 0.21-0.40: fair; 0.41-0.60: moderate: 0.61-0.80: substantial/good; 0.81-1.00: excellent/almost perfect.

Table 4.9.1: Admission Response Distributions (in Percentages) for SSTI – Transfusions Item

Items	HHA	IRF	LTCH	SNF	Overall
# of assessments	629	762	448	1087	**2926**
Other treatment performed: Transfusions (j2i)	0	1	2	0	**0**

Table 4.9.2: IRR Kappa/Weighted Kappa and Percent Agreement for SSTI – Transfusions Item

Items	HHA	IRF	LTCH	SNF	Overall
# of patients	187	236	203	256	**882**
Kappa	-	-	-	-	**-**
Other treatment performed: Transfusions (j2i)	-	-	-	-	-
Percent Agreement	-	-	-	-	**-**
Other treatment performed: Transfusions (j2i)	100	99	99	100	**100**

NOTE: Based on dichotomized never noted vs. noted any day. 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: slight/poor; 0.21-0.40: fair; 0.41-0.60: moderate: 0.61-0.80: substantial/good; 0.81-1.00: excellent/almost perfect.

Table 4.10.1: Admission Response Distributions (in Percentages) for SSTI – Dialysis Items

Items	HHA	IRF	LTCH	SNF	Overall
# of assessments	629	762	448	1087	**2926**
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**

Table 4.10.2: IRR Kappa/Weighted Kappa and Percent Agreement for SSTI – Dialysis Items

Items	HHA	IRF	LTCH	SNF	Overall
# of patients	187	236	203	256	**882**
Kappa	-	-	-	-	**-**
Other treatment performed: Dialysis (j2j)	-	-	0.92	-	-
Type of dialysis performed: hemodialysis (j2j2a)	-	-	0.90	-	-
Type of dialysis performed: peritoneal (j2j3a)	-	-	-	-	-
Percent Agreement	-	-	-	-	**-**
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**

NOTE: Based on dichotomized never noted vs. noted any day. 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: slight/poor; 0.21-0.40: fair; 0.41-0.60: moderate: 0.61-0.80: substantial/good; 0.81-1.00: excellent/almost perfect.

Table 4.11.1: Admission Response Distributions (in Percentages) for SSTI – IV Access Items

Items	HHA	IRF	LTCH	SNF	Overall
# of assessments	629	762	448	1087	**2926**
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**

Table 4.11.2: IRR Kappa/Weighted Kappa and Percent Agreement for SSTI – IV Access Items

Items	HHA	IRF	LTCH	SNF	Overall
# of patients	187	236	203	256	**882**
Kappa	-	-	-	-	**-**
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	-	-
Type of IV access: central line (j2k4a)	-	-	0.78	-	**0.85**
Type of IV access: other (j2k10a)	-	-	-	-	-
Percent Agreement	-	-	-	-	**-**
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**

NOTE: Based on dichotomized never noted vs. noted any day. 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: slight/poor; 0.21-0.40: fair; 0.41-0.60: moderate: 0.61-0.80: substantial/good; 0.81-1.00: excellent/almost perfect.

Nutritional Approaches

Table 5.1.1: Admission Response Distributions (in Percentages) for Nutritional Approaches – Parenteral/IV Feeding Tube

Items	HHA	IRF	LTCH	SNF	Overall
# of assessments	629	762	448	1087	**2926**
Nutritional approach performed: parenteral/IV (j1a)	0	1	4	0	**1**

Table 5.1.2: IRR Kappa/Weighted Kappa and Percent Agreement for Nutritional Approaches– Parenteral/IV Feeding Tube

Items	HHA	IRF	LTCH	SNF	Overall
# of patients	187	236	203	256	**882**
Kappa	-	-	-	-	**-**
Nutritional approach performed: parenteral/IV (j1a)	-	-	-	-	-
Percent Agreement	-	-	-	-	**-**
Nutritional approach performed: parenteral/IV (j1a)	100	100	99	100	**100**

NOTE: Based on dichotomized never noted vs. noted any day. 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: slight/poor; 0.21-0.40: fair; 0.41-0.60: moderate: 0.61-0.80: substantial/good; 0.81-1.00: excellent/almost perfect.

Table 5.2.1: Admission Response Distributions (in Percentages) for Nutritional Approaches– Feeding Tube

Items	HHA	IRF	LTCH	SNF	Overall
# of assessments	629	762	448	1087	**2926**
Nutritional approach performed: feeding tube (j1b)	0	3	8	2	**3**

Table 5.2.2: IRR Kappa/Weighted Kappa and Percent Agreement for Nutritional Approaches– Feeding Tube

Items	HHA	IRF	LTCH	SNF	Overall
# of patients	187	236	203	256	**882**
Kappa	-	-	-	-	**-**
Nutritional approach performed: feeding tube (j1b)	-	-	-	-	**-**
Percent Agreement	-	-	-	-	**-**
Nutritional approach performed: feeding tube (j1b)	100	100	98	100	**100**

NOTE: Based on dichotomized never noted vs. noted any day. 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: slight/poor; 0.21-0.40: fair; 0.41-0.60: moderate: 0.61-0.80: substantial/good; 0.81-1.00: excellent/almost perfect.

Table 5.3.1: Admission Response Distributions (in Percentages) for Nutritional Approaches– Mechanically Altered Diet

Items	HHA	IRF	LTCH	SNF	Overall
# of assessments	629	762	448	1087	**2926**
Nutritional approach performed: mechanically altered diet (j1c)	2	15	14	11	**10**

Table 5.3.2: IRR Kappa/Weighted Kappa and Percent Agreement for Nutritional Approaches – Mechanically Altered Diet

Items	HHA	IRF	LTCH	SNF	Overall
# of patients	187	236	203	256	**882**
Kappa	-	-	-	-	**-**
Nutritional approach performed: mechanically altered diet (j1c)	-	0.53	0.69	0.70	**0.65**
Percent Agreement	-	-	-	-	**-**
Nutritional approach performed: mechanically altered diet (j1c)	100	89	92	94	**93**

NOTE: Based on dichotomized never noted vs. noted any day. 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: slight/poor; 0.21-0.40: fair; 0.41-0.60: moderate: 0.61-0.80: substantial/good; 0.81-1.00: excellent/almost perfect.

Table 5.4.1: Admission Response Distributions (in Percent) for Nutritional Approaches–Therapeutic Diet

Items	HHA	IRF	LTCH	SNF	Overall
# of assessments	629	762	448	1087	**2926**
Nutritional approach performed: therapeutic diet (j1d)	54	49	59	49	**52**

Table 5.4.2: IRR Kappa/Weighted Kappa and Percent Agreement for Nutritional Approaches–Therapeutic Diet

Items	HHA	IRF	LTCH	SNF	Overall
# of patients	187	236	203	256	**882**
Kappa	-	-	-	-	**-**
Nutritional approach performed: therapeutic diet (j1d)	0.43	0.70	0.62	0.61	**0.60**
Percent Agreement	-	-	-	-	**-**
Nutritional approach performed: therapeutic diet (j1d)	71	85	82	80	**80**

NOTE: Based on dichotomized never noted vs. noted any day. 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: slight/poor; 0.21-0.40: fair; 0.41-0.60: moderate: 0.61-0.80: substantial/good; 0.81-1.00: excellent/almost perfect.

High-Risk Drug Classes: Use and Indication Items

Table 6.1.1: Admission Response Distributions (in Percentages) for Medication Class Taking and Indication Items

Care Setting	HHA (627)	HHA (627)	IRF (769)	IRF (769)	LTCH (459)	LTCH (459)	SNF (1096)	SNF (1096)	Overall (2951)	Overall (2951)
Medication Class	Taking (Percent)	Indication (Percent)	Taking (Percent)	Indication (Percent)	Taking (Percent)	Indication (Percent)	Taking (Percent)	Indication (Percent)	Taking (Percent)	Indication (Percent)
Anticoagulants	29	47	61	29	66	20	42	77	**48**	**45**
Antiplatelets	15	52	19	31	16	10	12	77	**15**	**45**
Hypoglycemics	29	47	30	49	48	52	26	72	**31**	**56**
Opioids	39	87	51	91	64	90	52	96	**51**	**92**
Antipsychotics	9	73	9	33	14	30	16	89	**12**	**66**
Antimicrobials	13	57	23	60	73	22	27	84	**30**	**53**

NOTE: Indication (percent) reflects percent with indication among those taking medications in that class

Table 6.1.2: IRR Kappa and Percent Agreement for Medication Class Taking and Indication Items

Items	HHA	IRF	LTCH	SNF	Overall
# of patients	187	240	212	261	**900**
Kappa	-	-	-	-	**-**
Is patient taking: anticoagulants (i1a1)	0.78	0.84	0.87	0.85	**0.85**
Is patient taking: antiplatelets (i1a2)	0.69	0.71	0.83	-	**0.72**
Is patient taking: hypoglycemics (i1a3)	0.83	0.80	0.97	0.90	**0.89**
Is patient taking: opioids (i1a4)	0.84	0.86	0.90	0.85	**0.86**
Is patient taking: antipsychotics (i1a5)	-	-	-	-	-
Is patient taking: antimicrobials (i1a6)	-	0.76	0.93	0.82	**0.86**
Indication noted for anticoagulants (i1b1)	0.54	0.64	0.80	0.87	**0.78**
Indication noted for antiplatelets (i1b2)	0.69	0.85	-	0.89	**0.87**
Indication noted for hypoglycemics (i1b3)	0.39	0.62	0.70	0.75	**0.65**
Indication noted for opioids (i1b4)	-	-	-	-	**-**
Indication noted for antipsychotics (i1b5)	0.33	1.00	0.88	0.73	**0.81**
Indication noted for antimicrobials (i1b6)	0.74	0.63	0.72	-	**0.81**
Percent Agreement	-	-	-	-	**-**
Is patient taking: anticoagulants (i1a1)	91	93	94	93	**93**
Is patient taking: antiplatelets (i1a2)	92	91	95	91	**92**
Is patient taking: hypoglycemics (i1a3)	92	92	99	96	**95**
Is patient taking: opioids (i1a4)	92	93	96	92	**93**
Is patient taking: antipsychotics (i1a5)	96	95	94	93	**94**
Is patient taking: antimicrobials (i1a6)	94	91	97	93	**94**
Indication noted for all meds in class (i1b1-6)	79	89	91	96	**90**
Indication noted for anticoagulants (i1b1)	77	85	94	95	**89**
Indication noted for antiplatelets (i1b2)	84	93	100	95	**94**
Indication noted for hypoglycemics (i1b3)	69	82	85	90	**82**
Indication noted for opioids (i1b4)	87	96	89	100	**94**
Indication noted for antipsychotics (i1b5)	63	100	95	89	**90**
Indication noted for antimicrobials (i1b6)	88	81	91	98	**91**

NOTE: 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: slight/poor; 0.21-0.40: fair; 0.41-0.60: moderate: 0.61-0.80: substantial/good; 0.81-1.00: excellent/almost perfect.

Pain: Pain Interference

Table 7.1.1: Admission Response Distributions (in Percentages) for Pain Interference Items

Items	HHA	IRF	LTCH	SNF	Overall
# of assessments	489	618	375	872	**2354**
How often pain made it hard to sleep (d3)	-	-	-	-	**-**
Rarely or not at all	40	32	29	37	**35**
Occasionally	29	30	24	28	**28**
Frequently	19	26	29	23	**24**
Almost constantly	12	13	17	13	**13**
Offered rehab therapies (d4a)	-	-	-	-	**-**
Yes	78	98	81	93	**89**
Yes N	379	606	302	803	**2090**
How often limited rehab due to pain (d4b)	-	-	-	-	**-**
Rarely or not at all	74	76	62	73	**73**
Occasionally	14	17	17	16	**16**
Frequently	7	5	14	8	**8**
Almost constantly	5	2	7	3	**4**
How often limited daily activities due to pain (d4c)	-	-	-	-	**-**
Rarely or not at all	40	55	42	41	**45**
Occasionally	26	18	19	26	**23**
Frequently	17	16	20	21	**19**
Almost constantly	16	11	19	12	**14**

Table 7.1.2: IRR Kappa/Weighted Kappa and Percent Agreement for Pain Interference Items

Items	HHA	IRF	LTCH	SNF	Overall
# of patients	197	256	232	268	**953**
Kappa	-	-	-	-	**-**
How often pain made it hard to sleep (d3)	0.96	0.98	0.98	0.99	**0.98**
How often limited rehab due to pain (d4b)	0.95	0.96	0.98	0.97	**0.97**
How often limited daily activities due to pain (d4c)	0.97	0.98	0.99	0.98	**0.98**
Percent Agreement	-	-	-	-	**-**
How often pain made it hard to sleep (d3)	95	98	98	100	**98**
How often limited rehab due to pain (d4b)	97	98	98	99	**98**
How often limited daily activities due to pain (d4c)	97	98	99	99	**98**

NOTE: 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: slight/poor; 0.21-0.40: fair; 0.41-0.60: moderate: 0.61-0.80: substantial/good; 0.81-1.00: excellent/almost perfect. *Pearson correlation for rating of worst pain, which is on a 0-10 scale

IMPAIRMENTS: Hearing

Table 8.1.1: Admission Response Distributions (in Percentages) for Hearing Item

Items	HHA	IRF	LTCH	SNF	Overall
# of assessments	643	783	498	1141	**3065**
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**

Table 8.1.2: IRR Weighted Kappa and Percent Agreement for Hearing Item

Items	HHA	IRF	LTCH	SNF	Overall
# of patients	197	258	237	268	**960**
Weighted kappa	-	-	-	-	**-**
Ability to hear (a1)	0.71	0.67	0.58	0.62	**0.65**
Percent agreement	-	-	-	-	**-**
Ability to hear (a1)	83	87	84	83	**84**

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

IMPAIRMENTS: Vision

Table 9.2.1: Admission Response Distributions (in Percentages) for Vision Item

Items	HHA	IRF	LTCH	SNF	Overall
# of assessments	643	783	498	1141	**3065**
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**

Table 9.2.2: IRR Weighted Kappa and Percent Agreement for Vision Item

Items	HHA	IRF	LTCH	SNF	Overall
# of patients	197	258	237	268	**960**
Weighted kappa	-	-	-	-	**-**
Ability to see (a2)	0.67	0.50	0.47	0.57	**0.56**
Percent agreement	-	-	-	-	**-**
Ability to see (a2)	83	90	75	83	**83**

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