April 2016

Proposed Measure Specifications for Measures Proposed in the FY 2017 LTCH QRP NPRM

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RTI INTERNATIONAL

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SECTION 1
CROSS-SETTING MEASURES DEVELOPMENT WORK: AN INTRODUCTION

The Improving Medicare Post-Acute Care Transformation Act of 2014 (IMPACT Act), enacted Oct. 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 domains, including medication reconciliation and resource use measures, including Medicare spending per beneficiary, discharge to community and all-condition risk-adjusted potentially preventable readmission rates. The IMPACT Act requires the implementation of measures to address these measure domains in home health agencies (HHAs), skilled nursing facilities (SNFs), long-term care hospitals (LTCHs), and inpatient rehabilitation facilities (IRFs).

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 such instrument as necessary to enable such use; for LTCHs, the LTCH Continuity Assessment Record and Evaluation Data Set (LTCH CARE Data Set) will be used.

For more information on the IMPACT Act as it pertains to the selection and proposal of measures for the LTCH QRP, please refer to the FY 2016 IPPS/LTCH PPS final rule at https://www.gpo.gov/fdsys/pkg/FR-2015-08-04/pdf/2015-18950.pdf. More information on the IMPACT Act is available at https://www.govtrack.us/congress/bills/113/hr4994.

In this document, we present specifications for the following three (3) measures proposed for adoption for the LTCH QRP through the FY 2017 IPPS/LTCH PPS proposed rule:

1. Discharge to Community- Post Acute Care (PAC) Long-Term Care Hospital (LTCH) Quality Reporting Program (QRP);

2. Potentially Preventable 30-Days Post-Discharge Readmission Measure for Long-Term Care Hospital (LTCH) Quality Reporting Program (QRP);

3. Drug Regimen Review Conducted with Follow-Up for Identified Issues- Post Acute Care (PAC) Long-Term Care Hospital (LTCH) Quality Reporting Program (QRP).

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SECTION 2
MEASURES AFFECTING THE FY 2018 PAYMENT DETERMINATION AND SUBSEQUENT YEARS

2.1 Discharge to Community-Post Acute Care (PAC) Long-Term Care Hospital (LTCH) Quality Reporting Program (QRP)

2.1.1 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-Post Acute Care (PAC) Long-Term Care Hospital (LTCH) Quality Reporting Program (QRP) for the LTCH QRP as a Medicare FFS claims-based measure to meet this requirement.

This proposed measure assesses successful discharge to the community from a PAC setting, with successful discharge to the community including no unplanned rehospitalizations and no death in the 31 days following discharge. Specifically, this proposed measure reports an LTCH's risk-standardized rate of Medicare FFS patients who are discharged to the community following an LTCH stay, and do not have an unplanned readmission to an acute care hospital or LTCH in the 31 days following discharge to community, and who remain alive during the 31 days following discharge to community. Community, for this measure, is defined as home/self-care, with or without home health services, based on Patient Discharge Status Codes 01, 06, 81, and 86 on the Medicare FFS claim.[1,2]

We have developed three discharge to community measures for IRF, SNF, and LTCH settings, respectively. These measures are conceptualized uniformly across the PAC settings, in terms of the definition of the discharge to community outcome, the approach to risk adjustment, and the measure calculation. It is important to note, though, that each measure is specific to the particular PAC setting (i.e., IRF, SNF, or LTCH); we do not pool PAC patients/residents across settings in the measure development and calculation.

2.1.2 Purpose/Rationale for the Measure

Discharge to a community setting is an important health care outcome for many patients/residents 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/residents who are not expected to make functional improvement during their PAC stay, and for patients/residents who may be expected to decline functionally due to their medical condition. The discharge to community outcome offers a multi-dimensional view of preparation for community life,

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[1] 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.

[2] This definition is not intended to suggest that board and care homes, assisted living facilities, or other settings included in the definition of "community" for the purpose of this measure are the most integrated setting for any particular individual or group of individuals under the Americans with Disabilities Act (ADA) and Section 504.

including the cognitive, physical, and psychosocial elements involved in a discharge to the community.[3,4]

In addition to being an important outcome from a patient/resident and family perspective, patients/residents discharged to community settings, on average, incur lower costs over the recovery episode, compared with those discharged to institutional settings.[5,6] Given the high costs of care in institutional settings, encouraging PACs to prepare patients for discharge to community, when clinically appropriate, may have cost-saving implications for the Medicare program.[7] Also, providers have found that successful discharge to community was a major driver of their ability to achieve savings, where capitated payments for post-acute care were in place.[8] For patients/residents 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'/residents' out-of-pocket expenditures.[9]

Analyses conducted for the Assistant Secretary for Planning and Evaluation (ASPE) 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 IRFs, SNFs, LTCHs or HHAs, as compared with payments associated with discharge to community settings.[10] Average, unadjusted Medicare payments associated with discharge to community settings ranged from $0 to $4,017 for IRF discharges, $0 to $3,544 for SNF discharges, $0 to $4,706 for LTCH discharges, and $0 to $992 for HHA discharges. In contrast, payments associated with discharge to non-community settings were considerably higher, ranging from $11,847 to $25,364 for IRF discharges, $9,305 to $29,118 for SNF discharges, $12,465 to $18,205 for LTCH discharges, and $7,981 to $35,192 for HHA discharges.[11]

Measuring and comparing facility-level discharge to community rates is expected to help differentiate among facilities with varying performance in this important domain, and to help avoid disparities in care across patient/resident groups. Variation in discharge to community

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[3] 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.

[4] 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.

[5] Dobrez D, Heinemann AW, Deutsch A, Manheim L, Mallinson T. Impact of Medicare's prospective payment system for inpatient rehabilitation facilities on stroke patient outcomes. *American journal of physical medicine & rehabilitation / Association of Academic Physiatrists.* 2010;89(3):198-204.

[6] Gage B, Morley M, Spain P, Ingber M. Examining Post Acute Care Relationships in an Integrated Hospital System. Final Report. RTI International;2009.

[7] *Ibid.*

[8] Doran JP, Zabinski SJ. 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. 2015;30(3):353-355.

[9] Newcomer RJ, Ko M, Kang T, Harrington C, Hulett D, Bindman AB. Health Care Expenditures After Initiating Long-term Services and Supports in the Community Versus in a Nursing Facility. Med Care. 2016 Jan 12. *Epub ahead of print.*

[10] Gage B, Morley M, Spain P, Ingber M. Examining Post Acute Care Relationships in an Integrated Hospital System. Final Report. RTI International;2009.

[11] *Ibid.*

rates has been reported within and across post-acute settings; across a variety of facility-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.[12,13,14,15,16,17] Discharge to community rates in the IRF setting have been reported to range from about 60 to 80 percent.[18,19,20,21,22,23] Longer-term studies show that rates of discharge to community from IRFs have decreased over time as IRF length of stay has decreased.[24,25] Greater variation in discharge

[12] Reistetter TA, Karmarkar AM, Graham JE, et al. Regional variation in stroke rehabilitation outcomes. *Archives of physical medicine and rehabilitation.* 2014;95(1):29-38.

[13] 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.

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

[15] 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.

[16] 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.

[17] 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 Physiatrists.* 2008;87(7):567-572.

[18] Galloway RV, Granger CV, Karmarkar AM, et al. 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 / Association of Academic Physiatrists.* 2013;92(1):14-27.

[19] Morley MA, Coots LA, Forgues AL, Gage BJ. Inpatient rehabilitation utilization for Medicare beneficiaries with multiple sclerosis. *Archives of physical medicine and rehabilitation.* 2012;93(8):1377-1383.

[20] Reistetter TA, Graham JE, Deutsch A, Granger CV, Markello S, Ottenbacher KJ. Utility of functional status for classifying community versus institutional discharges after inpatient rehabilitation for stroke. *Archives of physical medicine and rehabilitation.* 2010;91(3):345-350.

[21] Gagnon D, Nadeau S, Tam V. Clinical and administrative outcomes during publicly-funded inpatient stroke rehabilitation based on a case-mix group classification model. *Journal of rehabilitation medicine.* 2005;37(1):45-52.

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

[23] Kushner DS, Peters KM, Johnson-Greene D. 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.* 2015;96(7):1310-1318.

[24] Galloway RV, Granger CV, Karmarkar AM, et al. 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 / Association of Academic Physiatrists.* 2013;92(1):14-27.

[25] Mallinson T, Deutsch A, Bateman J, et al. 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.* 2014;95(2):209-217.

to community rates is seen in the SNF setting, with rates ranging from 31 to 65 percent.[26,27,28,29] 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.[30] A single-center study found that 31 percent of LTCH hemodialysis patients were discharged to home.[31] In the LTCH Medicare FFS population, using CY 2012-2013 national data, we found that approximately 25 percent of patients were discharged to the community. One study noted that 64 percent of beneficiaries who were discharged from the home health episode did not use any other acute or post-acute services paid by Medicare in the 30 days after discharge.[32] However, significant numbers of patients were admitted to hospitals (29 percent) and lesser numbers to skilled nursing facilities (7.6 percent), inpatient rehabilitation facilities (1.5 percent), home health (7.2 percent) or hospice (3.3 percent).[33]

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.[34,35,36,37] Many of these interventions involve discharge planning or specific rehabilitation strategies, such as addressing discharge barriers and improving medical and

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[26] 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.

[27] Hall RK, Toles M, Massing M, et al. Utilization of acute care among patients with ESRD discharged home from skilled nursing facilities. *Clinical journal of the American Society of Nephrology: CJASN.* 2015;10(3):428-434.

[28] Stearns SC, Dalton K, Holmes GM, Seagrave SM. Using propensity stratification to compare patient outcomes in hospital-based versus freestanding skilled-nursing facilities. *Medical care research and review : MCRR.* 2006;63(5):599-622.

[29] Wodchis WP, Teare GF, Naglie G, et al. Skilled nursing facility rehabilitation and discharge to home after stroke. *Archives of physical medicine and rehabilitation.* 2005;86(3):442-448.

[30] Scheinhorn DJ, Hassenpflug MS, Votto JJ, et al. Post-ICU mechanical ventilation at 23 long-term care hospitals: a multicenter outcomes study. *Chest.* 2007;131(1):85-93.

[31] Thakar CV, Quate-Operacz M, Leonard AC, Eckman MH. Outcomes of hemodialysis patients in a long-term care hospital setting: a single-center study. *American journal of kidney diseases: the official journal of the National Kidney Foundation.* 2010;55(2):300-306.

[32] Wolff JL, Meadow A, Weiss CO, Boyd CM, Leff B. Medicare home health patients' transitions through acute and post-acute care settings. *Medical care.* 2008;46(11):1188-1193.

[33] *Ibid.*

[34] Kushner DS, Peters KM, Johnson-Greene D. 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.* 2015;96(7):1310-1318.

[35] Wodchis WP, Teare GF, Naglie G, et al. Skilled nursing facility rehabilitation and discharge to home after stroke. *Archives of physical medicine and rehabilitation.* 2005;86(3):442-448.

[36] Berkowitz RE, Jones RN, Rieder R, et al. Improving disposition outcomes for patients in a geriatric skilled nursing facility. *Journal of the American Geriatrics Society.* 2011;59(6):1130-1136.

[37] Kushner DS, Peters KM, Johnson-Greene D. Evaluating use of the Siebens Domain Management Model during inpatient rehabilitation to increase functional independence and discharge rate to home in stroke patients. *PM & R : the journal of injury, function, and rehabilitation.* 2015;7(4):354-364.

functional status. [38,39,40,41] The effectiveness of these interventions suggests that improvement in discharge to community rates among post-acute care patients/residents is possible through modifying provider-led processes and interventions.

2.1.3 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/resident characteristics with the facility effect removed. The "expected" number of discharges to community is the predicted number of risk-adjusted discharges to community if the same patients/residents were treated at the average facility appropriate to the measure.

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

2.1.4 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/residents who are discharged to the community, do not have an unplanned readmission to an acute care hospital or LTCH in the 31-day post-discharge observation window, and who remain alive during the post-discharge observation window. This estimate starts with the observed discharges to community, and is risk adjusted for patient/resident characteristics and a statistical estimate of the facility 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 facility's patient/resident stays included in the measure, and includes the estimated effect of that facility. The prediction equation is based on a logistic statistical model with a two-level hierarchical structure. The patient/resident stays in the model have an indicator of the facility they are discharged from; the effect of the facility is measured as a positive or negative shift in the intercept term of the equation. The facility effects are modeled as belonging to a normal (Gaussian) distribution centered at 0, and are estimated along with the effects of patient/resident characteristics in the model. Numerator details are provided below.

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[38] Kushner DS, Peters KM, Johnson-Greene D. 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.* 2015;96(7):1310-1318.

[39] Wodchis WP, Teare GF, Naglie G, et al. Skilled nursing facility rehabilitation and discharge to home after stroke. *Archives of physical medicine and rehabilitation.* 2005;86(3):442-448.

[40] Berkowitz RE, Jones RN, Rieder R, et al. Improving disposition outcomes for patients in a geriatric skilled nursing facility. *Journal of the American Geriatrics Society.* 2011;59(6):1130-1136.

[41] Kushner DS, Peters KM, Johnson-Greene D. Evaluating use of the Siebens Domain Management Model during inpatient rehabilitation to increase functional independence and discharge rate to home in stroke patients. *PM & R : the journal of injury, function, and rehabilitation.* 2015;7(4):354-364.

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.[42] Table 1 below lists the Patient Discharge Status Codes used to define community.

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

Discharge Status Codes Indicating Community Discharge	
01	Discharged to home/self-care (routine discharge)
06	Discharged/transferred to home under care of organized home health service organization
81	Discharged to home or self-care with a planned acute care hospital readmission
86	Discharged/transferred to home under care of organized home health service organization with a planned acute care hospital inpatient readmission

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

A patient/resident who is discharged to the community is considered to have an unfavorable outcome if they have a subsequent unplanned readmission to an acute care hospital or LTCH in the post-discharge observation window, which includes the day of discharge and the 31 days following day of discharge. We identify unplanned readmissions 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.[43,44,45,46] These readmission measures are based on the Hospital-Wide All-Cause Readmission Measure

[42] 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.

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

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

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

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

(HWR) (CMS/Yale) (NQF #1789),[47] with some additions made for post-acute settings. The planned readmission definition is based on the claim from the readmission 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 readmission is reclassified as unplanned. Readmissions to psychiatric hospitals or units are classified as planned readmissions.

Please note that this measure has been developed with ICD-9 procedure and diagnosis codes. The measure will be revised using the ICD-9 to ICD-10 cross-walk.

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

Patients/residents 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 days following day of discharge. Death in the post-discharge window is identified based on date of death from Medicare eligibility files.

2.1.5 Target Population and Measure Exclusions

The target population for the measure is the group of Medicare FFS patients/residents 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. Only PAC stays that are preceded by a short-term acute care stay in the 30 days prior to the PAC admission date are included in the measure. Stays ending in transfers to the same level of care are excluded.

1) *Age under 18 years*

   Rationale:

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

2) *No short-term acute care stay within the 30 days preceding an IRF, SNF, or LTCH admission*

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

Rationale: Acute care claims from the 30 days prior to IRF, SNF, or LTCH admission provide the principal diagnosis and other important patient/resident data for risk adjustment. In IRF, SNF, and LTCH settings, patients/residents without a short-term acute care discharge within the 30 days prior to PAC admission will be excluded from the measure, because important risk adjustment data will be missing.

3) Discharges to psychiatric hospital

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

4) Discharges against medical advice

Rationale: Patients/residents 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 facility's discharge recommendation. Additionally, patients/residents discharged against medical advice may potentially be at higher risk of post-discharge readmissions or death, depending on their medical condition, or due to potential non-adherence or non-compliance with care recommendations.

5) Discharges to disaster alternative care sites or federal hospitals

Rationale: Patients/residents 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.

6) Discharges to court/law enforcement

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

7) Patients/residents discharged to hospice

Rationale:

a. Patients/residents discharged to hospice care are terminally ill, and have very different goals of care compared with non-hospice patients/residents. For non-hospice patients/residents, the primary goal of post-acute care is to return to baseline, independent living in the community; death is an undesirable outcome in the non-hospice population. For patients/residents discharged to hospice, the goal is to provide them the opportunity to die comfortably, at home or in a facility.
b. A large proportion of patients/residents discharged to hospice care die in the 31-day window following discharge from the post-acute setting.

c. The hospice agency, not the post-acute care setting, makes the final decision of discharge to hospice-home or hospice-facility.

8) *Patients/residents not continuously enrolled in Part A FFS Medicare for the 12 months prior to the post-acute admission date, and at least 31 days after post-acute discharge date*

Rationale: Patients/residents not continuously enrolled in Part A FFS Medicare for the 12 months prior to the PAC admission date are excluded because risk adjustment for certain comorbidities requires information on acute inpatient bills for one year prior to post-acute admission. Patients/residents not continuously enrolled in Part A FFS Medicare for at least 31 days after post-acute discharge are excluded because readmissions and death must be observable in the 31-day post-discharge period. Patients/residents without Part A coverage or those who are enrolled in Medicare Advantage plans will not have complete inpatient claims in the system.

9) *Patients/residents whose prior short-term acute care stay was for non-surgical treatment of cancer*

Rationale: Patients/residents whose prior short-term acute care stay was for non-surgical treatment of cancer are excluded because they have a different trajectory for recovery after discharge, with a high mortality rate.[48] Exclusion of these patients/residents is consistent with the hospital-wide and post-acute readmission measures.

10) *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.

11) *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. No-pay post-acute stays involving exhaustion of Part A benefits are also excluded.

12) *Planned discharges to an acute or LTCH setting*

Rationale: For the IRF and SNF settings, planned discharges to an acute care hospital or LTCH will be excluded. For the LTCH setting, planned discharges to an

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

acute care hospital will be excluded. (Note that, in the LTCH setting, transfer to another LTCH is excluded because it represents a transfer to the same level of care).

13) *Medicare Part A benefits exhausted*

Rationale: Patients/residents who have exhausted their Medicare Part A coverage during the PAC stay are excluded because the discharge destination decision may be related to exhaustion of benefits.

14) *Patients/residents who received care from a facility located outside of the United States, Puerto Rico or a U.S. territory*

Rationale: Patients/residents who received care from foreign facilities may not have complete inpatient claims in the system, and these facilities may not be subject to policy decisions related to this quality measure.

15) *Swing Bed Stays in Critical Access Hospitals (SNF setting only)*

Rationale: Critical access hospital (CAH) swing bed stays are excluded from the SNF setting measure. This is because CAH swing bed facilities are not required to submit quality data under the SNF QRP, and are exempt from the SNF Prospective Payment System (PPS). Note that non-CAH swing bed stays are included in the measure, because non-CAH swing bed facilities are required to submit quality data under the SNF QRP and are subject to the SNF PPS.

2.1.6 Data Sources

This measure is based on Medicare FFS administrative claims, and uses data in the Medicare eligibility files and inpatient claims. The eligibility files provide information such as date of birth, date of death, sex, reasons for Medicare eligibility, periods of Part A coverage, and periods in the Medicare FFS program. The data elements from the Medicare FFS claims are those basic to the operation of the Medicare payment systems and include data such as date of admission, date of discharge, diagnoses, procedures, indicators for use of dialysis services, and indicators of whether the Part A benefit was exhausted. The inpatient claims data files contain patient/resident-level PAC and other hospital records. No data beyond the bills submitted in the normal course of business are required from providers for the calculation of this measure.

IRF & LTCH Measure Data Sources

The following are the specific files used for the IRF and LTCH measures and links to their documentation:

Medicare Inpatient claims (Standard Analytical Files), Index PAC claims

Documentation for the Medicare claims data is provided online by ResDAC. The following web page includes data dictionaries for the Standard analytical files (Inpatient RIF): http://www.resdac.org/cms-data/files/ip-rif/data-documentation

Medicare Enrollment Database - Information about the Enrollment Database may be found at: http://aspe.hhs.gov/datacncl/datadir/cms.htm

Medicare Denominator files - Documentation available at: http://www.cms.gov/Research-Statistics-Data-and-Systems/Files-for-Order/IdentifiableDataFiles/DenominatorFile.html

SNF Measure Data Sources

The following are the specific files used for the SNF measure and links to their documentation:

Medicare Inpatient Claims (MedPAR RIF), Index SNF Claims:

Documentation for the Medicare claims data is provided online by the CMS contractor, Research Data Assistance Center (ResDAC) at the University of Minnesota. The following web page includes data dictionaries for the MedPAR RIF: http://www.resdac.org/cms-data/files/medpar-rif

Medicare Enrollment Database - Information about the Enrollment Database may be found at: http://aspe.hhs.gov/datacncl/datadir/cms.htm

Medicare Denominator files - Documentation available at: http://www.cms.gov/Research-Statistics-Data-and-Systems/Files-for-Order/IdentifiableDataFiles/DenominatorFile.html

2.1.7 Measure Time Window

Time windows vary across settings due to variation in facility sizes across settings. The measure time window is two years in IRF and LTCH settings, and one year in the SNF setting. Specific measure time window descriptions for each setting are provided below.

IRF and LTCH Time Windows: In the IRF and LTCH settings, the measure is calculated using two years of data. All IRF and LTCH stays during the two-year time window, except those that meet the exclusion criteria, are included in the measure. For patients with multiple stays during the two-year time window, each stay is eligible for inclusion in the measure. Data from CY 2012-2013 were used to develop this measure.

SNF Time Window: In the SNF setting, the measure is calculated using one year of data. All SNF stays during the one-year time window, except those that meet the exclusion criteria, are included in the measure. For SNF residents with multiple SNF stays during the one year window, each stay is eligible for inclusion in the measure. Data from CY 2013 were used to develop this measure.

2.1.8 Statistical Risk Model and Risk Adjustment Covariates

We used a hierarchical logistic regression method to predict the probability of discharge to community. Patient/resident characteristics related to discharge and a marker for the specific discharging facility are included in the equation. The equation is hierarchical in that both

individual patient/resident characteristics are accounted for, as well as the clustering of patient/resident characteristics by facility. The statistical model estimates both the average predictive effect of the patient/resident characteristics across all facilities, and the degree to which each facility has an effect on discharge to community that differs from that of the average facility. The facility effects are assumed to be randomly distributed around the average (according to a normal distribution). When computing the facility effect, hierarchical modeling accounts for the known predictors of discharge to community, on average, such as patient/resident characteristics, the observed facility rate, and the number of facility stays eligible for inclusion in the measure. The estimated facility effect is determined mostly by the facility's own data if the number of patient/resident discharges is relatively large (as the estimate would be relatively precise), but is adjusted toward the average if the number of patient/resident 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/resident *i* is discharged to community, 0 otherwise) for a patient/resident *i* at facility *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 dispersion:

$$\text{logit}(\text{Prob}(Y_{ij}=1)) = \alpha_j + \beta * Z_{ij} + \varepsilon_{ij} \qquad (1)$$
$$\alpha_j = \mu + \omega_j ; \ \omega_j \sim N(0, \tau^2)$$

where $Z_{ij} = (Z_1, Z_2, \ldots Z_k)$ is a set of *k* patient/resident-level risk adjustment variables; α_j represents the facility-specific intercept; μ is the adjusted average outcome across all facilities; τ^2 is the between-facility 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/residents in the facility measure, including both the effects of patient/resident characteristics and the facility, is the "predicted number" of discharges to community after adjusting for the facility's case mix. The same equation is used without the facility effect to compute the "expected number" of discharges to community for the same patients/residents at the average facility. 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 facility stays for the measure, yielding the risk-standardized discharge to community rate for each facility. 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/resident characteristics to vary over time as patient/resident case-mix and medical treatment patterns change.

Risk adjustment variables include demographic and eligibility characteristics; principal diagnoses; types of surgery or procedures from the prior short-term acute care stay; comorbidities; length of stay and intensive care utilization from the 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 (CCS) groups) from the prior acute stay in the past 30 days. The ICD-9 codes from the prior acute claim are grouped clinically using the CCS for ICD-9 diagnoses developed by the Agency for Healthcare Research and Quality (AHRQ).[49]

4) Case-Mix Groups (in the IRF model).

5) Surgical procedure categories (if present) based on the prior acute stay in the past 30 days. The procedures are grouped using the CCS classes for ICD-9 procedures developed by AHRQ.

6) Dialysis in prior acute stay where ESRD not indicated.

7) Indicator for ESRD status.

8) Length of prior acute hospital stay in days, for patients/residents whose prior acute stay was in a non-psychiatric hospital (categorical variables are used to account for nonlinearity); indicator of prior psychiatric hospital stay for patients/residents whose prior acute stay was in a psychiatric hospital.

9) Number of intensive/cardiac care days during the prior acute stay (in the LTCH model).

10) Ventilator use during the post-acute stay (in the LTCH and SNF models).

11) Comorbidities (Hierarchical Condition Categories) (based on prior acute stay in the past 30 days or based on a one year look back, depending on the specific comorbidity). Comorbidities are clustered using the Hierarchical Condition Categories [HCC] groups used by CMS.[50]

12) Number of prior acute hospital discharges in the past year, not including the hospitalization in the 30 days prior to the post-acute stay.

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[49] AHRQ CCS groupings of ICD-9 codes - Documentation available at: http://www.hcup-us.ahrq.gov/toolssoftware/ccs/ccs.jsp

[50] 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

2.1.9 Measure Calculation Algorithm

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

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

Step 2: Identify patients/residents meeting the numerator criteria, i.e., discharge to community, no unplanned readmissions on the day of discharge or in the 31 days following discharge, and no death on the day of discharge or in the 31 days following discharge.

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

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

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

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

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

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

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

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

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

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

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

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

To aid interpretation, the facility-wide standardized risk ratio, SRR_j, obtained from equation (4) is then multiplied by the overall national raw

discharge to community rate for all facility stays, $\bar{Y}$, to produce the facility-wide risk-standardized discharge to community rate (RSR_j).

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

$$RSR_j = SRR_j * \bar{Y} \quad (5)$$

NOTE: Because the statistic described in Step six 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.

See **Appendix 1, Table 1-1** for risk adjustment model results. Distribution of facility-level discharge to community rates is provided in **Appendix 1, Table 1-2 and Appendix 1, Figure 1-1**.

2.2 Potentially Preventable 30-Day Post-Discharge Readmission Measure for Long-Term Care Hospital (LTCH) Quality Reporting Program (QRP)

2.2.1 Measure Description

This set of potentially preventable readmission (PPR) measures for post-acute care (PAC) estimates the risk-standardized rate of unplanned, potentially preventable readmissions for patients (Medicare fee-for-service [FFS] beneficiaries) who receive services in one of the following post-acute care provider types: skilled nursing facilities (SNFs), inpatient rehabilitation facilities (IRFs), and long-term care hospitals (LTCH). This measure is conceptualized uniformly across the PAC settings, in terms of the definition of the PPR outcome, the approach to risk adjustment, and the measure calculation.

These outcome measures reflect readmission rates for patients who are readmitted to a short-stay acute-care hospital or an LTCH with a principal diagnosis considered to be unplanned and *potentially preventable*.

Four PPR PAC measures are being developed.

1) Potentially Preventable 30-Day Post-Discharge Readmission Measure for Skilled Nursing Facility Quality Reporting Program (IMPACT Act)

2) Potentially Preventable 30-Day Post-Discharge Readmission Measure for Inpatient Rehabilitation Facility Quality Reporting Program (IMPACT Act)

3) Potentially Preventable 30-Day Post-Discharge Readmission Measure for Long-Term Care Hospital Quality Reporting Program (IMPACT Act)

4) Potentially Preventable Within Stay Readmission Measure for Inpatient Rehabilitation Facilities. Note: This measure is not being developed to meet IMPACT Act requirements.

Three of these measures assess PPR within a 30-day window following discharge from PAC—one measure for each PAC setting (i.e. SNF, IRF, and LTCH)—and are being developed to meet the requirements of the IMPACT Act. An additional IRF measure assesses PPR during the IRF stay (referred to as the within-stay window), and is being developed for use in the IRF Quality Reporting Program. There is also a related SNF measure of potentially preventable hospital readmissions, which is being developed along with the measures cited above in order to meet the requirements of the Protecting Access to Medicare Act of 2014; this measure is detailed in a separate document.

Each measure calculates a risk-adjusted PPR rate for each PAC provider. This is derived by first calculating a standardized risk ratio -- the predicted number of readmissions at the PAC provider (facility) divided by the expected number of readmissions for the same patients if treated at the average PAC provider. The standardized risk ratio is then multiplied by the mean readmission rate in the population (i.e., all Medicare FFS patients included in the measure) to generate the PAC provider-level standardized readmission rate of potentially preventable readmissions.

For these PPR measures, readmissions that are usually for planned procedures are not counted as being potentially preventable (see details below).

2.2.2 Purpose/Rationale for the Measure

Hospital readmissions among the Medicare population are common, costly, and often preventable.[51,52] The Medicare Payment Advisory Commission (MedPAC) and a study by Jencks et al. estimated that 17-20 percent of Medicare beneficiaries discharged from the hospital were readmitted within 30 days. Among these hospital readmissions, MedPAC has estimated that 76 percent were considered potentially avoidable--associated with $12 billion in Medicare expenditures.[53,54]

The Centers for Medicare & Medicaid Services (CMS) has addressed the high rates of hospital readmissions for the acute care hospital setting and more recently, among post-acute care providers. For example, CMS developed the following all-cause readmission measures: All-Cause Unplanned Readmission Measure for 30 days Post Discharge from Inpatient Rehabilitation Facilities (IRFs), All-Cause Unplanned Readmission Measure for 30 days Post Discharge from Long-Term Care Hospitals (LTCHs), and the Skilled Nursing Facility (SNF) 30-Day All-Cause Readmission Measure (NQF #2380, #2502, #2512, and #2510, respectively).[55] These measures were endorsed by the National Quality Forum (NQF). The IRF and LTCH measures were adopted for their respective quality reporting programs for public reporting, and

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51 Friedman, B. and J. Basu, *The rate and cost of hospital readmissions for preventable conditions.* Med Care Res Rev, 2004. **61**(2): p. 225-40.

52 Jencks, S.F., M.V. Williams, and E.A. Coleman, *Rehospitalizations among Patients in the Medicare Fee-for-Service Program.* New England Journal of Medicine, 2009. **360**(14): p. 1418-1428.

53 *Ibid.*

54 MedPAC, *Payment policy for inpatient readmissions*, in *Report to the Congress: Promoting Greater Efficiency in Medicare*. 2007: Washington D.C. p. 103-120.

55 National Quality Forum., *All-Cause Admissions and Readmissions Measures.* April 2015. p. 1-319.

the SNF measure was adopted for value-based purchasing. The NQF-endorsed measures focus on all-cause readmissions and are not cross-setting in that the specifications differ by measure.

Current work is focused on the development of potentially preventable hospital readmission measures for post-acute care, as directed by Congress through the *Improving Medicare Post-Acute Care Transformation Act of 2014* (IMPACT Act). The IMPACT Act requires the development and submission of standardized data from post-acute care settings with the intent for cross-setting quality comparison to promote patient-centeredness.[56] This includes the requirement to develop and implement measures to reflect all-condition risk-adjusted potentially preventable hospital readmission rates.

2.2.3 Denominator

The denominator for the PPR measures is computed the same way as the numerator, but the facility effect is set at the average. The details of the readmission types counted in the numerator and the patients who are included in the measures are below.

For the eligible PAC stays at each facility, the measure denominator is the risk-adjusted expected number of readmissions. This estimate includes risk adjustment for patient characteristics with the facility effect removed. The "expected" number of readmissions is the predicted number of risk-adjusted readmissions if the same patients were treated at the average PAC provider appropriate to the measure.

This population, like that of the numerator, is the group of Medicare FFS PAC patients who are not excluded for the reasons below.

Denominator Exclusions: SNF, IRF, and LTCH Post-Discharge Measures

The post-PAC discharge PPR measures are based on Medicare FFS claims data and include PAC discharges to non-hospital post-acute levels of care or to the community. The observation window is 30-days after discharge from a PAC facility; this window of observation excludes the day of discharge and the day thereafter (i.e. the 30 days starts 2 days after the discharge date). Stays ending in transfers to the same level of care or acute hospitals are excluded. Only PAC stays where patients/residents had a short-term acute care stay within 30 days prior to the PAC admission date are included in the measures. Prior proximal hospital stays include an inpatient admission to an acute care hospital (including IPPS, CAH, or a psychiatric hospital).

1) *Patients/residents who died during the SNF/IRF/LTCH stay.*

   Rationale: The PPR measures are not relevant for patients who died during their PAC stay because there is no post-PAC discharge period to observe.

2) *Patients/residents less than 18 years old.*

[56] United States Congress., H.R. 4994. *IMPACT Act of 2014*. 2014: United States of America. p. 1-19

Rationale: Patients under 18 years old are not included in the target population for this measure. Pediatric patients/residents are relatively few and may have different patterns of care than adults.

3) *Patients/residents who were transferred at the end of a stay to another SNF/IRF/LTCH or short-term acute care hospital.*

Rationale: SNF, IRF, or LTCH patients/residents who were transferred to another SNF/IRF/LTCH or short-term acute-care hospital are excluded from this measure because the transfer suggests that either their SNF/IRF/LTCH treatment has not been completed or that their condition worsened, requiring a transfer (i.e. readmission) back to the acute care setting. The intent of these measures is to follow patients/residents deemed well enough to be discharged to a less intensive care setting (i.e., discharged to less intense levels of care or to the community).

4) *Patients/residents who were not continuously enrolled in Part A FFS Medicare for the 12 months prior to the SNF/IRF/LTCH admission date, and at least 30 days after SNF/IRF/LTCH discharge date.*

Rationale: The adjustment for certain comorbid conditions in the measures requires information on acute inpatient claims for one year prior to the SNF/IRF/LTCH admission, and readmissions must be observable in the observation window following discharge. Patients/residents without Part A coverage or who are enrolled in Medicare Advantage plans will not have complete inpatient claims in the system.

5) *Patients/residents who did not have a short-term acute-care stay within 30 days prior to a SNF/IRF/LTCH admission date.*

Rationale: These measures require information from the prior short-term acute-care stay in the elements used for risk adjustment.

6) *Patients/residents discharged against medical advice (AMA).*

Rationale: Patients discharged AMA are excluded because these patients have not completed their full course of treatment in the opinion of the facility.

7) *Patients/residents for whom the prior short-term acute-care stay was for nonsurgical treatment of cancer.*

Rationale: Consistent with the Hospital Wide Readmission (HWR) Measure (NQF #1789), patients/residents for whom the prior short-term acute-care stay was for nonsurgical treatment of cancer are excluded because these patients were identified as following a very different trajectory after discharge, with a particularly high mortality rate.

8) *Patients/residents who were transferred to a federal hospital from the PAC facility.*

Rationale: Patients/residents who are transferred to federal hospitals will not have complete inpatient claims in the system.

9) *Patients/residents who received care from a provider located outside of the United States, Puerto Rico, or a U.S. territory.*

Rationale: Patients/residents who received care from foreign providers may not have complete inpatient claims in the system, and these providers may not be subject to the same policy decisions related to readmissions.

10) *SNF/IRF/LTCH stays with data that are problematic (e.g., anomalous records for hospital stays that overlap wholly or in part, or are otherwise erroneous or contradictory). This also includes SNF stays for patients who exhausted their Medicare benefits for SNF coverage.*

Rationale: This measure requires accurate information from the SNF/IRF/LTCH stay and prior short-term acute-care stays, for the elements used in risk adjustment. No-pay PAC stays involving exhaustion of Part A benefits are also excluded.

11) *SNF stays in which the prior proximal hospitalization was for pregnancy.*

Rationale: This is a very atypical reason for beneficiaries to be admitted to SNFs.

2.2.4 Numerator

As described, the index PAC admission must have occurred within up to 30 days of discharge from a prior proximal hospital stay (including IPPS, CAH, or a psychiatric hospital). Hospital readmissions include readmissions to a short-stay acute-care hospital or an LTCH, with a diagnosis considered to be unplanned and potentially preventable. Note: Readmissions to inpatient psychiatric facilities are considered planned and not counted for the purposes of this measure.

The numerators of these measures are mathematically related to the number of patients/residents in the target population who have the event of a potentially preventable, unplanned readmission (PPR definitions and planned readmissions are further described below) during the specific readmission window (i.e. 30-day post-PAC discharge). Each measure includes only one readmission window, as described above.

The measures do not have a simple form for the numerator and denominator—that is, the risk adjustment method does not make the observed number of readmissions the numerator, and a predicted number the denominator. Instead, the numerator is the risk-adjusted estimate of the number of unplanned readmissions that occurred within 30 days of PAC discharge. This estimate starts with the observed readmissions, and is then risk-adjusted for patient characteristics and a statistical estimate of the PAC provider's effect, beyond patient case mix.

The prediction equations are based on a logistic statistical model with a 2-level hierarchical structure. The patient/residents stays in the model have an indicator as to which PAC provider they are discharged from and the effect of the provider is measured as a positive or

negative shift in the intercept term of the equation. The facility effects are modeled as belonging to a normal (Gaussian) distribution centered at 0, and are estimated along with the effects of patient characteristics in the model.

The data are from Medicare FFS inpatient claims, and eligibility and enrollment data. Because this measure is claims-based, there is no additional data collection or submission burden for providers.

See below for more details on the data sources.

Note: These measures were developed with ICD-9 procedure and diagnosis codes. ICD-10 was implemented on October 1, 2015; when we calculate this measure using data from calendar year 2015, we will use ICD-10 codes. A preliminary list of the PPR definition using ICD-10 codes can be found in **Appendix 2, Table 2-2**. Provisional ICD-10 mappings of the PAC additions to the CMS Planned Readmission Algorithm for NQF #2512 can be found here (see Appendix A6): http://www.qualityforum.org/ProjectMeasures.aspx?projectID=73619

Numerator Details: Readmissions Counted in Measures

PPR Definitions:

Some general methods and algorithms have been developed to assess potentially avoidable or preventable hospitalizations and readmissions for the general Medicare population, such as the Agency for Healthcare Research and Quality's (AHRQ) Prevention Quality Indicators (PQI), approaches developed by and for MedPAC, and proprietary approaches, such as the 3M™ algorithm for Potentially Preventable Readmissions.[57,58,59] However, there is no consensus on how to define potentially avoidable or preventable readmissions, especially among Medicare beneficiaries who utilize PAC services including SNF, IRF, and LTCH. Recent work led by Kramer et al. for MedPAC identified 13 conditions that were deemed potentially preventable among the SNF and IRF populations;[60,61] however, these conditions did not differ by PAC setting or readmission window (i.e. during the PAC stay or post-PAC discharge). To support the development of potentially preventable hospital readmission measures among patients/residents who use PAC, measure development contractors (RTI International and Abt Associates) have developed an approach to define potentially preventable readmissions, building on existing research in this area, and are developing measures to address this high priority area.

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57 Goldfield, N.M., Elizabeth; Hughes, John; Tang, Ana; Eastman, Beth; Rawlins, Lisa; Averill, Richard, *Identifying Potentially Preventable Readmissions.* Health Care Financing Review, 2008. **30**(1): p. 75-91.

58 Agency for Healthcare Research and Quality., *Prevention Quality Indicators Overview.* 2008.

59 MedPAC, *Online Appendix C: Medicare Ambulatory Care Indicators for the Elderly*, in *Report to the Congress: Medicare Payment Policy*. 2011. p. 7-11.

60 Kramer, A.L., Michael; Fish, Ron; Min, Sung-Joon, *Development of Potentially Avoidable Readmission and Functional Outcome SNF Quality Measures*. 2014. p. 1-75.

61 Kramer, A.L., Michael; Fish, Ron; Min, Sung-joon, *Development of Inpatient Rehabilitation Facility Quality Measures: Potentially Avoidable Readmissions, Community Discharge, and Functional Improvement*. 2014. p. 1-42.

The literature shows that some hospital readmissions can be prevented, and that many of these readmissions occur in the context of PAC, including SNF, IRF, and LTCH.[62,63] For certain diagnoses, proper care and management of patients' conditions (in the facility or by primary care following discharge) along with appropriate, clearly explained and implemented discharge instructions and referrals, can often prevent a patient's readmission to the hospital. Identifying these PPR conditions will assist healthcare providers' efforts to improve quality of care and coordination across the care continuum.

In order to develop PPR definitions for PAC, we conducted a comprehensive environmental scan to identify studies and previously published methodologies related to potentially preventable hospitalizations and hospital readmissions. The evidence specific to PAC is limited, and we found substantial variation across methodologies for defining potentially preventable hospitalizations or readmissions. Based on this scan, we compiled a list of all PPR conditions described in the literature. This list had considerable overlap with the Ambulatory Care Sensitive Conditions (ACSC) / PQI, developed by the AHRQ.

We used the ACSC approach as the starting point for this work. Given clinical evidence that these conditions can be avoided with appropriate access to high quality ambulatory care, we found that a majority of these conditions reflect reasons for readmissions that would be considered potentially preventable.[64] We extended this logic to both the within-PAC stay readmission window and 30-day post-PAC discharge window.

In addition, this PPR definition was informed by empirical analyses. Specifically, we analyzed Medicare claims data to identify the most frequent diagnoses associated with hospital readmissions among patients/residents that received post-acute care. We evaluated whether these common causes for readmission could also be considered potentially preventable, by applying the working conceptual definition for PPR explained above, to each of the diagnoses found in the claims analysis. Some conditions such as pressure ulcers, were not on either the ACSC list or in the preliminary data analyses. However, the literature strongly suggests that readmissions for these conditions can be prevented with close monitoring from healthcare providers and under appropriate ambulatory care.

In developing these sets of PPR conditions, we grouped them based on clinical rationale, as follows:

1) Inadequate management of chronic conditions

2) Inadequate management of infections

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62 Vest, J.R., et al., *Determinants of preventable readmissions in the United States: a systematic review.* Implement Sci, 2010. **5**: p. 88.

63 van Walraven, C., A. Jennings, and A.J. Forster, *A meta-analysis of hospital 30-day avoidable readmission rates.* Journal of Evaluation in clinical practice, 2012. **18**(6): p. 1211-1218.

64 AHRQ Quality Indicators—Guide to Prevention Quality Indicators: Hospital Admission for Ambulatory Care Sensitive Conditions. Rockville, MD: Agency for Healthcare Research and Quality, 2001. AHRQ Pub. No. 02-R0203.

3) Inadequate management of other unplanned events

4) Inadequate injury prevention

We sought technical expert and detailed clinical input on these definitions and overall approach. The Technical Expert Panel's (TEP) consensus was that it is feasible to develop uniform definitions that may be applied to all PAC providers. Based on TEP feedback, we substantially revised the definitions to remove several proposed PPR conditions (for example, we excluded several chronic conditions included in the ACSC approach, such as readmissions for long-term complications of diabetes) and, in some cases, added new PPR conditions based on TEP input, such as influenza. In instances where no clear consensus was reached among TEP members (e.g., urinary tract infection, septicemia) we deferred to clinical expertise from the measure development team along with results from our environmental scan which suggested that these conditions were appropriate to consider as potentially preventable.

Appendix 2, Table 2-1 summarizes the set of conditions we considered potentially preventable for the 30-day post-PAC discharge readmission window based on TEP input. The list of PPR conditions is organized by the clinical rationale for each condition's inclusion on this list.

In order for a readmission to be considered potentially preventable, it must be coded as the principal diagnosis on the readmission claim. However, there are some exceptions based on the PQI specifications, as noted in the appendices (see dehydration conditions).

Planned Readmissions

These measures are focused on readmissions that are potentially preventable and *unplanned*. Thus, planned readmissions are not counted in the numerator—PPRs are only counted in the numerator if the readmission is considered unplanned. Planned readmissions are defined largely by the definition used for the HWR measure, and were revised to include additional procedures determined suitable for PAC, with input from a Technical Expert Panel convened by the CMS contractor, RTI International. Both are described in greater detail below. ICD-9 codes for these additional procedures were identified by a certified coder.

If a readmission claim contains a code for a procedure that is frequently a planned procedure, then that readmission is designated to be a planned readmission. However, the readmission is reclassified as unplanned if the claim also contains a code indicating one or more acute diagnoses from a specified list, which can be found in **Appendix 2, Table 2-6.**

Appendix 2, Table 2-7 presents the list of codes for procedures identified as "planned" for PAC, which were not included in the CMS Planned Readmission Algorithm at the time of its development. These procedures and diagnoses are currently defined by ICD-9 procedure and diagnosis codes grouped by the Clinical Classification Software (CCS), developed by the AHRQ. They are included as full CCS classes where appropriate, or by individual codes, if necessary. Readmissions to psychiatric hospitals or units are also classified as planned readmissions.

The Appendix includes details on the planned readmission definitions, including the CMS Planned Readmission Algorithm version 3.0 (**Appendix 2, Figure 2-1 and Tables 2-3 to 2-6**) and a table summarizing the additional planned readmissions added for PAC (**Appendix 2, Table 2-7**). Note this approach is consistent with that used for the NQF-endorsed SNF, IRF, and LTCH all-cause readmission measures (NQF #2510, 2502, and 2512, respectively).

Readmission Time Frames

The conceptual definition for PPR hinges on the readmission window timeframe. We considered two readmission windows in this work: 1) within-PAC stay and 2) 30 days post-PAC discharge.

For the within-PAC stay window, potentially preventable readmissions should be avoidable with sufficient medical monitoring and appropriate patient treatment. For patients in the 30-day post-PAC discharge period, a potentially preventable readmission refers to a readmission that should be avoidable with adequately planned, explained, and implemented post discharge instructions, including the establishment of appropriate follow-up ambulatory care.

Table 2 below summarizes the specific readmission windows that are being developed for each PAC potentially preventable hospital readmission measure. As noted, this reflects the current PPR measures under development; however additional measures may be considered in future work. At this time, CMS is only developing a PPR within stay measure for IRFs. Due to data limitations, specifically that claims are not generated for short program interruptions (<4 days) from LTCHs, CMS is unable to develop a PPR within-stay measure for LTCHs.

Table 2
PAC Readmission Windows for Potentially Preventable Hospital Readmission Measure Development

PAC	Within stay	30-days post PAC discharge (IMPACT Act Measures)
SNF		X
IRF	X	X
LTCH		X

Other Documentation

AHRQ CCS groupings of ICD-9 codes: Documentation available at: http://www.hcup-us.ahrq.gov/toolssoftware/ccs/ccs.jsp

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

2.2.5 Data Sources

All measures are based on administrative claims data.

SNF Measure Data Sources: This measure is for Medicare beneficiaries and uses the data in the Medicare eligibility files and inpatient claims data. The eligibility files provide information on date of birth, sex, reasons for Medicare eligibility, periods of Part A coverage, and periods in the fee-for-service program. The data elements from the Medicare FFS claims are those basic to the operation of the Medicare payment systems and include date of admission, date of discharge, diagnoses, procedures, indicators for use of dialysis services, and indicators of whether the Part A benefit was exhausted. The inpatient claims data files contain beneficiary-level SNF and other hospital records. No data beyond the bills submitted in the normal course of business are required from providers for the calculation of this measure. The following are the specific files and links to their documentation:

Medicare Inpatient Claims (MedPAR RIF), Index SNF Claims:

Documentation for the Medicare claims data is provided online by the CMS contractor, Research Data Assistance Center (ResDAC) at the University of Minnesota. The following web page includes data dictionaries for the MedPAR RIF: http://www.resdac.org/cms-data/files/medpar-rif

Medicare Denominator files - Documentation available at: http://www.cms.gov/Research-Statistics-Data-and-Systems/Files-for-Order/IdentifiableDataFiles/DenominatorFile.html

IRF & LTCH Measure Data Sources: The following are the specific files and links to their documentation:

Medicare Inpatient claims - standard analytical files, index PAC claims

Documentation for the Medicare claims data is provided online by ResDAC. The following web page includes data dictionaries for these files: Standard analytical files (Inpatient RIF): http://www.resdac.org/cms-data/files/ip-rif/data-documentation

Medicare Enrollment Database - Information about the Enrollment Database may be found here: http://aspe.hhs.gov/datacncl/datadir/cms.htm

Medicare Denominator files - Documentation available at: http://www.cms.gov/Research-Statistics-Data-and-Systems/Files-for-Order/IdentifiableDataFiles/DenominatorFile.html

2.2.6 Measure Time Window

Time windows vary across settings due to variation in facility sizes across settings. The measure time window is two years in IRF and LTCH settings, and one year in the SNF setting. Specific measure time window descriptions for each setting are provided below.

SNF Time Window: In the SNF setting, the measure will be calculated using one year of data. All SNF stays during the one-year time window, except those that meet the exclusion criteria, will be included in the measure. For SNF residents with multiple SNF stays during the one year window, each stay is eligible for inclusion in the measure. Data from calendar year 2013 data was used to develop this PPR measure.

Rationale: Through the analytic work to develop this and an earlier SNF readmission measure (NQF #2510), we found one year of data to be sufficient to calculate this measure in a statistically reliable manner. This is because the reliability of a SNF's measure rate is related to the number of SNF stays included in the measure.

IRF and LTCH Time Windows: In the IRF and LTCH settings, the measure will be calculated using two years of data. All IRF and LTCH stays during the two-year time window, except those that meet the exclusion criteria, will be included in the measure. For patients with multiple stays during the two-year time window, each stay will be eligible for inclusion in the measure. Data from 2012-2013 were used for measure development.

Rationale: Through the analytic work to develop these and previously developed measures, we found that one year of claims data provided a somewhat limited sample size at the provider level. In order to have a more sufficient sample size, we expanded the data to include two consecutive years of claims data. In this way, the IRF and LTCH PPR measures diverge from the SNF measures which have substantially larger samples sizes compared to the IRF and LTCH settings. Pooling two years of data provides more reliable and stable estimates.

NOTE: For the purposes of public reporting, a minimum of 25 eligible stays is required.

2.2.7 Statistical Risk Model and Risk Adjustment Covariates

The statistical methods, including risk adjustment, were developed to harmonize with the HWR measure (NQF #1789) as well as the SNF, IRF, and LTCH all-cause readmission measures. The following section summarizes the risk adjustment approach for all PPR measures.

A hierarchical regression method using a logistic regression to predict the probability of a countable (potentially preventable, unplanned) readmission is used. The risk adjusters are predictor variables. The patient characteristics related to each discharge and a marker for the specific discharging PAC provider are included in the equation. The equation is hierarchical in that both individual patient characteristics are accounted for as well as the clustering of patients into PAC providers. The statistical model estimates both the average predictive effect of the patient characteristics across all providers and the degree to which each provider has an effect on readmissions that differs from that of the average provider. The provider effects are assumed to be randomly distributed around the average (according to a normal distribution). When computing the facility effect, hierarchical modeling accounts for the known predictors of readmissions, on average, such as patient characteristics, the observed provider rate, and the number of provider stays eligible for the measure. The estimated provider effect is determined mostly by the provider'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 an estimate of lower precision).

We used the following model:

Let Y_{ij}, denote the outcome (equal to 1 if patient *i* is readmitted within 30 days, zero otherwise) for a patient *i* at PAC *j*; Z_{ij} denotes a set of risk factors. We assume the outcome is related linearly to the covariates via a logit function with dispersion:

$$\text{logit}(\text{Prob}(Y_{ij}=1)) = \alpha_j + \beta * Z_{ij} + \varepsilon_{ij} \qquad (6)$$
$$\alpha_j = \mu + \omega_j ; \ \omega_j \sim N(0, \tau^2)$$

where $Z_{ij} = (Z_1, Z_2, \ldots Z_k)$ is a set of *k* patient-level covariates. α_j represents the PAC specific intercept; μ is the adjusted average outcome over all PAC providers; and τ^2 is the between PAC 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.)

NOTE: The description above refers to the method used for each measure applied to each PAC provider type and readmission window.

The estimated equation is used twice in the measure. The sum of the probabilities of readmission of all patients in the measure, including both the effects of patient characteristics and the provider, is the "predicted number" of readmissions after adjusting for the provider's case mix. The same equation is used without the provider effect to compute the "expected number" of potentially preventable readmissions for the same patients at the average provider. The ratio of the predicted-to-expected number of readmissions is a measure of the degree to which the readmissions are higher or lower than what would otherwise be expected. This standardized risk ratio is then multiplied by the mean readmission rate for all provider stays for the measure, yielding the risk-standardized readmission rate for each provider. This estimation procedure is recalculated for each measurement period. Estimating the equations for each measurement period allows the estimated effects of the patient characteristics to vary over time as medical treatment patterns change.

Risk-adjustment variables include demographic and eligibility characteristics; principal diagnoses; types of surgery or procedure from the prior short-term stay; comorbidities; length of stay and ICU/CCU utilization from the immediately prior short-term stay; and number of admissions in the year preceding the PAC admission.

The risk adjustment variables include the following:

1) Age/sex categories

2) Original reason for Medicare entitlement (age, disability or ESRD)

3) Surgery category if present (e.g., cardiothoracic, orthopedic), defined as in the HWR model software; the procedures are grouped using the CCS classes for ICD-9 procedures developed by AHRQ

4) Receiving dialysis in prior short-term stay, defined by presence of revenue code

5) Principal diagnosis on prior short-term claim as in the HWR measure. The ICD-9 codes are grouped clinically using the CCS for ICD-9 diagnoses developed by AHRQ.

6) Comorbidities from secondary diagnoses on the prior short-term claim and diagnoses from earlier short-term stays up to one year before PAC admission (these are clustered using the Hierarchical Condition Categories [HCC] groups used by CMS)

Prior Utilization Measures (vary by measure):

1) Length of stay in the prior short-term hospital stay (categorical to account for nonlinearity)

2) Prior acute ICU/CCU utilization (days) (categorical)

3) Count of prior short-term discharges in the prior year

PAC-Specific Risk Adjusters

1) IRF: Aggregates of the IRF Case-Mix Groups (CMGs) for IRF patients

C) LTCH: Ventilator use — prolonged ventilation in LTCH (defined as ICD-9 procedure code on the index LTCH claim of 96.72, continuous invasive mechanical ventilation for 96 consecutive hours or more). We also intend to test multiple organ failure as a risk adjuster for the LTCH model.

Risk Adjustment for Sociodemographic Status (SDS):

Based on recommendations of the Consensus Standards Approval Committee, the National Quality Forum (NQF) has recently called for adjusting performance measures for sociodemographic status (SDS) when appropriate. CMS is currently conducting empirical testing under an NQF trial period to construct specific variables that capture aspects of SDS in order to account for this factor in the risk-adjustment models for the NQF-endorsed PAC readmission measures. This issue is also relevant for the potentially preventable hospital readmission measures that are currently under development. In addition, work being conducted by the Assistant Secretary for Planning and Evaluation on SDS risk adjustment per the IMPACT Act may provide additional direction on this issue.

2.2.8 Measure Calculation Algorithm

We are developing 4 PPR measures; each is specific to a single PAC provider type and readmission window. Because the overall calculation algorithms and logic are aligned for the set of PPR PAC measures, we describe these technical details for all measures below, rather than duplicating similar information. It is important to clarify that each measure is specific to a single PAC provider type; we do not pool PAC patients across settings in the measure calculation.

The Medicare PAC claims are matched to prior acute hospital stays, hospital stays post-PAC discharge, and patient eligibility data to determine which stays remain in the measure (i.e.

not excluded per the exclusions described above) and which have potentially preventable, unplanned readmissions.

The measures are calculated according to the following steps:

Step 1: Identify patients/residents meeting the denominator (measure inclusion) criteria.

Step 2: Identify patients/residents meeting the numerator (unplanned PPR) criteria taking into account the planned readmission algorithm.

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

Step 4: Calculate the predicted and expected number of readmissions for each PAC provider using hierarchical logistic regression model.

The predicted number of readmissions for each PAC provider for each measure is calculated as the sum of the predicted probability of readmission for each patient included in the measure discharged from the provider, including the provider-specific effect. The model specific risk standardized readmission ratio for each PAC provider associated with each PPR measure is calculated as follows.

To calculate the predicted number of readmissions $pred_j$ for index PAC provider stays at $provider_j$, we used

$$pred_j = \Sigma logit^{-1}(\mu + \omega_i + \beta * Z_{ij}) \quad (7)$$

where the sum is over all stays in $provider_j$, and ω_i is the random intercept. To calculate the expected number exp_j use

$$exp_j = \Sigma logit^{-1}(\mu + \beta * Z_{ij}) \quad (8)$$

Then, as a measure of excess or reduced readmissions among index stays at PAC $provider_j$, calculate the provider-wide standardized risk ratio, SRR_j, as

$$SRR_j = pred_j / exp_j \quad (9)$$

Step 5: Calculate the risk-standardized PAC potentially preventable readmission rate.

The value obtained from equation (4) above, the SRR_j, is the PAC provider-wide standardized risk ratio for $provider_j$. To aid interpretation, the provider-wide standardized risk ratio, SRR_j, is then multiplied by the overall national raw readmission rate for all provider stays, $\bar{Y}$, to produce the provider-wide risk-standardized readmission rate ($RSRR_j$).

$$RSRR_j = SRR_j * \bar{Y} \quad (5)$$

2.2.9 Measure Results

We present measure results for the set of PPR measures in the **Appendix 2, Table 2-8 and Figures 2-2 and 2-3**. These appendices include the full risk adjustment model results along with distributions of the unadjusted and risk-standardized PPR rates for facilities.

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SECTION 3
MEASURES AFFECTING THE FY 2020 PAYMENT DETERMINATION AND SUBSEQUENT YEARS

3.1 Drug Regimen Review Conducted with Follow-Up for Identified Issues- Post Acute Care (PAC) Long-Term Care Hospital (LTCH) Quality Reporting Program (QRP)

3.1.1 Measure Description

Under sections 1899B(a)(2)(E)(i)(III) and 1899B(c)(1)(C) of the Act requires the Secretary to specify a quality measure to address the medication reconciliation domain for IRFs, LTCHs and SNFs by October 1, 2018 and for HHAs by January 1, 2017. We are proposing to adopt the quality measure, Drug Regimen Review Conducted with Follow-Up for Identified Issues- Post Acute Care (PAC) Long-Term Care Hospital (LTCH) Quality Reporting Program (QRP), for the LTCH QRP as a patient assessment-based, cross-setting quality measure to meet the LTCH requirements with data collection beginning April 1, 2018 for FY 2020 payment determinations and subsequent years.

This proposed measure assesses whether PAC providers were responsive to potential or actual clinically significant medication issue(s) when such issues were identified. Specifically, the proposed quality measure reports the percentage of patient/resident stays in which a drug regimen review was conducted at the time of admission and timely follow-up with a physician occurred each time potential clinically significant medication issues were identified throughout that stay.

Additionally, for this proposed quality measure, drug regimen review is defined as the review of all medications or drugs the patient/resident is taking to identify any potentially clinically significant medication issues. This proposed quality measure utilizes both the processes of medication reconciliation and a drug regimen review, in the event an actual or potential medication issue occurred. The proposed measure informs whether the PAC facility identified and addressed each clinically significant medication issue and if the facility responded or addressed the medication issue in a timely manner.[65] Of note, drug regimen review in PAC settings is generally considered to include medication reconciliation and review of the patient's drug regimen to identify potential clinically significant medication issues. [66] This measure is applied uniformly across the PAC settings.

For SNFs, this measure applies to resident stays covered by Medicare Part A. In IRFs, this measure is limited to Medicare (Part A and Part C) patients. In LTCHs, this measure includes all patients.

3.1.2 Purpose/Rationale for the Quality Measure

This proposed measure assesses whether PAC providers were responsive to potential or actual clinically significant medication issue(s) when such issues were identified. Specifically, the proposed quality measure reports the percentage of patient/resident stays in which a drug

[65] Institute of Medicine. Preventing Medication Errors. Washington DC: National Academies Press; 2006.
[66] Ibid.

regimen review was conducted at the time of admission and timely follow-up with a physician occurred each time potential clinically significant medication issues were identified throughout that stay.

The performance of timely medication reconciliation is valuable to the process of drug regimen review. Preventing and responding to ADEs is of critical importance as ADEs account for significant increases in health services utilization and costs,[67, 68 ,69] including subsequent emergency room visits and re-hospitalizations.[70] Annual health care costs in the United States are estimated at $3.5 billion, resulting in 7,000 deaths annually.[71,72]

Medication reconciliation is a process of reviewing an individual's complete and current medication list and drug regimen review is included in that process. Medication reconciliation is a recognized process for reducing the occurrence of medication discrepancies that may lead to Adverse Drug Events (ADEs).[73] Medication discrepancies occur when there is conflicting information documented in the medical records. The World Health Organization regards medication reconciliation as a standard operating protocol necessary to reduce the potential for ADEs that cause harm to patients. Medication reconciliation is an important patient safety process that addresses medication accuracy during transitions in patient care and in identifying preventable ADEs.[74] The Joint Commission added medication reconciliation to its list of National Patient Safety Goals (2005), suggesting that medication reconciliation is an integral component of medication safety.[75] The Society of Hospital Medicine published a statement in agreement of the Joint Commission's emphasis and value of medication reconciliation as a patient safety goal.[76] There is universal agreement that medication reconciliation directly

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67 Institute of Medicine. Preventing Medication Errors. Washington DC: National Academies Press; 2006.

68 Jha AK, Kuperman GJ, Rittenberg E, et al. Identifying hospital admissions due to adverse drug events using a computer-based monitor. Pharmacoepidemiol Drug Saf. 2001;10(2):113-119.

69 Hohl CM, Nosyk B, Kuramoto L, et al. Outcomes of emergency department patients presenting with adverse drug events. Ann Emerg Med. 2011;58:270–279.

70 Kohn LT, Corrigan JM, Donaldson MS. To Err Is Human: Building a Safer Health System Washington, DC: National Academies Press; 1999.

71 Greenwald, J. L., Halasyamani, L., Greene, J., LaCivita, C., et al. (2010). Making inpatient medication reconciliation patient centered, clinically relevant and implementable: a consensus statement on key principles and necessary first steps. Journal of Hospital Medicine, 5(8), 477-485.

72 Phillips, David P.; Christenfeld, Nicholas; and Glynn, Laura M. Increase in US Medication-Error Deaths between 1983 and 1993. The Lancet. 351:643–644, 1998.

73 Institute of Medicine. Preventing Medication Errors. Washington DC: National Academies Press; 2006.

74 Leotsakos A., et al. Standardization in patient safety: the WHO High 5s project. Int J Qual Health Care. 2014:26(2):109-116.

75 The Joint Commission. 2016 Long Term Care: National Patient Safety Goals Medicare/Medicaid Certification-based Option. (NPSG.03.06.01).

76 Greenwald, J. L., Halasyamani, L., Greene, J., LaCivita, C., et al. (2010). Making inpatient medication reconciliation patient centered, clinically relevant and implementable: a consensus statement on key principles and necessary first steps. Journal of Hospital Medicine, 5(8), 477-485.

addresses patient safety issues that can result from medication miscommunication and unavailable or incorrect information.[77,78,79]

Medication errors include the duplication of medications, delivery of an incorrect drug, inappropriate drug omissions, or errors in the dosage, route, frequency, and duration of medications. Medication errors are one of the most common types of medical error and can occur at any point in the process of ordering and delivering a medication. Medication errors have the potential to result in an ADE.[80,81,82,83,84,85] Inappropriately prescribed medications are also considered a major healthcare concern in the United States for the elderly population, with costs of roughly $7.2 billion annually.[86]

There is strong evidence that medication discrepancies occur during transfers from acute care facilities to post-acute care facilities. Discrepancies occur when there is conflicting information documented in the medical records. Almost one-third of medication discrepancies have the potential to cause patient harm.[87] An estimated fifty percent of patients experienced a clinically important medication error after hospital discharge in an analysis of two tertiary care academic hospitals.[88]

Medication reconciliation has been identified as an area for improvement during transfer from the acute care facility to the receiving post-acute care facility. Post-acute care facilities report gaps in medication information between the acute care hospital and the receiving post-

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77 Leotsakos A., et al. Standardization in patient safety: the WHO High 5s project. Int J Qual Health Care. 2014:26(2):109-116.

78 The Joint Commission. 2016 Long Term Care: National Patient Safety Goals Medicare/Medicaid Certification-based Option. (NPSG.03.06.01).

79 IHI. Medication Reconciliation to Prevent Adverse Drug Events [Internet]. Cambridge, MA: Institute for Healthcare Improvement; [cited 2016 Jan 11]. Available from: http://www.ihi.org/topics/adesmedicationreconciliation/Pages/default.aspx.

80 Institute of Medicine. To err is human: building a safer health system. Washington, DC: National Academies Press; 2000.

81 Lesar TS, Briceland L, Stein DS. Factors related to errors in medication prescribing. JAMA. 1997:277(4): 312-317.

82 Bond CA, Raehl CL, & Franke T. Clinical pharmacy services, hospital pharmacy staffing, and medication errors in United States hospitals. Pharmacotherapy. 2002:22(2): 134-147.

83 Bates DW, Cullen DJ, Laird N, Petersen LA, Small SD, et al. Incidence of adverse drug events and potential adverse drug events. Implications for prevention. JAMA. 1995:274(1): 29-34.

84 Barker KN, Flynn EA, Pepper GA, Bates DW, & Mikeal RL. Medication errors observed in 36 health care facilities. JAMA. 2002: 162(16):1897-1903.

85 Bates DW, Boyle DL, Vander Vliet MB, Schneider J, & Leape L. Relationship between medication errors and adverse drug events. J Gen Intern Med. 1995:10(4): 199-205.

86 Fu, Alex Z., et al. "Potentially inappropriate medication use and healthcare expenditures in the US community-dwelling elderly." Medical care 45.5 (2007): 472-476.

87 Wong, Jacqueline D., et al. "Medication reconciliation at hospital discharge: evaluating discrepancies." Annals of Pharmacotherapy 42.10 (2008): 1373-1379.

88 Kripalani S, Roumie CL, Dalal AK, et al. Effect of a pharmacist intervention on clinically important medication errors after hospital discharge: A randomized controlled trial. Ann Intern Med. 2012:157(1):1-10.

acute care setting when performing medication reconciliation.[89,90] Hospital discharge has been identified as a particularly high risk point in time, with evidence that medication reconciliation identifies high levels of discrepancy.[91,92,93,94,95,96] Also, there is evidence that medication reconciliation discrepancies occur throughout the patient stay.[97,98] For older patients, who may have multiple comorbid conditions and thus multiple medications, transitions between acute and post-acute care settings can be further complicated,[99] and medication reconciliation and patient knowledge (medication literacy) can be inadequate post-discharge.[100] The proposed quality measure, Drug Regimen Review Conducted with Follow-Up for Identified Issues-PAC IRF QRP, provides an important component of care coordination for PAC settings and would affect a large proportion of the Medicare population who transfer from hospitals into PAC services each year. For example, in 2013, 1.7 million Medicare FFS beneficiaries had SNF stays, 338,000 beneficiaries had IRF stays, and 122,000 beneficiaries had LTCH stays.[101]

3.1.3 Denominator

The denominator is the number of stays during the SNF, IRF, or LTCH reporting period. Specific denominator definitions for each setting are provided below.

SNF Denominator: The denominator is the number of stays in the selected time window for SNF residents with a SNF PPS Part A Discharge Assessment (A0310H = 1) during the reporting period. A stay is defined as the time period from resident admission or reentry to the

89 Gandara, Esteban, et al. "Communication and information deficits in patients discharged to rehabilitation facilities: an evaluation of five acute care hospitals." Journal of Hospital Medicine 4.8 (2009): E28-E33.

90 Gandara, Esteban, et al. "Deficits in discharge documentation in patients transferred to rehabilitation facilities on anticoagulation: results of a system wide evaluation." Joint Commission Journal on Quality and Patient Safety 34.8 (2008): 460-463.

91 Coleman EA, Smith JD, Raha D, Min SJ. Post hospital medication discrepancies: prevalence and contributing factors. Arch Intern Med. 2005 165(16):1842–1847.

92 Wong JD, Bajcar JM, Wong GG, et al. Medication reconciliation at hospital discharge: evaluating discrepancies. Ann Pharmacother. 2008 42(10):1373–1379.

93 Hawes EM, Maxwell WD, White SF, Mangun J, Lin FC. Impact of an outpatient pharmacist intervention on medication discrepancies and health care resource utilization in post hospitalization care transitions. Journal of Primary Care & Community Health. 2014; 5(1):14-18.

94 Foust JB, Naylor MD, Bixby MB, Ratcliffe SJ. Medication problems occurring at hospital discharge among older adults with heart failure. Research in Gerontological Nursing. 2012, 5(1): 25-33.

95 Pherson EC, Shermock KM, Efird LE, et al. Development and implementation of a post discharge home-based medication management service. Am J Health Syst Pharm. 2014; 71(18): 1576-1583.

96 Pronovosta P, Weasta B, Scwarza M, et al. Medication reconciliation: a practical tool to reduce the risk of medication errors. J Crit Care. 2003; 18(4): 201-205.

97 Bates DW, Cullen DJ, Laird N, Petersen LA, Small SD, et al. Incidence of adverse drug events and potential adverse drug events. Implications for prevention. JAMA. 1995:274(1): 29-34.

98 Himmel, W., M. Tabache, and M. M. Kochen. "What happens to long-term medication when general practice patients are referred to hospital? "European journal of clinical pharmacology 50.4 (1996): 253-257.

99 Chhabra, P. T., et al. (2012). “Medication reconciliation during the transition to and from long-term care settings: a systematic review.” Res Social Adm Pharm 8(1): 60-75.

100 Kripalani S, Roumie CL, Dalal AK, et al. Effect of a pharmacist intervention on clinically important medication errors after hospital discharge: A randomized controlled trial. Ann Intern Med. 2012:157(1):1-10.

101 March 2015 Report to the Congress: Medicare Payment Policy. Medicare Payment Advisory Commission; 2015.

facility (identified by a 5-day PPS assessment) to discharge, which may be an OBRA discharge or a SNF PPS Part A Discharge.

LTCH Denominator: The denominator is the number of patient stays with a discharge or expired assessment (A0250=10, 11, 12) during the reporting period.

IRF Denominator: The denominator is the number of Medicare patient stays* (Part A or Part C) during the reporting period.

*IRF-PAI data are submitted only for Medicare patients (Part A and Part C).

Denominator Exclusions

This measure has no denominator exclusions for IRF, LTCH, and SNF.

3.1.4 Numerator

Number of stays in the denominator where the medical record contains documentation of a drug regimen review conducted at admission with all potential clinically significant medication issues identified during the course of care and followed-up with a physician or physician designee.

Specific numerator definitions for each setting are provided below.

SNF Numerator: The numerator is the number of short-stay residents with an MDS 3.0 assessment during the selected time window for which all of the following are each true:

1) The facility conducted a drug regimen review at the admission (N2001= [0,1]) or resident is not taking any medications (N2001= [9]); and

2) If potential clinically significant medication issues were identified at the admission (N2001 = [1]), then the facility contacted a physician (or physician-designee) by midnight of the next calendar day and completed prescribed/recommended actions in response to the identified issues (N2003= [1]); and

3) The facility contacted a physician (or physician-designee) and completed prescribed/recommended actions by midnight of the next calendar day each time potential clinically significant medication issues were identified since the admission (N2005 = [1]) or no potential clinically significant medications issues were identified since the admission (N2005 = [9]). This condition is evaluated at discharge.

LTCH Numerator: The numerator is the number of stays for which the LTCH CARE indicated all of the following are each true:

1) The facility conducted a drug regimen review at the admission (N2001= [0,1]) or patient is not taking any medications (N2001= [9]); and

2) If potential clinically significant medication issues were identified at the admission (N2001 = [1]), then the facility contacted a physician (or physician-designee) by

midnight of the next calendar day and completed prescribed/recommended actions in response to the identified issues (N2003= [1]); and

3) The facility contacted a physician (or physician-designee) and completed prescribed/recommended actions by midnight of the next calendar day each time potential clinically significant medication issues were identified since the admission (N2005 = [1]) or no potential clinically significant medications issues were identified since the admission (N2005 = [9]).

IRF Numerator: The numerator is the number of stays for which the IRF PAI indicated all of the following are each true:

1) The facility conducted a drug regimen review at the admission (N2001= [0,1]) or patient is not taking any medications (N2001= [9]); and

2) If potential clinically significant medication issues were identified at the admission (N2001 = [1]), then the facility contacted a physician (or physician-designee) by midnight of the next calendar day and completed prescribed/recommended actions in response to the identified issues (N2003= [1]); and

3) The facility contacted a physician (or physician-designee) and completed prescribed/recommended actions by midnight of the next calendar day each time potential clinically significant medication issues were identified since the admission (N2005 = [1]) or no potential clinically significant medications issues were identified since the admission (N2005 = [9]).

Please note that if data is missing on any of the three items used to calculate the numerator of the measure (specifically, (N2001= [-] or N2003= [-] or N2005= [-])), the patient/resident will not be included in the numerator count though they will continue to be counted in the denominator, assuming all denominator criteria for that patient/resident have been met.

3.1.5 Items Included in the Quality Measure

See **Appendix 3 Table 3-1** for a summary of the setting specific language used to describe the resident or patient within the PAC setting. There are no other differences in the content language within each Drug Regimen Review quality measure item.

N2001. Drug Regimen Review Item

Did a complete drug regimen review identify potential clinically significant medication issues?

0. No - No issues found during review

1. Yes - Issues found during review

9. NA - Patient/Resident is not taking any medications

N2003 Medication Follow-up Item

Did the facility contact a physician (or physician-designee) by midnight of the next calendar day and complete prescribed/recommended actions in response to the identified potential clinically significant medication issues?

0. No

1. Yes

N2005. Medication Intervention Item

Did the facility contact and complete physician (or physician-designee) prescribed/recommended actions by midnight of the next calendar day each time potential clinically significant medication issues were identified since the Admission?

0. No

1. Yes

9. NA - There were no potential clinically significant medication issues identified since Admission or patient/resident is not taking any medications.

3.1.6 Risk Adjustment

This measure is not risk-adjusted or stratified.

3.1.7 Quality Measure Calculation Algorithm

The following steps are used to calculate the measure:

Step 1: Calculate the denominator count (see Section 3.1.3 for details):

In the SNF setting, identify SNF residents with a PPS Part A Discharge (A0310H=1). Count the number of SNF stays (resident admission or reentry to the facility to discharge, which may be an OBRA discharge or a SNF PPS Part A Discharge) among these residents.

In the LTCH setting, calculate the number of patient stays with a discharge or expired assessment (A0250=10, 11, 12),

In the IRF setting, calculate the number of Medicare (Part A or Part C) patient stays.

Step 2: Calculate the numerator count (see Section 3.1.4 for details):

In the SNF setting, calculate the total number short-stay resident stays in the denominator where the medical record contains documentation of a drug regimen review conducted at: (1) admission, and (2) discharge with a look back through the entire patient stay with all potential clinically significant medication issues identified during the course of care and followed up with a physician or physician designee by midnight of the next calendar day.

In the LTCH setting, calculate the total number of patient stays whose LTCH CARE Data Set assessment indicates that the medical record contains documentation of a drug regimen review conducted at: (1) admission, and (2) discharge with a look back through the entire patient stay with all potential clinically significant medication issues identified during the course of care and followed up with a physician or physician designee by midnight of the next calendar day.

In the IRF setting, calculate the total number of patient stays whose IRF-PAI assessment indicates that the medical record contains documentation of a drug regimen review conducted at: (1) admission, and (2) discharge with a look back through the entire patient stay with all potential clinically significant medication issues identified during the course of care and followed up with a physician or physician designee by midnight of the next calendar day.

Step 3: Calculate the facility's observed score:

Divide the facility's numerator count by its denominator count to obtain the facility's observed score; that is, divide the result of step 2 by the result of step 1.

APPENDIX 1
DISCHARGE TO COMMUNITY- POST ACUTE CARE (PAC) LONG-TERM CARE HOSPITAL (LTCH) QUALITY REPORTING PROGRAM (QRP)

- Table 1-1. Preliminary Logistic Regression Model Results for Discharge to Community-Post Acute Care (PAC) Long-Term Care Hospital Quality Reporting Program, 2012-2013
- Table 1-2. Long-Term Care Hospital: Facility-Level Observed and Risk-Standardized Discharge to Community Rates, 2012-2013
- Figure 1-1. Long-Term Care Hospital: Facility-Level Observed and Risk-Standardized Discharge to Community Rates, 2012-2013

Table 1-1. Preliminary Logistic Regression Model Results for Discharge to Community-Post Acute Care (PAC) Long-Term Care Hospital Quality Reporting Program, 2012-2013

Number of beneficiaries included in the model = 203,601
Observed number (percent) of beneficiaries in the sample who were discharged to community = 50,653 (24.88%)
Model c-statistic = 0.762
Based on Medicare fee-for-service claims data from CY 2012-2013. These model estimates only apply to CY 2012-2013 LTCH data. We will re-estimate the regression models for each measurement period to allow the estimated effects of patient characteristics to vary over time.

Covariate	N	%	Coefficient Estimate	SE[1]	p-value	Odds Ratio (OR)	OR 95% Lower CL[2]	OR 95% Upper CL[2]
Intercept	.	.	2.091	0.139	<.0001	.	.	.
Age and Sex Groupings (Reference: Female, age 18-34 years)								
Male, age 18-34 years	1,472	0.72	-0.032	0.093	0.727	0.968	0.808	1.161
Male, age 35-44 years	3,271	1.61	-0.176	0.082	0.032	0.839	0.714	0.985
Male, age 45-54 years	8,919	4.38	-0.435	0.076	<.0001	0.647	0.557	0.752
Male,age 55-59 years	7,236	3.55	-0.683	0.078	<.0001	0.505	0.434	0.588
Male, age 60-64 years	7,893	3.88	-0.834	0.078	<.0001	0.434	0.373	0.506
Male, age 65-69 years	15,030	7.38	-0.877	0.077	<.0001	0.416	0.358	0.484
Male, age 70-74 years	16,250	7.98	-1.069	0.077	<.0001	0.343	0.296	0.399
Male, age 75-79 years	14,886	7.31	-1.281	0.077	<.0001	0.278	0.239	0.323
Male, age 80-84 years	12,885	6.33	-1.454	0.078	<.0001	0.234	0.201	0.272
Male, age 85-89 years	8,518	4.18	-1.738	0.081	<.0001	0.176	0.15	0.206
Male, age ≥ 90 years	3,820	1.88	-1.954	0.090	<.0001	0.142	0.119	0.169
Female, age 35-44 years	2,514	1.23	-0.173	0.085	0.041	0.841	0.713	0.993
Female, age 45-54 years	6,637	3.26	-0.408	0.078	<.0001	0.665	0.571	0.774
Female, age 55-59 years	5,875	2.89	-0.624	0.079	<.0001	0.536	0.459	0.625
Female, age 60-64 years	7,195	3.53	-0.754	0.078	<.0001	0.47	0.404	0.548
Female, age 65-69 years	14,504	7.12	-0.840	0.076	<.0001	0.432	0.372	0.502
Female, age 70-74 years	15,808	7.76	-1.015	0.076	<.0001	0.362	0.312	0.421
Female, age 75-79 years	15,889	7.80	-1.213	0.076	<.0001	0.297	0.256	0.345

(continued)

Table 1-1. Preliminary Logistic Regression Model Results for Discharge to Community-Post Acute Care (PAC) Long-Term Care Hospital Quality Reporting Program, 2012-2013 (continued)

Covariate	N	%	Coefficient Estimate	SE[1]	p-value	Odds Ratio (OR)	OR 95% Lower CL[2]	OR 95% Upper CL
Female, age 80-84 years	14,995	7.36	-1.439	0.077	<.0001	0.237	0.204	0.276
Female, age 85-89 years	11,750	5.77	-1.657	0.079	<.0001	0.191	0.164	0.223
Female, age ≥ 90 years	7,320	3.60	-1.868	0.082	<.0001	0.154	0.131	0.181
Original Reason for Entitlement								
Age ≥ 65 at LTCH admission and original reason for entitlement was Disability or ESRD	33,471	16.44	-0.081	0.018	<.0001	0.923	0.891	0.955
Principal Diagnosis Clinical Classifications Software (CCS) Groupings based on Prior Acute Stay (Reference: Diseases of the Genitourinary System, no UTI, no renal failure)								
Infectious & Parasitic Disease: Septicemia (2)	41,466	20.37	-0.297	0.074	<.0001	0.743	0.643	0.858
Other Infectious and Parasitic Diseases (1, 3-10)	1,423	0.70	-0.429	0.097	<.0001	0.651	0.538	0.787
Neoplasms, e.g., Head & Neck, Esophagus, Stomach, Colon, GI, Respiratory, Bone, Bladder, Kidney, Hodgkin's disease, Non-Hodgkin's Lymphomas, Leukemias, Malignant Neoplasm site unspecified (11-15, 18, 20, 21, 32-34, 37-41, 43)	2,274	1.12	-0.171	0.089	0.056	0.843	0.708	1.004
Neoplasms including Liver, Pancreas, Bronchus, Lung, Ovary, Brain & Nervous System, Secondary Malignancies (16, 17, 19, 27, 35, 42)	1,095	0.54	-0.297	0.105	0.005	0.743	0.605	0.914
Misc: Neopl including Skin, Breast, Uterus, Cervix, Prostate, Testis, Other Female & Male Genital, Thyroid; Headache; Eye Disorders; Pregnancy; Poisoning; Others (22-26, 28-31, 36, 84-94, 176-196, 241-243)	914	0.45	-0.174	0.106	0.099	0.840	0.683	1.033
Misc: Neopl including Benign, Others; Thyroid Disorders; Endocrine Disorders; Nutritional deficiencies; Lipid Disorders; TIA; Congenital anomalies (44-48, 51-53, 58, 112, 213-217)	1,402	0.69	-0.473	0.098	<.0001	0.623	0.515	0.754
Diabetes with and without Complications (49, 50)	6,691	3.29	-0.116	0.077	0.131	0.890	0.765	1.035
Orthopedic Conditions, e.g., Gout, Infective Arthritis, Bone and Connective Tissue Diseases (54, 201, 203-204, 206, 208-209, 211-212)	5,440	2.67	-0.179	0.078	0.021	0.836	0.718	0.973
Fluid / Electrolyte Disorders (55)	1,375	0.68	-0.445	0.098	<.0001	0.641	0.529	0.777
Diseases of Blood and Blood-Forming Organs (56, 57, 59-64)	1,086	0.53	-0.479	0.105	<.0001	0.620	0.505	0.761
Dis Nerv Syst: Meningitis, Encephalitis, Other CNS infections, Polio (76-78)	875	0.43	-0.442	0.109	<.0001	0.643	0.520	0.796

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Table 1-1. Preliminary Logistic Regression Model Results for Discharge to Community-Post Acute Care (PAC) Long-Term Care Hospital Quality Reporting Program, 2012-2013 (continued)

Covariate	N	%	Coefficient Estimate	SE[1]	p-value	Odds Ratio (OR)	OR 95% Lower CL[2]	OR 95% Upper CL
Dis Nerv Syst: Parkinson's, MS, Other Hered CNS Disease, Paralysis (79-82)	333	0.16	-0.507	0.155	0.001	0.602	0.444	0.816
Dis Nerv Syst: Epilepsy; Convulsions & Other Nervous Disorders (83, 95)	2,182	1.07	-0.582	0.093	<.0001	0.559	0.465	0.671
Circ Syst: Heart Valve Disorders (96)	1,743	0.86	-0.421	0.101	<.0001	0.656	0.538	0.800
Circ Syst: Carditis & Other Heart Disease (97, 104)	835	0.41	-0.243	0.108	0.025	0.784	0.634	0.970
Circ Syst: HTN & HTN Complication (98, 99)	1,302	0.64	-0.279	0.099	0.005	0.756	0.623	0.918
Circ Syst: Acute MI & Cardiac Arrest (100, 107)	3,676	1.81	-0.408	0.085	<.0001	0.665	0.563	0.785
Circ Syst: Coron Athero & Chest Pain (101, 102)	1,696	0.83	-0.463	0.097	<.0001	0.630	0.521	0.761
Circ Syst: Pulmonary Heart Disease (103)	1,078	0.53	-0.365	0.102	0.000	0.694	0.568	0.848
Circ Syst: Conduction Disorders & Cardiac Dysrhythmia (105, 106)	1,904	0.94	-0.354	0.093	0.000	0.702	0.586	0.842
Circ Syst: CHF (108)	7,178	3.53	-0.387	0.077	<.0001	0.679	0.584	0.791
Circ Syst: CVD (109-111, 113)	6,648	3.27	-1.121	0.085	<.0001	0.326	0.276	0.385
Circ Syst: Peripheral and Visceral Atherosclerosis (114)	1,812	0.89	-0.341	0.091	0.000	0.711	0.594	0.851
Circ Syst: Aneurysm (115)	981	0.48	-0.338	0.113	0.003	0.714	0.571	0.891
Circ Syst: Arterial Embolism & Other Circul Disease (116, 117)	709	0.35	-0.358	0.118	0.002	0.699	0.555	0.880
Circ Syst: Phlebitis, Varicose Vein, Hemorrhoids, Other Vein Disease (118-121)	1,015	0.50	-0.418	0.102	<.0001	0.658	0.538	0.804
Resp Syst: Pneumonia, Influenza, Acute Bronchitis, Other Upper Resp Infections (122,123,125-126)	11,598	5.70	-0.402	0.075	<.0001	0.669	0.578	0.775
Resp Syst: Tonsillitis, Pleurisy, Pneumothorax, Lung Collapse, Lung disease d/t external agents, Other Lower or Upper Respiratory (124, 130, 132-134)	2,379	1.17	-0.460	0.087	<.0001	0.631	0.532	0.749
Resp Syst: COPD & Asthma (127-128)	6,299	3.09	-0.325	0.077	<.0001	0.723	0.622	0.840
Resp Syst: Aspiration Pneumonia (129)	4,831	2.37	-0.717	0.084	<.0001	0.488	0.414	0.576
Resp Syst: Adult Respiratory Failure (131)	13,463	6.61	-0.442	0.076	<.0001	0.643	0.554	0.745
Diseases of Digestive System (135-144, 146-148, 154, 155)	7,724	3.79	-0.296	0.076	0.000	0.744	0.641	0.864
Digestive System-Intestinal Obstruction without Hernia (145)	2,519	1.24	-0.242	0.087	0.005	0.785	0.662	0.931

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Table 1-1. Preliminary Logistic Regression Model Results for Discharge to Community-Post Acute Care (PAC) Long-Term Care Hospital Quality Reporting Program, 2012-2013 (continued)

Covariate	N	%	Coefficient Estimate	SE[1]	p-value	Odds Ratio (OR)	OR 95% Lower CL[2]	OR 95% Upper CL
Biliary Disease, Liver Disease, Other Liver Disease, Pancreatic Disorders (149-152)	2,511	1.23	-0.210	0.085	0.014	0.811	0.686	0.958
GI Hemorrhage (153)	1,612	0.79	-0.483	0.099	<.0001	0.617	0.508	0.748
Genitourinary: Acute or Chronic Renal Failure (157,158)	4,414	2.17	-0.445	0.081	<.0001	0.641	0.547	0.751
Genitourinary: UTI (159)	3,070	1.51	-0.421	0.084	<.0001	0.656	0.556	0.774
Diseases of Skin & Subcutaneous Tissue and Burns (167; 197-200, 240)	10,941	5.37	-0.221	0.075	0.003	0.801	0.693	0.927
Rheumatoid Arthritis, Lupus, Oth Connective Tissue Disease (202, 210, 211)	86	0.04	-0.676	0.265	0.011	0.509	0.303	0.854
Back Problems (205)	1,047	0.51	-0.373	0.102	0.000	0.689	0.565	0.840
Fractures (Pathological, Skull, Arm, Leg, Other) (207, 228-231)	3,204	1.57	-0.730	0.087	<.0001	0.482	0.406	0.572
Intracranial Injury (233)	2,075	1.02	-1.081	0.109	<.0001	0.339	0.274	0.420
Injury (Joint Disorders, Sprains, Intracranial Injury, Crush Injury, Open Wounds of Head Neck and Trunk) (225, 232, 234, 235, 236, 239, 244)	1,553	0.76	-0.276	0.095	0.004	0.759	0.630	0.915
Fracture of Hip (226)	2,374	1.17	-0.940	0.097	<.0001	0.391	0.323	0.472
Spinal Cord Injury (227)	377	0.19	-1.088	0.192	<.0001	0.337	0.231	0.491
Complications of Device, Procedures, or Medical Care (237-238)	18,698	9.18	-0.183	0.073	0.012	0.832	0.721	0.961
Symptoms, Signs, and Ill-Defined Conditions and Factors Influencing health Status (245-247, 249-259)	2,188	1.07	-0.353	0.107	0.001	0.702	0.569	0.866
Gangrene (248)	1,277	0.63	-0.204	0.107	0.058	0.816	0.661	1.007
Mental Illness (650-670)	2,481	1.22	-0.158	0.090	0.078	0.854	0.716	1.018
Surgical Categories Based On Prior Acute Stay								
Cardio Thoracic	9,363	4.60	0.409	0.035	<.0001	1.506	1.407	1.611
Otolaryngology	1,476	0.72	0.183	0.069	0.008	1.200	1.049	1.373
General surgery	26,535	13.03	0.056	0.020	0.006	1.057	1.016	1.100
Orthopedics	18,615	9.14	-0.118	0.022	<.0001	0.889	0.851	0.928
Obstetrics/Gynecology or Neurosurgery	4,817	2.37	-0.091	0.049	0.065	0.913	0.829	1.006
Dialysis in Prior Acute Stay where End-Stage Renal Disease Not Indicated								
Dialysis where HCC133 (End-Stage Renal Disease) Not Indicated	8,989	4.42	-0.123	0.033	0.000	0.884	0.829	0.943

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Table 1-1. Preliminary Logistic Regression Model Results for Discharge to Community-Post Acute Care (PAC) Long-Term Care Hospital Quality Reporting Program, 2012-2013 (continued)

Covariate	N	%	Coefficient Estimate	SE[1]	p-value	Odds Ratio (OR)	OR 95% Lower CL[2]	OR 95% Upper CL
Prior Acute Length of Stay in Non-Psychiatric Hospital or Prior Stay in Psychiatric Hospital (Reference: Psychiatric Hospital Stay Irrespective Of Length								
1-7 Days in Non-Psychiatric Hospital	76,148	37.40	-0.131	0.093	0.162	0.878	0.731	1.054
8-11 Days in Non-Psychiatric Hospital	43,660	21.44	-0.216	0.094	0.022	0.806	0.670	0.969
12-30 Days in Non-Psychiatric Hospital	71,419	35.08	-0.379	0.095	<.0001	0.685	0.569	0.824
30+ Days in Non-Psychiatric Hospital	11,509	5.65	-0.629	0.102	<.0001	0.533	0.437	0.651
Number of Intensive/Cardiac Care Days during Prior Acute Stay (Reference: 0 ICU/CCU Days)								
1-3 days in ICU/CCU	22,909	11.25	-0.095	0.019	<.0001	0.909	0.877	0.943
4-6 days in ICU/CCU	25,642	12.59	-0.203	0.019	<.0001	0.816	0.787	0.847
7-9 days in ICU/CCU	21,091	10.36	-0.216	0.022	<.0001	0.806	0.772	0.841
10-13 days in ICU/CCU	20,268	9.95	-0.278	0.025	<.0001	0.757	0.721	0.795
14-18 days in ICU/CCU	17,512	8.60	-0.377	0.030	<.0001	0.686	0.647	0.727
19-24 days in ICU/CCU	12,614	6.20	-0.485	0.035	<.0001	0.616	0.575	0.660
25+ days in ICU/CCU	13,482	6.62	-0.592	0.043	<.0001	0.553	0.509	0.602
Ventilator Use in LTCH								
Prolonged Ventilation in LTCH	33,620	16.51	-1.075	0.025	<.0001	0.341	0.325	0.358
Comorbidities - Hierarchical Condition Categories (HCCs) (* indicates that the HCC is based on the most recent acute care claim. HCCs not preceded by * are based on acute care claims from the past 365 days (including the most recent acute care claim))								
HCC1: HIV/AIDS	1,179	0.58	-0.149	0.070	0.034	0.861	0.750	0.989
HCC2: Septicemia, Sepsis, Systemic Inflammatory Response Syndrome/Shock*	66,072	32.45	-0.115	0.019	<.0001	0.892	0.859	0.926
HCC3-HCC5: Bacterial, Fungal, and Parasitic Central Nervous System Infections, Viral and Late Effects Central Nervous System Infections, Tuberculosis*	2,660	1.31	-0.075	0.050	0.131	0.927	0.841	1.023
HCC6: Opportunistic Infections	5,211	2.56	-0.059	0.039	0.134	0.943	0.873	1.018
HCC8: Metastatic Cancer and Acute Leukemia	5,735	2.82	-0.471	0.037	<.0001	0.624	0.581	0.671
HCC9: Lung and Other Severe Cancers	3,917	1.92	-0.260	0.043	<.0001	0.771	0.708	0.840
HCC10: Lymphoma and Other Cancers	3,169	1.56	-0.113	0.046	0.015	0.893	0.816	0.978

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Table 1-1. Preliminary Logistic Regression Model Results for Discharge to Community-Post Acute Care (PAC) Long-Term Care Hospital Quality Reporting Program, 2012-2013 (continued)

Covariate	N	%	Coefficient Estimate	SE[1]	p-value	Odds Ratio (OR)	OR 95% Lower CL[2]	OR 95% Upper CL
HCC11: Colorectal, Bladder, and Other Cancers	2,435	1.20	-0.085	0.053	0.112	0.919	0.828	1.020
HCC15: Other Neoplasms	1,989	0.98	-0.157	0.059	0.008	0.855	0.761	0.960
HCC17: Diabetes with Acute Complications	2,639	1.30	-0.111	0.054	0.042	0.895	0.805	0.996
HCC18; HCC19: Diabetes with Chronic Complications; Diabetes without Complication	98,060	48.16	-0.052	0.013	<.0001	0.950	0.926	0.973
HCC20: Type I Diabetes Mellitus	4,123	2.03	-0.078	0.042	0.067	0.925	0.851	1.005
HCC21: Protein-Calorie Malnutrition	77,086	37.86	-0.192	0.013	<.0001	0.825	0.804	0.846
HCC22: Morbid Obesity	35,263	17.32	-0.164	0.016	<.0001	0.849	0.822	0.876
HCC23: Other Significant Endocrine and Metabolic Disorders	19,685	9.67	-0.020	0.021	0.357	0.981	0.941	1.022
HCC24: Disorders of Fluid/Electrolyte/Acid-Base Balance	149,090	73.23	-0.085	0.013	<.0001	0.918	0.895	0.943
HCC27: End-Stage Liver Disease	4,745	2.33	-0.347	0.040	<.0001	0.707	0.653	0.765
HCC28: Cirrhosis of Liver	3,545	1.74	-0.204	0.043	<.0001	0.816	0.749	0.888
HCC35: Inflammatory Bowel Disease	2,419	1.19	-0.116	0.053	0.028	0.890	0.803	0.988
HCC36: Peptic Ulcer, Hemorrhage, Other Specified Gastrointestinal Disorders*	28,687	14.09	-0.142	0.019	<.0001	0.868	0.836	0.900
HCC44: Congenital/Developmental Skeletal and Connective Tissue Disorders	211	0.10	-0.345	0.174	0.047	0.709	0.504	0.996
HCC46: Severe Hematological Disorders	3,101	1.52	-0.059	0.049	0.232	0.943	0.857	1.038
HCC48: Coagulation Defects and Other Specified Hematological Disorders	36,992	18.17	-0.031	0.017	0.060	0.969	0.938	1.001
HCC49: Iron Deficiency and Other/Unspecified Anemias and Blood Disease*	89,824	44.12	-0.039	0.012	0.001	0.961	0.939	0.985
HCC50: Delirium and Encephalopathy	51,896	25.49	-0.185	0.015	<.0001	0.831	0.806	0.856
HCC51: Dementia With Complications	7,087	3.48	-0.864	0.045	<.0001	0.421	0.386	0.460
HCC52: Dementia Without Complication	38,203	18.76	-0.576	0.019	<.0001	0.562	0.542	0.583
HCC53: Nonpsychotic Organic Brain Syndromes/Conditions	1,604	0.79	-0.125	0.063	0.048	0.883	0.780	0.999
HCC57: Schizophrenia	6,867	3.37	-0.761	0.037	<.0001	0.467	0.435	0.502
HCC58: Major Depressive, Bipolar, and Paranoid Disorders	13,225	6.50	-0.277	0.025	<.0001	0.758	0.723	0.796
HCC59: Reactive and Unspecified Psychosis	4,558	2.24	-0.302	0.043	<.0001	0.740	0.679	0.805

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Table 1-1. Preliminary Logistic Regression Model Results for Discharge to Community-Post Acute Care (PAC) Long-Term Care Hospital Quality Reporting Program, 2012-2013 (continued)

Covariate	N	%	Coefficient Estimate	SE[1]	p-value	Odds Ratio (OR)	OR 95% Lower CL[2]	OR 95% Upper CL
HCC60: Personality Disorders	502	0.25	-0.503	0.113	<.0001	0.605	0.485	0.755
HCC61: Depression	37,777	18.55	-0.135	0.015	<.0001	0.874	0.848	0.901
HCC63: Other Psychiatric Disorders	13,887	6.82	-0.038	0.023	0.093	0.963	0.921	1.006
HCC64-HCC67: Profound Mental Retardation/Developmental Disability; Severe Mental Retardation/Developmental Disability; Moderate Mental Retardation/Developmental Disability; Mild Mental Retardation, Autism, Down's Syndrome	4,461	2.19	-0.460	0.043	<.0001	0.631	0.580	0.687
HCC72: Spinal Cord Disorders/Injuries	1,590	0.78	-0.114	0.065	0.079	0.892	0.786	1.013
HCC74: Cerebral Palsy	1,631	0.80	-0.290	0.067	<.0001	0.749	0.656	0.854
HCC77: Multiple Sclerosis	2,364	1.16	-0.315	0.053	<.0001	0.729	0.657	0.809
HCC78: Parkinson's and Huntington's Diseases	6,219	3.05	-0.247	0.039	<.0001	0.781	0.724	0.843
HCC79: Seizure Disorders and Convulsions	20,564	10.10	-0.084	0.022	0.000	0.919	0.881	0.959
HCC80: Coma, Brain Compression/Anoxic Damage	9,482	4.66	-0.425	0.039	<.0001	0.654	0.605	0.706
HCC82: Respirator Dependence/Tracheostomy Status	15,662	7.69	-0.083	0.030	0.006	0.921	0.868	0.976
HCC83: Respiratory Arrest	671	0.33	-0.325	0.120	0.007	0.723	0.571	0.914
HCC84: Cardio-Respiratory Failure and Shock	85,128	41.81	-0.167	0.015	<.0001	0.846	0.822	0.871
HCC85: Congestive Heart Failure	97,583	47.93	-0.094	0.013	<.0001	0.910	0.887	0.934
HCC86: Acute Myocardial Infarction*	8,108	3.98	-0.103	0.034	0.003	0.902	0.844	0.965
HCC96: Specified Heart Arrhythmias	76,515	37.58	-0.145	0.013	<.0001	0.865	0.843	0.888
HCC99: Cerebral Hemorrhage*	1,773	0.87	-0.312	0.088	0.000	0.732	0.616	0.871
HCC100: Ischemic or Unspecified Stroke*	4,483	2.20	-0.687	0.056	<.0001	0.503	0.451	0.562

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Table 1-1. Preliminary Logistic Regression Model Results for Discharge to Community-Post Acute Care (PAC) Long-Term Care Hospital Quality Reporting Program, 2012-2013 (continued)

Covariate	N	%	Coefficient Estimate	SE[1]	p-value	Odds Ratio (OR)	OR 95% Lower CL[2]	OR 95% Upper CL
HCC102: Cerebrovascular Atherosclerosis, Aneurysm, and Other Disease*	2,397	1.18	-0.119	0.064	0.062	0.888	0.784	1.006
HCC103: Hemiplegia/Hemiparesis*	12,215	6.00	-0.597	0.033	<.0001	0.551	0.516	0.588
HCC104: Monoplegia, Other Paralytic Syndromes*	618	0.30	-0.372	0.117	0.002	0.690	0.549	0.867
HCC105: Late Effects of Cerebrovascular Disease, Except Paralysis*	5,962	2.93	-0.254	0.039	<.0001	0.776	0.719	0.837
HCC106: Atherosclerosis of the Extremities with Ulceration or Gangrene	12,245	6.01	-0.240	0.027	<.0001	0.787	0.746	0.830
HCC107: Vascular Disease with Complications*	6,481	3.18	-0.069	0.035	0.045	0.933	0.872	0.998
HCC108: Vascular Disease*	31,789	15.61	-0.027	0.017	0.109	0.974	0.942	1.006
HCC109: Other Circulatory Disease	30,704	15.08	-0.028	0.017	0.089	0.972	0.941	1.004
HCC110-HCC112: Cystic Fibrosis; Chronic Obstructive Pulmonary Disease; Fibrosis of Lung and Other Chronic Lung Disorders	85,542	42.01	-0.015	0.013	0.251	0.985	0.961	1.011
HCC114: Aspiration and Specified Bacterial Pneumonias*	33,257	16.33	-0.185	0.021	<.0001	0.831	0.797	0.866
HCC116: Viral and Unspecified Pneumonia, Pleurisy*	33,977	16.69	-0.122	0.017	<.0001	0.885	0.855	0.915
HCC119: Legally Blind	3,491	1.71	-0.213	0.047	<.0001	0.808	0.736	0.886
HCC120-HCC125: Major Eye Infections/Inflammations; Retinal Detachment; Proliferative Diabetic Retinopathy and Vitreous Hemorrhage; Diabetic and Other Vascular Retinopathies; Exudative Macular Degeneration; Other Retinal Disorders	8,955	4.40	-0.040	0.029	0.174	0.961	0.907	1.018
HCC126: Glaucoma*	3,834	1.88	-0.068	0.043	0.109	0.934	0.859	1.015
HCC132: Kidney Transplant Status	2,065	1.01	-0.122	0.057	0.033	0.885	0.791	0.990
HCC133: End-Stage Renal Disease	21,420	10.52	-0.296	0.023	<.0001	0.744	0.711	0.778
HCC134: Dialysis Status*	474	0.23	-0.125	0.123	0.308	0.882	0.694	1.122

(continued)

Table 1-1. Preliminary Logistic Regression Model Results for Discharge to Community-Post Acute Care (PAC) Long-Term Care Hospital Quality Reporting Program, 2012-2013 (continued)

Covariate	N	%	Coefficient Estimate	SE[1]	p-value	Odds Ratio (OR)	OR 95% Lower CL[2]	OR 95% Upper CL
HCC135: Acute Renal Failure	80,824	39.70	-0.149	0.014	<.0001	0.862	0.838	0.886
HCC136: Chronic Kidney Disease, Stage 5	220	0.11	-0.355	0.177	0.045	0.701	0.496	0.991
HCC137: Chronic Kidney Disease, Severe (Stage 4)	1,326	0.65	-0.172	0.069	0.013	0.842	0.735	0.964
HCC138; HCC139: Chronic Kidney Disease, Moderate (Stage 3); Chronic Kidney Disease, Mild or Unspecified (Stages 1-2 or Unspecified)	12,715	6.25	-0.039	0.024	0.100	0.962	0.918	1.008
HCC144: Urinary Tract Infection	79,170	38.88	-0.161	0.013	<.0001	0.851	0.830	0.874
HCC157: Pressure Ulcer of Skin with Necrosis Through to Muscle, Tendon, or Bone	13,960	6.86	-0.498	0.027	<.0001	0.608	0.576	0.640
HCC158: Pressure Ulcer of Skin with Full Thickness Skin Loss	10,830	5.32	-0.541	0.030	<.0001	0.582	0.549	0.618
HCC159: Pressure Ulcer of Skin with Partial Thickness Skin Loss	9,885	4.86	-0.497	0.032	<.0001	0.608	0.571	0.647
HCC160: Pressure Pre-Ulcer Skin Changes or Unspecified Stage	8,953	4.40	-0.450	0.032	<.0001	0.638	0.599	0.679
HCC161: Chronic Ulcer of Skin, Except Pressure	12,748	6.26	-0.079	0.024	0.001	0.925	0.883	0.968
HCC162; HCC163: Severe Skin Burn or Condition; Moderate Skin Burn or Condition	572	0.28	-0.217	0.110	0.049	0.805	0.649	0.999
HCC166-HCC168: Severe Head Injury; Major Head Injury; Concussion or Unspecified Head Injury	3,761	1.85	-0.097	0.050	0.053	0.908	0.823	1.001
HCC169: Vertebral Fractures without Spinal Cord Injury	4,709	2.31	-0.162	0.043	0.000	0.851	0.781	0.926
HCC170: Hip Fracture/Dislocation	2,884	1.42	-0.275	0.057	<.0001	0.759	0.679	0.848
HCC171: Major Fracture, Except of Skull, Vertebrae, or Hip	3,104	1.52	-0.202	0.052	0.000	0.817	0.737	0.905
HCC173: Traumatic Amputations and Complications	1,386	0.68	-0.129	0.079	0.105	0.879	0.753	1.027
HCC174: Other Injuries	50,616	24.86	-0.058	0.015	0.000	0.944	0.916	0.972
HCC176: Complications of Specified Implanted Device or Graft*	7,937	3.90	-0.051	0.031	0.098	0.950	0.894	1.010
HCC188: Artificial Openings for Feeding or Elimination	22,271	10.94	-0.098	0.022	<.0001	0.906	0.868	0.947
HCC189; HCC190: Amputation Status, Lower Limb/Amputation Complications; Amputation Status, Upper Limb	8,077	3.97	-0.026	0.029	0.368	0.974	0.920	1.031

(continued)

Table 1-1. Preliminary Logistic Regression Model Results for Discharge to Community-Post Acute Care (PAC) Long-Term Care Hospital Quality Reporting Program, 2012-2013 (continued)

Covariate	N	%	Coefficient Estimate	SE[1]	p-value	Odds Ratio (OR)	OR 95% Lower CL[2]	OR 95% Upper CL
Acute History: Number of Hospital Stays in Past Year, Excluding Most Recent Stay (Reference: No Stays)								
1 Stay	47,799	23.48	-0.080	0.016	<.0001	0.923	0.895	0.952
2 Stays	29,893	14.68	-0.081	0.019	<.0001	0.922	0.888	0.958
3 Stays	22,490	11.05	-0.180	0.022	<.0001	0.835	0.800	0.872
4 Stays	12,864	6.32	-0.183	0.027	<.0001	0.833	0.789	0.879
5 Stays	9,953	4.89	-0.292	0.031	<.0001	0.747	0.703	0.794
6 Stays	6,347	3.12	-0.295	0.038	<.0001	0.744	0.691	0.801
7 Stays	4,965	2.44	-0.283	0.042	<.0001	0.753	0.694	0.817
8 Stays	2,990	1.47	-0.337	0.052	<.0001	0.714	0.645	0.791
9 Stays	2,758	1.35	-0.408	0.056	<.0001	0.665	0.597	0.742
10+ Stays	7,912	3.89	-0.499	0.036	<.0001	0.607	0.565	0.652

[1] SE = Standard Error; [2] CL = Confidence Limit.

Source: RTI International analysis of Medicare claims data (program reference: RTI RK11 DTC-LTCH_RA model_11)

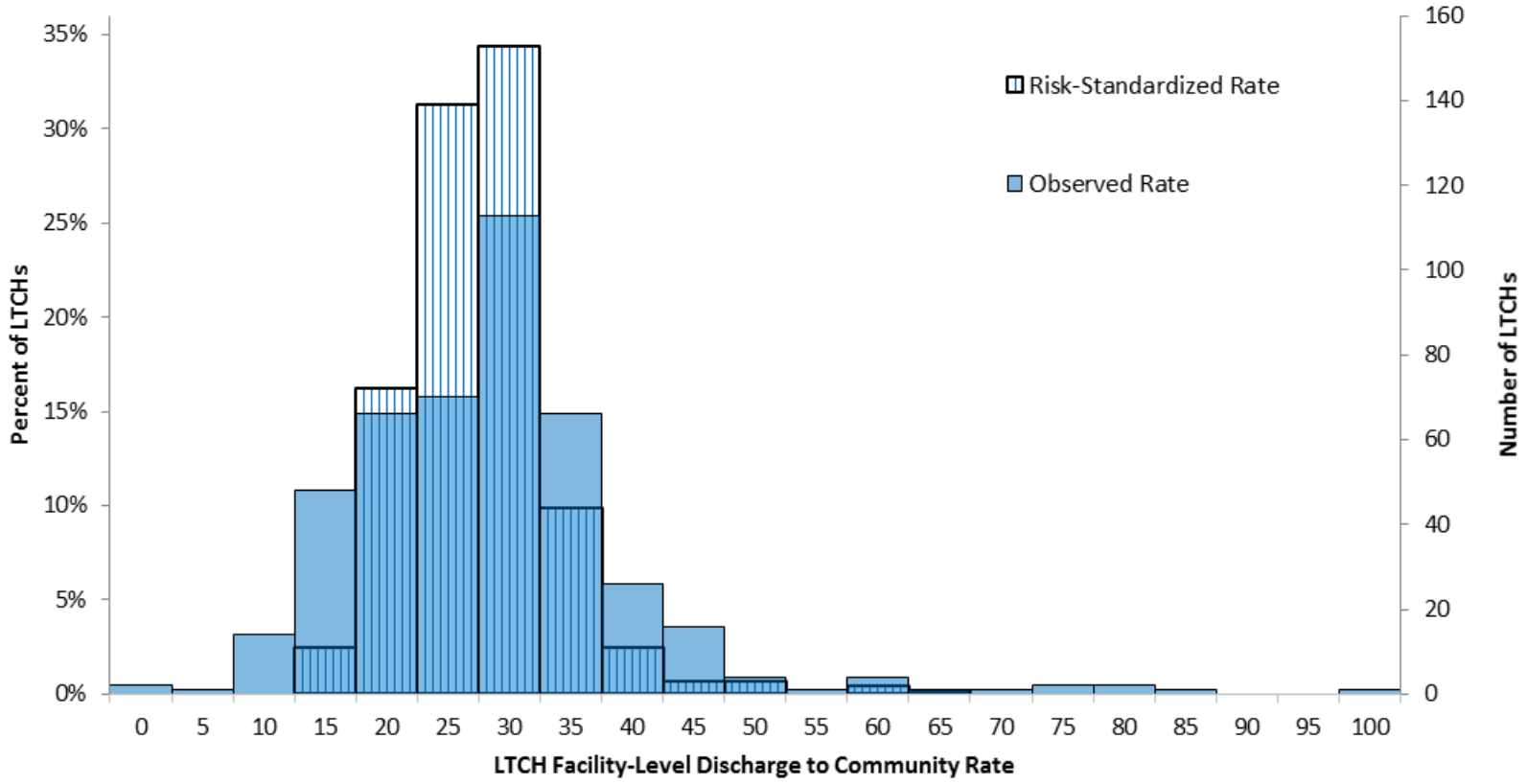
Table 1-2. Long-term Care Hospital: Facility-Level Observed and Risk-Standardized Discharge to Community Rates, 2012-2013

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	26.11	11.65	0.00	6.33	10.77	13.36	18.90	25.90	31.27	36.92	42.22	75.00	100.00
Risk-Standardized	25.12	6.17	10.34	13.82	16.31	18.11	21.01	24.99	28.36	31.25	34.60	48.32	63.13

NOTE: Based on CY 2012-2013 Medicare fee-for-service claims data from 439 LTCHs. Facility-level number of LTCH stays ranged from 1 to 3,083, with a mean of 463.8 and median of 384.0. SD = standard deviation, pctl = percentile.

Source: RTI International analysis of Medicare claims data (program reference: RTI RK11 DTC-LTCH_RA model_11).

Figure 1-1. Long-Term Care Hospital: Facility-Level Observed and Risk-Standardized Discharge to Community Rates, 2012-2013



NOTE: Based on CY 2012-2013 Medicare fee-for-service claims data from 439 LTCHs. Facility-level number of LTCH stays ranged from 1 to 3,083, with a mean size of 463.8 and median of 384. Blue bars represent the observed rate distribution; striped bars represent the risk-standardized rate distribution; the overlap between blue and striped bars represents the overlap between observed and risk-standardized rate distributions.

Source: RTI International analysis of Medicare claims data (program reference: RTI RK11 DTC-LTCH_RA model_11)

APPENDIX 2
POTENTIALLY PREVENTABLE 30-DAY POST-DISCHARGE READMISSION MEASURE FOR LONG-TERM CARE HOSPITAL (LTCH) QUALITY REPORTING PROGRAM (QRP)

Table 2-1.
List of Conditions for Defining Potentially Preventable Hospital Readmissions for 30-Days Post-PAC Discharge with ICD-9 Codes

Note: These conditions will be used for the post-PAC discharge measures.

Conditions	Diagnosis	ICD-9- CM	30 day post-PAC discharge	Clinical Rationale
Adult asthma*	*Extrinsic asthma NOS	493.00	X	Inadequate management of chronic conditions
	*Ext asthma w/ status asth	493.01	X	
	*Ext asthma w(acute) exac	493.02	X	
	*Intrinsic asthma NOS	493.10	X	
	*Int asthma w status asth	493.11	X	
	*Int asthma w (ac) exac	493.12	X	
	*Chronic obst asthma NOS	493.20	X	
	*Ch ob asthma w stat asth	493.21	X	
	*Ch obst asth w (ac) exac	493.22	X	
	*Exercise ind bronchospasm	493.81	X	
	*Cough variant asthma	493.82	X	
	*Asthma NOS	493.90	X	
	*Asthma w status asth mat	493.91	X	
	*Asthma NOS w (ac) exac	493.92	X	
Chronic obstructive pulmonary disease (COPD)*	*Simple Chr Bronchitis	491.0	X	Inadequate management of chronic conditions
	*Mucopurul Chr Bronchitis	491.1	X	
	*Obs Chr Brnc w/o act exa	491.20	X	
	*Obs Chr Brnc w/ act exa	491.21	X	
	*Obs Chr Bronc w/ ac Bronc	491.22	X	
	*Chronic Bronchitis NEC	491.8	X	
	*Chronic Bronchitis NOS	491.9	X	
	*Emphysematous Bleb	492.0	X	
	*Emphysema NEC	492.8	X	
	*Bronchiectasis	494	X	
	*Bronchiectas w/o ac exac	494.0	X	
	*Bronchiectasis w/ ac exac	494.1	X	
	*Chr airway obstruct NEC	496	X	

(continued)

Table 2-1. List of Conditions for Defining Potentially Preventable Hospital Readmissions for 30-Days Post-PAC Discharge with ICD-9 Codes (continued)

Note: These conditions will be used for the post-PAC discharge measures.

Conditions	Diagnosis	ICD-9- CM	30 day post-PAC discharge	Clinical Rationale
Congestive heart failure (CHF)*	*Rheumatic Heart Failure	398.91	X	Inadequate management of chronic conditions
	*Mal hypert hrt dis w/ CHF	402.01	X	
	*Benign hyp hrt dis w CHF	402.11	X	
	*Hyperten heart dis w CHF	402.91	X	
	*Mal hyper hrt/ren w/ CHF	404.01	X	
	*Mal hyp hrt/ren w CHF/RF	404.03	X	
	*Ben hyper hrt/ren w CHF	404.11	X	
	*Ben hyp hrt/ren w CHF/RF	404.13	X	
	*Hyper hrt/ren NOS w CHF	404.91	X	
	*Hyp Ht/Ren NOS w CHR	404.93	X	
	*Congestive Heart Failure	428.0	X	
	*Left heart failure	428.1	X	
	*Systolic hrt failure NOS	428.20	X	
	*AC systolic hrt failure	428.21	X	
	*Chr systolic hrt failure	428.22	X	
	*AC on chr syst hrt fail	428.23	X	
	*Diastolic hrt failure NOS	428.30	X	
	*AC diastolic hrt failure	428.31	X	
	*Chr diastolic hrt fail	428.32	X	
	*AC on chr diast hrt fail	428.33	X	
	*Syst/diast hrt fail NOS	428.40	X	
	*AC syst/diastole hrt fail	428.41	X	
	*Chr syst/diastl hrt fail	428.42	X	
	*AC/CHR syst/dia hrt fail	428.43	X	
	*Heart Failure NOS	428.9	X	
	Acute lung edema NOS	518.4	X	
Diabetes short-term complication*	Secondary diabetes mellitus with ketoacidosis	249.1X	X	Inadequate management of chronic conditions
	Secondary diabetes mellitus with hyperosmolarity	249.2X	X	
	Secondary diabetes mellitus with other coma	249.3X	X	
	Secondary diabetes mellitus with other specified manifestations (hypoglycemia)	249.8X	X	

(continued)

Table 2-1. List of Conditions for Defining Potentially Preventable Hospital Readmissions for 30-Days Post-PAC Discharge with ICD-9 Codes (continued)

Note: These conditions will be used for the post-PAC discharge measures.

Conditions	Diagnosis	ICD-9- CM	30 day post-PAC discharge	Clinical Rationale
	Diabetes with other specified manifestations (hypoglycemia)	250.8X	X	
	*DM Keto T2, DM Cont	250.10	X	
	*DM Keto T1, DM Cont	250.11	X	
	*DM Keto T2, DM Uncont	250.12	X	
	*DM Keto T1, DM Uncont	250.13	X	
	*DM W/ Hyprosm T2, DM Cont	250.20	X	
	*DM W/ Hyprosm T1, DM Cont	250.21	X	
	*DM W/ Hyprosm T2, DM Uncnt	250.22	X	
	*DM W/ Hyprosm T1, DM Uncnt	250.23	X	
	*DM Coma Nec Typ Ii, DM Cnt	250.30	X	
	*DM Coma Nec T1, DM Cont	250.31	X	
	*DM Coma Nec T2, DM Uncont	250.32	X	
	*DM Coma Nec T1, DM Uncont	250.33	X	
Hypertension*/ Hypotension	*Malignant Hypertension	401.0	X	Inadequate management of chronic conditions
	*Hypertension NOS	401.9	X	
	*Mal Hyperten hrt dis NOS	402.00	X	
	*Benign hyp ht dis w/o hf	402.10	X	
	*Hyp hrt dis NOS w/o hf	402.90	X	
	*Mal hyp ren w/o ren fail	403.00	X	
	*Ben hy kid w cr kid I-IV	403.10	X	
	*Hy kid NOS w cr kid I-IV	403.90	X	
	*Mal hy ht/ren w/o chf/rf	404.00	X	
	*Ben hy ht/ren w/o chf/rf	404.10	X	
	*Hy ht/ren NOS w/o chf/rf	404.90	X	
	Orthostatic hypotension	458.0	X	
	Chronic hypotension	458.1	X	
	Iatrogenic hypotension NEC	458.29	X	
	Hypotension NEC	458.8	X	
	Hypotension NOS	458.9	X	
Influenza	Influenza	487.X	X	Inadequate management of infection
	Influenza due to identified avian influenza virus	488.X	X	

(continued)

Table 2-1. List of Conditions for Defining Potentially Preventable Hospital Readmissions for 30-Days Post-PAC Discharge with ICD-9 Codes (continued)

Note: These conditions will be used for the post-PAC discharge measures.

Conditions	Diagnosis	ICD-9- CM	30 day post-PAC discharge	Clinical Rationale
Bacterial pneumonia*	*Pneumococcal Pneumonia	481	X	Inadequate management of infection
	*H.Influenzae Pneumonia	482.2	X	
	*Strep Pneumonia Unspec	482.30	X	
	*Grp A Strep Pneumonia	482.31	X	
	*Grp B Strep Pneumonia	482.32	X	
	*Oth Strep Pneumonia	482.39	X	
	*Meth Sus Pneum D/T Staph	482.41	X	
	*Meth Res Pneu D/T Staph	482.42	X	
	*Bacterial Pneumonia Nos	482.9	X	
	*Mycoplasma Pneumonia	483.0	X	
	*Chlamydia Pneumonia	483.1	X	
	*Oth Spec Org Pneumonia	483.8	X	
	*Broncopneumonia Org Nos	485	X	
	*Pneumonia, Organism Nos	486	X	
Urinary tract infection*/Kidney infection	*Ac pyelonephritis NOS	590.10	X	Inadequate management of infection
	*Ac pyelonephr w med necr	590.11	X	
	*Renal/perirenal abscess	590.2	X	
	*Pyeloureteritis cystica	590.3	X	
	*Pyelonephritis NOS	590.80	X	
	*Pyelonephrit in oth dis	590.81	X	
	*Infection of kidney NOS	590.9	X	
	*Acute cystitis	595.0	X	
	Urethral abscess	597.0	X	
	*Urin tract infection NOS	599.0	X	
C. difficile infection [135 subset]	Intestinal infection due to Clostridium difficile	008.45	X	Inadequate management of infection
Septicemia (except in labor) [2]	Salmonella septicemia	003.1	X	Inadequate management of infection
	Septicemic plague	020.2	X	
	Anthrax septicemia	022.3	X	
	Meningococcemia	036.2	X	
	Streptococcal septicemia	038.0	X	
	Staphylococcal septicemia	038.1	X	
	Staphylococcal septicemia, unspecified	038.10	X	

(continued)

Table 2-1. List of Conditions for Defining Potentially Preventable Hospital Readmissions for 30-Days Post-PAC Discharge with ICD-9 Codes (continued)

Note: These conditions will be used for the post-PAC discharge measures.

Conditions	Diagnosis	ICD-9- CM	30 day post-PAC discharge	Clinical Rationale
	Methicillin susceptible Staphylococcus aureus septicemia	038.11	X	
	Methicillin resistant Staphylococcus aureus septicemia	038.12	X	
	Other staphylococcal septicemia	038.19	X	
	Pneumococcal septicemia [Streptococcus pneumoniae septicemia]	038.2	X	
	Septicemia due to anaerobes	038.3	X	
	Septicemia due to gram-negative organism, unspecified	038.40	X	
	Septicemia due to hemophilus influenzae [H. influenzae]	038.41	X	
	Septicemia due to escherichia coli [E. coli]	038.42	X	
	Septicemia due to pseudomonas	038.43	X	
	Septicemia due to serratia	038.44	X	
	Other septicemia due to gram-negative organisms	038.49	X	
	Other specified septicemias	038.8	X	
	Unspecified septicemia	038.9	X	
	Herpetic septicemia	054.5	X	
	Septic arterial embolism	449	X	
	Sepsis	995.91	X	
	Severe sepsis	995.92	X	
	Septic shock	785.52	X	
Skin and subcutaneous tissue infections [197]	Cellulitis and abscess of finger, unspecified	681.00	X	Inadequate management of infection
	Cellulitis and abscess of toe, unspecified	681.10	X	
	Cellulitis and abscess of unspecified digit	681.9	X	
	Cellulitis and abscess of face	682.0	X	
	Cellulitis and abscess of neck	682.1	X	
	Cellulitis and abscess of trunk	682.2	X	
	Cellulitis and abscess of upper arm and forearm	682.3	X	
	Cellulitis and abscess of hand, except fingers and thumb	682.4	X	
	Cellulitis and abscess of buttock	682.5	X	

(continued)

Table 2-1. List of Conditions for Defining Potentially Preventable Hospital Readmissions for 30-Days Post-PAC Discharge with ICD-9 Codes (continued)

Note: These conditions will be used for the post-PAC discharge measures.

Conditions	Diagnosis	ICD-9- CM	30 day post-PAC discharge	Clinical Rationale
	Cellulitis and abscess of leg, except foot	682.6	X	
	Cellulitis and abscess of foot, except toes	682.7	X	
	Cellulitis and abscess of other specified sites	682.8	X	
	Cellulitis and abscess of unspecified sites	682.9	X	
	Other specified local infections of skin and subcutaneous tissue	686.8	X	
	Unspecified local infection of skin and subcutaneous tissue	686.9	X	
Dehydration*/ Electrolyte imbalance [55]	**Hyperosmolality and/or hypernatremia	276.0	X	Inadequate management of other unplanned events
	Hyposmolality and/or hyponatremia	276.1	X	
	Acidosis	276.2	X	
	Alkalosis	276.3	X	
	Mixed acid-base balance disorder	276.4	X	
	*Volume depletion, unspecified	276.50	X	
	*Dehydration	276.51	X	
	*Hypovolemia	276.52	X	
	Fluid overload disorder	276.6	X	
	Other fluid overload	276.69	X	
	Hyperpotassemia	276.7	X	
	Hypopotassemia	276.8	X	
	Electrolyte and fluid disorders not elsewhere classified	276.9	X	
	**Intes Infec Rotavirus	008.61	X	
	**Intes Infec Adenovirus	008.62	X	
	**Int Inf Norwalk Virus	008.63	X	
	**Int Inf Oth Sml Rnd Vrus	008.64	X	
	**Intes Infec Calcivirus	008.65	X	
	**Intes Infec Astrovirus	008.66	X	
	**Int Inf Enterovirus NEC	008.67	X	
	**Enteritis NOS	008.69	X	

(continued)

Table 2-1. List of Conditions for Defining Potentially Preventable Hospital Readmissions for 30-Days Post-PAC Discharge with ICD-9 Codes (continued)

Note: These conditions will be used for the post-PAC discharge measures.

Conditions	Diagnosis	ICD-9- CM	30 day post-PAC discharge	Clinical Rationale
	**Viral Enteritis NOS	008.8	X	
	**Infectious Enteritis NOS	009.0	X	
	**Enteritis of Infect Orig	009.1	X	
	**Infectious Diarrhea NOS	009.2	X	
	**Diarrhea of Infect Orig	009.3	X	
	**Noninf Gastroenterit NEC	558.9	X	
Aspiration pneumonitis; food/vomitus [129]	Pneumonitis due to inhalation of food or vomitus	507.0	X	Inadequate management of other unplanned events
Acute renal failure*	*Acute kidney failure with lesion of tubular necrosis	584.5	X	Inadequate management of other unplanned events
	*Acute kidney failure with lesion of renal cortical necrosis	584.6	X	
	*Acute kidney failure with lesion of renal medullary [papillary] necrosis	584.7	X	
	*Acute kidney failure with other specified pathological lesion in kidney	584.8	X	
	*Acute kidney failure, unspecified	584.9	X	
	*Renal Failure NOS	586	X	
	*Surg Compl-Urinary Tract	997.5	X	
Arrhythmia	Atrial fibrillation	427.31	X	Inadequate management of other unplanned events
	Atrial flutter	427.32	X	
Intestinal impaction [145 subset]	Impaction of intestine, unspecified	560.30	X	Inadequate management of other unplanned events
	Fecal impaction	560.32	X	
	Other impaction of intestine	560.39	X	
Pressure ulcers	Chronic ulcer of skin	707.0X 707.2X	X	Inadequate management of other unplanned events

SOURCE: List of potentially preventable readmission conditions from RTI International using ICD-9-CM (version: April 2016).

NOTES: [###] indicates Clinical Classifications Software (CCS) code

To be considered a potentially preventable readmission, diagnosis codes must be the principal diagnosis on the readmission claim, except where noted.

*Ambulatory Care Sensitive Conditions (ACSCs)/Prevention Quality Indicators (PQIs)

** Primary diagnosis with dehydration (codes: 276.50, 276.51, 276.52) as secondary diagnosis

Table 2-2. Preliminary List of Conditions for Defining Potentially Preventable Hospital Readmissions for 30-Days Post-PAC Discharge with ICD-10 Codes

Conditions	Subconditions	ICD-10-CM	ICD-10 Description
Adult Asthma*	Asthma* (PQI 05)	J4521	Mild intermittent asthma with (acute) exacerbation
		J4522	Mild intermittent asthma with status asthmaticus
		J4531	Mild persistent asthma with (acute) exacerbation
		J4532	Mild persistent asthma with status asthmaticus
		J4541	Moderate persistent asthma with (acute) exacerbation
		J4542	Moderate persistent asthma with status asthmaticus
		J4551	Severe persistent asthma with (acute) exacerbation
		J4552	Severe persistent asthma with status asthmaticus
		J45901	Unspecified asthma with (acute) exacerbation
		J45902	Unspecified asthma with status asthmaticus
		J45990	Exercise induced bronchospasm
		J45991	Cough variant asthma
		J45998	Other asthma
	Acute Bronchitis*^ (PQI 05)	J200	Acute bronchitis due to Mycoplasma pneumoniae
		J201	Acute bronchitis due to Hemophilus influenzae
		J202	Acute bronchitis due to streptococcus
		J203	Acute bronchitis due to coxsackievirus
		J204	Acute bronchitis due to parainfluenza virus
		J205	Acute bronchitis due to respiratory syncytial virus
		J206	Acute bronchitis due to rhinovirus
		J207	Acute bronchitis due to echovirus
		J208	Acute bronchitis due to other specified organisms
		J209	Acute bronchitis, unspecified
		J40	Bronchitis, not specified as acute or chronic
Chronic obstructive pulmonary disease (COPD)	COPD* (PQI 05)	J410	Simple chronic bronchitis
		J411	Mucopurulent chronic bronchitis
		J418	Mixed simple and mucopurulent chronic bronchitis
		J42	Unspecified chronic bronchitis
		J430	Unilateral pulmonary emphysema [MacLeod's syndrome]
		J431	Panlobular emphysema
		J432	Centrilobular emphysema

(continued)

Table 2-2. Preliminary List of Conditions for Defining Potentially Preventable Hospital Readmissions for 30-Days Post-PAC Discharge with ICD-10 Codes (continued)

Conditions	Subconditions	ICD-10-CM	ICD-10 Description
		J438	Other emphysema
		J439	Emphysema, unspecified
		J440	Chronic obstructive pulmonary disease with acute lower respiratory infection
		J441	Chronic obstructive pulmonary disease with (acute) exacerbation
		J449	Chronic obstructive pulmonary disease, unspecified
		J470	Bronchiectasis with acute lower respiratory infection
		J471	Bronchiectasis with (acute) exacerbation
		J479	Bronchiectasis, uncomplicated
Congestive heart failure (CHF)		I09.81	Rheumatic heart failure
		I11.0	Hypertensive heart disease with heart failure
		I11.0	Hypertensive heart disease with heart failure
		I11.0	Hypertensive heart disease with heart failure
		I13.0	Hypertensive heart and chronic kidney disease with heart failure and stage 1 through stage 4 chronic kidney disease, or unspecified chronic kidney disease
		I13.2	Hypertensive heart and chronic kidney disease with heart failure and with stage 5 chronic kidney disease, or end stage renal disease
		I13.0	Hypertensive heart and chronic kidney disease with heart failure and stage 1 through stage 4 chronic kidney disease, or unspecified chronic kidney disease
		I13.2	Hypertensive heart and chronic kidney disease with heart failure and with stage 5 chronic kidney disease, or end stage renal disease
		I13.0	Hypertensive heart and chronic kidney disease with heart failure and stage 1 through stage 4 chronic kidney disease, or unspecified chronic kidney disease
		I13.2	Hypertensive heart and chronic kidney disease with heart failure and with stage 5 chronic kidney disease, or end stage renal disease
		I50.9	Heart failure, unspecified
		I50.1	Left ventricular failure
		I50.20	Unspecified systolic (congestive) heart failure
		I50.21	Acute systolic (congestive) heart failure

(continued)

Table 2-2. Preliminary List of Conditions for Defining Potentially Preventable Hospital Readmissions for 30-Days Post-PAC Discharge with ICD-10 Codes (continued)

Conditions	Subconditions	ICD-10-CM	ICD-10 Description
		I50.22	Chronic systolic (congestive) heart failure
		I50.23	Acute on chronic systolic (congestive) heart failure
		I50.30	Unspecified diastolic (congestive) heart failure
		I50.31	Acute diastolic (congestive) heart failure
		I50.32	Chronic diastolic (congestive) heart failure
		I50.33	Acute on chronic diastolic (congestive) heart failure
		I50.40	Unspecified combined systolic (congestive) and diastolic (congestive) heart failure
		I50.41	Acute combined systolic (congestive) and diastolic (congestive) heart failure
		I50.42	Chronic combined systolic (congestive) and diastolic (congestive) heart failure
		I50.43	Acute on chronic combined systolic (congestive) and diastolic (congestive) heart failure
		I50.9	Heart failure, unspecified
		J81.0	Acute pulmonary edema
Diabetes short-term complication	Diabetes short-term complication* (PQI 01)	E1010	Type 1 diabetes mellitus with ketoacidosis without coma
		E1011	Type 1 diabetes mellitus with ketoacidosis with coma
		E10641	Type 1 diabetes mellitus with hypoglycemia with coma
		E1065	Type 1 diabetes mellitus with hyperglycemia
		E1100	Type 2 diabetes mellitus with hyperosmolarity without nonketotic hyperglycemic-hyperosmolar coma (NKHHC)
		E1101	Type 2 diabetes mellitus with hyperosmolarity with coma
		E11641	Type 2 diabetes mellitus with hypoglycemia with coma
		E1165	Type 2 diabetes mellitus with hyperglycemia
		E08.10	Diabetes mellitus due to underlying condition with ketoacidosis without coma
		E09.10	Drug or chemical induced diabetes mellitus with ketoacidosis without coma
		E13.10	Other specified diabetes mellitus with ketoacidosis without coma

(continued)

Table 2-2. Preliminary List of Conditions for Defining Potentially Preventable Hospital Readmissions for 30-Days Post-PAC Discharge with ICD-10 Codes (continued)

Conditions	Subconditions	ICD-10-CM	ICD-10 Description
		E08.65	Diabetes mellitus due to underlying condition with hyperglycemia
		E08.01	Diabetes mellitus due to underlying condition with hyperosmolarity with coma
		E09.01	Drug or chemical induced diabetes mellitus with hyperosmolarity with coma
		E13.00	Other specified diabetes mellitus with hyperosmolarity without nonketotic hyperglycemic-hyperosmolar coma (NKHHC)
		E08.65	Diabetes mellitus due to underlying condition with hyperglycemia
		E08.11	Diabetes mellitus due to underlying condition with ketoacidosis with coma
		E08.641	Diabetes mellitus due to underlying condition with hypoglycemia with coma
		E09.11	Drug or chemical induced diabetes mellitus with ketoacidosis with coma
		E09.641	Drug or chemical induced diabetes mellitus with hypoglycemia with coma
		E13.11	Other specified diabetes mellitus with ketoacidosis with coma
		E13.641	Other specified diabetes mellitus with hypoglycemia with coma
		E09.65	Drug or chemical induced diabetes mellitus with hyperglycemia
		E08.618	Diabetes mellitus due to underlying condition with other diabetic arthropathy
		E08.620	Diabetes mellitus due to underlying condition with diabetic dermatitis
		E08.621	Diabetes mellitus due to underlying condition with foot ulcer
		E08.622	Diabetes mellitus due to underlying condition with other skin ulcer
		E08.628	Diabetes mellitus due to underlying condition with other skin complications
		E08.630	Diabetes mellitus due to underlying condition with periodontal disease
		E08.638	Diabetes mellitus due to underlying condition with other oral complications

(continued)

Table 2-2. Preliminary List of Conditions for Defining Potentially Preventable Hospital Readmissions for 30-Days Post-PAC Discharge with ICD-10 Codes (continued)

Conditions	Subconditions	ICD-10-CM	ICD-10 Description
		E08.65	Diabetes mellitus due to underlying condition with hyperglycemia
		E08.69	Diabetes mellitus due to underlying condition with other specified complication
		E09.618	Drug or chemical induced diabetes mellitus with other diabetic arthropathy
		E09.621	Drug or chemical induced diabetes mellitus with foot ulcer
		E09.622	Drug or chemical induced diabetes mellitus with other skin ulcer
		E09.628	Drug or chemical induced diabetes mellitus with other skin complications
		E09.630	Drug or chemical induced diabetes mellitus with periodontal disease
		E09.638	Drug or chemical induced diabetes mellitus with other oral complications
		E09.649	Drug or chemical induced diabetes mellitus with hypoglycemia without coma
		E09.65	Drug or chemical induced diabetes mellitus with hyperglycemia
		E09.69	Drug or chemical induced diabetes mellitus with other specified complication
		E13.620	Other specified diabetes mellitus with diabetic dermatitis
		E13.621	Other specified diabetes mellitus with foot ulcer
		E13.622	Other specified diabetes mellitus with other skin ulcer
		E13.628	Other specified diabetes mellitus with other skin complications
		E13.638	Other specified diabetes mellitus with other oral complications
		E13.649	Other specified diabetes mellitus with hypoglycemia without coma
		E13.65	Other specified diabetes mellitus with hyperglycemia
		E13.69	Other specified diabetes mellitus with other specified complication
		E09.69	Drug or chemical induced diabetes mellitus with other specified complication
		E11.618	Type 2 diabetes mellitus with other diabetic arthropathy

(continued)

Table 2-2. Preliminary List of Conditions for Defining Potentially Preventable Hospital Readmissions for 30-Days Post-PAC Discharge with ICD-10 Codes (continued)

Conditions	Subconditions	ICD-10-CM	ICD-10 Description
		E11.620	Type 2 diabetes mellitus with diabetic dermatitis
		E11.621	Type 2 diabetes mellitus with foot ulcer
		E11.622	Type 2 diabetes mellitus with other skin ulcer
		E11.628	Type 2 diabetes mellitus with other skin complications
		E11.630	Type 2 diabetes mellitus with periodontal disease
		E11.638	Type 2 diabetes mellitus with other oral complications
		E11.649	Type 2 diabetes mellitus with hypoglycemia without coma
		E11.65	Type 2 diabetes mellitus with hyperglycemia
		E11.69	Type 2 diabetes mellitus with other specified complication
		E10.618	Type 1 diabetes mellitus with other diabetic arthropathy
		E10.620	Type 1 diabetes mellitus with diabetic dermatitis
		E10.621	Type 1 diabetes mellitus with foot ulcer
		E10.622	Type 1 diabetes mellitus with other skin ulcer
		E10.628	Type 1 diabetes mellitus with other skin complications
		E10.630	Type 1 diabetes mellitus with periodontal disease
		E10.638	Type 1 diabetes mellitus with other oral complications
		E10.649	Type 1 diabetes mellitus with hypoglycemia without coma
		E10.65	Type 1 diabetes mellitus with hyperglycemia
		E10.69	Type 1 diabetes mellitus with other specified complication
Hypotension/Hypertension	Hypotension	I95.1	Orthostatic hypotension
		I95.89	Other hypotension
		I95.2	Hypotension due to drugs
		I95.81	Postprocedural hypotension
		I95.89	Other hypotension
		I95.9	Hypotension, unspecified
	Hypertension* (PQI 07)	I10	Essential (primary) hypertension
		I119	Hypertensive heart disease without heart failure
		I129	Hypertensive chronic kidney disease with stage 1 through stage 4 chronic kidney disease, or unspecified chronic kidney disease

(continued)

Table 2-2. Preliminary List of Conditions for Defining Potentially Preventable Hospital Readmissions for 30-Days Post-PAC Discharge with ICD-10 Codes (continued)

Conditions	Subconditions	ICD-10-CM	ICD-10 Description
		I1310	Hypertensive heart and chronic kidney disease without heart failure, with stage 1 through stage 4 chronic kidney disease, or unspecified chronic kidney disease
Influenza		J11.00	Influenza due to unidentified influenza virus with unspecified type of pneumonia
		J12.9	Viral pneumonia, unspecified
		J10.1	Influenza due to other identified influenza virus with other respiratory manifestations
		J11.1	Influenza due to unidentified influenza virus with other respiratory manifestations
		J11.2	Influenza due to unidentified influenza virus with gastrointestinal manifestations
		J11.81	Influenza due to unidentified influenza virus with encephalopathy
		J11.89	Influenza due to unidentified influenza virus with other manifestations
		J09.X1	Influenza due to identified novel influenza A virus with pneumonia
		J09.X2	Influenza due to identified novel influenza A virus with other respiratory manifestations
		J09.X3	Influenza due to identified novel influenza A virus with gastrointestinal manifestations
		J09.X9	Influenza due to identified novel influenza A virus with other manifestations
		J10.08	Influenza due to other identified influenza virus with other specified pneumonia
Bacterial pneumonia	Bacterial pneumonia* (PQI 11)	J13	Pneumonia due to Streptococcus pneumoniae
		J14	Pneumonia due to Hemophilus influenzae
		J15211	Pneumonia due to Methicillin susceptible Staphylococcus aureus
		J15212	Pneumonia due to Methicillin resistant Staphylococcus aureus
		J153	Pneumonia due to streptococcus, group B
		J154	Pneumonia due to other streptococci
		J157	Pneumonia due to Mycoplasma pneumoniae

(continued)

Table 2-2. Preliminary List of Conditions for Defining Potentially Preventable Hospital Readmissions for 30-Days Post-PAC Discharge with ICD-10 Codes (continued)

Conditions	Subconditions	ICD-10-CM	ICD-10 Description
		J159	Unspecified bacterial pneumonia
		J160	Chlamydial pneumonia
		J168	Pneumonia due to other specified infectious organisms
		J180	Bronchopneumonia, unspecified organism
		J181	Lobar pneumonia, unspecified organism
		J188	Other pneumonia, unspecified organism
		J189	Pneumonia, unspecified organism
Urinary tract infection / Kidney infection	Urinary tract infection*	N10	Acute tubulo-interstitial nephritis
		N119	Chronic tubulo-interstitial nephritis, unspecified
		N12	Tubulo-interstitial nephritis, not specified as acute or
		N151	Renal and perinephric abscess
		N159	Renal tubulo-interstitial disease, unspecified
		N16	Renal tubulo-interstitial disorders in diseases classified elsewhere
		N2884	Pyelitis cystica
		N2885	Pyeloureteritis cystica
		N2886	Ureteritis cystica
		N3000	Acute cystitis without hematuria
		N3001	Acute cystitis with hematuria
		N3090	Cystitis, unspecified without hematuria
		N3091	Cystitis, unspecified with hematuria
		N390	Urinary tract infection, site not specified
	Kidney infection	N30.10	Interstitial cystitis (chronic) without hematuria
		N30.11	Interstitial cystitis (chronic) with hematuria
		N30.20	Other chronic cystitis without hematuria
		N30.21	Other chronic cystitis with hematuria
		N30.80	Other cystitis without hematuria
		N30.81	Other cystitis with hematuria
		N34.0	Urethral abscess

(continued)

Table 2-2. Preliminary List of Conditions for Defining Potentially Preventable Hospital Readmissions for 30-Days Post-PAC Discharge with ICD-10 Codes (continued)

Conditions	Subconditions	ICD-10-CM	ICD-10 Description
C. difficile infection [135 subset]		A04.7	Enterocolitis due to Clostridium difficile
Septicemia (except in labor) [2]		A02.1	Salmonella sepsis
		A20.7	Septicemic plague
		A22.7	Anthrax sepsis
		A39.4	Meningococcemia, unspecified
		A40.9	Streptococcal sepsis, unspecified
		A41.2	Sepsis due to unspecified staphylococcus
		A41.01	Sepsis due to Methicillin susceptible Staphylococcus aureus
		A41.02	Sepsis due to Methicillin resistant Staphylococcus aureus
		A41.1	Sepsis due to other specified staphylococcus
		A40.3	Sepsis due to Streptococcus pneumoniae
		A41.4	Sepsis due to anaerobes
		A41.50	Gram-negative sepsis, unspecified
		A41.3	Sepsis due to Hemophilus influenzae
		A41.51	Sepsis due to Escherichia coli [E. coli]
		A41.52	Sepsis due to Pseudomonas
		A4153	Sepsis due to Serratia
		A41.59	Other Gram-negative sepsis
		A41.89	Other specified sepsis
		A41.9	Sepsis, unspecified organism
		B00.7	Disseminated herpesviral disease
		I76	Septic arterial embolism
		A41.9	Sepsis, unspecified organism
		R65.20	Severe sepsis without septic shock
		R65.21	Severe sepsis with septic shock

(continued)

Table 2-2. Preliminary List of Conditions for Defining Potentially Preventable Hospital Readmissions for 30-Days Post-PAC Discharge with ICD-10 Codes (continued)

Conditions	Subconditions	ICD-10-CM	ICD-10 Description
Dehydration/ Electrolyte imbalance [55]	Dehydration*	E860	Dehydration
		E861	Hypovolemia
		E869	Volume depletion, unspecified
	Hyperosmolality and/or hypernatremia~	E870	Hyperosmolality and hypernatremia
	Gastroenteritis~	A080	Rotaviral enteritis
		A0811	Acute gastroenteropathy due to Norwalk agent
		A0819	Acute gastroenteropathy due to other small round
		A082	Aidenoviral enteritis
		A0831	Calicivirus enteritis
		A0832	Astrovirus enteritis
		A0839	Other viral enteritis
		A084	Viral intestinal infection, unspecified
		A088	Other specified intestinal infections
		A09	Infectious gastroenteritis and colitis, unspecified
		K5289	Other specified noninfective gastroenteritis and colitis
		K529	Noninfective gastroenteritis and colitis, unspecified
	Acute kidney failure~	N170	Acute kidney failure with tubular necrosis
		N171	Acute kidney failure with acute cortical necrosis
		N172	Acute kidney failure with medullary necrosis
		N178	Other acute kidney failure
		N179	Acute kidney failure, unspecified
		N19	Unspecified kidney failure
		N990	Postprocedural (acute) (chronic) kidney failure
		E87.2	Acidosis
		E87.3	Alkalosis
		E87.4	Mixed disorder of acid-base balance
		E87.70	Fluid overload, unspecified
		E87.79	Other fluid overload

(continued)

Table 2-2. Preliminary List of Conditions for Defining Potentially Preventable Hospital Readmissions for 30-Days Post-PAC Discharge with ICD-10 Codes (continued)

Conditions	Subconditions	ICD-10-CM	ICD-10 Description
		E87.5	Hyperkalemia
		E87.6	Hypokalemia
		E87.8	Other disorders of electrolyte and fluid balance, not elsewhere classified
Skin and subcutaneous tissue infections [197]		L03.021	Acute lymphangitis of right finger
		L03.022	Acute lymphangitis of left finger
		L03.029	Acute lymphangitis of unspecified finger
		L03.041	Acute lymphangitis of right toe
		L03.042	Acute lymphangitis of left toe
		L03.049	Acute lymphangitis of unspecified toe
		L03.121	Acute lymphangitis of right axilla
		L03.122	Acute lymphangitis of left axilla
		L03.123	Acute lymphangitis of right upper limb
		L03.124	Acute lymphangitis of left upper limb
		L03.125	Acute lymphangitis of right lower limb
		L03.126	Acute lymphangitis of left lower limb
		L03.129	Acute lymphangitis of unspecified part of limb
		L03.212	Acute lymphangitis of face
		L03.222	Acute lymphangitis of neck
		L03.321	Acute lymphangitis of abdominal wall
		L03.322	Acute lymphangitis of back [any part except buttock]
		L03.323	Acute lymphangitis of chest wall
		L03.324	Acute lymphangitis of groin
		L03.325	Acute lymphangitis of perineum
		L03.326	Acute lymphangitis of umbilicus
		L03.327	Acute lymphangitis of buttock
		L03.329	Acute lymphangitis of trunk, unspecified
		L03.891	Acute lymphangitis of head [any part, except face]
		L03.898	Acute lymphangitis of other sites
		L03.91	Acute lymphangitis, unspecified
		L03.011	Cellulitis of right finger

(continued)

Table 2-2. Preliminary List of Conditions for Defining Potentially Preventable Hospital Readmissions for 30-Days Post-PAC Discharge with ICD-10 Codes (continued)

Conditions	Subconditions	ICD-10-CM	ICD-10 Description
		L03.012	Cellulitis of left finger
		L03.019	Cellulitis of unspecified finger
		L03.031	Cellulitis of right toe
		L03.032	Cellulitis of left toe
		L03.039	Cellulitis of unspecified toe
		L03.111	Cellulitis of right axilla
		L03.112	Cellulitis of left axilla
		L03.113	Cellulitis of right upper limb
		L03.114	Cellulitis of left upper limb
		L03.115	Cellulitis of right lower limb
		L03.116	Cellulitis of left lower limb
		L03.119	Cellulitis of unspecified part of limb
		L03.211	Cellulitis of face
		L03.221	Cellulitis of neck
		L03.311	Cellulitis of abdominal wall
		L03.312	Cellulitis of back [any part except buttock]
		L03.313	Cellulitis of chest wall
		L03.314	Cellulitis of groin
		L03.315	Cellulitis of perineum
		L03.316	Cellulitis of umbilicus
		L03.317	Cellulitis of buttock
		L03.319	Cellulitis of trunk, unspecified
		L03.811	Cellulitis of head [any part, except face]
		L03.818	Cellulitis of other sites
		L03.90	Cellulitis, unspecified
		K12.2	Cellulitis and abscess of mouth
		L02.01	Cutaneous abscess of face
		L02.11	Cutaneous abscess of neck
		L02.211	Cutaneous abscess of abdominal wall
		L02.212	Cutaneous abscess of back [any part, except buttock]
		L02.213	Cutaneous abscess of chest wall
		L02.214	Cutaneous abscess of groin
		L02.215	Cutaneous abscess of perineum

(continued)

Table 2-2. Preliminary List of Conditions for Defining Potentially Preventable Hospital Readmissions for 30-Days Post-PAC Discharge with ICD-10 Codes (continued)

Conditions	Subconditions	ICD-10-CM	ICD-10 Description
		L02.216	Cutaneous abscess of umbilicus
		L02.219	Cutaneous abscess of trunk, unspecified
		L02.31	Cutaneous abscess of buttock
		L02.411	Cutaneous abscess of right axilla
		L02.412	Cutaneous abscess of left axilla
		L02.413	Cutaneous abscess of right upper limb
		L02.414	Cutaneous abscess of left upper limb
		L02.415	Cutaneous abscess of right lower limb
		L02.416	Cutaneous abscess of left lower limb
		L02.419	Cutaneous abscess of limb, unspecified
		L02.511	Cutaneous abscess of right hand
		L02.512	Cutaneous abscess of left hand
		L02.519	Cutaneous abscess of unspecified hand
		L02.611	Cutaneous abscess of right foot
		L02.612	Cutaneous abscess of left foot
		L02.619	Cutaneous abscess of unspecified foot
		L02.811	Cutaneous abscess of head [any part, except face]
		L02.818	Cutaneous abscess of other sites
		L02.91	Cutaneous abscess, unspecified
		L08.89	Other specified local infections of the skin and subcutaneous tissue
		L08.9	Local infection of the skin and subcutaneous tissue, unspecified
Aspiration pneumonitis; food/vomitus [129]		J69.0	Pneumonitis due to inhalation of food and vomit
Arrhythmia		I48.91	Unspecified atrial fibrillation
		I48.92	Unspecified atrial flutter
		I48.0	Paroxysmal atrial fibrillation
		I48.1	Persistent atrial fibrillation
		I48.3	Typical atrial flutter
		I48.4	Atypical atrial flutter
Intestinal impaction		K56.49	Other impaction of intestine
		K56.41	Fecal impaction

(continued)

Table 2-2. Preliminary List of Conditions for Defining Potentially Preventable Hospital Readmissions for 30-Days Post-PAC Discharge with ICD-10 Codes (continued)

Conditions	Subconditions	ICD-10-CM	ICD-10 Description
Pressure ulcers		L89.90	Pressure ulcer of unspecified site, unspecified stage
		L89.009	Pressure ulcer of unspecified elbow, unspecified stage
		L89.119	Pressure ulcer of right upper back, unspecified stage
		L89.129	Pressure ulcer of left upper back, unspecified stage
		L89.139	Pressure ulcer of right lower back, unspecified stage
		L89.149	Pressure ulcer of left lower back, unspecified stage
		L89.159	Pressure ulcer of sacral region, unspecified stage
		L89.209	Pressure ulcer of unspecified hip, unspecified stage
		L89.309	Pressure ulcer of unspecified buttock, unspecified stage
		L89.509	Pressure ulcer of unspecified ankle, unspecified stage
		L89.609	Pressure ulcer of unspecified heel, unspecified stage
		L89.819	Pressure ulcer of head, unspecified stage
		L89.899	Pressure ulcer of other site, unspecified stage
		L89.000	Pressure ulcer of unspecified elbow, unstageable
		L89.003	Pressure ulcer of unspecified elbow, stage 3
		L89.004	Pressure ulcer of unspecified elbow, stage 4
		L89.010	Pressure ulcer of right elbow, unstageable
		L89.013	Pressure ulcer of right elbow, stage 3
		L89.014	Pressure ulcer of right elbow, stage 4
		L89.019	Pressure ulcer of right elbow, unspecified stage
		L89.020	Pressure ulcer of left elbow, unstageable
		L89.023	Pressure ulcer of left elbow, stage 3
		L89.024	Pressure ulcer of left elbow, stage 4
		L89.029	Pressure ulcer of left elbow, unspecified stage
		L89.100	Pressure ulcer of unspecified part of back, unstageable
		L89.103	Pressure ulcer of unspecified part of back, stage 3
		L89.104	Pressure ulcer of unspecified part of back, stage 4
		L89.109	Pressure ulcer of unspecified part of back, unspecified stage
		L89.110	Pressure ulcer of right upper back, unstageable
		L89.113	Pressure ulcer of right upper back, stage 3
		L89.114	Pressure ulcer of right upper back, stage 4
		L89.120	Pressure ulcer of left upper back, unstageable
		L89.123	Pressure ulcer of left upper back, stage 3
		L89.124	Pressure ulcer of left upper back, stage 4

(continued)

Table 2-2. Preliminary List of Conditions for Defining Potentially Preventable Hospital Readmissions for 30-Days Post-PAC Discharge with ICD-10 Codes (continued)

Conditions	Subconditions	ICD-10-CM	ICD-10 Description
		L89.130	Pressure ulcer of right lower back, unstageable
		L89.133	Pressure ulcer of right lower back, stage 3
		L89.134	Pressure ulcer of right lower back, stage 4
		L89.140	Pressure ulcer of left lower back, unstageable
		L89.143	Pressure ulcer of left lower back, stage 3
		L89.144	Pressure ulcer of left lower back, stage 4
		L89.150	Pressure ulcer of sacral region, unstageable
		L89.153	Pressure ulcer of sacral region, stage 3
		L89.154	Pressure ulcer of sacral region, stage 4
		L89.200	Pressure ulcer of unspecified hip, unstageable
		L89.203	Pressure ulcer of unspecified hip, stage 3
		L89.204	Pressure ulcer of unspecified hip, stage 4
		L89.210	Pressure ulcer of right hip, unstageable
		L89.213	Pressure ulcer of right hip, stage 3
		L89.214	Pressure ulcer of right hip, stage 4
		L89.219	Pressure ulcer of right hip, unspecified stage
		L89.220	Pressure ulcer of left hip, unstageable
		L89.223	Pressure ulcer of left hip, stage 3
		L89.224	Pressure ulcer of left hip, stage 4
		L89.229	Pressure ulcer of left hip, unspecified stage
		L89.300	Pressure ulcer of unspecified buttock, unstageable
		L89.303	Pressure ulcer of unspecified buttock, stage 3
		L89.304	Pressure ulcer of unspecified buttock, stage 4
		L89.309	Pressure ulcer of unspecified buttock, unspecified stage
		L89.310	Pressure ulcer of right buttock, unstageable
		L89.313	Pressure ulcer of right buttock, stage 3
		L89.314	Pressure ulcer of right buttock, stage 4
		L89.319	Pressure ulcer of right buttock, unspecified stage
		L89.320	Pressure ulcer of left buttock, unstageable
		L89.323	Pressure ulcer of left buttock, stage 3
		L89.324	Pressure ulcer of left buttock, stage 4
		L89.329	Pressure ulcer of left buttock, unspecified stage

(continued)

Table 2-2. Preliminary List of Conditions for Defining Potentially Preventable Hospital Readmissions for 30-Days Post-PAC Discharge with ICD-10 Codes (continued)

Conditions	Subconditions	ICD-10-CM	ICD-10 Description
		L89.40	Pressure ulcer of contiguous site of back, buttock and hip, unspecified stage
		L89.43	Pressure ulcer of contiguous site of back, buttock and hip, stage 3
		L89.44	Pressure ulcer of contiguous site of back, buttock and hip, stage 4
		L89.45	Pressure ulcer of contiguous site of back, buttock and hip, unstageable
		L89.500	Pressure ulcer of unspecified ankle, unstageable
		L89.503	Pressure ulcer of unspecified ankle, stage 3
		L89.504	Pressure ulcer of unspecified ankle, stage 4
		L89.509	Pressure ulcer of unspecified ankle, unspecified stage
		L89.510	Pressure ulcer of right ankle, unstageable
		L89.513	Pressure ulcer of right ankle, stage 3
		L89.514	Pressure ulcer of right ankle, stage 4
		L89.519	Pressure ulcer of right ankle, unspecified stage
		L89.520	Pressure ulcer of left ankle, unstageable
		L89.523	Pressure ulcer of left ankle, stage 3
		L89.524	Pressure ulcer of left ankle, stage 4
		L89.529	Pressure ulcer of left ankle, unspecified stage
		L89.600	Pressure ulcer of unspecified heel, unstageable
		L89.603	Pressure ulcer of unspecified heel, stage 3
		L89.604	Pressure ulcer of unspecified heel, stage 4
		L89.610	Pressure ulcer of right heel, unstageable
		L89.613	Pressure ulcer of right heel, stage 3
		L89.614	Pressure ulcer of right heel, stage 4
		L89.619	Pressure ulcer of right heel, unspecified stage
		L89.620	Pressure ulcer of left heel, unstageable
		L89.623	Pressure ulcer of left heel, stage 3
		L89.624	Pressure ulcer of left heel, stage 4
		L89.629	Pressure ulcer of left heel, unspecified stage
		L89.629	Pressure ulcer of left heel, unspecified stage
		L89.810	Pressure ulcer of head, unstageable
		L89.813	Pressure ulcer of head, stage 3
		L89.814	Pressure ulcer of head, stage 4

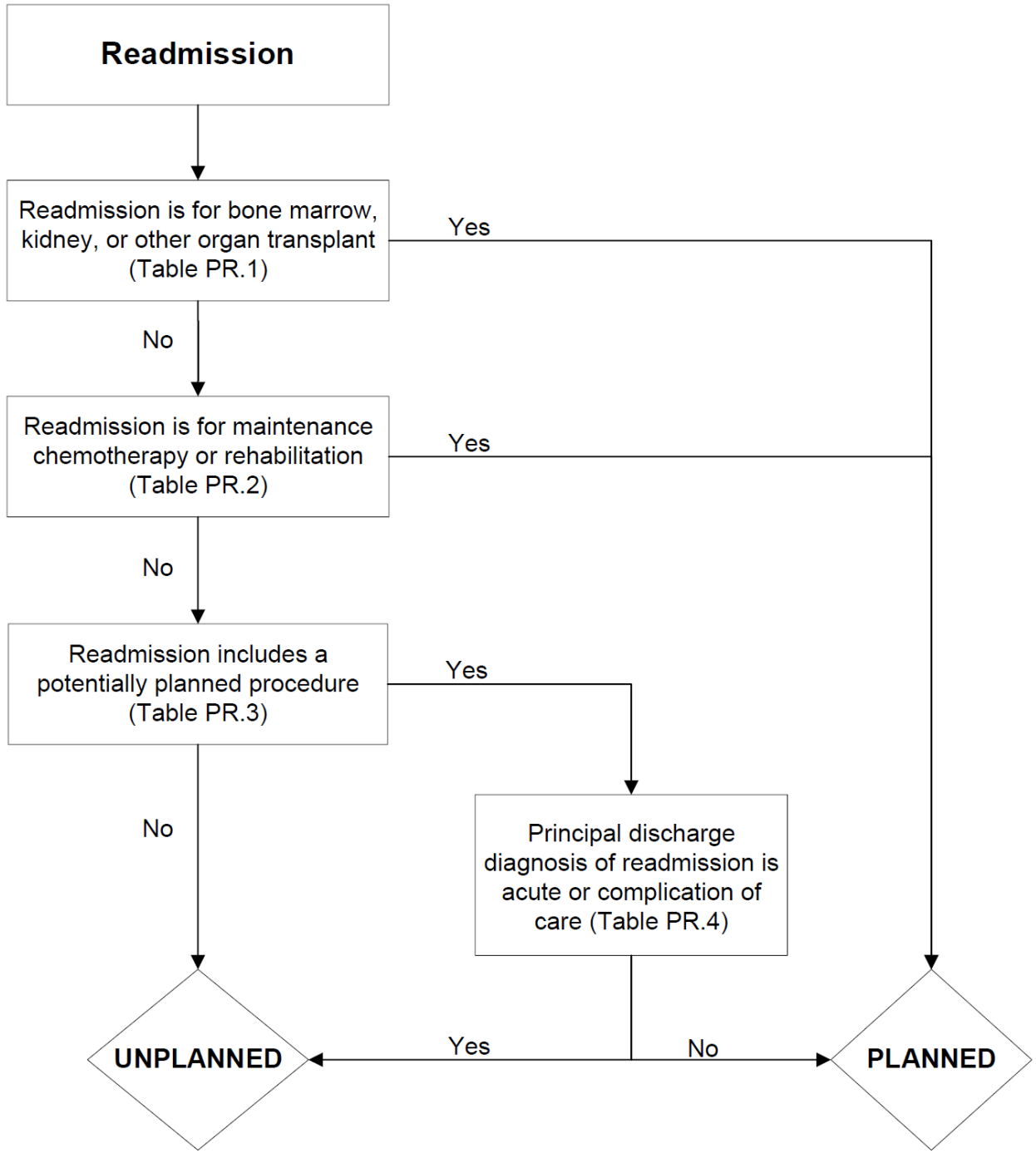
(continued)

Table 2-2. Preliminary List of Conditions for Defining Potentially Preventable Hospital Readmissions for 30-Days Post-PAC Discharge with ICD-10 Codes (continued)

Conditions	Subconditions	ICD-10-CM	ICD-10 Description
		L89.890	Pressure ulcer of other site, unstageable
		L89.893	Pressure ulcer of other site, stage 3
		L89.894	Pressure ulcer of other site, stage 4
		L89.90	Pressure ulcer of unspecified site, unspecified stage
		L89.93	Pressure ulcer of unspecified site, stage 3
		L89.94	Pressure ulcer of unspecified site, stage 4
		L89.95	Pressure ulcer of unspecified site, unstageable

SOURCE: List of potentially preventable readmission conditions from RTI International with ICD-10-CM (version: April 2016).
NOTES: [###] indicates CCS code; *AHRQ PQI ICD-10 v5 specifications
To be considered a potentially preventable readmission, diagnosis codes must be the principal diagnosis on the readmission claim, except where noted.
^Principal of acute bronchitis AND secondary of subcondition COPD
~principal ICD-10-CM code with secondary ICD-10-CM code for subcondition dehydration

Figure 2-1. CMS Planned Readmission Algorithm Version 3.0 Flowchart



Source: 2015 Version of the HWR Planned Readmission Algorithm

Planned Readmission Algorithm Version 3.0 Tables – Hospital Wide Readmission Measure

Table 2-3. Procedure Categories that are Always Planned (Version 3.0)

Procedure CCS	Description
64	Bone marrow transplant
105	Kidney transplant
134	Cesarean section**
135	Forceps; vacuum; and breech delivery††
176	Other organ transplantation

Table 2-4. Diagnosis Categories that are Always Planned (Version 3.0)

Diagnosis CCS	Description
45	Maintenance chemotherapy
194	Forceps delivery‡‡
196	Normal pregnancy and/or delivery§§
254	Rehabilitation

Table 2-5. Potentially Planned Procedure Categories (Version 3.0)

Procedure CCS	Description
3	Laminectomy; excision intervertebral disc
5	Insertion of catheter or spinal stimulator and injection into spinal
9	Other OR therapeutic nervous system procedures
10	Thyroidectomy; partial or complete
12	Other therapeutic endocrine procedures
33	Other OR therapeutic procedures on nose; mouth and pharynx
36	Lobectomy or pneumonectomy
38	Other diagnostic procedures on lung and bronchus
40	Other diagnostic procedures of respiratory tract and mediastinum
43	Heart valve procedures
44	Coronary artery bypass graft (CABG)
45	Percutaneous transluminal coronary angioplasty (PTCA)

(continued)

Table 2-5. Potentially Planned Procedure Categories (Version 3.0) (continued)

Procedure CCS	Description
47	Diagnostic cardiac catheterization; coronary arteriography
48	Insertion; revision; replacement; removal of cardiac pacemaker or cardioverter/defibrillator
49	Other OR heart procedures
51	Endarterectomy; vessel of head and neck
52	Aortic resection; replacement or anastomosis
53	Varicose vein stripping; lower limb
55	Peripheral vascular bypass
56	Other vascular bypass and shunt; not heart
59	Other OR procedures on vessels of head and neck
62	Other diagnostic cardiovascular procedures
66	Procedures on spleen
67	Other therapeutic procedures; hemic and lymphatic system
74	Gastrectomy; partial and total
78	Colorectal resection
79	Local excision of large intestine lesion (not endoscopic)
84	Cholecystectomy and common duct exploration
85	Inguinal and femoral hernia repair
86	Other hernia repair
99	Other OR gastrointestinal therapeutic procedures
104	Nephrectomy; partial or complete
106	Genitourinary incontinence procedures
107	Extracorporeal lithotripsy; urinary
109	Procedures on the urethra
112	Other OR therapeutic procedures of urinary tract
113	Transurethral resection of prostate (TURP)
114	Open prostatectomy
119	Oophorectomy; unilateral and bilateral
120	Other operations on ovary
124	Hysterectomy; abdominal and vaginal
129	Repair of cystocele and rectocele; obliteration of vaginal vault

(continued)

Table 2-5. Potentially Planned Procedure Categories (Version 3.0) (continued)

Procedure CCS	Description
132	Other OR therapeutic procedures; female organs
142	Partial excision bone
152	Arthroplasty knee
153	Hip replacement; total and partial
154	Arthroplasty other than hip or knee
157	Amputation of lower extremity
158	Spinal fusion
159	Other diagnostic procedures on musculoskeletal system
166	Lumpectomy; quadrantectomy of breast
167	Mastectomy
169	Debridement of wound; infection or burn
170	Excision of skin lesion
172	Skin graft
ICD-9 Codes	**Description**
30.1, 30.29, 30.3, 30.4, 31.74, 34.6	Laryngectomy, revision of tracheostomy, scarification of pleura (from Proc CCS 42- Other OR Rx procedures on respiratory system and mediastinum)
38.18	Endarterectomy leg vessel (from Proc CCS 60- Embolectomy and endarterectomy of lower limbs)
55.03, 55.04	Percutaneous nephrostomy with and without fragmentation (from Proc CCS 103- Nephrotomy and nephrostomy)
94.26, 94.27	Electroshock therapy (from Proc CCS 218- Psychological and psychiatric evaluation and therapy)

Table 2-6. Acute Diagnosis Categories (Version 3.0)

Diagnosis CCS	Description
1	Tuberculosis
2	Septicemia (except in labor)
3	Bacterial infection; unspecified site
4	Mycoses
5	HIV infection
7	Viral infection

(continued)

Table 2-6. Acute Diagnosis Categories (Version 3.0) (continued)

Diagnosis CCS	Description
8	Other infections; including parasitic
9	Sexually transmitted infections (not HIV or hepatitis)
54	Gout and other crystal arthropathies
55	Fluid and electrolyte disorders
60	Acute posthemorrhagic anemia
61	Sickle cell anemia
63	Diseases of white blood cells
76	Meningitis (except that caused by tuberculosis or sexually transmitted disease)
77	Encephalitis (except that caused by tuberculosis or sexually transmitted disease)
78	Other CNS infection and poliomyelitis
82	Paralysis
83	Epilepsy; convulsions
84	Headache; including migraine
85	Coma; stupor; and brain damage
87	Retinal detachments; defects; vascular occlusion; and retinopathy
89	Blindness and vision defects
90	Inflammation; infection of eye (except that caused by tuberculosis or sexually transmitted disease)
91	Other eye disorders
92	Otitis media and related conditions
93	Conditions associated with dizziness or vertigo
99	Hypertension with complications
100	Acute myocardial infarction (with the exception of ICD-9 codes 410.x2)
102	Nonspecific chest pain
104	Other and ill-defined heart disease
107	Cardiac arrest and ventricular fibrillation
109	Acute cerebrovascular disease
112	Transient cerebral ischemia
116	Aortic and peripheral arterial embolism or thrombosis
118	Phlebitis; thrombophlebitis and thromboembolism

(continued)

Table 2-6. Acute Diagnosis Categories (Version 3.0) (continued)

Diagnosis CCS	Description
120	Hemorrhoids
122	Pneumonia (except that caused by TB or sexually transmitted disease)
123	Influenza
124	Acute and chronic tonsillitis
125	Acute bronchitis
126	Other upper respiratory infections
127	Chronic obstructive pulmonary disease and bronchiectasis
128	Asthma
129	Aspiration pneumonitis; food/vomitus
130	Pleurisy; pneumothorax; pulmonary collapse
131	Respiratory failure; insufficiency; arrest (adult)
135	Intestinal infection
137	Diseases of mouth; excluding dental
139	Gastroduodenal ulcer (except hemorrhage)
140	Gastritis and duodenitis
142	Appendicitis and other appendiceal conditions
145	Intestinal obstruction without hernia
146	Diverticulosis and diverticulitis
148	Peritonitis and intestinal abscess
153	Gastrointestinal hemorrhage
154	Noninfectious gastroenteritis
157	Acute and unspecified renal failure
159	Urinary tract infections
165	Inflammatory conditions of male genital organs
168	Inflammatory diseases of female pelvic organs
172	Ovarian cyst
197	Skin and subcutaneous tissue infections
198	Other inflammatory condition of skin
225	Joint disorders and dislocations; trauma-related
226	Fracture of neck of femur (hip)
227	Spinal cord injury

(continued)

Table 2-6. Acute Diagnosis Categories (Version 3.0) (continued)

Diagnosis CCS	Description
228	Skull and face fractures
229	Fracture of upper limb
230	Fracture of lower limb
232	Sprains and strains
233	Intracranial injury
234	Crushing injury or internal injury
235	Open wounds of head; neck; and trunk
237	Complication of device; implant or graft
238	Complications of surgical procedures or medical care
239	Superficial injury; contusion
240	Burns
241	Poisoning by psychotropic agents
242	Poisoning by other medications and drugs
243	Poisoning by nonmedicinal substances
244	Other injuries and conditions due to external causes
245	Syncope
246	Fever of unknown origin
247	Lymphadenitis
249	Shock
250	Nausea and vomiting
251	Abdominal pain
252	Malaise and fatigue
253	Allergic reactions
259	Residual codes; unclassified
650	Adjustment disorders
651	Anxiety disorders
652	Attention-deficit, conduct, and disruptive behavior disorders
653	Delirium, dementia, and amnestic and other cognitive disorders
656	Impulse control disorders, NEC
658	Personality disorders
660	Alcohol-related disorders

(continued)

Table 2-6. Acute Diagnosis Categories (Version 3.0) (continued)

Diagnosis CCS	Description
661	Substance-related disorders
662	Suicide and intentional self-inflicted injury
663	Screening and history of mental health and substance abuse codes
670	Miscellaneous disorders
ICD-9 Codes	**Description**
Acute ICD-9 codes within Dx CCS 97: Peri-; endo-; and myocarditis; cardiomyopathy	
03282	Diphtheritic myocarditis
03640	Meningococcal carditis nos
03641	Meningococcal pericarditis
03642	Meningococcal endocarditis
03643	Meningococcal myocarditis
07420	Coxsackie carditis nos
07421	Coxsackie pericarditis
07422	Coxsackie endocarditis
07423	Coxsackie myocarditis
11281	Candidal endocarditis
11503	Histoplasma capsulatum pericarditis
11504	Histoplasma capssulatum endocarditis
11513	Histoplasma duboisii pericarditis
11514	Histoplasma duboisii endocarditis
11593	Histoplasmosis pericarditis
11594	Histoplasmosis endocarditis
1303	Toxoplasma myocarditis
3910	Acute rheumatic pericarditis
3911	Acute rheumatic endocarditis
3912	Acute rheumatic myocarditis
3918	Acute rheumatic heart disease nec
3919	Acute rheumatic heart disease nos
3920	Rheumatic chorea w heart involvement
3980	Rheumatic myocarditis
39890	Rheumatic heart disease nos

(continued)

Table 2-6. Acute Diagnosis Categories (Version 3.0) (continued)

Diagnosis CCS	Description
39899	Rheumatic heart disease nec
4200	Acute pericarditis in other disease
42090	Acute pericarditis nos
42091	Acute idiopath pericarditis
42099	Acute pericarditis nec
4210	Acute/subacute bacterial endocarditis
4211	Acute endocarditis in other diseases
4219	Acute/subacute endocarditis nos
4220	Acute myocarditis in other diseases
42290	Acute myocarditis nos
42291	Idiopathic myocarditis
42292	Septic myocarditis
42293	Toxic myocarditis
42299	Acute myocarditis nec
4230	Hemopericardium
4231	Adhesive pericarditis
4232	Constrictive pericarditis
4233	Cardiac tamponade
4290	Myocarditis nos
Acute ICD-9 codes within Dx CCS 105: Conduction disorders	
4260	Atrioventricular
42610	Atrioventricular block nos
42611	Atrioventricular block-1st degree
42612	Atrioventricular block-mobitz ii
42613	Atrioventricular block-2nd degree nec
4262	Left bundle branch hemiblock
4263	Left bundle branch block nec
4264	Right bundle branch block
42650	Bundle branch block nos
42651	Right bundle branch block/left posterior fascicular block
42652	Right bundle branch block/left ant fascicular block

(continued)

Table 2-6. Acute Diagnosis Categories (Version 3.0) (continued)

Diagnosis CCS	Description
42653	Bilateral bundle branch block nec
42654	Trifascicular block
4266	Other heart block
4267	Anomalous atrioventricular excitation
42681	Lown-ganong-levine syndrome
42682	Long qt syn
4269	Conduction
Acute ICD-9 codes within Dx CCS 106: Dysrhythmia	
4272	Paroxysmal tachycardia nos
7850	Tachycardia nos
42789	Cardiac dysrhythmias nec
4279	Cardiac dysrhythmia noc
42769	Premature beats nec
Acute ICD-9 codes within Dx CCS 108: Congestive heart failure; nonhypertensive	
39891	Rheumatic heart failure
4280	Congestive heart failure
4281	Left heart failure
42820	Unspecified systolic heart failure
42821	Acute systolic heart failure
42823	Acute on chronic systolic heart failure
42830	Unspecified diastolic heart failure
42831	Acute diastolic heart failure
42833	Acute on chronic diastolic heart failure
42840	Unspec combined syst & dias heart failure
42841	Acute combined systolic & diastolic heart failure
42843	Acute on chronic combined systolic & diastolic heart failure
4289	Heart failure nos
Acute ICD-9 codes within Dx CCS 149: Biliary tract disease	
5740	Calculus of gallbladder with acute cholecystitis
57400	Calculus of gallbladder with acute cholecystitis without mention of obstruction
57401	Calculus of gallbladder with acute cholecystitis with obstruction

(continued)

Table 2-6. Acute Diagnosis Categories (Version 3.0) (continued)

Diagnosis CCS	Description
5743	Calculus of bile duct with acute cholecystitis
57430	Calculus of bile duct with acute cholecystitis without mention of obstruction
57431	Calculus of bile duct with acute cholecystitis with obstruction
5746	Calculus of gallbladder and bile duct with acute cholecystitis
57460	Calculus of gallbladder with acute cholecystitis without mention of obstruction
57461	Calculus of gallbladder and bile duct with acute cholecystitis with obstruction
5748	Calculus of gallbladder and bile duct with acute and chronic cholecystitis
57480	Calculus of gallbladder obstruction and bile duct with acute and chronic cholecystitis without mention of obstruction
57481	Calculus of gallbladder and bile duct with acute and chronic cholecystitis with obstruction
5750	Acute cholecystitis
57512	Acute and chronic cholecystitis
5761	Cholangitis
Acute ICD-9 codes with Dx CCS 152: Pancreatic disorders	
5770	Acute pancreatitis

Source: 2015 Version of the HWR Planned Readmission Algorithm

Table 2-7. AHRQ CCS Single Level Procedure Codes and ICD-9 Procedure Codes Added to Yale's Planned Readmission Algorithm, for the Post-Acute Care Setting

AHRQ CCS Single Level Procedures Codes	Description	Comment
37	Diagnostic Bronchoscopy and Biopsy of Bronchus	
71	Gastrostomy: temporary and permanent	
82	Endoscopic retrograde cannulation of pancreases (ERCP)	
87	Laparoscopy (GI only)	
89	Exploratory Laparotomy	
160	Other therapeutic procedure on muscles and tendons	
164	Other OR therapeutic procedures on musculoskeletal system	
171	Suture of skin and subcutaneous tissue ICD-9	

ICD-9 Procedure Codes	Description	Comment
Topic: Amputation of Lower Extremity		
83.82	Graft of muscle or fascia	
86.87	Fat graft of skin and subcutaneous tissue	Required, Diagnosis V58.41, encounter for planned postoperative wound closure
Topic: Amputation of Upper Extremity		
84.1	Upper limb amputation, not otherwise specified	
84.2	Amputation and disarticulation of finger	
84.3	Amputation and disarticulation of thumb	
84.4	Amputation through hand	
84.5	Disarticulation of wrist	
84.6	Amputation through forearm	
84.7	Disarticulation of elbow	

(continued)

Table 2-7. AHRQ CCS Single Level Procedure Codes and ICD-9 Procedure Codes Added to Yale's Planned Readmission Algorithm, for the Post-Acute Care Setting (continued)

ICD-9 Procedure Codes	Description	Comment
84.8	Amputation through humerus	
84.9	Disarticulation of shoulder	
84.10	Interthoracoscapular amputation	
Topic: Removal of Vascular Obstruction, Non-Coronary		
38.18	Endarterectomy, lower limb vessels	
38.08	Embolectomy, lower limb arteries	
39.50	Angioplasty or atherectomy of other non- coronary vessels	
00.55	Insertion of drug-eluting stent(s) of other peripheral vessel(s)	
00.60	Insertion of drug-eluting stent(s) of superficial femoral artery	
39.90	Insertion of non-drug-eluting peripheral (non-coronary) vessel stent(s)	
Topic: Colon and Rectal Procedures, Selected		
46.85	Dilation of intestine (includes endosopic approach)	
96.8	Insertion of naso-intestinal tube (includes for decompression)	
96.9	Insertion of rectal tube	
46.50	Closure of intestinal stoma, not otherwise specified	Required, Diagnosis code V55.2, attention to ileostomy, and V55.3, attention to colostomy
46.51	Closure of stoma of small intestine	Required, Diagnosis code V55.2, attention to ileostomy, and V55.3, attention to colostomy

(continued)

Table 2-7. AHRQ CCS Single Level Procedure Codes and ICD-9 Procedure Codes Added to Yale's Planned Readmission Algorithm, for the Post-Acute Care Setting (continued)

ICD-9 Procedure Codes	Description	Comment
46.52	Closure of stoma of large intestine	Required, Diagnosis code V55.2, attention to ileostomy, and V55.3, attention to colostomy
46.86	Endoscopic insertion of colonic stent(s)	
46.87	Other insertion of colonic stent (s)	
Topic: Insertion of Feeding Tubes		
44.39	Other gastroenterostomy (GJ-tube)	
46.39	Other enterostomy (J-tube)	
Topic: Routine Device Replacement		
86.06	Insertion of totally implanted infusion pump	
Topic: Routine Removal of Devices		
84.57	Removal of (cement) spacer (includes antibiotic impregnated spacer)	
97.41	Removal of thoracotomy tube or pleural cavity drain (non-incisional)	
02.43	Removal of ventricular shunt	
97.37	Removal of tracheostomy tube (non-incisional)	
01.27	removal of catheter(s) from cranial cavity or tissue	
86.05	Incision with removal of foreign body or device from skin and subcutaneous tissue	
02.95	Removal of skull tongs or halo traction device	
78.60-78.69	Removal of implanted devices from bone (includes internal and external fixation	
80.00-80.09	Orthopedic implants arthrotomy for removal of prosthesis without replacement	
Topic: Pleurosclerosis		
34.6	Scarification of pleura	
34.92	Injection into thoracic cavity	

(continued)

Table 2-7. AHRQ CCS Single Level Procedure Codes and ICD-9 Procedure Codes Added to Yale's Planned Readmission Algorithm, for the Post-Acute Care Setting (continued)

ICD-9 Procedure Codes	Description	Comment
Topic: Colon and Rectal Procedures, Selected		
51.14	Other close (endoscopic) biopsy of biliary duct or sphincter of Oddi	
51.64	Endoscopic excision or destruction of lesion of biliary ducts or sphincter of Oddi	
51.84	Endoscopic dilation of ampulla and biliary duct	This code became available in CY 2010
51.84	Endoscopic sphincterotomy and papillotomy	
51.85	Endoscopic insertion of nasobiliary drainage tube	
51.86	Endoscopic insertion of stent (tube) into bile duct	
51.87	Endoscopic removal of stone(s)from biliary tract	
Topic: Fistula		
42.84	Repair of esophageal fistula, not elsewhere classified	
44.63	Closure of other gastric fistula (include gastrocolic, gastrojejunocolic fistula)	
46.72	Closure of fistula of duodenum	
46.74	Closure of fistula of small intestine, except duodenum (includes enterocutaneous)	
46.76	Closure of fistula of large intestine	
47.92	Closure of appendiceal fistula	
48.73	Closure of other rectal fistula	
48.93	Repair of perirectal fistula	
49.11	Anal fistulotomy	
49.12	Anal fistulectomy	
49.73	Closure of anal fistula	
19.9	Other repair of middle ear (includes closure of mastoid fistula	

(continued)

Table 2-7. AHRQ CCS Single Level Procedure Codes and ICD-9 Procedure Codes Added to Yale's Planned Readmission Algorithm, for the Post-Acute Care Setting (continued)

ICD-9 Procedure Codes	Description	Comment
20.93	Repair of oval and round windows (includes closure of fistula)	
21.82	Closure of nasal fistula	
31.62	Closure of fistula of larynx (includes laryngotracheal)	
31.73	Closure of other fistula of trachea (includes tracheoesophageal)	
33.42	Closure of bronchial fistula (includes bronchocutaneous, bronchoesophageal, bronchovisceral)	
34.73	Closure of other fistula of thorax (includes bronchopleural, bronchopleurocutaneous, bronchopleuromediastinal)	
34.83	Closure of fistula of diaphragm (includes thoracicoabdominal, thoracicogastric, thoracicointestinal)	
34.93	Repair of pleura (includes closure of unspecified pleural fistula)	
61.42	Repair of scrotal fistula	
Topic: Tendon Repair (eye)		
15.7	Repair of injury of extraocular muscle (includes repair of tendon)	
Topic: Aneurysm		
39.51	Clipping of aneurysm	

NOTE: December, 2012 Yale added several additional AHRQ CCS Single-Level Procedure Codes. Two of these codes 169 (Debridement of wound; infection or burn) and 172 (Skin graft) had been on the prior RTI developed list.

Preliminary Testing Results for the LTCH Setting

Table 2-8. Potentially Preventable Unplanned Readmission Measure for 30 Days Post Discharge for Long-Term Care Hospitals: Logistic Regression Model Results from 2012-2013

Variable Name in Model	Covariate	Count	Percent Total	Percent Readm	Estimate	Std. Error	P value	Odds Ratios	OR 95% Lower CL	OR 95% Upper CL
	Age-Sex Groups (Reference group: Male 18-44)									
m45_54	Male age 45-54	8,394	4.7	11.7	0.121	0.061	0.046	1.128	1.002	1.271
m55_59	Male age 55-59	6,632	3.7	12.8	0.187	0.063	0.003	1.206	1.066	1.363
m60_64	Male age 60-64	7,088	4.0	13.2	0.195	0.062	0.002	1.215	1.076	1.372
m65_69	Male age 65-69	13,326	7.5	13.2	0.210	0.059	0.000	1.234	1.100	1.384
m70_74	Male age 70-74	14,051	7.9	14.3	0.295	0.058	<.0001	1.343	1.200	1.503
m75_79	Male age 75-79	12,493	7.0	15.2	0.384	0.058	<.0001	1.468	1.310	1.645
m80_84	Male age 80-84	10,540	5.9	16.0	0.445	0.059	<.0001	1.561	1.391	1.752
m85_GT	Male age 85+	9,798	5.5	17.1	0.536	0.060	<.0001	1.709	1.521	1.920
w18_44	Female age 18-44	3,250	1.8	10.0	-0.079	0.078	0.309	0.924	0.794	1.076
w45_54	Female age 45-54	6,213	3.5	11.9	0.095	0.064	0.140	1.099	0.969	1.247
w55_59	Female age 55-59	5,453	3.1	13.0	0.194	0.065	0.003	1.214	1.068	1.379
w60_64	Female age 60-64	6,561	3.7	13.2	0.209	0.063	0.001	1.233	1.089	1.395
w65_69	Female age 65-69	13,063	7.3	13.1	0.181	0.059	0.002	1.198	1.068	1.344
w70_74	Female age 70-74	14,019	7.9	13.4	0.237	0.058	<.0001	1.268	1.132	1.419
w75_79	Female age 75-79	13,831	7.8	14.1	0.316	0.058	<.0001	1.372	1.225	1.535
w80_84	Female age 80-84	13,004	7.3	15.3	0.428	0.058	<.0001	1.534	1.370	1.718
w85_GT	Female age 85+	16,035	9.0	14.5	0.393	0.057	<.0001	1.481	1.323	1.658

(continued)

Table 2-8. Potentially Preventable Unplanned Readmission Measure for 30 Days Post Discharge for Long-Term Care Hospitals: Logistic Regression Model Results from 2012-2013 (continued)

Variable Name in Model	Covariate	Count	Percent Total	Percent Readm	Estimate	Std. Error	P value	Odds Ratios	OR 95% Lower CL	OR 95% Upper CL
	CCS Groupings (Reference group: p_CCSv3_Misc - Misc Negative/Non Sign: Mental Illness (650-670), Gangrene (248), Pregnancy (176-196), CongAnom (213-217), TIA (112), Aneurysm (115) Art embolism and Ot circul dx (116-117), Meningitis, Encephalitis, Other CNS infx (76-78), Orthopedics, Biliary, Rheum arth (202), SLE (210), OthConnTiss (211), Endocrn (48, 51, 53, 54), NervSystLow (84-94), Complic Devi & Complic Proc (237-238))									
p_CCSv1_AdltRespFl	Resp Syst: Adlt Resp Fl (131)	10,905	6.1	15.1	0.273	0.037	<.0001	1.314	1.222	1.414
p_CCSv1_AMICardArrst	Circ Syst: AMI & Cardiac arrst (100, 107)	2,974	1.7	14.9	0.388	0.059	<.0001	1.474	1.313	1.656
p_CCSv1_AspPneum	Resp Syst: Asp Pneumonia (129)	3,968	2.2	19.6	0.562	0.047	<.0001	1.755	1.599	1.926
p_CCSv1_BackProb	Back Problem	976	0.5	8.8	0.134	0.117	0.253	1.143	0.909	1.437
p_CCSv1_BloodDx	Diseases of blood and blood-forming organs (56-57, 59-64)	956	0.5	12.3	0.110	0.102	0.283	1.116	0.913	1.364
p_CCSv1_CHF	Circ Syst: CHF, Nonhypertensive (108)	6,031	3.4	19.3	0.562	0.041	<.0001	1.755	1.619	1.902
p_CCSv1_CirCardOthVl	Circ Syst: Carditis and Other heart dx (97, 104) Heart Valve (96)	2,123	1.2	13.3	0.326	0.075	<.0001	1.385	1.195	1.606
p_CCSv1_CircHtn	Circ Syst: Htn & Htn complicn (98-99)	1,099	0.6	19.1	0.576	0.082	<.0001	1.779	1.516	2.087
p_CCSv1_CondDysr	Circ Syst: Conduction & Dysrhythmia (105-106)	1,605	0.9	14.9	0.317	0.075	<.0001	1.372	1.185	1.589
p_CCSv1_COPDAsthm	Resp Syst: COPD & Asthma (127-128)	5,512	3.1	18.1	0.680	0.043	<.0001	1.974	1.814	2.149
p_CCSv1_CoroAthChsPn	Circ Syst: Coron Athero & Chest pain (101-102)	1,436	0.8	14.1	0.439	0.085	<.0001	1.551	1.314	1.831

(continued)

Table 2-8. Potentially Preventable Unplanned Readmission Measure for 30 Days Post Discharge for Long-Term Care Hospitals: Logistic Regression Model Results from 2012-2013 (continued)

Variable Name in Model	Covariate	Count	Percent Total	Percent Readm	Estimate	Std. Error	P value	Odds Ratios	OR 95% Lower CL	OR 95% Upper CL
p_CCSv1_CVD	Circ Syst: CVD (109-111, 113)	5,854	3.3	13.4	0.364	0.049	<.0001	1.440	1.308	1.585
p_CCSv1_DigSyst	Diseases of Digestive System (135-144, 146-148, 154-155)	6,898	3.9	12.4	0.265	0.044	<.0001	1.303	1.196	1.420
p_CCSv1_FluidElcDx	Fluid/elec dx (55)	1,208	0.7	14.2	0.336	0.087	0.000	1.400	1.181	1.659
p_CCSv3_NutritDef	NutritDef (52, 58)	499	0.3	13.6	0.413	0.134	0.002	1.511	1.161	1.965
p_CCSv1_Geni_UTI	Diseases of the genitourinary system (156, 160-166, 168-173, 175) UTI (159)	3,846	2.2	15.1	0.434	0.051	<.0001	1.544	1.397	1.706
p_CCSv1_GIHemorr	GI Hemorrhage (153)	1,370	0.8	14.4	0.238	0.081	0.003	1.269	1.082	1.488
p_CCSv1_HipFx	Fx hip (226)	2,115	1.2	12.0	0.466	0.076	<.0001	1.594	1.373	1.849
p_CCSv1_InfecParasDx	Infectious and parasitic diseases (1, 3-10)	1,216	0.7	13.5	0.305	0.088	0.001	1.356	1.141	1.612
p_CCSv1_IntObstruct	Digestive System-Int Obstruct (145)	2,230	1.3	11.3	0.126	0.072	0.081	1.135	0.984	1.307
p_CCSv1_Intracraninj	Intracrn Inj (233)	1,819	1.0	12.3	0.389	0.079	<.0001	1.476	1.264	1.723
p_CCSv3_NeoplBenLow	Neoplasms: Low (22-26, 28-31, 36), Benign (44-47)	535	0.3	11.4	0.364	0.140	0.009	1.440	1.094	1.895
p_CCSv1_Neo_Med_2_HI	Neoplasms-Medium (11-15, 18, 20-21, 32-34, 37-41, 43), 2nd Malign (42) Neoplasms Hi (16-17, 19, 27, 35, 42)	2,903	1.6	10.2	0.253	0.069	0.000	1.288	1.125	1.474
p_CCSv1_ParkMSCNSPar	Parkinsons MS CNS	310	0.2	14.5	0.610	0.165	0.000	1.840	1.331	2.543

(continued)

Table 2-8. Potentially Preventable Unplanned Readmission Measure for 30 Days Post Discharge for Long-Term Care Hospitals: Logistic Regression Model Results from 2012-2013 (continued)

Variable Name in Model	Covariate	Count	Percent Total	Percent Readm	Estimate	Std. Error	P value	Odds Ratios	OR 95% Lower CL	OR 95% Upper CL
p_CCSv1_PhlVnPeriAth	Circ Syst: Phlebitis, Varicose vn, Hemorrhoids, Oth vein dx (118-121) Perip Athero (114)	2,530	1.4	10.5	0.106	0.069	0.125	1.112	0.971	1.274
p_CCSv1_PneumInf	Resp Syst: Pneum, Influ, Bronc, Ot up rsp (122-123, 125-126)	9,643	5.4	16.6	0.526	0.036	<.0001	1.691	1.575	1.816
p_CCSv1_PulmHart	Circ Syst: Pulm hart dx (103)	907	0.5	14.6	0.395	0.098	<.0001	1.485	1.225	1.801
p_CCSv1_Renl_fail	Genitourinary: Ac & Chr renl fail (157-158)	3,866	2.2	16.2	0.466	0.051	<.0001	1.594	1.442	1.763
p_CCSv1_RespPleurEtc	Resp Syst: Pleurisy, Lung externl, Oth low resp, Oth uppr resp, Tonsillitis (124, 130, 132-134)	1,938	1.1	12.3	0.200	0.074	0.007	1.222	1.056	1.414
p_CCSv1_SCI	Spin cor inj (227)	313	0.2	14.4	0.739	0.168	<.0001	2.094	1.507	2.909
p_CCSv1_Septicemia	Infect & Paras Dx: Septicemia (2)	35,046	19.7	17.4	0.348	0.030	<.0001	1.416	1.336	1.500
p_CCSv1_SxSigns	Symptoms, Signs, and Ill-Defined Conditions and Factors influencing health status (245-247, 249-259)	1,973	1.1	13.0	0.322	0.072	<.0001	1.379	1.199	1.587
p_CCSv2_EpiCNVOthNer	DisNervSyst: Epilepsy/CNV (83) & Oth Nerv Dx (95)	1,927	1.1	12.8	0.168	0.073	0.021	1.183	1.026	1.365
p_CCSv2_Fractures	Fractures regroup (Path, Skull, Arm, Leg, Oth) (207, 228-231)	2,891	1.6	9.9	0.244	0.068	0.000	1.277	1.117	1.459
p_CCSv2_Skin_Inj	Injury(Joint inj, Sprain, Crush inj, Opn wnds, Superfic) (225, 232, 234-236, 239, 244) Skin-Diseases skin/subcut tissue; Burns (167, 197-200, 240)	11,941	6.7	11.2	0.290	0.037	<.0001	1.337	1.242	1.438
p_CCSv1_Diab	Diabetes	6,389	3.6	10.5	0.275	0.047	<.0001	1.317	1.200	1.445

(continued)

Table 2-8. Potentially Preventable Unplanned Readmission Measure for 30 Days Post Discharge for Long-Term Care Hospitals: Logistic Regression Model Results from 2012-2013 (continued)

Variable Name in Model	Covariate	Count	Percent Total	Percent Readm	Estimate	Std. Error	P value	Odds Ratios	OR 95% Lower CL	OR 95% Upper CL
p_CCSv3_Poison	Poison (241-243)	383	0.2	11.7	0.213	0.163	0.190	1.237	0.900	1.702
	Surgical Groupings									
p_ct	Cardio Thoracic	7,729	4.3	12.5	-0.190	0.044	<.0001	0.827	0.759	0.902
p_gen_uro_obgyn	General surgery, Obstetrics/Gynecology, and urologic surgical procedures	25,107	14.1	11.7	-0.115	0.025	<.0001	0.891	0.849	0.936
p_neuro_vas	Neurosurgery, Vascular Surgery	6,360	3.6	10.5	-0.177	0.047	0.000	0.838	0.765	0.918
p_ortho	Orthopedics	17,407	9.8	9.3	-0.205	0.033	<.0001	0.815	0.764	0.868
p_plastic	Plastic Surgery	11,824	6.6	10.1	-0.146	0.034	<.0001	0.864	0.808	0.924
	Ventilator Indicator									
Vent	Prolonged Ventilation in LTCH	24,225	13.6	17.7	0.143	0.022	<.0001	1.154	1.105	1.204
	Comorbidities - Hierarchical Condition Categories (HCCs)									
p_HCC2	Septicemia, Sepsis, Systemic Inflammatory Response Syndrome/Shock (prior HCC 2)	55,280	31.0	16.4	0.120	0.022	<.0001	1.127	1.080	1.177
p_HCC8_9_10_11_14	Serious Cancers: Metastatic Cancer, Acute Leukemia, Lung and Other Severe Cancers, Lymphoma, Colorectal, Bladder, and Other Cancers, Other Digestive and Urinary Neoplasms (prior HCC 8, 9, 10, 11, 14)	10,813	6.1	14.0	0.044	0.030	0.139	1.045	0.986	1.109
HCC17_18_19_20	Diabetes with Acute Complications/Diabetes with Chronic Complications/Diabetes without Complication/ Type I Diabetes Mellitus (HCC 17, 18, 19, 20)	87,963	49.3	15.1	0.055	0.015	0.000	1.056	1.025	1.088

(continued)

Table 2-8. Potentially Preventable Unplanned Readmission Measure for 30 Days Post Discharge for Long-Term Care Hospitals: Logistic Regression Model Results from 2012-2013 (continued)

Variable Name in Model	Covariate	Count	Percent Total	Percent Readm	Estimate	Std. Error	P value	Odds Ratios	OR 95% Lower CL	OR 95% Upper CL
p_HCC21	Protein-Calorie Malnutrition (prior HCC 21)	50,345	28.2	15.1	0.022	0.016	0.182	1.022	0.990	1.055
HCC22	Morbid Obesity (HCC 22)	31,536	17.7	13.7	-0.088	0.020	<.0001	0.916	0.880	0.953
p_HCC24	Disorders of Fluid/Electrolyte/Acid-Base Balance (prior HCC 24)	95,552	53.6	15.0	0.057	0.015	0.000	1.059	1.027	1.091
p_HCC36	Peptic Ulcer, Hemorrhage, Other Specified Gastrointestinal Disorders (prior HCC 36)	23,865	13.4	15.5	0.030	0.021	0.146	1.031	0.990	1.074
HCC40	Rheumatoid Arthritis and Inflammatory Connective Tissue Disease (HCC 40)	11,090	6.2	14.6	0.051	0.029	0.077	1.052	0.995	1.113
p_HCC51_52	Dementia With or Without Complications (prior HCC 51 and 52)	29,799	16.7	16.6	0.097	0.020	<.0001	1.102	1.060	1.145
p_HCC53	Nonpsychotic Organic Brain Syndromes/Conditions (prior HCC 53)	989	0.6	13.8	0.096	0.095	0.309	1.101	0.915	1.326
p_HCC64_65_66_67	Profound, Severe, Moderate, Mild Mental Retardation/Developmental Disability, Autism, Down Syndrome (prior HCC 64, 65, 66, 67)	3,311	1.9	15.5	0.276	0.052	<.0001	1.317	1.191	1.458
p_HCC70	Quadriplegia (prior HCC 70)	3,560	2.0	16.1	0.157	0.049	0.002	1.170	1.062	1.288
p_HCC71	Paraplegia (prior HCC 71)	5,277	3.0	12.7	0.061	0.047	0.196	1.062	0.969	1.165
p_HCC76_80	Muscular Dystrophy, MS, Parkinsons, Huntingtons, Coma, Brain Compression/Anoxic (prior HCC 76 and 80)	12,128	6.8	16.0	0.098	0.027	0.000	1.103	1.045	1.164
HCC83_84	Respiratory Arrest, Cardio-Respiratory Failure and Shock (HCC 83_84)	70,611	39.6	16.2	0.068	0.016	<.0001	1.071	1.038	1.105
HCC85	Congestive Heart Failure (HCC 85)	81,430	45.7	16.5	0.078	0.017	<.0001	1.081	1.047	1.117
p_HCC89	Coronary Atherosclerosis/Other Chronic Ischemic Heart Disease (prior HCC 89)	51,053	28.6	15.2	0.034	0.016	0.036	1.034	1.002	1.068
HCC91	Valvular and Rheumatic Heart Disease (HCC 91)	22,232	12.5	16.7	0.021	0.021	0.310	1.022	0.980	1.065
HCC96_97	Specified Heart Arrhythmias (HCC 96 and 97)	79,890	44.8	15.9	0.023	0.015	0.136	1.023	0.993	1.054
p_HCC100	Ischemic or Unspecified Stroke (prior HCC 100)	3,592	2.0	16.0	0.132	0.048	0.006	1.141	1.038	1.255

(continued)

Table 2-8. Potentially Preventable Unplanned Readmission Measure for 30 Days Post Discharge for Long-Term Care Hospitals: Logistic Regression Model Results from 2012-2013 (continued)

Variable Name in Model	Covariate	Count	Percent Total	Percent Readm	Estimate	Std. Error	P value	Odds Ratios	OR 95% Lower CL	OR 95% Upper CL
p_HCC_101_102	Precerebral Arterial Occlusion and Transient Cerebral Ischemia, Cerebrovascular Atherosclerosis, Aneurysm, and Other Disease (prior HCC 101 and 102)	4,737	2.7	14.9	0.055	0.043	0.202	1.056	0.971	1.149
p_HCC103_104	Hemiplegia/Hemiparesis, Monoplegia, Other Paralytic Syndromes (prior HCC 103 and 104)	11,159	6.3	16.6	0.165	0.030	<.0001	1.179	1.113	1.250
p_HCC105	Late Effects of Cerebrovascular Disease, Except Paralysis (prior HCC 105)	5,313	3.0	16.7	0.100	0.039	0.011	1.105	1.023	1.193
HCC111	Chronic Obstructive Pulmonary Disease (HCC 111)	69,160	38.8	16.5	0.106	0.016	<.0001	1.112	1.078	1.146
p_HCC114_116	Aspiration/Specified Bacterial Viral/Unspecified Pneumonias, Pleurisy (prior HCC 114 and 116)	54,560	30.6	16.8	0.100	0.017	<.0001	1.106	1.069	1.143
p_HCC119	Legally Blind (prior HCC 119)	1,822	1.0	14.9	0.083	0.068	0.224	1.086	0.951	1.241
p_HCC132	Kidney Transplant Status (prior HCC 132)	1,451	0.8	16.5	0.314	0.075	<.0001	1.369	1.183	1.584
p_HCC133_136	End Stage Renal Disease, Chronic Kidney Disease, Stage 5 (prior HCC 133 and 136)	17,679	9.9	14.4	0.076	0.026	0.004	1.079	1.025	1.136
p_HCC134	Dialysis Status (prior HCC 134)	398	0.2	16.6	0.292	0.138	0.034	1.340	1.022	1.755
p_HCC135	Acute Renal Failure (prior HCC 135)	50,547	28.3	16.3	0.214	0.018	<.0001	1.239	1.196	1.283
p_HCC137	Chronic Kidney Disease, Severe (Stage 4) (prior HCC 137)	1,644	0.9	17.3	0.268	0.069	<.0001	1.308	1.143	1.496
p_HCC138	Chronic Kidney Disease, Moderate (Stage 3) (prior HCC 138)	4,849	2.7	14.9	0.113	0.043	0.009	1.120	1.029	1.219
p_HCC139_140	Chronic Kidney Disease, Mild or Unspecified (Stages 1-2 or Unspecified), Unspecified Renal Failure (prior HCC 139 and 140)	8,587	4.8	15.7	0.162	0.033	<.0001	1.175	1.103	1.253
p_HCC157	Pressure Ulcer of Skin with Necrosis Through to Muscle, Tendon, or Bone (prior HCC 157)	10,613	6.0	16.4	0.272	0.032	<.0001	1.312	1.232	1.397
p_HCC158	Pressure Ulcer of Skin with Full Thickness Skin Loss (prior HCC 158)	7,163	4.0	17.6	0.210	0.034	<.0001	1.233	1.155	1.317

(continued)

Table 2-8. Potentially Preventable Unplanned Readmission Measure for 30 Days Post Discharge for Long-Term Care Hospitals: Logistic Regression Model Results from 2012-2013 (continued)

Variable Name in Model	Covariate	Count	Percent Total	Percent Readm	Estimate	Std. Error	P value	Odds Ratios	OR 95% Lower CL	OR 95% Upper CL
p_HCC159	Pressure Ulcer of Skin with Partial Thickness Skin Loss (prior HCC 159)	5,817	3.3	18.2	0.202	0.036	<.0001	1.224	1.140	1.313
p_HCC160	Pressure Pre-Ulcer Skin Changes or Unspecified Stage (prior HCC 160)	6,391	3.6	16.6	0.126	0.036	0.000	1.134	1.058	1.216
p_HCC164_165	Cellulitis, Local Skin Infection, and Other Dermatological Disorders (prior HCC 164 and 165)	29,043	16.3	12.4	0.037	0.021	0.074	1.038	0.996	1.081
p_HCC171	Major Fracture, Except of Skull, Vertebrae, or Hip (prior HCC 171)	1,596	0.9	12.5	0.149	0.079	0.061	1.160	0.993	1.356
p_HCC186	Major Organ Transplant or Replacement Status (prior HCC 186)	726	0.4	17.4	0.140	0.102	0.168	1.150	0.943	1.404
p_HCC188	Artificial Openings for Feeding or Elimination (prior HCC 188)	13,946	7.8	19.5	0.187	0.025	<.0001	1.205	1.148	1.265
p_HCC197	Supplemental Oxygen (prior HCC 197)	8,637	4.8	16.4	0.061	0.032	0.057	1.063	0.998	1.132
	Prior Acute Care Length of Stay (Reference group: LOS when prior acute was inpatient psychiatric facility)									
p_LOS_1_7	Prior Acute Length of Stay 1-7 days	69,936	39.2	13.1	0.258	0.146	0.079	1.294	0.971	1.724
p_LOS_8_11	Prior Acute Length of Stay 8-11 days	38,491	21.6	13.8	0.291	0.147	0.048	1.338	1.003	1.785
p_LOS_12_30	Prior Acute Length of Stay 12-30 days	60,031	33.7	14.7	0.346	0.148	0.019	1.414	1.059	1.888
p_LOS_30_Plus	Prior Acute Length of Stay 30+ days	9,010	5.1	15.6	0.403	0.153	0.008	1.496	1.109	2.018
	Prior Acute ICU/CCU Days (Reference Group: 0 ICU/CCU days associated with prior acute stay)									
p_ICU_CCU_1_2	1-2 ICU/CCU days associated with prior acute stay	12,748	7.1	13.7	0.058	0.030	0.052	1.059	1.000	1.123
p_ICU_CCU_3	3 ICU/CCU days associated with prior acute stay	7,951	4.5	15.0	0.123	0.035	0.000	1.131	1.056	1.211
p_ICU_CCU_4_6	4-6 ICU/CCU days associated with prior acute stay	22,400	12.6	15.2	0.112	0.024	<.0001	1.119	1.067	1.173

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Table 2-8. Potentially Preventable Unplanned Readmission Measure for 30 Days Post Discharge for Long-Term Care Hospitals: Logistic Regression Model Results from 2012-2013 (continued)

Variable Name in Model	Covariate	Count	Percent Total	Percent Readm	Estimate	Std. Error	P value	Odds Ratios	OR 95% Lower CL	OR 95% Upper CL
p_ICU_CCU_7_9	7-9 ICU/CCU days associated with prior acute stay	17,927	10.1	14.8	0.078	0.027	0.004	1.081	1.025	1.141
p_ICU_CCU_10_13	10-13 ICU/CCU days associated with prior acute stay	16,805	9.4	15.2	0.103	0.030	0.001	1.108	1.045	1.175
p_ICU_CCU_14_18	14-18 ICU/CCU days associated with prior acute stay	14,213	8.0	15.5	0.129	0.034	0.000	1.137	1.064	1.216
p_ICU_CCU_19_24	19-24 ICU/CCU days associated with prior acute stay	10,026	5.6	16.2	0.206	0.038	<.0001	1.229	1.141	1.324
p_ICU_CCU_25Plus	25+ ICU/CCU days associated with prior acute stay	10,332	5.8	16.3	0.220	0.044	<.0001	1.246	1.142	1.359
	Original Reason for Entitlement Codes									
OVER_65_OREC_123	Over 65, Original reason for entitlement other than age: 1-Disability Insurance Benefit (DIB), 2-ESRD; 3-BOTH DIB and ESRD	29,146	16.3	15.4	0.082	0.021	<.0001	1.085	1.042	1.130
	Prior Acute Care Utilization-Count of prior stays									
history_stay_1	1 Stay - Acute history	42,142	23.6	12.3	0.285	0.022	<.0001	1.330	1.274	1.389
history_stay_2	2 Stays - Acute history	26,215	14.7	12.9	0.328	0.025	<.0001	1.388	1.322	1.458
history_stay_3	3 Stays - Acute history	19,407	10.9	15.9	0.557	0.027	<.0001	1.746	1.657	1.839
history_stay_4	4 Stays - Acute history	11,179	6.3	16.7	0.611	0.032	<.0001	1.843	1.732	1.961
history_stay_5	5 Stays - Acute history	8,543	4.8	18.9	0.758	0.034	<.0001	2.134	1.998	2.279
history_stay_6	6 Stays - Acute history	5,458	3.1	20.3	0.860	0.039	<.0001	2.364	2.189	2.552
history_stay_7	7 Stays - Acute history	4,202	2.4	20.6	0.887	0.043	<.0001	2.428	2.230	2.643
history_stay_8	8 Stays - Acute history	2,652	1.5	21.5	0.936	0.052	<.0001	2.550	2.303	2.823
history_stay_9	9 Stays - Acute history	2,365	1.3	24.5	1.121	0.053	<.0001	3.068	2.768	3.400

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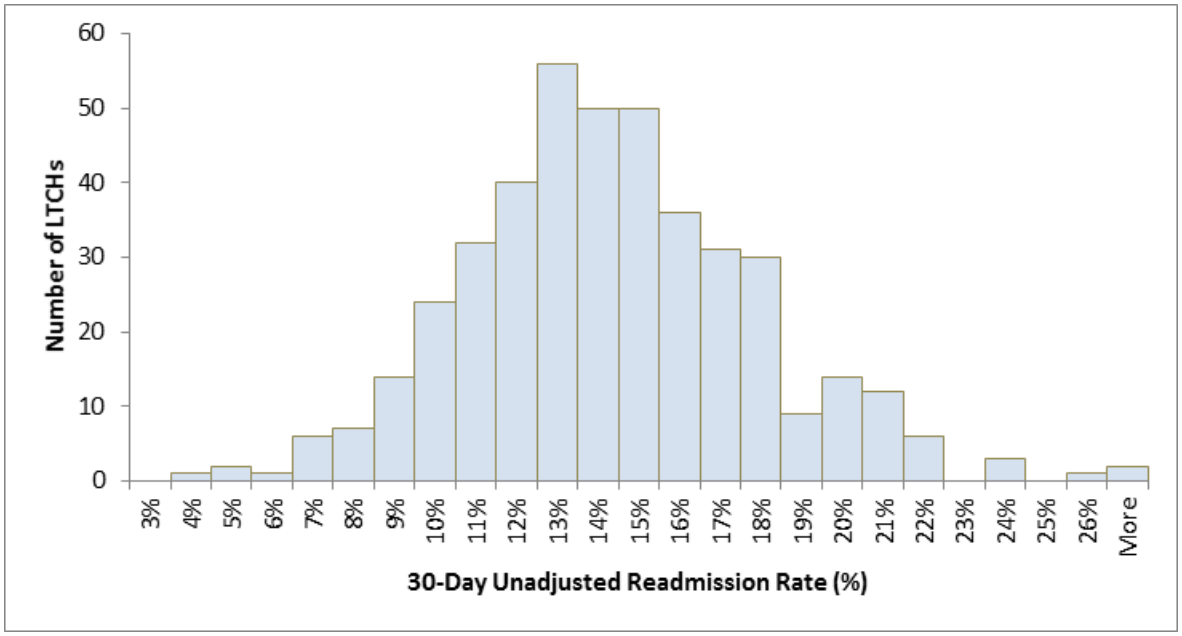
Table 2-8. Potentially Preventable Unplanned Readmission Measure for 30 Days Post Discharge for Long-Term Care Hospitals: Logistic Regression Model Results from 2012-2013 (continued)

Variable Name in Model	Covariate	Count	Percent Total	Percent Readm	Estimate	Std. Error	P value	Odds Ratios	OR 95% Lower CL	OR 95% Upper CL
history_stay_10 plus	10+ Stays - Acute history	6,769	3.8	27.4	1.293	0.035	<.0001	3.642	3.403	3.897

Note: Number of Observations in 2012/2013: 178,308. There were 24,768 unplanned readmissions. The C-Statistic was 0.66.

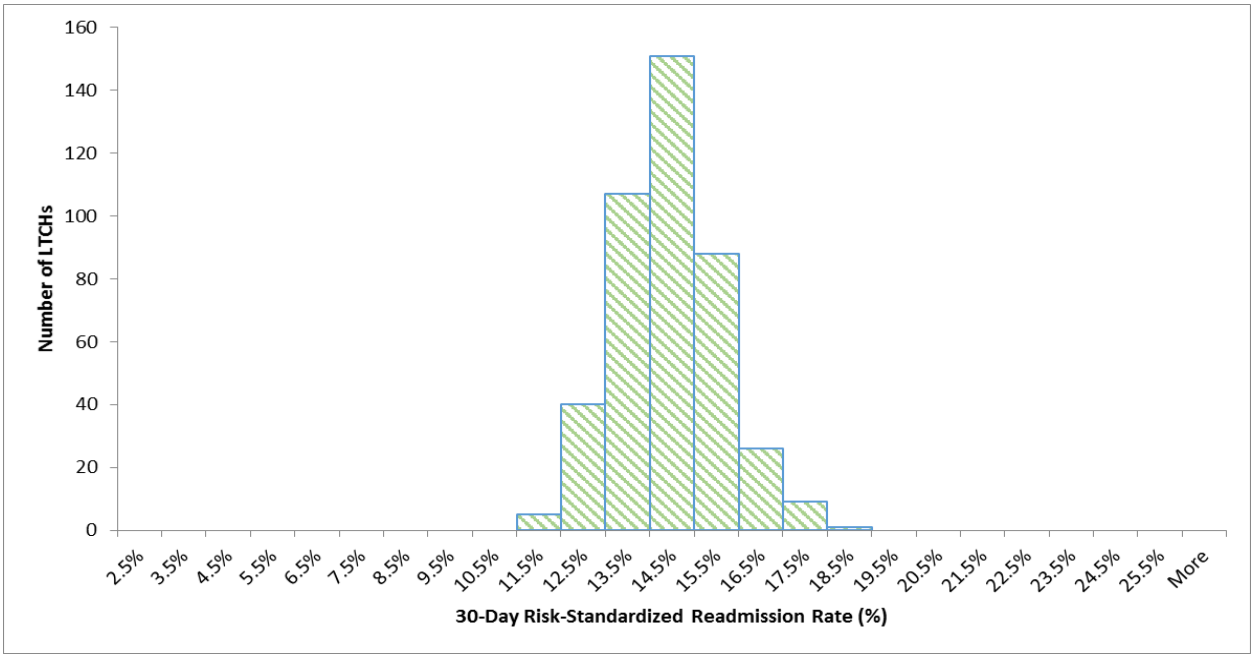
Source: RTI International analysis of Medicare claims data, 2012-2013. (RTI program reference: ab11_ltch_ltc1213logistic; ab11_ltch_ltc1213logisticpar.xlsx; ab11ltcgli_mean_1213.xlsx)

Figure 2-2. Distribution of Unadjusted Potentially Preventable Readmission Rates among LTCHs with at Least 25 Index Stays [N=427; Mean(StD) 13.4(3.5)]



Source: RTI International analysis of Medicare claims data, 2012-2013. (RTI program reference: ab11ltcgli_ALL_rsrr_1213.xlsx)

Figure 2-3. Distribution of Risk Standardized Potentially Preventable Readmission Rates (RSRR) among LTCHs with at Least 25 Index Stays [N=427; Mean(StD) 13.9(1.1)]



Source: RTI International analysis of Medicare claims data, 2012-2013. (RTI program reference:ab11ltcgli_ALL_rsrr_1213.xlsx)

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APPENDIX 3
DRUG REGIMEN REVIEW CONDUCTED WITH FOLLOW-UP FOR IDENTIFIED ISSUES- POST ACUTE CARE (PAC) LONG-TERM CARE HOSPITAL (LTCH) QUALITY REPORTING PROGRAM (QRP)

Table 1 below summarizes the setting specific language used to describe the resident or patient within the PAC setting. There are no other differences in the content language within each Drug Regimen Review quality measure item.

Table 3-1.
Drug Regimen Review Quality Measure Setting-Specific Language

SNF	IRF	LTCH
Beginning of stay	**Beginning of stay**	**Beginning of stay**
N2001 Drug Regimen Review: Did a complete drug regimen review identify potential clinically significant medication issues? ☐ 0 - No - No issues found during review ☐ 1 - Yes - Issues found during review ☐ 9 - NA – **Resident** is not taking any medications	**N. 2001 Drug Regimen Review:** Did a complete drug regimen review identify potential clinically significant medication issues? ☐ 0 - No - No issues found during review ☐ 1 - Yes - Issues found during review ☐ 9 - NA – **Patient** is not taking any medications	**N. 2001 Drug Regimen Review:** Did a complete drug regimen review identify potential clinically significant medication issues? ☐ 0 - No - No issues found during review ☐ 1 - Yes - Issues found during review ☐ 9 - NA – **Patient** is not taking any medications
N. 2003 Medication Follow-up: Did the facility contact a physician (or physician-designee) by midnight of the next calendar day and complete prescribed/recommended actions in response to the identified potential clinically significant medication issues? ☐ 0 - No ☐ 1 - Yes	**N. 2003 Medication Follow-up:** Did the facility contact a physician (or physician-designee) by midnight of the next calendar day and complete prescribed/recommended actions in response to the identified potential clinically significant medication issues? ☐ 0 - No ☐ 1 - Yes	**N. 2003 Medication Follow-up:** Did the facility contact a physician (or physician-designee) by midnight of the next calendar day and complete prescribed/recommended actions in response to the identified potential clinically significant medication issues? ☐ 0 - No ☐ 1 - Yes

(continued)

Table 3-1. (continued)
Drug Regimen Review Quality Measure Setting-Specific Language

SNF	IRF	LTCH
End of stay	**End of stay**	**End of stay**
N. 2005 Medication Intervention: Did the facility contact and complete physician (or physician-designee) prescribed/recommended actions by midnight of the next calendar day each time potential clinically significant medication issues were identified since the **Admission**? ☐ 0 - No ☐ 1 - Yes ☐ 9 - NA -There were no potential clinically significant medication issues identified since Admission or **resident** is not taking any medications.	**N. 2005 Medication Intervention:** Did the facility contact and complete physician (or physician-designee) prescribed/recommended actions by midnight of the next calendar day each time potential clinically significant medication issues were identified since the **Admission**? ☐ 0 - No ☐ 1 - Yes ☐ 9 - NA -There were no potential clinically significant medication issues identified since Admission or **patient** is not taking any medications.	**N. 2005 Medication Intervention:** Did the facility contact and complete physician (or physician-designee) prescribed/recommended actions by midnight of the next calendar day each time potential clinically significant medication issues were identified since the **Admission**? ☐ 0 - No ☐ 1 - Yes ☐ 9 - NA -There were no potential clinically significant medication issues identified since Admission or **patient** is not taking any medications.