Specifications for the All-Cause Unplanned Readmission Measure for 30 Days Post Discharge from Inpatient Rehabilitation Facilities

Current as of May 2, 2013

Table of Contents

List of Tables

List of Figures

1. Specifications for the All-Cause Unplanned Readmission Measure for 30 Days Post Discharge from Inpatient Rehabilitation Facilities

1.1 Measure Name

All-Cause Unplanned Readmission Measure for 30 Days Post Discharge from Inpatient Rehabilitation Facilities

1.2 Summary Description of the Measure

This measure estimates the risk-standardized rate of unplanned, all-cause readmissions for patients discharged from an inpatient rehabilitation facility (IRF) who were readmitted to a short-stay acute-care hospital or a long-term care hospital (LTCH), within 30 days of an IRF discharge. The measure will be based on data for 24 months of IRF discharges to lower levels of care or to the community.

A risk-adjusted readmission rate for each facility begins with the calculation of the ratio of the predicted number of readmissions at the facility divided by the expected number of readmissions for the same patients if treated at the average facility. This standardized risk ratio is then multiplied by the mean rate of readmission in the population (i.e., all Medicare fee-for-service [FFS] patients).

The risk adjustment for the predicted (numerator) and expected (denominator) number of readmissions is described below. This risk-standardized ratio is the essential indicator in differentiating a facility's effects on readmission rates.

For this measure, readmissions that are usually for planned procedures are excluded.[1] The measure definition is further described below.

1.3 Purpose of Measure

Because the measure tracks patients for 30 days after discharge from an IRF, it will provide information to providers that is not easily available to them currently. Rates of readmission are related to quality of care, particularly in the transition from the hospital to the next care setting. Though facility-level readmissions are not expected to be zero, elevated risk-adjusted readmission rates are indicators that there are opportunities for improvements in patient care and transitions of care.

[1] Planned procedures were determined by clinical panels convened for the hospital-wide readmission measure and supplemented for the IRF measure. They are defined by a table of ICD-9 procedure codes that may appear on a hospital claim, with exceptions to the status of planned when certain principal diagnosis codes appear on a claim.

In 2010, almost 360,000 Medicare FFS beneficiaries received care in roughly 1,180 IRFs nationwide.[2] In 2011, about 371,000 Medicare beneficiaries received care in roughly 1,165 IRFs nationwide.[3] For patients discharged from an IRF, the unadjusted rate of readmission to a short-stay acute-care hospital or an LTCH in the 30 days after an IRF discharge was about 15 percent (RTI analysis of 2010–2011 Medicare Claims data). With such a large proportion of patients being readmitted to an acute level of care in either a short-stay acute-care hospital or an LTCH, CMS proposes[4] to monitor the readmission rates for each IRF to improve patient care and transitions of care. By doing so, CMS hopes to reduce IRF readmission rates that are inappropriately high and improve patient safety and quality of care. Reducing avoidable readmissions can also reduce costs to the Medicare program.

Readmission rates are affected not only by the characteristics of patients, but by complex and critical aspects of care such as communication between providers or between providers and patients; prevention of and response to complications; patient safety; and coordinated transitions to the outpatient environment.[5] Readmissions have been identified as being sensitive to improvements in coordination of care and discharge planning for patients. Literature on readmissions focuses mainly on discharges from short-stay acute-care hospitals. However, processes that affect readmission, such as discharge planning and transition of care, communications, and care coordination, also occur at other inpatient facilities, such as the IRFs, and may affect readmission rates. Randomized controlled trials in short-stay acute-care hospitals have shown that improvements in the quality of care during the initial admission; improvement in communication with patients, their caregivers, and their clinicians; patient education; predischarge assessment; and coordination of care after discharge can directly reduce 30-day readmission rates by 20 to 40 percent. A 2011 meta-analysis of such randomized clinical trials found evidence that interventions associated with discharge planning helped to reduce readmission rates.[6] Evidence that hospitals have been able to reduce readmission through these quality improvement initiatives illustrates the degree to which hospital best practices in these areas can improve readmission rates. Hospital-wide, all-condition readmission measures could portray a broader sense of the quality of care in hospitals and hence, can promote hospital quality improvement and better inform consumers about care quality.[7]

---

[2] Medicare Payment Advisory Commission: Report to the Congress: Medicare Payment Policy, March 2012; see Chapter 9, Inpatient rehabilitation facility services, pp. 233–253. http://www.medpac.gov/chapters/Mar12_Ch09.pdf.

[3] Medicare Payment Advisory Commission: Report to the Congress: Medicare Payment Policy, March 2013; see Chapter 10, Long-term care hospital services, pp. 215–233. http://www.medpac.gov/chapters/Mar13_Ch10.pdf.

[4] See FY 2014 IPPS/LTCH PPS Notice of Proposed Rule Making accessible at http://www.regulations.gov, search for FY 2014 IPPS/LTCH PPS Proposed Rule.

[5] See FY 2013 IPPS/LTCH PPS Final Rule accessible at http://www.regulations.gov/; see 77 FR 53619 through 53623 and 53667 through 53672. Publication date: August 31, 2013.

[6] Naylor, M.D., Aiken, L.H., Kurtzman, E.T., et al. The importance of transitional care in achieving health reform. Health Affairs 30(4):746–754. 2011.

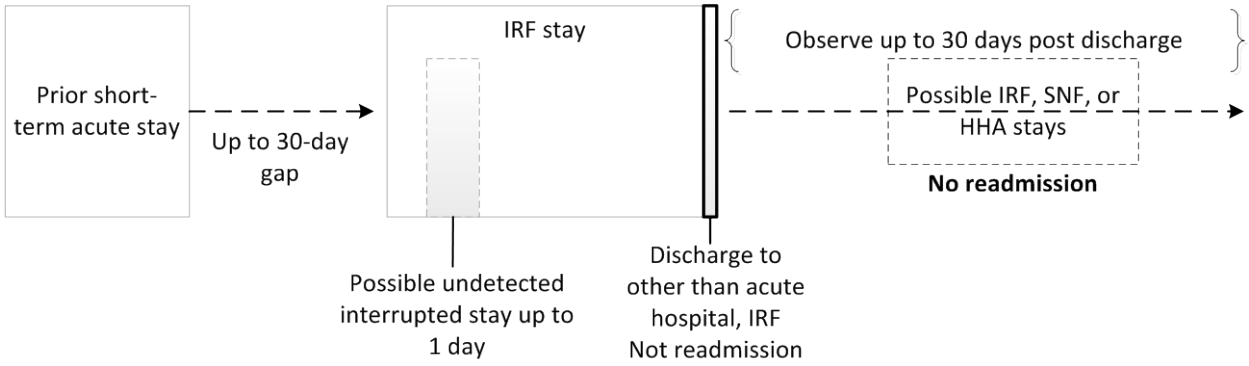
[7] See FY 2013 IPPS/LTCH PPS Final Rule accessible at http://www.regulations.gov; see 77 FR 53619 through 53623 and 53667 through 53672. Publication date: August 31, 2013.

1.4 Population

The population being tracked in the measure includes IRF Medicare FFS patients, aged 18 years and older, who are discharged to lower levels of care or to the community. This group includes patients discharged from the IRF to skilled nursing facilities or home health care, or patients who are discharged to the community or nursing homes. It excludes patients who are transferred to another IRF, short-stay acute-care hospital, or an LTCH on the day of discharge or the day following the day of discharge from the IRF.

To clarify the relationships between events used to define the population included in this measure, Figures 1 through 3 present three different scenarios. In **Figure 1,** the patient has a prior short-term acute-care hospital stay within 30 days prior to the IRF admission. There may have been program interruptions during the IRF stay, which are not considered in the measure. Since the patient is not readmitted in the 30-day post-discharge window, the patient is included in the measure as "No Readmission." If the discharge from the IRF is a transfer to another IRF or acute-level facility, the stay would not be included in the measure.[8]

Figure 1
IRF Discharge to Lower Level of Care, No Readmission

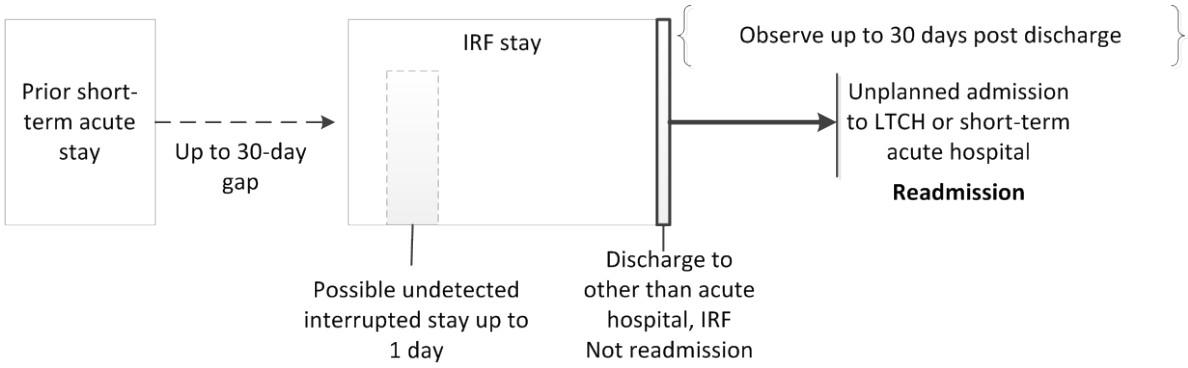


HHA = home health agency; IRF = inpatient rehabilitation facility; SNF = skilled nursing facility.

In **Figure 2**, the situation is similar to Figure 1, except that an unplanned readmission occurs within the 30-day window. This patient is included in the measure as a "Readmission."

[8] If the admission to the acute-care facility occurs on the day of discharge from the IRF or the day after, it is counted as a "transfer" to an acute-care facility. The 30-day window starts the next day.

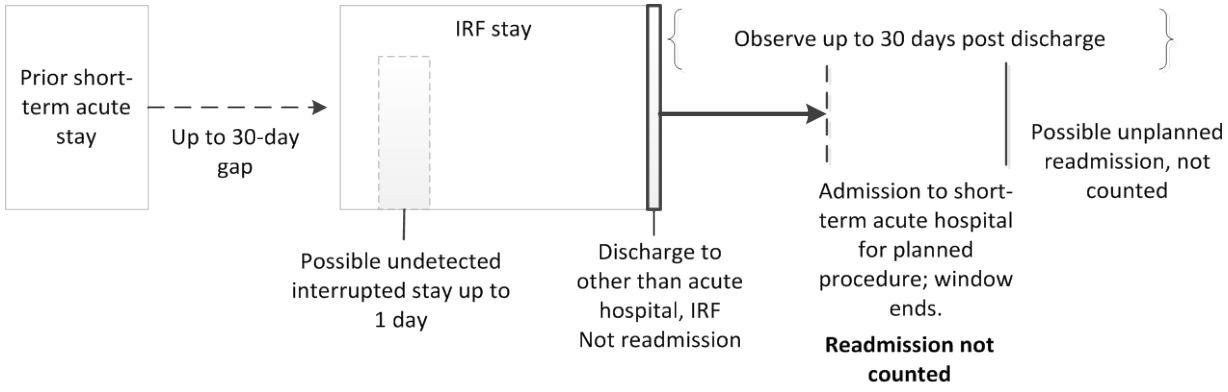
Figure 2
IRF Discharge to Lower Level of Care, Unplanned Readmission



IRF = inpatient rehabilitation facility; LTCH = long-term care hospital.

In **Figure 3**, a planned readmission occurs as the first of two readmissions in the 30-day observation window. This readmission is not counted in the measure, though the IRF stay is included in the denominator, and the observation period ends. Any unplanned readmission thereafter (i.e., after the observation window is terminated) is not counted as a post-IRF discharge "readmission."

Figure 3
IRF Discharge to Lower Level of Care, Planned Readmission



IRF = inpatient rehabilitation facility.

1.5 Numerator

The measure does not have a simple form for the numerator and denominator—that is, the risk adjustment method used 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 from discharge. This estimate includes risk adjustment for patient characteristics and a statistical estimate of the facility effect beyond patient mix.

The 30-day window of observation excludes the day of discharge and the day thereafter. Admissions to IRFs or acute hospitals (short-stay acute care and LTCH) on these days are considered transfers, and these patients are not included in the post-IRF discharge measure.

Planned readmissions are not counted in the numerator. The planned readmissions are defined largely by the definition used for the CMS Hospital-Wide Readmission (HWR) measure,[9] and were revised to include additional procedures determined as suitable for IRFs with input from a Technical Expert Panel. International Classification of Diseases (ICD-9) codes for these additional procedures were identified by a certified coder. The definition is based on the claim from the readmission having a code for a procedure that is frequently *planned*, but if a principal diagnosis in a specified list of acute diagnoses is present, the readmission is reclassified as *unplanned*. **Table 1** presents the list of codes for procedures identified as "planned" for IRFs, which are not in the HWR list. These procedures and diagnoses are currently defined by ICD-9 procedure and diagnosis codes grouped by the Clinical Classification Software (CCS), developed by the Agency for Healthcare Research and Quality (AHRQ), where large clusters were appropriate and by individual codes, if necessary.

1.6 Denominator

The denominator has two aspects: the facility IRF stays that are included in developing the measure and the estimate of the expected number of readmissions for this population at the average IRF. The measure includes all the IRF stays in the measurement period that are observed in national Medicare data and do not fall into an excluded category.

The measure excludes some IRF patient stays; some of these exclusions result from data limitations.

- IRF patients who died during the IRF stay.
- IRF patients less than 18 years old.
- IRF patients who were transferred at the end of a stay to another IRF, short-term acute hospital, or LTCH.
- Patients who were not continuously enrolled in Part A FFS Medicare for the 12 months prior to the IRF stay admission date, and at least 30 days after IRF stay discharge date. The adjustment for comorbid conditions in the measure requires the inclusion of diagnoses on short-term acute hospital bills for 1 year prior to the IRF admission, and readmissions must be observable in the observation window following discharge. There is insufficient information to include Medicare Advantage enrollees at this time.

[9] QualityNet. *Hospital-wide All-Cause Unplanned Readmission (HWR) Measure.* http://www.qualitynet.org/dcs/ContentServer?c=Page&pagename=QnetPublic%2FPage%2FQnetTier4&cid=1228772504318. As obtained on March 20, 2013.

- Patients who did not have a short-term acute-care stay within 30 days prior to an IRF stay admission date. This measure requires information from the prior acute stay in the elements used for risk adjustment.

- IRF patients discharged against medical advice (AMA).

- IRF patients for whom the prior acute stay was for nonsurgical treatment of cancer (consistent with the HWR Measure because these patients were identified as following a very different trajectory after discharge, with a particularly high mortality rate).

- IRF stays with data that are problematic (e.g., hospital stays that overlap wholly or in part).

For the includable IRF 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 patients were treated at the average IRF.

1.7 Risk Adjustment and Statistical Method

The statistical method, including risk adjustment, has many similarities with that used in the HWR measure.[10] A hierarchical regression method is used in which a logistic regression predicting the probability of a countable readmission is run. The risk adjusters are predictor variables. The patient characteristics related to each discharge and a marker for the specific discharging IRF 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 IRFs. The statistical model estimates both the average predictive effect of the patient characteristics across all IRFs and the degree to which each facility has an effect on readmissions 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 readmissions, on average, such as patient characteristics, the observed facility rate, and the number of IRF stays eligible for the measure. The estimated facility effect is determined mostly by the facility'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).

The estimated equation is used twice in the measure. The sum of the probabilities of readmission of all patients in the facility measure, including both the effects of patient characteristics and the IRF, is the "predicted number" of readmissions after adjusting for case mix. The same equation is used without the IRF effect to compute the "expected number" of

[10] QualityNet. *Hospital-wide All-Cause Unplanned Readmission (HWR) Measure.* http://www.qualitynet.org/dcs/ContentServer?c=Page&pagename=QnetPublic%2FPage%2FQnetTier4&cid=1228772504318. As obtained on March 20, 2013.

readmissions for the same patients at the average IRF. 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 risk-standardized ratio may also be multiplied by the mean readmission rate for all IRF stays to get the risk-standardized readmission rate for each facility. This estimation procedure is redone for each measurement period. Reestimating 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 and length of stay from the immediately prior short-term stay; types of surgery or procedure from the prior short-term stay; and number of admissions and comorbidities from all short-term stays in the year preceding the IRF admission. Unique to the readmission measure is the inclusion of the IRF case-mix groups (CMGs), which are assigned to all patients in connection with the IRF payment system. CMGs are mutually exclusive groupings built on the patient's underlying medical problem related to IRF care, functional motor score, and for some CMGs, cognitive score and age. This variable adds information beyond the acute-care diagnosis. The risk adjustment variables include the following:

- Age/sex categories.
- Original reason for entitlement being disability.
- Surgery category if present (e.g., cardiothoracic, orthopedic), defined as in the HWR model; the procedures are grouped using the CCS for ICD-9 procedures developed by AHRQ.
- Receiving dialysis in prior short-term stay, defined by presence of revenue code.
- Principal diagnosis on short-term bill (as in the HWR measure, they are grouped clinically using the CCS for ICD-9 diagnoses developed by AHRQ).
- IRF Case-mix groups on the IRF bill.
- Comorbidities from secondary diagnoses on the prior short-term bill and diagnoses from earlier short-term stays up to 1 year before IRF admission (these are clustered using the Hierarchical Condition Categories [HCC] groups used by CMS).
- Length of stay in the prior short-term hospital stay; the square of the short-term length of stay is also included to allow the effect of an additional day to differ for shorter and longer stays.
- Counts of prior short-term discharges in the 365 days before the IRF admission.

Current specifications make use of ICD-9 codes. Consistent with the approaching change to ICD-10 in FY 2015 (starting October 1, 2014), the code groups will be populated by ICD-10 codes when available. The specific variables included in the model are provided in **Appendix A**.

1.8 Sources of Data

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, and reasons for Medicare eligibility. The data elements from the Medicare claims are those basic to the operation of the Medicare payment systems and include date of admission, date of discharge, diagnoses, procedures, and indicators for use of dialysis services. The inpatient claims data files contain beneficiary-level IRF, LTCH, and other hospital records. No data beyond the bills submitted in the normal course of business are required from the providers.

In the FY 2014 IRF proposed rule, we propose to use 2 years of data to calculate the measure rate for the All-Cause Unplanned Readmission Measure for 30 Days Post Discharge Inpatient Rehabilitation Facility measure, which we believe is sufficient to calculate this measure in a statistically reliable manner. This is because the reliability of a hospital's measure rate is related to its sample size.

Table 1
Additions to List of Planned Readmissions Currently Used in the Hospital-Wide Readmission Measure,* for Use in the IRF Measure

Code	Description	Comment
AHRQ CCS Single-Level Procedure Codes		
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 Procedure Codes		
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: Amputations of Upper Extremity		
84.00	Upper-limb amputation, not otherwise specified	
84.01	Amputation and disarticulation of finger	
84.02	Amputation and disarticulation of thumb	
84.03	Amputation through hand	
84.04	Disarticulation of wrist	

(continued)

Table 1 (continued)
Additions to List of Planned Readmissions Currently Used in the Hospital-Wide Readmission Measure,* for Use in the IRF Measure

Code	Description	Comment
Topic: Amputations of Upper Extremity (continued)		
84.05	Amputation through forearm	
84.06	Disarticulation of elbow	
84.07	Amputation through humerus	
84.08	Disarticulation of shoulder	
84.09	Interthoracoscapular amputation	
Topic: Removal of Vascular Obstruction, Non-Coronary		
39.50	Angioplasty or atherectomy of other noncoronary vessels	
38.18	Endarterectomy, intracranial vessels	
38.08	Embolectomy, lower limb arteries	
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 nondrug-eluting peripheral (noncoronary) vessel stent(s)	
Topic: Colon and Rectal Procedures, Selected		
46.85	Dilation of intestine (includes endosopic approach)	
96.08	Insertion of naso-intestinal tube (includes for decompression)	
96.09	insertion of rectal tube	
46.50	Closure of intestinal stoma, not otherwise specified	Required, diagnosis codes V55.2: attention to ileostomy and V55.3: attention to colostomy
46.51	Closure of stoma of small intestine	Required, diagnosis codes V55.2: attention to ileostomy and V55.3: attention to colostomy
46.52	Closure of stoma of large intestine	Required, diagnosis codes 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)	

(continued)

Table 1 (continued)
Additions to List of Planned Readmissions Currently Used in the Hospital-Wide Readmission Measure,* for Use in the IRF Measure

Code	Description	Comment
Topic: Endoscope		
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	
51.85	Endoscopic sphincterotomy and papillotomy	
51.86	Endoscopic insertion of nasobiliary drainage tube	
51.87	Endoscopic insertion of stent (tube) into bile duct	
51.88	Endoscopic removal of stone(s) from biliary tract	
Topic: Insertion of Feeding Tubes		
44.39	Other gastroenterostomy (GastroJejunal-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 (nonincisional)	
02.43	Removal of ventricular shunt	
97.37	Removal of tracheostomy tube (nonincisional)	
1.27	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	

(continued)

Table 1 (continued)
Additions to List of Planned Readmissions Currently Used in the Hospital-Wide Readmission Measure,* for Use in the IRF Measure

Code	Description	Comment
Topic: Pleurosclerosis		
34.6	Scarification of pleura	
34.92	Injection into thoracic cavity	
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)	
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)	

(continued)

Table 1 (continued)
Additions to List of Planned Readmissions Currently Used in the Hospital-Wide Readmission Measure,* for Use in the IRF Measure

Code	Description	Comment
Topic: Fistula (continued)		
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	

* We refer readers to the measure methodology report for the HWR measure for the list of procedure codes and discharge diagnosis categories for each readmission to identify planned readmissions. See QualityNet. *Hospital-wide All-Cause Unplanned Readmission (HWR) Measure. Hospital-Wide Readmission Technical Report.* http://www.qualitynet.org/dcs/ContentServer?c=Page&pagename=QnetPublic%2FPage%2FQnetTier4&cid=1228772504318. As obtained on March 20, 2013.

For the most current list of planned procedures for the HWR measure, see NQF #0505 Hospital 30-day all-cause risk-standardized readmission rate (RSRR) following acute myocardial infarction (AMI) hospitalization at http://www.qualityforum.org/WorkArea/linkit.aspx?LinkIdentifier=id&ItemID=72189; specifically, refer to Tables A1–A4 at http://www.qualityforum.org/WorkArea/linkit.aspx?LinkIdentifier=id&ItemID=72212. As obtained on April 3, 2013.

APPENDIX A
VARIABLES IN THE IRF MODEL FOR UNPLANNED READMISSIONS WITHIN 30 DAYS OF DISCHARGE TO A NON-ACUTE LEVEL OF CARE

Variables in the IRF Model for Unplanned Readmissions within 30 days of Discharge to a Non-Acute Level of Care

Numbers in the variable descriptions refer to the AHRQ CCS groupings or CMS HCC groupings of diagnoses.

Variable	Variable Description
Intercept	Intercept – includes effects of reference groups for age/sex, primary diagnoses, CMGs
Age-Sex Groups (Ref: Male 18-54)	
m55_59	Male age 55-59
m60_64	Male age 60-64
m65_69	Male age 65-69
m70_74	Male age 70-74
m75_79	Male age 75-79
m80_84	Male age 80-84
m85_89	Male age 85-89
m90_plus	Male age 90+
w18_54	Female age 18-54
w55_59	Female age 55-59
w60_64	Female age 60-64
w65_69	Female age 65-69
w70_74	Female age 70-74
w75_79	Female age 75-79
w80_84	Female age 80-84
w85_89	Female age 85-89
w90_plus	Female age 90+
CCS Groupings – Based on primary diagnosis (Reference group includes p_ccs_AcqDeform (208-209); p_ccs_NervSystLOW (84-94); p_ccs_Osteoarthros (203); p_ccs_Ot_Joint_Osteo (204, 206); p_ccs_Poison (241-243); p_ccs_Pregnancy (176-196); p_ccs_SprainSuperfic (232, 239))	
p_ccs_AMICardArrst	Circ Syst: AMI & Cardiac arrst (100, 107)
p_ccs_AdltRespFl	Resp Syst: Adlt Resp Fl (131)
p_ccs_Aneurysm	Circ Syst: Aneurysm (115)
p_ccs_ArmFx	Fx arm (229)
p_ccs_ArtEmbOt	Circ Syst: Art embolism & Ot circul dx (116-117)
p_ccs_AspPneum	Resp Syst: Asp Pneumonia (129)
p_ccs_BackProb	Back problem (205)
p_ccs_Biliary	Biliary Dx, Liver Dx, Other Liver Dx, Pancreas (149-152)
p_ccs_BloodDx	Diseases of blood and blood-forming organs (56-57, 59-64)
p_ccs_CHF	Circ Syst: CHF, Nonhypertensive (108)
p_ccs_COPD_Asthm	Resp Syst: COPD & Asthma (127-128)
p_ccs_CVD	Circ Syst: CVD (109-111, 113)
p_ccs_Circ_CarditOth	Circ Syst: Carditis & Other heart dx (97, 104)
p_ccs_Circ_HrtValve	Circ Syst: Heart Valve (96)
p_ccs_Circ_Htn	Circ Syst: Htn & Htn complicn (98-99)
p_ccs_ComplicDevProc	Complic Devi & Complic Proc (237-238)
p_ccs_CondDysr	Circ Syst: Conduction & Dysrhythmia (105-106)
p_ccs_CongenAnom	Congenital Anomalies: 213-217
p_ccs_CoronAthChstPa	Circ Syst: Coron Athero & Chest pain (101-102)

(continued)

Variables in the IRF Model for Unplanned Readmissions within 30 days of Discharge to a Non-Acute Level of Care (continued)

Variable	Variable Description
p_ccs_CrushInj	Crush Injury (234)
p_ccs_Diab	Diabetes based on 49-50
p_ccs_DigSyst	Diseases of Digestive System (135-144, 146-148, 154-155)
p_ccs_Endocrn	Endocrine includes 48, 51, 53, 54
p_ccs_EpilepCNV	Dis Nerv Syst: Epilepsy/CNV (83)
p_ccs_FluidElcDx	Fluid/elc dx (55)
p_ccs_GIHemorr	GI Hemorrhag (153)
p_ccs_Gangrene	Gangrene (from Sx, Sign, Ill-defined conditions) (248)
p_ccs_Genitourin	Diseases of the genitourinary system (156, 160-166, 168-175)
p_ccs_HipFx	Fx hip (226)
p_ccs_InfectArth	Infect Arth (201)
p_ccs_InfectParasDx	Infectious and parasitic diseases (1, 3-10)
p_ccs_IntObstruct	Digestive System-Int Obstruct (145)
p_ccs_Intracraninj	Intracrn Inj (233)
p_ccs_JointInj	Joint injury (225)
p_ccs_LegFx	Fx leg (230)
p_ccs_MeninEnceCNS	Dis Nerv Syst: Meningitis, Encephalitis, Other CNS infx (76-78)
p_ccs_Mentl_Illness	Mental Illness (650-670)
p_ccs_Neopl_2ndryMal	Secondary Malignant Neoplasm (42)
p_ccs_Neopl_Ben_Low	Neoplasms-Benign (44-47) Neoplasms-Low (22-26, 28-31, 36)
p_ccs_Neopl_Hi	Neoplasms-Hi (16-17, 19, 27, 35
p_ccs_Neopl_Med	Neoplasms-Medium (11-15, 18, 20-21, 32-34, 37-41, 43)
p_ccs_Nutrit	Nutrit defic and oth nutrit dx (52, 58)
p_ccs_OpnWnd_Burns_O	Opn wnd head & extrem (235-236), Burns (240), Other Inj (244)
p_ccs_Ot_Bone_Dx	Ot bone dx (212)
p_ccs_OthNervDx	Dis Nerv Syst: Oth Nerv Dx (95)
p_ccs_ParkMSCNSPara	Dis Nerv Syst: Parkinsons, MS, Ot hered CNS, Paralysis (79-82)
p_ccs_PathFx	Patholog Fx (207)
p_ccs_PeripAthero	Circ Syst: Perip Athero (114)
p_ccs_PhlebVn	Circ Syst: Phlebitis, Vericose vn, Hemorrhoids, Oth vein dx (118-121)
p_ccs_PneumInf	Resp Syst: Pneum, Influ, Bronc, Oth up rsp (122-123, 125-126)
p_ccs_PulmHart	Circ Syst: Pulm heart dx (103)
p_ccs_Renl_fail	Genitourinary: Ac & Chr renl fail (157-158)
p_ccs_Resp_PleurEtc	Resp Syst: Pleurisy, Lung externl, Oth low resp, Oth uppr resp, Tonsillitis (124, 130, 132-134)
p_ccs_RheumArth_SLE	Rheum arth (202), SLE (210), OthConnTiss (211)
p_ccs_SCI	Spin cor inj (227)
p_ccs_Septicemia	Infect & Paras Dx: Septicemia (2)
p_ccs_Skin	Diseases of the skin and subcutaneous tissue (167, 197-200)
p_ccs_SkullFx_OthFx	Fx skull fac (228) and Oth fracture (231)

(continued)

Variables in the IRF Model for Unplanned Readmissions within 30 days of Discharge to a Non-Acute Level of Care (continued)

Variable	Variable Description
p_ccs_SxSigns	Symptoms, Signs, and Ill-Defined Conditions & Factors influencing health status (no gangrene) (245-247, 249-259)
p_ccs_TIA	Circ Syst: TIA (112)
p_ccs_UTI	Genitourinary: UTI (159)
Surgical Groups	
p_gen_obgyn_uro	General surgery, Obstetrics/Gynecology, and urologic surgical procedures
p_ct	Cardio Thoracic
p_ent	Otolaryngology
p_plastic	Plastic Surgery
Dialysis Indicator	
p_Dialysis_NotHCC133	Dialysis in acute hospital where HCC133 not indicated
Modified CMG Groupings (Ref: Fracture of lower extremity: Motor score >28.15 (CMGs: 0701-703); Replacement of lower extremity joint: Motor score >28.65 (CMGs: 0801-0804))	
CMG_1	Stroke: Motor score >44.45 (CMGs: 0101-0103)
CMG_2	Stroke: Motor score 26.15-44.45 (CMGs: 0104-0107)
CMG_3	Stroke: Motor score 22.35-26.15 (CMGs: 0108-0109)
CMG_4	Stroke: Motor score <22.35 and Age <84.5 (CMG: 0110)
CMG_5	Traumatic brain injury: Motor score >28.75 (CMGs: 0201-0205)
CMG_6	Traumatic brain injury: Motor score <28.75 (CMGs: 0206-0207)
CMG_7	Non-traumatic brain injury: Motor score >35.05 (CMGs:0301-0302)
CMG_8	Non-traumatic brain injury: Motor score <35.05 (CMGs:0303-0304)
CMG_9_10	Traumatic spinal cord injury: All (CMGs: 0401-0405)
CMG_11	Non-traumatic spinal cord injury: Motor score >31.25 (CMGs: 0501-0503)
CMG_12	Non-traumatic spinal cord injury: Motor score <31.25 (CMGs: 0504-0506)
CMG_13	Neurological: Motor score >37.35 (CMGs: 0601-0602)
CMG_14	Neurological: Motor score <37.35 (CMGs: 0603-0604)
CMG_16	Fracture of lower extremity: Motor score <28.15 (CMG: 0704)
CMG_18	Replacement of lower extremity joint: Motor score <28.65 (CMGs: 0805-0806)
CMG_19	Other orthopedic: Motor score >24.15 (CMGs: 0901-0903)
CMG_20	Other orthopedic: Motor score <24.15 (CMG: 0904)
CMG_21	Amputation, lower extremity: Motor score >36.25 (CMGs:1001-1002)
CMG_22_23	Amputation, lower extremity: Motor score <36.25 (CMG:1003) & Amputation, non-lower extremity: All (CMGs: 1101-1102)
CMG_24	Osteoarthritis: All (CMGs: 1201-1203)
CMG_25	Rheumatoid, Other arthritis: All (CMGs: 1301-1303)
CMG_26	Cardiac: Motor score >38.55 (CMGs: 1401-1402)

(continued)

Variables in the IRF Model for Unplanned Readmissions within 30 days of Discharge to a Non-Acute Level of Care (continued)

Variable	Variable Description
CMG_27_29	Cardiac: Motor score <38.55 (CMGs: 1403-1404) & Pulmonary: Motor score <39.05 (CMGs: 1503-1504)
CMG_28	Pulmonary: Motor score >39.05 (CMGs: 1501-1502)
CMG_30	Pain syndrome: All (CMGs: 1601-1603)
CMG_31	Major multiple trauma without brain or spinal cord injury: All (CMGs: 1701-1704)
CMG_32	Major multiple trauma with brain or spinal cord injury; All (CMGs: 1801-1803)
CMG_33	Guillain Barre: All (CMGs; 1901-1903)
CMG_34_35_36	Miscellaneous: All (CMGs: 2001-2004); Burns (CMG 2101); Short-stay cases (CMG: 5001)
HCC Comorbidities - based on prior acute (p_HCC*) or 365-day look-back (HCC*)	
HCC8	Metastatic Cancer and Acute Leukemia
HCC9_13	Lung and Other Severe Cancers/Other Respiratory and Heart Neoplasms
HCC10	Lymphoma and Other Cancers
p_HCC17_18_19_20	Diabetes with Acute Complications/Diabetes with Chronic Complications/Diabetes without Complication/Type I Diabetes Mellitus
p_HCC21	Protein-Calorie Malnutrition
p_HCC22	Morbid Obesity
p_HCC23	Other Significant Endocrine and Metabolic Disorders
p_HCC24	Disorders of Fluid/Electrolyte/Acid-Base Balance
HCC25	Disorders of Lipoid Metabolism
HCC27	End-Stage Liver Disease
HCC28	Cirrhosis of Liver
HCC29	Chronic Hepatitis
p_HCC36	Peptic Ulcer, Hemorrhage, Other Specified Gastrointestinal Disorders
HCC39	Bone/Joint/Muscle Infections/Necrosis
HCC40	Rheumatoid Arthritis and Inflammatory Connective Tissue Disease
HCC41	Disorders of the Vertebrae and Spinal Discs
HCC43	Osteoporosis and Other Bone/Cartilage Disorders
HCC44_45	Congenital/Developmental Skeletal and Connective Tissue Disorders/ Other Musculoskeletal and Connective Tissue Disorders
p_HCC46	Severe Hematological Disorders
p_HCC48	Coagulation Defects and Other Specified Hematological Disorders
p_HCC50	Delirium and Encephalopathy
p_HCC51_52	Dementia With Complications/Dementia Without Complication

(continued)

Variables in the IRF Model for Unplanned Readmissions within 30 days of Discharge to a Non-Acute Level of Care (continued)

Variable	Variable Description
HCC57_thru_63	Schizo/Major Depressive/Reactive and Unspecified Psychosis/Personality/Depression/Anxiety/Other Psychiatric Disorders
p_HCC73	Amyotrophic Lateral Sclerosis and Other Motor Neuron Disease
p_HCC74	Cerebral Palsy
p_HCC75_81	Polyneuropathy/ Mononeuropathy, Other Neurological Conditions/Injuries
HCC78	Parkinson's and Huntington's Diseases
p_HCC79	Seizure Disorders and Convulsions
p_HCC85	Congestive Heart Failure
p_HCC86	Acute Myocardial Infarction
p_HCC87	Unstable Angina and Other Acute Ischemic Heart Disease
p_HCC89	Coronary Atherosclerosis/Other Chronic Ischemic Heart Disease
HCC91	Valvular and Rheumatic Heart Disease
HCC92_93	Major Congenital Cardiac/Circulatory Defect/ Other Congenital Heart/Circulatory Disease
HCC94	Hypertensive Heart Disease
HCC95	Hypertension
p_HCC96	Specified Heart Arrhythmias
HCC103	Hemiplegia/Hemiparesis
p_HCC106	Atherosclerosis of the Extremities with Ulceration or Gangrene
p_HCC107	Vascular Disease with Complications
p_HCC108	Vascular Disease
HCC111	Chronic Obstructive Pulmonary Disease
HCC112	Fibrosis of Lung and Other Chronic Lung Disorders
p_HCC115_116	Pneumococcal Pneumonia, Empyema, Lung Abscess/Viral and Unspecified Pneumonia, Pleurisy
p_HCC117	Pleural Effusion/Pneumothorax
HCC118	Other Respiratory Disorders
p_HCC119	Legally Blind
HCC126	Glaucoma
HCC132	Kidney Transplant Status
HCC133	End Stage Renal Disease
p_HCC135	Acute Renal Failure
p_HCC136	Chronic Kidney Disease, Stage 5
p_HCC137	Chronic Kidney Disease, Severe (Stage 4)
p_HCC138	Chronic Kidney Disease, Moderate (Stage 3)
p_HCC139	Chronic Kidney Disease, Mild or Unspecified (Stages 1-2 or Unspecified)

(continued)

Variables in the IRF Model for Unplanned Readmissions within 30 days of Discharge to a Non-Acute Level of Care (continued)

Variable	Variable Description
p_HCC142	Urinary Obstruction and Retention
p_HCC144	Urinary Tract Infection
p_HCC145	Other Urinary Tract Disorders
HCC149	Male Genital Disorders
p_HCC157_158	Pressure Ulcer of Skin with Necrosis Through to Muscle, Tendon, or Bone/ Pressure Ulcer of Skin with Full Thickness Skin Loss
p_HCC164	Cellulitis, Local Skin Infection
p_HCC169	Vertebral Fractures without Spinal Cord Injury
p_HCC170	Hip Fracture/Dislocation
HCC171	Major Fracture, Except of Skull, Vertebrae, or Hip
HCC187	Other Organ Transplant Status/Replacement
p_HCC188	Artificial Openings for Feeding or Elimination
HCC191	Post-Surgical States/Aftercare/Elective
p_HCC197	Supplemental Oxygen
Prior Acute Care Length of Stay	
p_LOS	Prior Acute Length of Stay
p_LOS_sq	Prior Acute Length of Stay, Squared
Original Reason for Entitlement Codes	
OREC_1	Original reason for entitlement: 1-Disability Insurance Benefits (DIB)
Prior Acute Care Utilization-Count of Prior Stays	
history_stay_1	1 Stay - Acute history
history_stay_2	2 Stays - Acute history
history_stay_3	3 Stays - Acute history
history_stay_4	4 Stays - Acute history
history_stay_5	5 Stays - Acute history
history_stay_6	6 Stays - Acute history
history_stay_7	7 Stays - Acute history
history_stay_8	8 Stays - Acute history
history_stay_9	9 Stays - Acute history
history_stay_10plus	10+ Stays - Acute history