February 2016

Technical Expert Panel Summary Report: Development of Potentially Preventable Readmission Measures for Post-Acute Care

Deliverable 14

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TECHNICAL EXPERT PANEL SUMMARY REPORT: DEVELOPMENT OF POTENTIALLY PREVENTABLE READMISSION MEASURES FOR POST-ACUTE CARE

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ACKNOWLEDGMENTS

We would like to thank the members of our technical expert panel for their valuable contributions to this work. In particular, we would like to acknowledge our chair person, Dr. Terrence A. O'Malley, for his service.

Members of our technical expert panel were given the opportunity to review the draft version of this report for the purpose of ensuring that the report accurately reflects the meeting proceedings and discussions. We incorporated their suggestions in preparing the final report.

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SECTION 1
INTRODUCTION AND OVERVIEW

1.1 Introduction

On August 12 and 13, 2015, RTI International and Abt Associates convened an in-person Technical Expert Panel (TEP) meeting to seek input on the development of potentially preventable readmission (PPR) measures for post-acute care (PAC). On October 14, 2015, the TEP reconvened via webinar for a follow-up workgroup meeting, during which the TEP provided additional feedback on the revised PPR definition and measure specifications. This work was conducted for the Centers for Medicare & Medicaid Services (CMS).

As part of its measure development process, CMS asks contractors to convene groups of stakeholders and experts who contribute direction and thoughtful input to measure contractors during measure development. This report provides a summary of the TEP process and proceedings, detailing the discussion of key issues and the panel's recommendations.

1.2 Background and Purpose

The development of cross-setting PPR measures for PAC supports national efforts to increase the standardization of quality measures. Specifically, the Improving Medicare Post-Acute Care Transformation (IMPACT) Act of 2014 calls for the submission of standardized assessment data by PAC providers and the implementation of standardized quality measures for these settings. The Act specifically requires the development of *all-condition risk-adjusted potentially preventable hospital readmission measures* for the PAC settings. Additionally, the 2014 Protecting Access to Medicare Act (PAMA) includes a statutory mandate to develop a PPR measure to replace the all-cause readmission measure for skilled nursing facilities (SNFs) by October 2016.

CMS has contracted with RTI and Abt to develop cross-setting potentially preventable hospital readmission measures for SNFs, inpatient rehabilitation facilities (IRFs), long-term care hospitals (LTCHs), and home health agencies (HHAs). This work is being conducted under two contracts: *Development and Maintenance of Symptom Management Measures* (HHSM-500-2013-13015I; Task Order HHSM-500-T0001) and *Outcome and Assessment Information Set (OASIS) Quality Measure Development and Maintenance* (HHSM-500-2013-13001I; Task Order HHSM-500-T0002).

CMS has previously developed five all-cause hospital readmission measures for PAC, which were endorsed by the National Quality Forum (NQF). These measures include the following:

- the Skilled Nursing Facility 30-Day All-Cause Readmission Measure (SNFRM) (NQF #2510)

- the All-Cause Unplanned Readmission Measure for 30 Days Post Discharge from Inpatient Rehabilitation Facilities (NQF #2502)

- the All-Cause Unplanned Readmission Measure for 30 Days Post Discharge from Long-Term Care Hospitals (NQF #2512)

- Rehospitalization During the First 30 Days of Home Health (NQF #2380)

- Acute Care Hospitalization (risk-adjusted) (NQF #0171).

The all-cause measures provide a foundation for developing readmission measures that are more narrowly defined, yet there is no precedent for an approach that solely addresses potentially preventable readmissions for PAC. Though a variety of methodologies and definitions of potentially preventable readmissions or hospitalizations have been developed and used throughout the literature, there is no consensus or existing approach pertaining to how PPR could be defined specific to PAC providers. Given this context, the primary objectives of the TEP were to develop an approach for defining potentially preventable readmissions and to provide input on a preliminary set of conditions that would be considered potentially preventable causes of a hospital readmission from PAC, on the basis of a comprehensive environmental scan and other clinical and technical input. In addition, the TEP provided input on the measure specifications, including measure exclusions and the risk adjustment approach.

1.3 Organization of the Report

This report summarizes the TEP proceedings for the development of potentially preventable readmission measures for PAC. ***Section 2*** details the TEP selection process and composition, as well as the environmental scan and approach for defining potentially preventable readmissions. ***Section 3*** outlines the TEP's discussion of key issues and recommendations during the in-person meeting, and ***Section 4***, the follow-up workgroup meeting. ***Section 5*** provides the main takeaways from the TEP and the next steps for PPR measure development.

SECTION 2
TEP PROCESS AND MATERIALS

2.1 TEP Selection and Composition

In May 2015, the measure development teams began seeking TEP nominations with the posting of a Call for TEP announcement and a TEP Nomination Form on the CMS website. To increase awareness about this TEP opportunity, RTI and Abt contacted several key stakeholders, such as national provider associations, former TEP members, and other national experts, via e-mail. The nomination period lasted approximately 3 weeks, and the process of selecting TEP members began in June. Given that the focus of this TEP was to obtain feedback on development of a PPR definition, measure developers prioritized nominees with strong clinical backgrounds and those with knowledge of hospital readmissions and technical expertise in quality measurement and risk adjustment during the TEP selection process. RTI and Abt made every effort to select a balanced panel with respect to setting of expertise, identifying TEP members with backgrounds in SNFs, IRFs, LTCHs, and HHAs, along with experts with cross-setting perspectives. In July, 26 nominees were appointed to the TEP, including a TEP Chair. For more details on the TEP composition, see ***Table 1.***

2.2 Environmental Scan

To support the PPR measure development and familiarize TEP members with the current state of the research on this topic, RTI and Abt conducted comprehensive environmental scans on potentially preventable and avoidable hospital readmissions and summarized their findings in a memo shared with the TEP before the August meeting **(*Appendix A-2*)**. The scan included a summary of the characteristics of hospital readmissions and interventions found in the literature aimed at reducing hospital readmissions, various definitions for potentially preventable readmissions, and highlights of the evidence by setting.

Results from the environmental scans identified several general methods and algorithms that have been developed to assess potentially preventable hospitalizations and readmissions, such as the Agency for Healthcare Research and Quality's (AHRQ's) Prevention Quality Indicators (PQIs), approaches developed by the Medicare Payment Advisory Commission (MedPAC), and proprietary methods such as 3M™'s Potentially Preventable Readmissions Classification System. Key findings from the environmental scans suggest that in some definitions, potentially preventable readmissions are related to specific medical conditions or diagnoses that predate the readmission. However, there is little consensus on how to define potentially preventable readmissions, and no existing definition specific to Medicare PAC beneficiaries.

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Table 1
TEP Composition List

Name, Credentials	Professional Role Organizational Affiliation City, State	Consumer Perspective	Clinical Content	Performance Measurement	Coding and Informatics	Conflict of Interest Disclosure
Terrie Black, DNP, MBA, RN, CRRN, FAHA	**Chair, Health Policy Committee; National Quality Forum (NQF) Liaison** Association of Rehabilitation Nurses *Chicago, IL* **Clinical Assistant Professor** University of Massachusetts Amherst *Amherst, MA* **Nurse Reviewer** The Joint Commission *Chicago, IL*		X	X		None
Peter Boling, MD	**Chair, Division of Geriatric Medicine** Virginia Commonwealth University *Richmond, VA*		X			None
Rebecca Boxer, MD, MS	**Associate Professor of Medicine, Division of Geriatric Medicine** University of Colorado *Aurora, CO*		X	X		None
Mary Carr, RN, MPH	**Vice President for Regulatory Affairs** National Association for Home Care & Hospice *Washington, DC*		X			None
David Gifford, MD, MPH	**Senior Vice President for Quality & Regulatory Affairs** American Health Care Association *Washington, DC*		X	X		None
Mary Ellen Hatch, MSN, RN, CRRN	**National Director of Nursing** HealthSouth Corporation *Memphis, TN*		X	X		None

(continued)

Table 1 (continued)
TEP Composition List

Name, Credentials	Professional Role Organizational Affiliation City, State	Consumer Perspective	Clinical Content	Performance Measurement	Coding and Informatics	Conflict of Interest Disclosure
Warren Hebert, DNP, RN, CAE	**Chief Executive Officer** HomeCare Association of Louisiana *Lafayette, LA*	X	X			None
Atul Kamath, MD	**Assistant Professor; Senior Fellow; Director, Center for Hip Preservation** University of Pennsylvania *Philadelphia, PA* **Clinical Leader** Pennsylvania Hospital *Philadelphia, PA*		X	X		None
Marjorie King, MD, FACC, MAACVPR	**Chief Medical Officer; Chair, Patient Safety Committee; Chair, IRB** Helen Hayes Hospital, New York-Presbyterian Hospital Network *West Haverstraw, NY*		X	X		None
Ronald (Bud) Langham, PT, MBA, COS-C	**Chief Clinical Officer** Encompass Home Health *Dallas, TX*		X			None
Barbara McCann, MA	**Chief Industry Officer** Interim HealthCare Inc. *Alexandria, VA*			X		None
Dana B. Mukamel, PhD	**Professor, Department of Medicine** University of California Irvine *Irvine, CA*			X		None
Arif Nazir, MD, FACP, CMD	**Associate Professor of Clinical Medicine** Indiana University School of Medicine *Indianapolis, IN*		X			None

(continued)

Table 1 (continued)
TEP Composition List

Name, Credentials	Professional Role Organizational Affiliation City, State	Consumer Perspective	Clinical Content	Performance Measurement	Coding and Informatics	Conflict of Interest Disclosure
Terrence A. O'Malley, MD, TEP Chair	**Physician** Massachusetts General Hospital, Partners HealthCare System, Inc. *Boston, MA*		X	X		None
Kenneth Ottenbacher, PhD, OTR	**Professor** University of Texas Medical Branch *Galveston, TX*			X		None
Jane Pederson, MD	**Chief Medical Quality Officer** Stratis Health *Bloomington, MN* **Adjunct Assistant Professor, Division of Health Policy and Management** University of Minnesota, School of Public Health *Minneapolis, MN*	X	X			None
Charles Pu, MD, CMD, FACP	**Medical Director Care Transitions & Continuum, Population Health Management** Partners Healthcare System *Boston, MA* **Chair, Acute Transfer Committee, Partners Continuing Care** Partners Healthcare System *Boston, MA*		X			None
Carol Siem, MSN, RN, BC, GNP	**Clinical Consultant/ Educator; Team Leader, Quality Improvement Program for Missouri** University of Missouri, Sinclair School of Nursing *Augusta, MO*		X	X		None

(continued)

Table 1 (continued)
TEP Composition List

Name, Credentials	Professional Role Organizational Affiliation City, State	Consumer Perspective	Clinical Content	Performance Measurement	Coding and Informatics	Conflict of Interest Disclosure
Burton Silverstein, PhD	**AVP, Operations Engineering and Outcomes Management** HCR Manor Care *Toledo, OH*			X	X	None
Gloria Skinner, MSN, RN, SVP	**Chief Nursing Officer, LTCH Division** Select Medical *Mechanicsburg, PA*		X			None
Patricia Stimac, DHA, MS, RD, LDN, NHA	**Skilled Nursing Home Administrator; Director, Quality Management; Director, Medical Nutrition Therapy** Spartanburg Hospital for Restorative Care *Spartanburg, SC*		X			None
Carolyn Svehla, RN, BSN, MA, CPRM	**Vice President of Risk Management** RML Specialty Hospital *Hinsdale, IL*	X	X			None
Linda Valentino, MSN, RN	**Executive Vice President; Chief of Clinical Transformation & Innovation** Visiting Nurse Service of New York *New York, NY*		X			None
Mary Van de Kamp, MS, CCC-SLP	**Senior Vice President of Quality** RehabCare and Kindred Rehabilitation Services *Louisville, KY*			X		None
Rachel Werner, MD, PhD	**Associate Professor of Medicine** University of Pennsylvania *Philadelphia, PA*		X	X		None
Gregory Worsowicz, MD, MBA	**Medical Director, Post-Acute Care** University of Missouri *Columbia, MO*		X	X		None

2.3 Defining Potentially Preventable Readmissions (PPR)

The approach for defining potentially preventable readmissions relies on the concept that for certain diagnoses, proper management and care of the condition (in the PAC facility or by primary care providers after discharge), combined with appropriate, clearly explained, and implemented discharge instructions and referrals, can potentially prevent a patient's readmission to the hospital. On the basis of this framework, RTI developed a working conceptual definition for potentially preventable readmissions for PAC. Three readmission time frames were considered: *within PAC stay*, *30 days post-PAC discharge*, and *30 days post-discharge from the prior hospitalization*. A within-PAC stay PPR refers to an avoidable rehospitalization that occurs while a patient is receiving care in the SNF, IRF, or LTCH institution or from an HHA. For 30 days post-PAC discharge, a PPR is a potentially avoidable readmission that occurs up to 30 days after PAC discharge. Lastly, a 30 days post-discharge from the prior hospitalization readmission window would include a PPR during this fixed post-hospital discharge window, which may span PAC and non-PAC (i.e., community) settings.

Informed by the environmental scans, RTI began compiling a list of potentially preventable hospitalization and readmission conditions identified throughout the literature to begin developing a clinical definition for PPR from PAC.[1] Although not specific to PAC or readmissions, the AHRQ PQIs/Ambulatory Care Sensitive Conditions (ACSCs) served as a starting point for this work. The list of ACSCs consists of 16 conditions for which hospitalization can potentially be prevented, given good outpatient care and early intervention.[2]

RTI and Abt also performed analyses on Medicare claims data to identify the most frequent diagnoses associated with readmissions among PAC beneficiaries (see ***Appendix A-5***), and then applied the conceptual PPR definition to evaluate whether these common conditions for readmission may be considered potentially preventable. This list of conditions identified from the literature and claims analysis formed the preliminary PPR definition.

Given that the primary objective of the TEP was to develop a definition for potentially preventable readmissions, most of the in-person TEP meeting was focused on discussing RTI's proposed PPR definitions. Before the meeting, the list of PPR conditions was presented to TEP members in a memo, which can be found in ***Appendix A-3***. The list of conditions, grouped based on clinical rationale, was the foundation for the clinical discussion during the meeting. The following clinical rationales were developed:

- Inadequate management of chronic conditions
- Inadequate management of infection

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[1] We would like to note the distinction between a hospital admission and a hospital readmission. Though this project is focused on hospital readmission measures (which require prior hospitalizations), some of the evidence cited is drawn from studies focusing on hospital admissions and not necessary hospital readmissions.

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

- Inadequate management of other unplanned events
- Inadequate prophylaxis
- Inadequate injury prevention

Abt and RTI developed worksheets for TEP members in order to obtain their ratings (1 = strongly disagree; 2 = disagree; 3 = neither agree nor disagree; 4 = agree; 5 = strongly agree) and written comments for each of the proposed conditions. The worksheets also allowed space for TEP members to suggest additional conditions for consideration. ***Appendix A-4*** includes a copy of the TEP worksheets.

The worksheets, which were collected at the end of the meeting along with TEP discussion surrounding the proposed PPR definition, formed the basis of the PPR definition and measure development.

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SECTION 3
SUMMARY OF TEP PROCEEDINGS

This section summarizes the TEP discussions throughout the 2-day in-person meeting. TEP members provided general feedback as well as specific feedback related to PPR definitions. We categorized TEP comments into major themes, as described below, and summarized the detailed clinical discussions on specific conditions or sets of conditions for which readmissions may be considered potentially preventable.

This meeting was open to the public for listening-in only. On the second day of the meeting, members of the public were invited to provide comments through a public comment period. A summary of the comments received is included at the end of this section.

3.1 General Comments About Quality Measurement

Some TEP members raised concerns about the type of quality measures that could be used to assess potentially preventable readmissions. Though TEP members recognized that the purpose of the meeting was to develop outcome measures of potentially preventable readmissions, there was some discussion about whether measuring processes of care or assessing systems of care would be better suited to address PPRs.

Some TEP members noted that process measures, such as those that capture adherence to evidence-based practices, can be used to identify causes of potentially preventable readmissions and may facilitate adoption of innovative approaches that reduce readmissions. A couple of TEP members suggested the possibility of developing measures that integrate both processes and outcomes of care. However, another TEP member expressed general concern over the volume of existing process measures being used. A few TEP members noted that a readmission could depend on a diagnosis or disease that is independent of the processes of care; in other words, even if the PAC provider gave the best transition and highest quality care, a hospital readmission could still occur. A number of TEP members commented on the difficulty of proposing a process measure for potentially preventable readmissions, indicating that this approach may lead to micromanagement of providers, stifling of competition and innovation of new processes, and increased provider burden associated with data collection.

TEP members discussed the association between systemic issues and readmissions, but concluded that a systems-based approach for this measure would be difficult to develop because of the variation and fragmentation within health care systems. One TEP member stated that if this were a proxy measure to reflect systems of care, then any set of diagnoses would be applicable to each PAC setting. However, CMS and the measure development teams reiterated that the purpose of this TEP was to focus on the development of condition-specific outcome measures of potentially preventable readmissions for PAC, in response to statutory requirements.

Generally, TEP members supported the focus on outcomes. For example, one TEP member stated that outcomes are what patients care about and what gives providers a target. The TEP supported outcome measures that are appropriately risk-adjusted, allowing for benchmarking of provider performance.

In addition to considering issues around quality measurement, the TEP also discussed what would be an "actionable" definition of PPR. TEP members emphasized the need for collecting information or developing measures that allow PAC providers to take action towards reducing these types of readmissions. They noted that some of the information collected in PAC is actionable, such as information related to specific diseases. However, TEP members stated that some, but not all, diagnoses associated with a particular disease are actionable. For example, during subsequent discussions, one TEP member cited septicemia as one diagnosis for which not all PAC provider types may be able to take direct action to prevent readmission in all cases.

A few TEP members argued that some conditions are not actionable if the readmission is caused by the progression of a chronic illness. Providers may consider many of the conditions listed as high-prevalence—such as heart failure, respiratory failure, and chronic obstructive pulmonary disease (COPD)—to be a result of a progression of chronic illness. Several TEP members suggested that the measures should assess the use of best practices rather than focus on readmissions in the case of progression of chronic illness. CMS and the measure developers appreciated this point, but clarified that patients with some chronic illnesses may still have readmissions that could have been prevented if their chronic illness was properly treated during the prior hospitalization, if they had access to ambulatory care, and if they had received clear discharge instructions on how to manage their chronic illness.

3.2 Discussion of Readmission Windows

The TEP discussed readmission windows. To some TEP members, the 30-day readmission window seemed arbitrary. Some TEP members suggested that a shorter time frame (e.g., 3 days) to measure PPR would be more actionable, allowing PAC providers to develop interventions during the transition from the prior hospitalization. TEP members also discussed clinical processes related to the readmission windows. Processes included early intervention and identification, teamwork, and communication. One TEP member proposed combining the first 2-4 days of a patient's PAC stay with the prior hospital discharge in order to link them, because the transition is the responsibility of the prior care setting as well as the PAC provider.

The measure developers presented three distinct readmission time windows: (1) post-PAC discharge (for SNF, IRF, LTCH, and HH), (2) post discharge from the prior hospital stay (SNF only), and (3) within-stay (IRF and LTCH only). The multiple readmission time windows were confusing to the TEP, particularly given their understanding of the IMPACT Act, which requires cross-setting alignment of measures. CMS and the measure developers clarified that each measure is being developed to meet different legislative requirements or for use in different programs. Overall, TEP members recommended that consistent readmission time windows be used when possible.

Several TEP members discussed the IMPACT Act's requirement of potentially preventable readmission measures that would be aligned across PAC settings. However, the discussion about different measures and readmission windows confused several TEP members. The measure developers explained that the set of PPR conditions should be the same regardless of PAC type for the 30-day post-discharge and within-stay readmission windows, to satisfy the cross-setting requirements. TEP members agreed but noted that there may be a need to

distinguish within-stay readmissions for HH; however, at this time, there is no within-stay PPR HH measure being developed.

3.3 Risk Adjustment

Throughout the meeting, TEP members raised the importance of risk adjustment in developing the PPR measures. TEP members specifically suggested that the measures be risk adjusted for functional status. Specifically, one TEP member emphasized the importance of motor and cognitive function in risk adjustment. Throughout the meeting, the majority of TEP members recommended that the PPR measures be risk adjusted for motor function, cognition, and socioeconomic status. A more-detailed TEP discussion of risk adjustment is included in ***Section 4*** of this report, which summarizes the follow-up work group meeting, during which risk adjustment was a major topic.

Some TEP members also recommended that the measure developers consider geographic variation (urban vs. rural), different sizes of PAC providers, severity of illness per patient population (risk adjustment), and staffing ratios at each PAC setting.

3.4 Data Limitations

3.4.1 Time Lag Associated with Claims Data

The lag time between when claims data are available to calculate the PPR measures and when providers' PPR rates would be publicly reported, concerned some TEP members. TEP members stressed that patient-level readmission data must be reported in "real time" to provide useful information for PAC providers and facilitate quality improvement. In response to these concerns, other TEP members suggested that this was not a quality improvement process and emphasized that the purpose of these PPR measures is to assess how PAC providers performed as an indicator of quality. Others noted that, despite the lag associated with claims data, monitoring readmission rates can drive process improvements aimed at reducing readmissions.

3.4.2 Concerns over Hospital Coding Practices

TEP members said that the risk for gaming is inherent when using diagnosis codes to construct a condition-based measure. However, measure developers clarified that the coding information will be based on the claim associated with the hospital readmission, and not on information provided by the PAC. TEP members noted concerns over coding practices in the hospital setting. Specifically, hospitals may use certain diagnosis codes in order to maximize reimbursement. Septicemia was one example that a TEP member cited as a condition that probably appears frequently for readmissions because Medicare pays relatively more for that diagnosis-related group (DRG). A TEP member noted that this results in some DRGs being catchall codes that may not be accurate or fully reflective of the reason for readmission. Another TEP member mentioned that hospitals might select specific codes without the PAC provider's knowledge. For example, finding bacteria in urine during routine testing could be subsequently coded as a urinary tract infection (UTI). Another TEP member expressed concern over hospitals using diagnosis codes associated with broad categories, such as "congestive heart failure (CHF) unspecified." This TEP member noted that some cases of CHF may require a readmission because the PAC provider could not resolve this; however, this general code provides limited

information. TEP members concluded that risk adjustment would be able to alleviate some of these concerns over coding practices, but not all.

3.5 TEP Input on Proposed PPR Definitions

Before the TEP, the team at RTI with clinical expertise, developed preliminary PPR definitions for TEP consideration. Given that the focus was on developing cross-setting measures for the within-stay and post-discharge time frames, RTI developed two PPR definitions that would be applied for all PAC providers. These definitions built upon existing approaches developed to define potentially avoidable hospitalizations or potentially avoidable readmissions, as identified in the environmental scan.

AHRQ's ACSCs served as the foundation for this work. ACSCs are conditions for which "good outpatient care can potentially prevent the need for hospitalization or for which early intervention can prevent complications or more severe disease." AHRQ assesses the rates of these conditions using the PQIs, which are population-based and adjusted for covariates. This approach has been widely used and was developed for patients in ambulatory care settings which is consistent with patients in the post-PAC discharge readmission window. In addition to the ACSC conditions, the proposed PPR definitions included several conditions identified through the environmental scan, empirical analyses, and clinical expertise.

The major focus of this TEP meeting was to seek clinical and expert input on these definitions. The clinical discussion of the PPR definition was organized by categories listed in ***Section 2.3***. The PPR conditions are organized by these groupings for clinical discussion purposes; however, measure developers clarified that the PPR measures would be based on combining all PPR conditions into one measure definition, as opposed to multiple PPR definitions based on these clinical groupings.

3.5.1 Inadequate Management of Chronic Conditions

RTI presented the following chronic conditions, largely based on the ACSC definition: adult asthma, angina without procedure, COPD, CHF, diabetes long-term complication, diabetes short-term complication, uncontrolled diabetes, hypertension, and lower-extremity amputation among patients with diabetes.

- **Adult asthma:** The TEP supported broadly including asthma as a PPR condition, providing evidence in favor of inclusion for both the within-stay and the 30-day post-discharge window. TEP members with home health expertise stated that they have certain processes that can help patients manage asthma; however, they also commented that home health providers are often unable to control the patients' home environments. One TEP member posited that for LTCHs, the impact on readmissions for asthma would be low. Another TEP member commented that persistent asthma is a Healthcare Effectiveness Data and Information Set (HEDIS) indicator.

- **Angina without procedure:** The TEP did not support considering this condition as potentially preventable. TEP members felt that treatment for angina would typically not require rehospitalization. Further, for more severe cases, there are no

interventions available to PAC providers outside of those requiring procedures, such as the placement of a stent, which would prevent readmissions for angina.

- **COPD:** TEP members with home health expertise stated that this condition is very complicated, but they felt it was important to include because it draws attention to performance improvement. The majority of TEP members with SNF, IRF, and LTCH expertise voted to include COPD readmissions as potentially preventable. TEP members with IRF expertise noted that certain processes could help manage and prevent readmission of IRF patients with COPD, such as intensive oximetry monitoring, ordering oxygen before discharge, making decisions about home nebulizers, and patient education.

- **CHF:** TEP members representing each PAC provider type supported CHF as a PPR condition and expressed that PAC providers can be held accountable for CHF readmissions. The TEP agreed that patient education and clinical practices, such as continuous monitoring of the patient and good care provided at transitions from the facility, can prevent patients from being readmitted for CHF.

- **Diabetes long-term complication:** TEP members did not support readmissions for long-term complications associated with diabetes as being potentially preventable given that this reflects, to some extent, a progression of chronic disease, which extends beyond the realm of what a PAC provider is able to prevent.

- **Diabetes short-term complication:** TEP members suggested that readmissions for hypo- and hyperglycemic conditions could be considered potentially preventable. One TEP member commented that patients with low blood sugar are more common, and that prolonged hypoglycemia can lead to hospitalization.

- **Uncontrolled diabetes:** TEP members did not support the inclusion of readmissions for uncontrolled diabetes in the definitions as this is difficult to identify using ICD codes, and, like diabetes with long-term complications, may reflect exacerbation or progression of a chronic disease.

- **Hypertension/Hypotension:** TEP members raised a few issues related to hypertension, and some TEP members did not support considering readmissions for hypertension as being potentially preventable. For example, one TEP member commented that simple hypertension cases are not the cases that lead to hospitalizations or readmissions, and often a hypertension diagnosis is a result of an acute event. Despite this concern, TEP members reached consensus that hypotension should be considered potentially preventable. One TEP member with IRF expertise explained that the providers could keep the patient connected with a system in order to avoid admission/readmission for orthostatic or symptomatic hypotension. Another TEP member expressed willingness to be responsible for patients with hypotension. TEP members recommended specifically removing hemodialysis hypotension from the 30 days post-discharge definition because they felt that providers are unable to

manage this outside of their facility or care. The panel recommended including hypertension and adding hypotension to the definition.

- **Lower-extremity amputation among patients with diabetes:** Generally, TEP members did not support lower-extremity amputation resulting from diabetes, as a potentially preventable cause for readmission. Similar to the rationale for excluding long-term complications resulting from diabetes, they felt that progression of chronic disease is not something for which PAC providers can be held accountable. One TEP member provided an example of a patient needing a lower-extremity amputation because of diabetes, and emphasized that this progression of the disease does not occur suddenly and instead is the result of prolonged disease. This TEP member noted that most patients needing amputation know in advance that this will be done. Though one TEP member felt that PAC providers could manage the symptoms that result in a lower-extremity amputation among patients with diabetes, the majority felt that lower-extremity amputation is a catastrophic outcome that develops over time while receiving care from multiple clinicians, and is beyond the scope of PAC providers' ability to prevent.

3.5.2 Inadequate Management of Infections

The specific infections that were included in the proposed PPR definitions were: bacterial pneumonia, UTI, *C. difficile* infection, septicemia, skin and subcutaneous tissue infections, and kidney infection. Overall, there was not consensus among the TEP as to which infections should be considered potentially preventable causes for readmission. In addition, the TEP provided general recommendations concerning how to address infections for the PPR measures, as summarized below.

Many TEP members commented that most infections are random events that providers cannot always prevent. For the within-stay readmission window, TEP members stated that there may be minimal prevention for some infections because there is usually a "brewing period" for infections that may have been acquired before PAC admission. The TEP made several suggestions for how to address some of these concerns; for example, one TEP member suggested excluding all infectious diseases with the exception of *C. difficile,* as *C. difficile* can be prevented with strict precaution. However, other TEP members felt that a general grouping of infectious diseases was appropriate.

Other TEP members suggested that if PAC providers are going to be held responsible for these types of readmissions for infections, then a shorter time frame for readmissions resulting from infections should be used. Several TEP members agreed that PAC providers could be responsible for patients with infections within 5 days of PAC discharge. One TEP member suggested that the 30-day post-discharge measure would only include readmissions for infections within 5 days of PAC discharge. When considering readmissions for infections for the within-stay readmission window, TEP members with LTCH and SNF expertise suggested that several of the proposed infections are often the result of a device, such as catheter-associated UTI.

Results from the preliminary analysis presented during the meeting showed that readmissions for septicemia were common for all PAC providers; however, some TEP members

felt that readmissions for septicemia should not be considered potentially preventable. One TEP member extended this argument by suggesting that readmissions for all infections be completely excluded.

Several other TEP members argued for including infections in the PPR definitions, noting that it would increase awareness and may also promote new practices to mitigate potential post-discharge readmissions. Another TEP member noted that, given the data presented, infectious disease will drive PPR rates because of their high prevalence.

TEP members discussed *C. difficile* specifically and commented that readmissions for this type of infection are not always potentially preventable. For example, one TEP member cited an example of *C. difficile* worsening to the point of requiring a colectomy.

Some TEP members recommended considering readmissions for bacterial pneumonia, *C. difficile,* and skin and subcutaneous tissue infections as potentially preventable for both the 30-day post-discharge and within-stay measure definitions. However, the TEP did not resolve the issue over what the best readmission window is for infections.

3.5.3 Inadequate Management of Other Unplanned Events

The following PPR conditions are categorized as inadequate management of other unplanned events: dehydration, aspiration pneumonitis (food/vomitus), fluid and electrolyte disorders, anticoagulant complications, acute delirium, acute renal failure, adverse drug events, and arrhythmia. The TEP reiterated concerns over how these events may be coded on the hospital claims associated with readmissions.

- ***Dehydration:*** Home health experts agreed that dehydration should be considered potentially preventable because HH providers can influence this outcome. SNF TEP members stated that dehydration should be considered potentially preventable from a clinical perspective, but may be problematic to operationalize because historically, dehydration is poorly coded on claims. IRF experts stated that if the principal diagnosis is dehydration, then IRFs can implement practices related to diuretic dosages and appropriate hydration through a G-tube, in some patients. LTCH members noted that providers should not be responsible for patients subsequently readmitted for dehydration during the 30-day post-discharge period.

- ***Aspiration pneumonitis (food/vomitus):*** The TEP recommended that this be considered potentially preventable. Many TEP members suggested that education could influence the outcome. HH, SNF, and IRF experts recommended this group for the PPR measures.

- ***Fluid and electrolyte disorders:*** There was general agreement among TEP members across settings that this condition as a primary diagnosis should be considered potentially preventable. However, an HH provider expressed some concern that this condition may be difficult to monitor in that setting, and a TEP member with LTCH expertise was concerned over the ability to prevent this condition in the 30 day post-discharge time window.

- ***Anticoagulant complications:*** TEP members recommended that readmissions for anticoagulant complications be considered potentially preventable during the 30-day post-discharge window.

- ***Acute delirium:*** The TEP voted to exclude this condition, with one TEP member noting that the sudden onset of the event indicates that it is not something that can be predicted as part of the health trajectory of a patient.

- ***Acute renal failure:*** The TEP agreed that this condition should be considered potentially preventable for the within-stay readmission window, but one member added a caveat that additional analysis be performed to only include cases where acute renal failure was present on admission (POA). TEP members stated that this condition should not be considered potentially preventable for the post-discharge window.

- ***Adverse drug events:*** TEP members discussed whether readmissions for adverse drug events are potentially preventable, and the consensus was that adverse drug events should be included. SNF experts argued that patients with cognitive impairment and compliance issues should not be the SNF's responsibility because these clinical issues may exist even with complete discharge orders.

- ***Arrhythmia:*** TEP members made strong arguments for arrhythmia to be included as a PPR condition because this is a chronic problem that PAC providers can monitor and address with appropriate anticoagulant drugs. In addition, one TEP member pointed out that patient education is a role that providers can play to help manage this condition. One TEP member suggested for the within-stay definition, that arrhythmia be risk-stratified for post-open heart or trans-catheter aortic valve replacement patients, as they may require hospitalization for the installment of pacemakers.

In summary, the TEP reached consensus on including dehydration, aspiration pneumonitis (food/vomitus), fluid and electrolyte disorders, anticoagulant complications, adverse drug events, and arrhythmia for the 30-day post-discharge window. In addition to these conditions, for the within-stay definition, the TEP also recommended inclusion of acute renal failure.

3.5.4 Inadequate Prophylaxis

The proposed PPR definitions included the following conditions related to inadequate prophylaxis: deficiency and other anemia, gastrointestinal hemorrhage, intestinal impaction, pressure ulcers, and deep vein thrombosis (DVT)/pulmonary embolism.

- ***Deficiency and other anemia:*** TEP members did not support deficiency and other anemia for the PPR definitions. One TEP member stated that deficiency, especially iron deficiency, is prevalent among readmissions because post-operative patients are persistently iron deficient from blood loss anemia. This TEP member noted that many providers are leaning away from transfusing post operatively and allowing patients to

build up their own hemoglobin. Other TEP members noted that this is not actionable for PAC providers.

- ***Gastrointestinal hemorrhage:*** TEP members discussed whether gastrointestinal hemorrhage should be considered for the PPR definition. HH experts stated that this is not an actionable diagnosis. SNF TEP members commented that there is some room for quality improvement, such as managing medications, but the condition is not necessarily preventable. IRF and LTCH experts noted that they could follow all standards of care and still have a bleed. Though some TEP members suggested we exclude this from the PPR definition for both readmission windows, not all TEP members agreed, and the TEP was unable to come to an agreement on the matter.

- ***Intestinal impaction:*** TEP members recommended that readmissions resulting from intestinal impaction be considered potentially preventable for the post-PAC discharge and within-stay readmission windows. Symptom management, medication education, hydration, and dietary regulation were among the reasons for including it as a potentially preventable readmission condition.

- ***Pressure ulcers:*** The TEP recommended readmissions resulting from pressure ulcers as potentially preventable for both the 30-day post-discharge and within-stay windows.

- ***DVT and pulmonary embolism***: The TEP recommended not considering readmissions for DVT and pulmonary embolism as potentially preventable for the 30-day post-discharge window. The clinical rationale was that a discharged patient is beyond the recommendations to do the prophylaxis for most hip and knee joints. One TEP member noted a point in the risk-benefit curve around day 20 where the risks of bleeding outweigh the risk of decreasing DVT if providers continue anticoagulation out to 30 days. However, DVT and pulmonary embolism were recommended for the within-stay PPR definition.

3.5.5 Inadequate Injury Prevention

The proposed PPR definitions only included fracture of neck of femur (i.e., hip fracture) to capture falls with injury in the inadequate injury prevention category. Some TEP members raised concerns about whether using hip fracture as a proxy for falls was sufficient. TEP members supported the idea that falls are potentially preventable and should not happen during a PAC stay/episode. However, most TEP members did not support holding PAC providers accountable for falls during the post-PAC discharge period. TEP members noted that PAC providers could mitigate some falls post-discharge through discharge planning, connecting patients with preferred providers, use of proper equipment, education about home environment, medications, and better functional assessments in facilities.

Other TEP members voiced concern over an unintended consequence of including falls, noting that it may create a disincentive for focusing on mobility. One TEP member noted that many patients receiving inpatient rehabilitation may fall as a result of trying to improve mobility. Another TEP member pointed out that there is little research on how PAC providers can

minimize falls, especially after PAC discharge. One TEP member suggested adding all types of limb fractures and not only hip fractures. TEP members did not reach a consensus on whether readmissions for falls post-PAC discharge should be considered potentially preventable: the discussion was tabled by the chair and the matter was left to be decided by the votes collected on the worksheets. (Note: We did not find consistent support to include this and removed it from the post-PAC discharge definition.)

3.5.6 Other PPR Conditions Suggested by TEP

TEP members suggested a few additional conditions for which readmissions may be considered potentially preventable, including the following:

- pain management
- chronic seizures
- depression
- influenza

The TEP discussion for each is summarized below.

- ***Pain management.*** The TEP agreed that pain management was important in general, but concluded that trying to identify principal diagnostic codes for pain management would be difficult or "nearly impossible," according to one TEP member.

- ***Chronic seizures.*** One TEP member suggested considering chronic seizures because these could be prevented if PAC providers gave clear discharge directions and the right seizure medications; however, this TEP member noted that readmissions for chronic seizures are likely infrequent. Other TEP members agreed that medication reconciliation was important for chronic seizure patients. The TEP agreed that chronic seizures should be a potentially preventable readmission condition for the 30-day post-discharge and within-stay time windows. Measure developers noted that the challenge with this condition is determining how to classify seizures as being chronic.

- ***Depression.*** A home health expert stated that depression is often a secondary diagnosis or goes undiagnosed. The TEP member that suggested this added that depression could influence the patient's ability to cope with their principal diagnosis, to be compliant with the plan of care, and to optimize their recovery. Some readmissions could be for patients with depression who cannot achieve the outcomes they need, which are associated with their principal diagnosis. Another TEP member suggested mental illness as a broader category. RTI confirmed that any admission to an inpatient psychiatric facility is considered planned; therefore, a principal diagnosis of depression or mental illness would not be considered a potentially preventable readmission condition. RTI also noted that we will adjust for these factors in the risk adjustment models.

- ***Influenza.*** One TEP member recommended adding influenza because the influenza vaccine is very effective; therefore, all PAC providers should be held accountable for administering the influenza vaccine. This TEP member cited recent literature and studies demonstrating that the vaccine is very effective in lowering rates of influenza and noted that influenza rates are down. However, this TEP member also added the caveat that hospital coding variation may exist for coding influenza on Medicare claims.

3.6 Recommendations for Within-Stay Potentially Preventable Readmissions

After the discussion of specific primary diagnoses for the 30-day post-discharge window, the TEP discussed which conditions should be included in the PPR definition for the within-stay window. All of the conditions that were recommended for inclusion in the 30-day post-discharge window PPR definition were also recommended for the within-stay PPR definition. Because of the greater degree of control over outcomes associated with the within-stay readmission window, the TEP recommended including two additional conditions that they did not recommend for the 30-day post-discharge window: acute renal failure and DVT/pulmonary embolism.

3.7 Major TEP Recommendations

Recommendations were based on the TEP discussions that took place during the in-person meeting that was facilitated by our TEP chairperson, as well as written TEP feedback obtained using the TEP worksheets, which were submitted by all TEP members after the in-person meeting (see ***Appendix B*** for summary statistics of the worksheet ratings). TEP members recommended that the following principal diagnoses be *excluded* from the definition of potentially preventable readmissions:

- Angina without procedure
- Diabetes long-term complication
- Uncontrolled diabetes
- Lower-extremity amputation among patients with diabetes
- Acute delirium
- Acute renal failure (post-discharge only)
- Deficiency and other anemia
- DVT and pulmonary embolism (post-discharge only)
- Pain management
- Depression

The majority of TEP members recommended that the following principal diagnoses be *included* in the definition of potentially preventable readmissions:

- Adult asthma
- COPD
- CHF
- Diabetes short-term complication
- Hypertension
- Hypotension
- Dehydration
- Aspiration pneumonitis (food/vomitus)
- Fluid and electrolyte disorders
- Anticoagulant complications
- Acute renal failure (within-stay only)
- Adverse drug events
- Arrhythmia
- Intestinal impaction
- Pressure ulcers
- DVT/pulmonary embolism (within-stay only)
- Chronic seizures

The TEP members did not reach a consensus on the following principal diagnoses:

- Gastrointestinal hemorrhage
- Influenza
- Infections
- Fracture of neck of femur

Please see ***Section 5*** of this report for additional conclusions from the in-person TEP meeting.

3.8 Summary of TEP Public Comments

The TEP proceedings were open to the public using a teleconference service in listen-only mode. The measure developers designated time at the end of the TEP meeting for public comments. Three commenters provided comments, which are summarized below:

- The PPR conditions should be validated through an independent medical chart review by a physician panel.
- The observed ability of the influenza vaccine to cover the virus strains present in a given flu season should be taken into consideration before providers are held accountable for the influenza condition.
- PAC providers need accurate and timely diagnostic information from hospitals, especially because PAC providers are being held accountable for readmissions.
- Internal quality improvement is challenging because of delays in providers' abilities to access timely claims data. In addition, there is no standardized process for providers to judge their own quality of care.
- Risk adjustment for functional and cognitive status should be considered.

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SECTION 4
TEP FOLLOW-UP WORKGROUP MEETING

4.1 Process and Materials

On October 14, 2015, the TEP reconvened via webinar for a follow-up workgroup meeting. The purpose of this meeting was to solicit TEP feedback on the revised PPR definition, share the results of additional analyses that were recommended by the TEP, and present measure specifications for each of the PPR measures, including the risk adjustment approach. Eight of the 26 TEP members were unable to attend the follow-up webinar; they were sent the meeting materials and were able to submit comments and/or questions via e-mail. This meeting was open to the public for listening in only.

The following materials were sent to TEP members in advance of the workgroup meeting and can be found in the appendix of this report: (1) the meeting agenda (***Appendix C-1***); (2) the Proposed Post-PAC Discharge PPR Conditions (***Appendix C-2***); (3) the Proposed Within-PAC Stay PPR Conditions (***Appendix C-3***); and (4) the PowerPoint presentation (***Appendix C-4***). Additional materials (not included in the appendix) sent included CMS's Planned Readmission Algorithm, RTI's additions to CMS's Planned Readmission Algorithm, RTI's Socioeconomic Status (SES)/Risk Adjustment Analytic Plan (for the NQF-endorsed all-cause readmission measures), and Acumen's (Abt's subcontractor) SES/Risk Adjustment Analytic Plan.

4.2 Summary of TEP Workgroup Meeting Proceedings

4.2.1 Overview of Revised PPR Definitions

After the in-person August TEP meeting, on the basis of TEP feedback, the measure developers made several revisions to the preliminary set of PPR conditions and conducted additional analyses to inform the PPR definition development. The following are highlights of the revisions and analyses that were presented to the TEP during the workgroup meeting:

- Several conditions were removed from the PPR 30-day post-discharge definition, including the following: angina without procedure, diabetes long-term complication, uncontrolled diabetes, hypotension as a result of hemodialysis, complications due to oral anticoagulants, acute delirium, deficiency and other anemia, gastrointestinal hemorrhage, and DVT/pulmonary embolism.

- For the PPR within-stay definition, the following conditions were removed: angina without procedure, diabetes long-term complication, uncontrolled diabetes, hypotension as a result of hemodialysis, and gastrointestinal hemorrhage conditions. The injury prevention category was expanded to include various head injury and upper/lower extremity fractures.

- Other changes to both the 30-day post-discharge and within-stay definitions included the following: adding several hypoglycemia conditions to the diabetes short-term complication grouping, adding influenza to the infections category, combining the dehydration and fluid/electrolyte disorders groupings and adding several electrolyte

imbalance conditions, and indicating conditions for which the primary diagnosis must be accompanied by dehydration as the secondary diagnosis.

- The measure developers performed analysis on the days to readmission for infections and shared Kaplan-Meier survival curves with the TEP, showing the probability of readmission on each day of the 30-day time window. The results were fairly consistent across infection types and PAC provider types. Results did not reveal an obvious breaking point for rates of readmissions resulting from infections during the 30 days after discharge; there was no distinct cluster of readmissions early in the post-discharge period.

Other analyses included assessing the frequency of readmissions resulting from various conditions and preliminary PPR definitions, as well as examining POA indicators for readmissions for acute renal failure. The claims analysis showed that for all readmissions with acute renal failure as the principal diagnosis, the condition was POA.

4.2.2 Measure Specifications

The TEP was presented with an overview of the specifications for each of the five PPR measures under development. The measure developers provided a description of the measure numerator, the readmission windows (30 days post-PAC discharge, within-PAC stay, and post–prior hospital discharge), data sources, and exclusions specific to each measure.

The risk adjustment method, consistent with the statistical approach of the SNF, IRF, and LTCH all-cause readmission measures and the Hospital-Wide Readmission measure, was also presented. The developers noted that they intend to test dual eligibility and race for the PPR measures, and that other SES risk adjusters will be tested during the NQF SES trial period. Additionally, the developers responded to recommendations by the TEP to adjust the PPR measures for motor and cognitive function by explaining that adopting assessment-based variables for function is currently infeasible during the first phase of this work, given the timeline. Current plans include adjusting the IRF and HH PPR measures for function using claims-based variables, and future adjustment for function will depend on the availability of standardized assessment data.

4.2.3 TEP Discussion

- The TEP expressed concern over the transition from International Classification of Diseases (ICD)-9 to ICD-10, particularly because the PPR definition is currently based on ICD-9 codes, which are less granular than ICD-10 codes. The TEP was reassured that the intent is not to expand the list of PPR conditions. Measure developers do not have access to ICD-10 data yet, but have reviewed equivalence mappings between the two versions and will continue to keep the TEP updated on this work.

- A TEP member asked if sub-reports of facilities' readmission rates for each condition grouping would be provided and if the overall PPR rate would be weighted by condition. Measure developers clarified that facilities will be provided with their

overall PPR rate, unweighted, and not broken out by condition. The purpose of the clinical groupings is to categorize the types of diagnosis codes included in the measure.

- One TEP member suggested that additional analysis be conducted to assess the difference in providers' rankings between their readmission rates with and without shrinkage estimators and based on different statistical approaches (i.e. observed to expected versus the expected to predicted approach).

- In response to a question about data selection periods, the measure developers clarified that the home health PPR measure will be based on 3 consecutive calendar years of data, the IRF and LTCH measures will be based on 2 years of data, and the SNF measures will be based on 1 year of data. Some TEP members expressed concern over using multiple years of data because they felt performance captured by the measure is not necessarily relevant to current performance and therefore, will be less actionable for quality improvement and less useful for consumers/families.

- There was some confusion among TEP members over the home health populations that would be excluded from the HH measure. Measure developers clarified that the HH PPR measure will exclude patients who are transferred directly to a higher level of care (i.e., a different PAC setting or a short-term acute care hospital) and are not discharged to the community after the home health episode. This approach is consistent with the SNF, IRF, and LTCH post-discharge PPR measures.

- TEP members discussed the issue of SES risk adjustment and whether patient-level data would be used for risk adjustment as opposed to regional data. Measure developers explained that regional characteristics are not being used as proxies for patient characteristics, and that they are a separate aspect of SES.

4.3 Summary of Revisions to PPR Definitions Following the TEP Workgroup Meeting

Measure developers received TEP feedback on the revised PPR definitions after the workgroup meeting. The following changes were made on the basis of TEP recommendations:

- Prostatitis conditions were removed from the UTI/kidney infection grouping (ICD-9 codes: 601.0, 601.1, 601.2, 601.3, 601.4, 601.8, and 601.9)

- Urethral stricture conditions were removed from the UTI/kidney infection grouping (ICD-9 codes: 589.00 and 589.01)

- The gallstone ileus condition was removed from the intestinal impaction grouping (ICD-9 code: 560.31)

In addition to changes in the PPR definitions, RTI confirmed that cranioplasty procedures, raised by one TEP member as being considered as a planned procedure, are included in the CMS Planned Readmission algorithm.

Measure developers also determined that the SNF PPR measure (with the 30-day readmission window beginning at discharge from the prior hospital stay) will use both the within-stay PPR definition and the post-discharge PPR definition, depending on the SNF patient's residence (i.e., in SNF vs. out of SNF) during the 30-day time frame. Previously, the within-stay PPR definition was to be applied to the entire readmission window, regardless of the patient's location.

SECTION 5
CONCLUSION

In response to the IMPACT Act and PAMA, CMS has directed measure development contractors at RTI and Abt Associates to develop all-condition risk-adjusted potentially preventable hospital readmission measures for PAC. Obtaining technical input on these potentially preventable hospital readmission measures is an essential part of the measure development process. This report summarizes the proceedings and recommendations of a TEP convened to support this measure development work.

CMS has previously developed a set of all-cause hospital readmission measures for PAC that was endorsed by the NQF. The all-cause measures provide the foundation for developing readmission measures that are more narrowly defined. Given the lack of available measures of potentially preventable hospital readmissions, CMS contractors conducted a comprehensive environmental scan, results of which were used to shape the approach for defining potentially preventable readmissions for beneficiaries who used PAC services. Though a variety of methodologies and definitions of potentially preventable readmissions or hospitalizations have been developed and used, there is no consensus or existing approach pertaining to how PPR could be defined specific to PAC providers.

Given this context, the primary objective of the TEP was to develop an approach for defining potentially preventable readmissions and to provide input on a preliminary set of conditions that would be considered potentially preventable causes of a hospital readmission from PAC. In addition, the TEP provided input on the measure specifications, including measure exclusions and the risk adjustment approach.

Sections 3 and ***4*** of this report summarize specific points raised in the TEP discussions and recommendations. The following list shows broad recommendations and themes that came up throughout the meetings:

- The TEP recommended alignment across all settings (SNF, IRF, LTCH, and HH) for the PPR measure development.
- The TEP encouraged measure developers to take into account the different readmission time windows and the fact that PAC providers' abilities to act on PPR conditions varies by the readmission windows.
- TEP members emphasized that the PPR measures should be risk-adjusted for motor function, cognitive status, and socioeconomic status.
- The TEP pointed out several data limitations that must be acknowledged, including time lags associated with claims data and possible variation in hospital coding practices.

CMS and the measure development contractors greatly value the input received from the TEP meetings and will continue to work with the TEP on an ad hoc basis to solicit additional

feedback and share results. The next steps for the development of potentially preventable hospital readmission measures for PAC include the following:

- Further develop measure specifications based on TEP feedback
- Disseminate revised measure specification for public comment (November 2015)
- Revise measure specifications on the basis of public comments and any additional TEP feedback
- Submit PPR measures to the Measure Application Partnership in December 2015
- Continue measure development, including analysis
- Finalize measure specifications
- Conduct testing and prepare analyses for the technical report

CMS also intends to submit the PPR measures to the NQF for endorsement.

Measure development will continue to evolve as policy decisions are made with regard to issues such as standardized functional assessment data and the inclusion of SES—both of which will be tested in the risk adjustment. CMS and its measure development contractors will continue to keep stakeholders updated on the progress of this work.

APPENDICES

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APPENDIX A
TECHNICAL EXPERT PANEL MEETING MATERIALS

1. **TEP Meeting Agenda (Appendix A-1)**
2. **Environmental Scan Memo (Appendix A-2)**
3. **Potentially Preventable Readmissions (PPR) Definition Rationale Memo (Appendix A-3)**
4. **TEP Worksheet (Appendix A-4)**
5. **Frequency of Readmissions Analyses for SNF, IRF, LTCH, and HH (Appendix A-5)**

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APPENDIX A-1
TEP MEETING AGENDA

Agenda – Day 1

Technical Expert Panel (TEP) Meeting
Development of Potentially Preventable Readmission (PPR) Measures for Post-Acute Care

Location: The Chesapeake Room
DoubleTree Hotel – BWI Airport
890 Elkridge Landing Road, Linthicum, MD 21090

8:30am-5:00pm EST, Wednesday, August 12, 2015
Dial-in Number: 888-706-0584 / Access Code 4996341

Time	Agenda	Item
—Morning Session—		
8:30-9:00am	Welcome and Introductions Project and IMPACT Act Overview	RTI/Abt J. Andress, CMS
9:00-9:30am	Overview of Key Issues Needing TEP Input	RTI/Abt
9:30-10:30am	Introduction to Current NQF Endorsed Readmission Measures	RTI/Abt/Acumen
10:30-10:45am	Break	
10:45-11:30am	Environmental Scan Results (see memo)	RTI/Abt
11:30-12:00pm	Introduction to Context for Considering PPR	RTI/Abt
—Afternoon Session—		
12:00-1:00pm	Lunch	
1:00-2:30pm	Results of Empirical Analyses – SNF, IRF, LTCH, & HHA	
2:30-3:30pm	Presentation of Proposed Definition for PPR & Clinical Discussion: *Inadequate management of chronic conditions*	RTI/Abt
3:30-3:45	Break	
3:45-5:00pm	Presentation of proposed definition for PPR & Clinical Discussion (cont.): *Inadequate management of infections*	RTI/Abt

Agenda – Day 2

Technical Expert Panel (TEP) Meeting
Development of Potentially Preventable Readmission Measures for Post-Acute Care

Location: The Chesapeake Room
DoubleTree Hotel – BWI Airport
890 Elkridge Landing Road, Linthicum, MD 21090

8:30am-2:30pm EST, Thursday, August 13, 2015
Dial-in Number: 888-706-0584 / Access Code 4996341

Time	Agenda	Item
—Morning Session—		
8:30-9:00	Summary of Day 1	RTI/Abt
9:00-12:00pm	Presentation of proposed definition for PPR & Clinical Discussion (cont.): *Inadequate management of other unplanned events*	RTI/Abt
—Afternoon Session—		
12:00-1:00pm	Lunch	
1:00-2:00pm	Presentation of proposed definition for PPR & Clinical Discussion (cont.): *Inadequate prophylaxis & Inadequate injury prevention*	RTI/Abt
2:15-2:30pm	Wrap-up and Next Steps	RTI/Abt
2:30-3:00pm	Public comments (CMS, RTI, Abt/Acumen only)	

APPENDIX A-2
ENVIRONMENTAL SCAN MEMO

Potentially Preventable Hospital Readmissions: Environmental Scan

Prepared by: RTI International & Abt Associates

August 2015

*Note to TEP members: Copies of all freely accessible articles cited are available for download **here**. If there are any additional articles or studies on this topic that you feel should be reviewed, please email them to nchong@rti.org.*

I. Introduction

Hospital readmissions among the Medicare population are common, costly, and often preventable.[1, 2] 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.[2, 3]

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 (PAC). For example, CMS developed the following measures: Rehospitalization During the First 30 Days of Home Health (HHs), All-Cause Unplanned Readmission Measure for 30 days Post Discharge from Inpatient Rehabilitation Facilities (IRFs) and 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).[4] These measures were proposed for public reporting and endorsed by the National Quality Forum (NQF).

Current work being conducted for CMS will focus 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) and the *Protecting Access to Medicare Act of 2014* (PAMA). 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.[5] This includes the requirement to develop and implement measures to reflect all-condition risk-adjusted potentially preventable hospital readmission rates. Section 215a of PAMA requires that a resource use measure reflecting an all-condition risk-adjusted potentially preventable hospital readmission rate for skilled nursing facilities, which must be developed and implemented by October 1, 2016, to be used in the SNF Value-Based Purchasing program.[6]

Some general methods and algorithms have been developed assessing potentially avoidable or preventable hospitalizations and readmissions for the general Medicare population, such as the Agency for Health Care Research and Quality's Prevention Quality Indicators,

approaches developed by and for MedPAC, and proprietary approaches, such as the 3M™ algorithm for Potentially Preventable Readmissions.[7-9] However, there is no consensus on how to define potentially avoidable or preventable readmissions, especially among Medicare beneficiaries who utilize PAC services including HH, SNF, IRF, and LTCH. Recent work led by Kramer et al. for MedPAC identified 13 conditions that were deemed as potentially preventable among the SNF and IRF populations;[10, 11] however, these conditions did not differ by PAC setting or readmission window (i.e. during the PAC stay or post-PAC discharge). Despite the fact that much of the current literature focuses on hospital readmissions, ambulatory care sensitive conditions, and potentially avoidable hospitalizations for long-term care, this evidence is relevant to consider for the development of these potentially preventable readmission measures for PAC.[12-14]

This memo presents results of an environmental scan on potentially preventable or avoidable hospital readmissions. This includes a summary on characteristics of hospital readmissions, as well as interventions aimed to reduce hospital readmissions, definitions used for identifying potentially preventable readmissions, and highlights of the evidence by setting. Results of this environmental scan suggest that potentially preventable readmissions have been identified related to specific types of medical conditions or diagnoses that pre-exist the readmission. We provide a discussion to synthesize these results and provide the context relevant to developing potentially preventable readmission measures for PAC.

II. Risk Factors for Hospital Readmissions

Among the studies included in this review, the following risk factors are associated with a higher rate of readmission:

- Black race[12]
- Lower education[21]
- Single household[17, 21]
- Increased age or retirement status[21-23]
- Discharge planning factor: lack of documented patient or family education[22]
- Receiving less care from informal caregiver[19]
- Hospitalization within the previous 12 months[25]
- Longer index hospital length of stay[25]
- Lower levels of cognitive functioning[13]
- Functional disability level[16]
- History of depression[16, 22, 24]

- Under-nutrition as defined by the Mini-Nutritional Assessment (MNA) as malnourished or at risk for malnourishment[20]

- Extreme weight loss[12]

- Inpatient use of narcotics or corticosteroids[12]

- Five or more medical comorbidities[21, 22]

- Congestive heart failure[12, 14-18]

- Obesity[19]

- Cancer[12, 15]

- Dyspnea severity[15-17]

- Skin or wound problems[16]

- Guarded rehabilitation prognosis[16]

A study investigating risk factors for 30-day hospital readmission among general surgical patients indicates that postoperative complications appear to drive readmissions[26]

- Among patients that underwent general surgery in this study, the most common reasons for readmissions are gastrointestinal problems/complications (28% of readmitted patients) and surgical infections (22% of readmitted patients).[26]

III. Strategies, Opportunities, and Interventions Aimed to Reduce Hospital Readmissions

- Strategies to prevent readmissions

  - Brooke et al. developed strategies for patients with vascular surgery at index admission on predicting and preventing readmissions in three phases: patient characteristics & procedures performed at the hospital or by a particular surgeon, postoperative care, and discharge planning[27]

  - Dawes and colleagues suggest that clinical data should be used to focus on inappropriate hospitalization when considering policies aimed at penalizing reimbursements based on readmission rates[28]

- Interventions to reduce readmissions

  - Several studies on telehealth have shown significant reductions in rehospitalizations. Most telehealth systems include a remote monitoring device to track patients' vital signs, a transmission system to transfer clinical data to the

monitoring center and a communications system for clinical follow-up on abnormal or missing data.

- A study of home health (HH) patients with diabetes reported a 12 percentage point lower probability of hospitalization in the first 30 days of home health care compared to non-telehealth matched patients.[29]

- Over seventy percent of patients with COPD enrolled in the VA home care telehealth program had a significant reduction in the numbers of ED visits, hospital admissions and total exacerbations.[30]

- A retrospective analysis of 22 months of heart failure data from one home health agency's 1,434 heart failure patients found that those receiving telehealth services had a 10 percent all-cause readmission rate as compared to the non-telehealth patients who had a 21 percent all-cause readmission rate.[31]

– Implementation of a restorative care model improved hospital readmission rates for participating HH patients.[32] HH patients receiving restorative care were 32 percent less likely to be readmitted to the hospital than those who received usual care. The study sample of 770 participants admitted to home care after a hospital discharge included 341 matched pairs. Participants received a unified plan of care based on input from the patient, family and home care staff implemented by an integrated interdisciplinary team.

- The treatment plan included exercise, behavioral change, self-management, environmental adjustments, training and counseling for patients, family and caregivers and medication adjustments. The study excluded the very frail and cognitively impaired individuals and took place in a single HH agency.

– Transitions care planning[23, 27, 33, 34]

- A transitional care program that involved multiple features, including for example, extensive education for a home health-based transitional care nurse, front-loading visits, medication reconciliation and management, and case conferences with the medical director, led to a gradual decline in 30-day rehospitalization rates.[35]

- A HH agency in Ohio used the program with their COPD patients; 82.9 percent of the intervention group's patients had no rehospitalizations in comparison with 51.3 percent of the control group. A New Jersey hospital system with a HHA, reduced 30-day rehospitalization rates from 30 to 10 percent by having the HHA's nurses work within the hospital to coordinate patients' transitions back to the community.[36]

        - A QIO-led Care Transitions Project was successful at reducing hospitalizations for participating HH agencies between 2008 and 2010.[37] Twenty-nine of 52 eligible HH agencies were recruited to the program along with community hospitals (2), IRFs (2), SNFs (11) and a federally qualified health center. Participating HHAs achieved a 30 percent relative improvement in quarterly readmission rates.

    - Care coordination[27, 38, 39]

        - 21 percent of patient readmissions in Dawes et al. were considered preventable because of poor follow-up, potential outpatient management, and premature hospital discharge. Therefore, improved coordination of care may reduce the need for those rehospitalizations.[28]

    - Logistics to follow-up care[23, 27, 33, 34, 39]

        - Improve discharge planning to limit both early and short readmissions[28]

    - End-of-life care (palliative or hospice care)[34]

    - Medication management[39]

IV. Defining Potentially Preventable Readmissions

Hospital readmissions can be the result of the discharge destination having inadequate capabilities, poor quality of care transitions, or lack of discharge planning.[40] The literature on preventable readmissions and rehospitalizations varies with regard to definitions, terminologies, data collection and analytic methods, communication and information gaps, and inconsistent translations.[23, 41, 42] For example, many studies that identify avoidable readmissions use medical records and chart reviews by clinicians.[21, 28, 41, 43-46] Clinicians may also have their own method of review and classification of preventable readmissions. In addition, the burden of added chart reviews may lead to inconsistent decisions across provider teams. The following section summarizes various definitions used in the literature as well as risk factors associated with potentially preventable readmissions.

- Suggested definitions from the literature

    - To begin defining potentially preventable readmission, a definition used for potentially avoidable hospitalizations can be used as a precursor: “hospitalizations that could have been avoided because the condition could have been prevented or treated outside of an inpatient hospital setting”[47]

    - A literature review by Vest et al. concludes that variation is more common than consistency in defining potentially preventable readmissions, noting that studies identify different combinations of index conditions, readmitting conditions, and timeframes[23]

- A preventable readmission from Dawes and colleagues is defined as one for which "reasonable improvement in the health care process performed in a timely fashion could have potentially avoided the need for rehospitalization"[28]

- Using the 3M™ approach, Goldfield et al. defined that a readmission was clinically related to the initial admission within a certain time period if it belonged to one of the following five categories:[7]

    - Medical readmission for a continuation or recurrence of the initial admission

    - Medical readmission for an acute decompensation of a chronic problem plausibly related to the care either during or immediately after initial admission

    - Medical readmission for an acute medical complication plausibly related to the care of the initial admission

    - Readmission for a surgical procedure to "address a continuation or recurrence of the problem causing the initial admission"[7]

    - Readmission for a surgical procedure to "address a complication of care resulting from care during the initial admission"[7]

- Halfon et al. classified a readmission as one that "is necessarily unforeseen at the time of the previous discharge and related to a previously known affection" as the gold standard[46]

- Some studies consider only unplanned and unexpected readmissions to be avoidable.

    - Exclude expected and planned readmissions (e.g., inpatient chemotherapy or radiation therapy)[48]

    - Van Walraven et al. determined that many studies used unplanned readmissions within 30 days as a proxy for potentially preventable readmissions[49]

- There is a difference between readmissions for complications due to prior surgical index admission and readmissions for medical reasons

    - Some readmission can be considered general avoidable medical conditions[49]

    - Some be a result of postoperative complications[38]

- Some studies suggests to focus only on principal diagnoses at hospital discharge[23, 38]

Summary of Evidence by Setting

The PAC setting from which the readmissions come from is critical in determining potentially preventable readmissions.[42] PAC settings have varying capabilities and equipment to care for their patient populations.

Skilled Nursing Facilities

- There is recent SNF research on potentially preventable readmissions, including work conducted for MedPAC by Kramer et al.[3, 50]

- MedPAC has focused on five potentially avoidable conditions including: congestive heart failure, electrolyte imbalance/dehydration, respiratory infection, sepsis, urinary tract infection/kidney infection[3]

- Kramer et al. added eight new conditions to the five original conditions developed by MedPAC, including hypoglycemia and diabetic complications, anticoagulant complications, fractures, and musculoskeletal injuries, acute delirium, adverse drug reactions, cellulitis/wound infection, pressure ulcers, and blood pressure management[10, 50]

- A study from Ouslander et al. investigated the frequency and diagnoses associated with readmission of SNF patients to an acute care hospital[51]

  - Data was collected on Medicare FFS patients (ages 75+) and among 10,777 discharges from a hospital, 30% of discharges were discharged to a SNF.

    - Of the 30% discharged to SNF, 15% of those were readmitted to a hospital within 30 days

  - Specific diagnoses associated with the highest readmission rates (observed and unadjusted) include: congestive heart failure (CHF) (31%); UTI (28%); renal failure (27%); pneumonia (23%); and COPD (23%).[51]

  - Infections (36%) and cardiovascular disorders (27%) were the primary diagnoses for hospital readmissions.

  - "The most frequent readmission primary diagnoses was the same as the index admission primary diagnoses in less than half the cases."[51]

Inpatient Rehabilitation Facilities

- The literature on preventable readmission specific to IRFs is limited

- Recently a MedPAC contractor report by Providigm identifies 13 conditions for which hospital readmissions would be considered to be potentially avoidable; these include the following:

- Congestive Heart Failure
- Electrolyte imbalance/dehydration
- Respiratory illness and bronchitis (e.g., pneumonia, influenza and pneumonitis due to inhalation of food or vomitus)
- Sepsis (septicemia)
- Urinary Tract Infection (UTI) and kidney infections (cystitis, urethritis, urethral stricture)
- Hypoglycemia and diabetic complications
- Anticoagulant complications
- Fractures and musculoskeletal problems
- Adverse drug reaction (ICD-9 960.xx-979.xx)
- Delirium
- Cellulitis/wound infection
- Pressure ulcers
- Blood pressure management (hyper and hypo)

- One study led by Ottenbacher et al. investigated all-cause hospital readmissions among Medicare Fee-for-Service patients discharged from IRFs to determine factors related to readmission patients.[52] Note, this study does not identify potentially preventable readmissions, but the following key findings are relevant.
  - The lowest readmission rate was 6 percent for persons with lower extremity joint replacement and the highest readmission rate was 19 percent for persons with debility.
  - Higher odds of readmission were found among patients with the following characteristics: male (13%), non-Hispanic blacks (14%), and beneficiaries with dual Medicare-Medicaid eligibility (15%).
  - Lower motor and cognitive functional status (i.e. greater dependence) were associated with higher odds of hospital readmission post-IRF discharge.
  - Readmissions to acute care hospitals were categorized using MS-DRGs. The most common reasons for readmission included MS-DRGs for Kidney and Urinary Tract Infections; Simple Pneumonia and Pleurisy; Heart Failure and Shock; Esophagitis; Gastroenteritis and Miscellaneous Digestive Disorders; and

Nutritional and Miscellaneous Metabolic Disorder for all rehabilitation impairment categories.

- Septicemia without mechanical ventilation for 96+ hours was the most common readmission type across all impairment categories with the exception of lower extremity joint replacement.

- The study suggested that developing hospital readmission models post-IRF discharge must take into account functional status, depressive symptoms, and social support.

Long-Term Care Hospitals

- Very little research has been done on readmissions conditions particularly in an LTCH setting.

- Patients with heart failure (8%) or pneumonia (8%) treated in the index hospitalization who were discharged to an LTCH setting are readmitted to an acute care hospital within 30 days of admission to an LTCH.[40]

- Patients who had long-term ventilator use discharged from an acute care hospital had higher risk for hospital readmission from an LTCH setting.[53]

- In a related study, researchers found that LTCH patients who stayed 30 days or longer were more likely to be readmitted to an acute care hospital than other post-acute care cases.[54]

Home Health

The literature review revealed that very few studies consider this post-episode period for home health care quality. There are studies that focus on hospital readmission during a home health episode that demonstrate some of these readmissions are potentially preventable. Research also shows that interventions that home health agencies can implement can be effective at reducing readmissions. Given the paucity of research on hospitalizations that occur post home health discharge, this environmental scan observed studies that addressed hospitalization during a home health episode and potentially preventable hospitalizations.

Hospitalizations within a home health episode

- There are certain diagnoses/conditions noted in the literature that put home health patients at a higher risk for hospitalization or emergency department (ED) treatment. Morris and colleagues used the interRAI HC[1] and found that certain clinical

[1] InterRAI HC (home care) is an assessment instrument developed by the international interRAI consortium. It consists of more than 300 items and covers demographics, cognition, function, disease diagnoses, drug use, treatments, service use, estimated proximity to death, self-reported health status and degree of medical instability.

complications, disease diagnoses and specialized treatments were related to subsequent hospitalizations or ED use within six months[55]. Specialized treatments included blood transfusions, IV infusion, wound treatment, radiation and dialysis.

- A 2014 study found that measures of pain management and improvement in bathing ability were highly correlated with a decrease in rehospitalizations.[15] Using OASIS data from 9,912 home care agencies, researchers found significant correlation between lower compliance with recommended home care process measures and higher rates of hospitalizations for 17 of the 20 process measures. Two quality measures associated with pain (assessment and effective treatment of pain as demonstrated by improved pain with mobility) were the most strongly correlated with reduced hospitalization. It was inferred that a 10 percent increase in pain assessment could be associated with an approximate reduction in hospitalizations by 16 percent. The bathing improvement measure had a protective effect against hospitalization that researchers attributed to improving health status.

- Using OASIS records from over 7,000 home health patients rehospitalized within one year of discharge from hospital, researchers categorized patients as to their level of risk for repeated hospitalizations.[56] Patients were considered at high risk of repeated hospitalizations if the patient had had three or more unplanned hospitalizations and at low risk if the patient had had two or fewer unplanned rehospitalizations.

  - High risk patients more likely to have chronic conditions such as CHF, diabetes, HIV/AIDS, chronic skin ulcers, and COPD.

  - More likely to have more than two secondary diagnoses, have difficulty breathing, need assistance with ADLs and with taking medications, referred from an inpatient setting, and lived alone

Potentially Avoidable Rehospitalizations

- Madigan and colleagues studied 74,580 Medicare home health patients with a rehospitalization within 30 days of the index hospital discharge.[17] The 30-day rehospitalization rate was 26 percent with the largest proportion related to a cardiac-related diagnosis (42 percent). Using the ARHQ Prevention Quality Indicators (PQIs), about one-third had a primary diagnosis of heart failure. Secondary diagnoses included heart failure, hypertension, COPD, UTI and dehydration.[17]

- A study of adverse events in a randomized sample of 450 patients from a total of 7,467 discharged Canadian home care patients (2004-2005) revealed that 286 patients screened positive for one or more adverse events.[18]

  - Adverse events were defined as “an unintended injury or complication which results in disability, death or increased use of health-care resources and is caused by health care management”.

- The most common adverse events were unplanned admission to acute care hospital (33.9 percent), unplanned visit to hospital ED (33.7 percent). One-third of adverse events were rated by physician reviewers as having a greater than 50 percent probability of preventability. The most preventable adverse events were falls and adverse drug events.

Methods/Algorithms Classifying PPR

To identify potentially preventable readmissions, input from experts and clinicians is needed to establish methods or algorithms that will later be tested and validated. The existing literature presents methods using different combinations of diagnostic codes and subjective criteria (social problems, inadequate management, psychological reasons, in adequate follow-up or family involvement) to determine avoidable readmissions.[33, 38] Variations between studies include number of reviewers involved (one to three reviewers per readmission case), sources of information (medical record of the index admission or readmission), and attributions to specific groups (patient, social issues, treating physicians or hospitals) creating a challenge for creating a standardized or widely accepted method of identifying potentially preventable readmissions. The method most often to determine potentially preventable readmissions is manual review.[23, 38] In addition, various data sources add to the complexity of determining PPRs. More notably, administrative data have higher proportions of avoidable readmissions than medical chart review.[33] The following section summarizes the most common methods associated with determining PPRs.

Agency for Healthcare Research and Quality's (AHRQ) Prevention Quality Indicators (PQIs)/Ambulatory Care Sensitive Conditions (ACSCs)

- ACSCs are conditions for which "good outpatient care can potentially prevent the need for hospitalization or for which early intervention can prevent complications or more severe disease". AHRQ assesses the rates of these conditions using PQIs, which are population-based and adjusted for covariates.[8] This approach has been widely used.

- PQIs consist of the following 13 relevant ambulatory care sensitive conditions (3 others are pediatric) including: bacterial pneumonia; dehydration; urinary tract infection; perforated appendix; angina without procedure; congestive heart failure; hypertension; adult asthma; chronic obstructive pulmonary disease; diabetes short-term complication; diabetes long-term complication; uncontrolled diabetes; and lower-extremity amputation among patients with diabetes[8]

- Evidence indicates that managed care programs have a 33 percent lower rate of ACSCs hospitalizations than fee-for-service programs; suggesting that managed care patients may have lower rates of rehospitalizations.[57]

- Potentially Avoidable Hospitalizations (PAH)[14]

  - Walsh *et al*. investigated reducing potentially avoidable admissions as a method of improving Medicare spending, health outcomes, and quality of life. PAH was

defined based on ambulatory care sensitive conditions, and is used to assess potentially avoidable (preventable) hospitalizations among Medicare and Medicaid dually eligible beneficiaries who receive long term care (in a nursing facility or through a home and community based services (HCBS) waiver program) or post-acute care in a SNF.

  - Five conditions (pneumonia, congestive heart failure, urinary tract infection, dehydration and chronic obstructive pulmonary disease or asthma) were responsible for 78 percent of preventable hospitalizations from nursing homes.

- MedPAC's Medicare Ambulatory Care Indicators for the Elderly (MACIEs)[9]
  - Formerly called Access to Care for the Elderly Project (ACE-PRO)
  - These include the following conditions:
    - Hospital admissions for serious short-term complications of diabetes mellitus
    - Hospital admissions for serious long-term complications of diabetes mellitus
    - Emergency department (ED) use for unstable angina
    - Hospital admissions for hypertension
    - Hospital admissions for heart failure
    - Hospital admissions for respiratory diagnosis in diagnosis of COPD or asthma

3M™ Potentially Preventable Readmissions Algorithm (See Appendix Figure 1)

- The 3M™ Potentially Preventable Readmissions (PPR) Grouping Software evaluates whether a readmission is *clinically related* to a prior admission within the past 7-30 days.
- According to this algorithm, medical readmissions following an initial medical admission or following a surgical admission are more likely to be potentially preventable, whereas surgical readmissions following an initial medical admission or following a surgical readmission are less likely to be potentially preventable.
- 3M™ uses the All Patient Refined Diagnosis Related Groups (APR DRGs) for risk-adjustment and to classify patients according to their reason of admission.[7]
- Calculating a Potentially Preventable Readmission rate uses readmissions related to an index admission as the numerator and the denominator includes all candidate admissions, including those determined to be clinically irrelevant to the initial admission.

- Data from 2004-2005 on Florida hospitals, 3M™ determined 11 percent of readmissions within 30 days were potentially preventable[7]

- Goldfield et al. emphasized that knowing the proportion of preventable readmissions is enough for policymakers to improve quality of care, even though it may not reflect the quality of care the patient is receiving[48]

- Jackson and colleagues compared 3M™ PPR to a four step manual review process[45]

  - Observed 450 30-day, all-cause readmissions at 18 different hospitals

  - The manual review process included a chart review; interviews with patients, their families, and treating providers; nurse reviewer; and physician evaluation of findings and determination of preventability on a five-point scale.

  - Results indicate that automated classification identified 78 percent of readmissions as potentially preventable while manual review identified 47 percent of the readmissions as potentially preventable.

  - Manual chart review also identified potentially preventable readmissions that automated classification did not identify. Concordance between methods was not high enough to replace manual review with automated classification.

Striving for High Quality Level and Analyzing of Patient Expenditures (SQLape) (See Appendix Figure 2)

- The process model from Halfon et al. was a precursor to SQLape (*See Appendix Figure 3*) in which a small Swiss study found that 1.7 percent of readmissions were considered avoidable within 30 days[46]

- SQLape had 180 surgical and 180 medical groups collapsed into a number of risk categories on the basis of clinical homogeneity and sufficient size. All indicators were risk adjusted.

- The algorithm detected 570 potentially avoidable readmissions, in which 494 observations were true potentially avoidable readmissions (other cases had missing information or transfers to another setting)

- Testing and validating the SQLape resulted in a risk-adjusted 78 percent identified as potentially avoidable readmissions with 27 percent of those cases considered to be completely avoidable[49]

- Causes of the considered completely avoidable readmissions from this study:[49]

  - Complication of surgical care

  - Complication of non-surgical care
  - Drug-related adverse event
  - Missing or erroneous diagnosis or inappropriate therapy
  - Premature discharge
  - Other inadequate discharge

- Another Swiss study from a university hospital found that 8.5 percent of hospitalizations in 2011 were readmissions and 46.8 percent of those readmissions were considered potentially avoidable using the SQLape approach[58]

- The SQLape approaches uses electronic health records and real-time, locally available data which made this predictive analytical model work, but this approach is not always feasible.

V. Discussion

Results of this environmental scan identified several issues and potential challenges associated with identifying potentially preventable readmissions. There is a lack of consensus on a definition for which readmissions should be considered potentially preventable and the PAC setting-specific evidence remains limited.

We found through this environmental scan that there was substantial variation across several different projects and studies in the approaches for defining potentially preventable readmissions. The literature also suggested the importance of considering the risk factors and characteristics of patients, including socio-demographic status. There were few examples of potentially preventable readmissions from PAC settings specifically. Work by Kramer et al. on the SNF setting developed a list of 13 SNF PPR conditions.[10] More recently, Kramer et al. applied those 13 conditions to the IRF setting.[11] Among the ambulatory care setting, a few models emerged from the literature to inform identifying potentially preventable readmissions including the ambulatory care sensitive conditions, the approach developed by 3M^{TM} and approaches that used electronic health records (EHR) data.

There are also important considerations in defining potentially preventable readmissions based on when the readmission occurs—either while receiving PAC services or after PAC discharge. Unexpected complications may arise during the post-discharge period, but these complications may be less likely when patients are under the direct care of an institutional PAC provider that can adequately care for their specific patient population. Different PAC settings and PAC sub-populations will also have unique considerations that need to be addressed in developing definitions for potentially preventable readmissions. Though some harmonization or standardization across PAC may be valuable, both the readmission window and particular features of a given PAC setting or populations will be essential to address in potentially preventable hospital readmission measure development for PAC. Identification of potentially

preventable and avoidable readmissions will allow hospitals and PAC providers to coordinate care and focus on reducing potentially preventable readmissions.

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APPENDIX

Figure 1
3M™ Potentially Preventable Readmission Algorithm

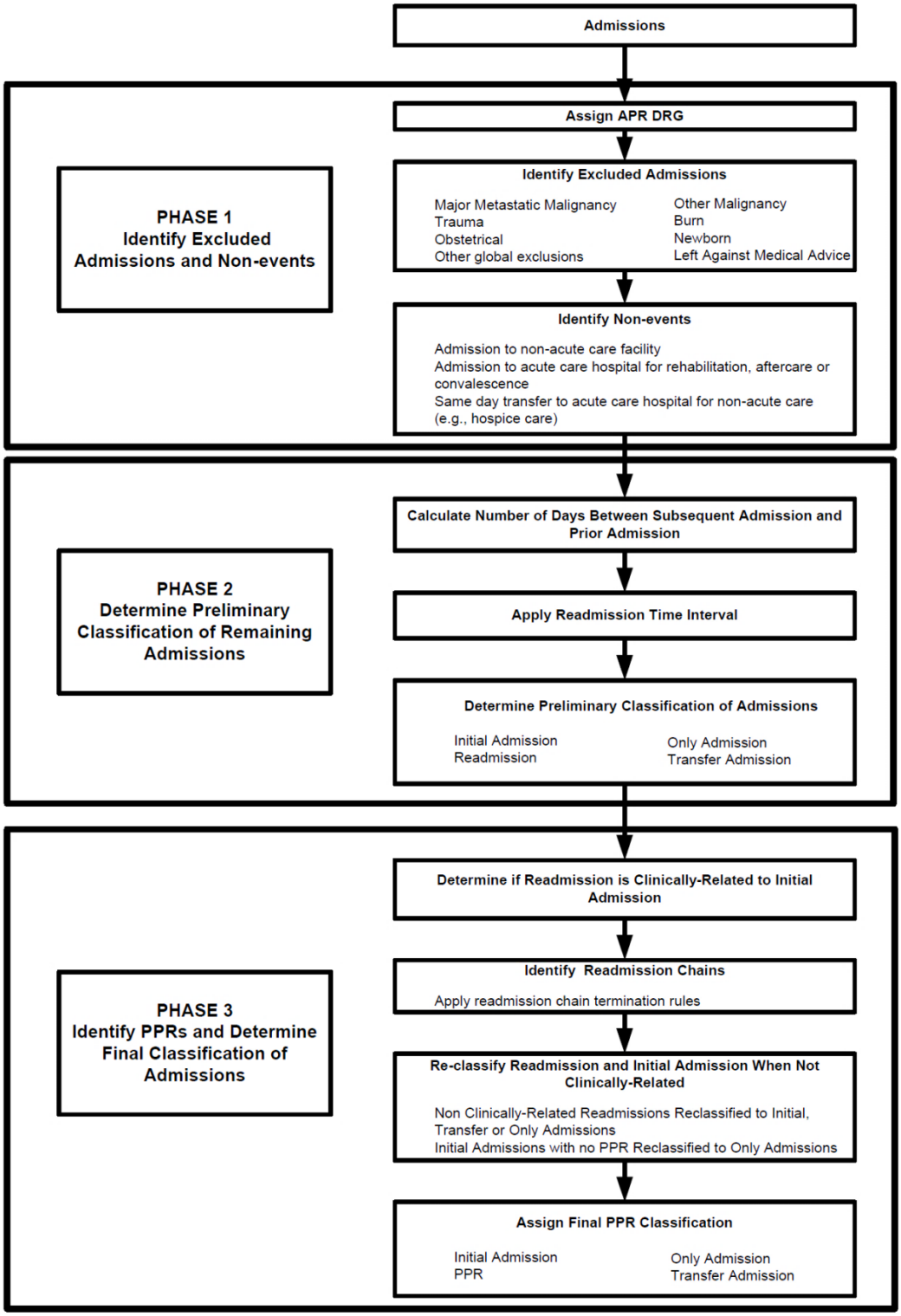


Figure 2
SQLape Readmission Algorithm

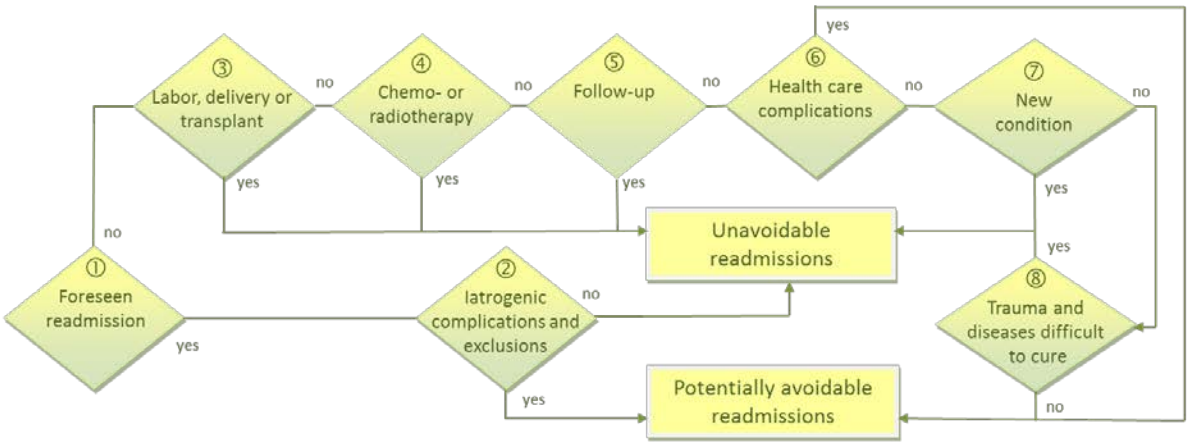
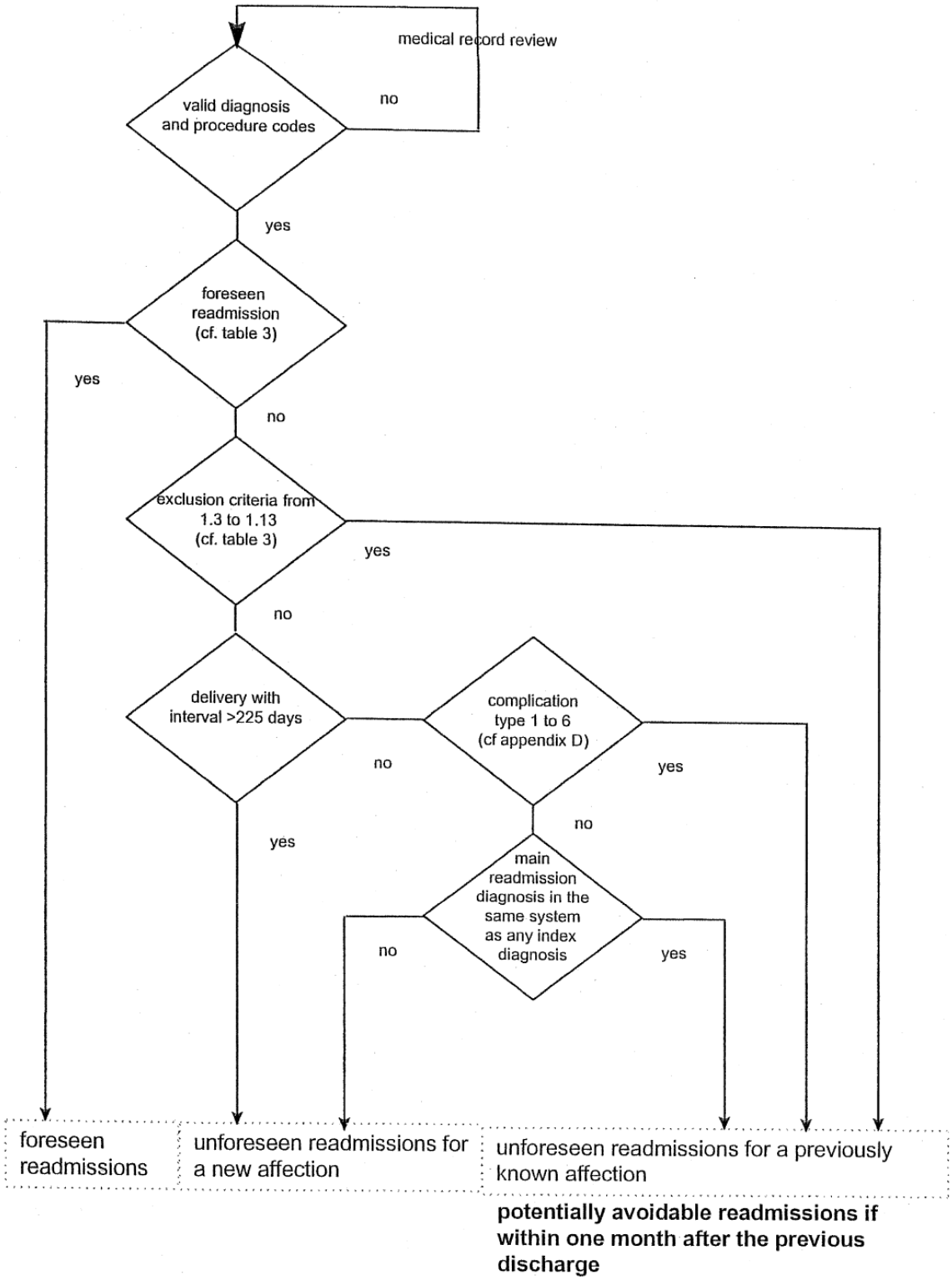


Figure 3
Halfon et al. (2002) Readmission Algorithm



APPENDIX A-3
POTENTIALLY PREVENTABLE READMISSIONS (PPR) DEFINITION RATIONALE MEMO

RTI's Proposed Approach and Definition for Potentially Preventable Readmissions for Post-Acute Care (PAC)

Overview: The purpose of this memo is to outline the approach used to develop the proposed list of potentially preventable readmission conditions for post-acute care. The literature shows that some hospital readmissions can be prevented, and that many of these readmissions occur in the context of post-acute care (PAC) settings, including skilled nursing facilities (SNF), inpatient rehabilitation facilities (IRF), long-term care hospitals (LTCH), and home health (HH).[1,2] For certain diagnoses, proper management and care of the condition (in the facility or by primary care after discharge) along with appropriate, clearly explained and implemented discharge instructions and referrals, can often prevent a patient's readmission to the hospital. Identifying these potentially preventable readmission (PPR) conditions will assist healthcare providers' efforts to improve quality of care and coordination across the care continuum.

Methods: The first phase of this work involved conducting a comprehensive environmental scan to identify studies and previously published methodologies related to potentially preventable hospitalizations and readmissions (note: results of this environmental scan are detailed in a separate memorandum). The evidence specific to PAC was limited, and we found substantial variation across different methodologies for defining potentially preventable hospitalizations or readmissions. Based on this scan, we compiled a list of all PPR conditions that were found in the literature. This list had considerable overlap with the conditions included in the Ambulatory Care Sensitive Conditions (ACSC)/ Prevention Quality Indicators (PQI), developed by the Agency for Healthcare Research and Quality (AHRQ).

Working Conceptual Definition: We developed a working conceptual definition for potentially preventable hospital readmissions for PAC. The conceptual definition for PPR hinges on the readmission window timeframe. We considered two readmission windows in this work: 1) within-PAC stay (i.e., SNF, IRF, LTCH, or HH) and 2) 30 days post-PAC discharge.

For the within-PAC stay window, potentially preventable readmissions should be avoidable with sufficient medical monitoring of the patient. For patients in the 30 day post-PAC discharge period, a potentially preventable readmission refers to a rehospitalization that should be avoidable with adequately planned, explained, and implemented post discharge instructions including establishment of appropriate follow-up ambulatory care. The PPRs for the current SNF measure will span these definitions and additional discussion may be needed after the two disjoint windows are operationalized. ***Table 1*** below summarizes the specific readmission

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

2 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.

windows that will be developed for each PAC potentially preventable hospital readmission measure:

Table 1
PAC Readmission Windows for Potentially Preventable Hospital Readmission Measure Development*

PAC	30-days post prior hospitalization†	Within stay	30-days post PAC discharge
HHA			X
IRF		X	X
LTCH		X	X
SNF	X		X

* Note these are the initial readmission windows being considered. Additional windows may be considered in future measure development work.

† This window may span the PAC stay and post-PAC discharge period, depending on the patient's length of stay.

We used the ACSC approach as the starting point for this work. We found that most of the conditions on the ACSC list reflect reasons for readmissions that would be considered potentially preventable, given clinical evidence that these conditions can be avoided with appropriate access to high quality ambulatory care.[3] We extended this logic to both the within-PAC stay readmission window and 30 day post-PAC discharge window.

Data Analysis: We analyzed Medicare claims data to identify the most frequent diagnoses associated with hospital readmissions among beneficiaries that received PAC. 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. Several conditions such as pressure ulcers, were not on either the ACSC list or in the preliminary data analyses. However, the literature strongly recommends that readmissions for these conditions can be prevented with close monitoring from healthcare providers and under appropriate ambulatory care.

Note: The proposed PPR list should not be considered a final list of potentially preventable conditions, but rather is intended to serve as a basis for discussion and clinical input. We seek technical expert and detailed clinical input on this approach and the proposed definition. There may be differences that are specific to certain PAC settings, and follow-up discussions will identify any PAC-specific considerations.

Table 2 summarizes a set of conditions for which we may consider readmissions potentially preventable. We indicate whether each condition would be considered potentially preventable for the within-stay or post-discharge readmission window. This list is organized by the summarized rationale for each condition's inclusion on this list. Note that this list of

[3] 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.

conditions refers to conditions that would be required as the principal diagnosis for the readmission, with some exceptions based on the PQI specifications.

Table 2
RTI's Proposed List of Conditions for Defining Potentially Preventable Hospital Readmissions among Post-Acute Care

Conditions	Within stay	30 day post-discharge	Clinical rationale
Adult asthma*	X	X	Inadequate management of chronic conditions
Angina without procedure*	X	X	Inadequate management of chronic conditions
Chronic obstructive pulmonary disease (COPD)*	X	X	Inadequate management of chronic conditions
Congestive heart failure (CHF)*	X	X	Inadequate management of chronic conditions
Diabetes long-term complication*	X	X	Inadequate management of chronic conditions
Diabetes short-term complication*	X	X	Inadequate management of chronic conditions
Uncontrolled diabetes*	X	X	Inadequate management of chronic conditions
Hypertension*	X	X	Inadequate management of chronic conditions
Lower-extremity amputation among patients with diabetes*	X	X	Inadequate management of chronic conditions
Bacterial pneumonia*	X	X	Inadequate management of infection
Urinary tract infection*	X	X	Inadequate management of infection
C. difficile infection [135 subset]	X		Inadequate management of infection
Septicemia (except in labor) [2]	X	X	Inadequate management of infection
Skin and subcutaneous tissue infections [197]	X	*Cellulitis only*	Inadequate management of infection
Kidney infection	X	X	Inadequate management of infection
Dehydration*	X	X	Inadequate management of other unplanned events
Aspiration pneumonitis; food/vomitus [129]	X	X	Inadequate management of other unplanned events
Fluid and electrolyte disorders [55]	X	X	Inadequate management of other unplanned events
Anticoagulant complications	X		Inadequate management of other unplanned events
Acute delirium	X		Inadequate management of other unplanned events
Acute renal failure	X	X	Inadequate management of other unplanned events
Adverse drug events	X	X	Inadequate management of other unplanned events
Arrhythmia	X		Inadequate management of other unplanned events
Deficiency and other anemia [59]	X	X	Inadequate prophylaxis
Gastrointestinal hemorrhage [153]	X	X	Inadequate prophylaxis
Intestinal impaction [145 subset]	X	X	Inadequate prophylaxis
Pressure Ulcers	X	X	Inadequate prophylaxis
Deep Vein Thrombosis/Pulmonary Embolism	X		Inadequate prophylaxis
Fracture of neck of femur (hip) [226]	X	X	Inadequate injury prevention

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

*Ambulatory Care Sensitive Conditions

SOURCE: Proposed list of potentially preventable readmission conditions from RTI International (version: 7/20/2015).

APPENDIX A-4
TEP WORKSHEET

For each condition, please rate your level of agreement for inclusion in a cross-setting PAC definition for PPR for each of the readmission windows listed in the columns. 1=strongly disagree; 2=disagree; 3=neither agree nor disagree; 4=agree; 5=strongly agree	Rating: Within Stay (IRF & LTCH)	Rating: Post PAC Dc	Rating: 30 Days Post Hospital Dc (SNF)	Comments
CHRONIC CONDITIONS:				
Adult asthma*				
Angina without procedure*				
Chronic Obstructive Pulmonary Disease (COPD)*				
Congestive Heart Failure (CHF)*				
Diabetes long-term complication*				
Diabetes short-term complication*				
Uncontrolled diabetes*				
Hypertension*				
Lower extremity amputation among patients with diabetes*				
Other – Please specify:				
Other – Please specify:				
Other – Please specify:				
INFECTIONS:				
Bacterial pneumonia*				
Urinary tract infection*				

(continued)

For each condition, please rate your level of agreement for inclusion in a cross-setting PAC definition for PPR for each of the readmission windows listed in the columns. 1=strongly disagree; 2=disagree; 3=neither agree nor disagree; 4=agree; 5=strongly agree	Rating: Within Stay (IRF & LTCH)	Rating: Post PAC Dc	Rating: 30 Days Post Hospital Dc (SNF)	Comments
C. difficile infection				
Septicemia				
Skin and subcutaneous tissue infections				
Kidney infection				
Other – Please specify:				
Other – Please specify:				
Other – Please specify:				
OTHER UNPLANNED EVENTS:				
Dehydration*				
Aspiration pneumonitis; food/vomitus				
Fluid and electrolyte disorders				
Anticoagulant complications				
Acute delirium				
Acute renal failure				
Adverse drug events				
Arrhythmia				
Other – Please specify:				
Other – Please specify:				
Other – Please specify:				

(continued)

For each condition, please rate your level of agreement for inclusion in a cross-setting PAC definition for PPR for each of the readmission windows listed in the columns. 1=strongly disagree; 2=disagree; 3=neither agree nor disagree; 4=agree; 5=strongly agree	Rating: Within Stay (IRF & LTCH)	Rating: Post PAC Dc	Rating: 30 Days Post Hospital Dc (SNF)	Comments
INADEQUATE PROPHYLAXIS				
Deficiency and other anemia				
Gastrointestinal hemorrhage				
Intestinal impaction				
Pressure Ulcer				
Deep Vein Thrombosis/Pulmonary Embolism				
Other – Please specify:				
Other – Please specify:				
Other – Please specify:				
INJURY PREVENTION:				
Fracture of neck of femur (hip)				
Other – Please specify:				
Other – Please specify:				
Other – Please specify:				
OTHER:				
Other – Please specify:				
Other – Please specify:				
Other – Please specify:				

* Refers to condition on AHRQ's Ambulatory Care Sensitive Conditions list.

APPENDIX A-5
FREQUENCY OF READMISSIONS ANALYSES FOR SNF, IRF, LTCH, AND HH

Table 1A
Top 20 CCS Codes Associated with Hospital Readmissions—SNF, 2013

CCS Code for Principal Diagnosis		# of Unplanned Readmissions	% of Unplanned Readmissions
1.	Code 2: Septicemia (except in labor)	56,344	13.9
2.	Code 108: Congestive heart failure; nonhypertensive	33,146	8.2
3.	Code 122: Pneumonia (except that caused by tuberculosis or sexually transmitted disease)	24,359	6.0
4.	Code 157: Acute and unspecified renal failure	19,568	4.8
5.	Code 237: Complication of device; implant or graft	18,171	4.5
6.	Code 238: Complications of surgical procedures or medical care	17,616	4.4
7.	Code 159: Urinary tract infections	15,669	3.9
8.	Code 131: Respiratory failure; insufficiency; arrest (adult)	13,823	3.4
9.	Code 153: Gastrointestinal hemorrhage	12,715	3.1
10.	Code 129: Aspiration pneumonitis; food/vomitus	12,414	3.1
11.	Code 127: Chronic obstructive pulmonary disease and bronchiectasis	9,892	2.4
12.	Code 106: Cardiac dysrhythmias	9,513	2.4
13.	Code 55: Fluid and electrolyte disorders	8,786	2.2
14.	Code 109: Acute cerebrovascular disease	8,597	2.1
15.	Code 135: Intestinal infection	8,374	2.1
16.	Code 59: Deficiency and other anemia	6,151	1.5
17.	Code 100: Acute myocardial infarction	5,881	1.5
18.	Code 95: Other nervous system disorders	5,349	1.3
19.	Code 145: Intestinal obstruction without hernia	5,349	1.3
20.	Code 226: Fracture of neck of femur (hip)	5,276	1.3
	Total Readmissions	**296,993**	**73.3**

SOURCE: RTI analysis of SNFRM data, 2013 (program reference: allStay031_sp08).

Table 1B
Top 20 DRGs Associated with Hospital Readmissions—SNF, 2013

DRG Family (MS-DRGs)		# of Unplanned Readmissions	% of Unplanned Readmissions
1.	Septicemia w/o MV 96+ hours (871, 872)	28,173	7.0
2.	Heart failure & shock (291, 292, 293)	21,455	5.3
3.	Renal failure (682, 683, 684)	13,716	3.4
4.	Simple pneumonia & pleurisy (193, 194, 195)	13,647	3.4
5.	G.I. hemorrhage (377, 378, 379)	11,270	2.8
6.	Kidney & urinary tract infections (689, 690)	11,213	2.8
7.	Respiratory infections & inflammations (177, 178, 179)	10,076	2.5
8.	Chronic obstructive pulmonary disease (190, 191, 192)	6,656	1.6
9.	Nutritional & misc metabolic disorders (640, 641)	6,568	1.6
10.	Cardiac arrhythmia & conduction disorders (308, 309, 310)	6,125	1.5
11.	Red blood cell disorders (811, 812)	6,048	1.5
12.	Major gastrointestinal disorders & peritoneal infections (371, 372, 373)	5,427	1.3
13.	Pulmonary edema & respiratory failure (189)	5,126	1.3
14.	Intracranial hemorrhage or cerebral infarction (064, 065, 066)	5,045	1.2
15.	Esophagitis, gastroent & misc digest disorders (391, 392)	4,554	1.1
16.	Other kidney & urinary tract diagnoses (698, 699, 700)	4,295	1.1
17.	Other circulatory system diagnoses (314, 315, 316)	3,892	1.0
18.	Acute myocardial infarction, discharged alive (280, 281, 282)	3,714	0.9
19.	Other digestive system diagnoses (393, 394, 395)	3,628	0.9
20.	Hip & femur procedures except major joint (480, 481, 482)	3,603	0.9
	Total Readmissions	**174,231**	**43.0**

SOURCE: RTI analysis of SNFRM data, 2013 (program reference: allStay031_sp08).

Table 2A
Top 20 CCS Codes Associated with Hospital Readmissions—IRF, 2013

CCS Code for Principal Diagnosis		# of Unplanned Readmissions	% of Unplanned Readmissions
1.	Code 2: Septicemia (except in labor)	3,108	8.5
2.	Code 108: Congestive heart failure, nonhypertensive	2,795	7.6
3.	Code 238: Complications of surgical procedures or medical care	2,187	6
4.	Code 237: Complication of device, implant or graft	1,940	5.3
5.	Code 109: Acute cerebrovascular disease	1,720	4.7
6.	Code 122: Pneumonia (except that caused by tuberculosis or sexually transmitted disease)	1,591	4.4
7.	Code 159: Urinary tract infections	1,491	4.1
8.	Code 157: Acute and unspecified renal failure	1,337	3.7
9.	Code 106: Cardiac dysrhythmias	990	2.7
10.	Code 127: Chronic obstructive pulmonary disease and bronchiectasis	942	2.6
11.	Code 131: Respiratory failure, insufficiency, arrest (adult)	819	2.2
12.	Code 55: Fluid and electrolyte disorders	797	2.2
13.	Code 135: Intestinal infection	716	2
14.	Code 153: Gastrointestinal hemorrhage	683	1.9
15.	Code 95: Other nervous system disorders	643	1.8
16.	Code 197: Skin and subcutaneous tissue infections	588	1.6
17.	Code 129: Aspiration pneumonitis, food/vomitus	571	1.6
18.	Code 118: Phlebitis, thrombophlebitis and thromboembolism	563	1.5
19.	Code 103: Pulmonary heart disease	562	1.5
20.	Code 0226: Fracture of neck of femur (hip)	536	1.5
	Total Readmissions	**24,579**	**67.4**

SOURCE: RTI analysis of Medicare claims data, 2013 (program reference: jc07_irf_2013_r_CCS_SNGL_DX1.xlsx).

Table 2B
Top 20 DRGs Associated with Hospital Readmissions—IRF, 2013

DRG Family (MS-DRGs)		# of Unplanned Readmissions	% of Unplanned Readmissions
1.	Heart failure & shock (291, 292, 293)	2,794	7.6
2.	Septicemia w/o MV 96+ hours (871, 872)	2,587	7.1
3.	Intracranial hemorrhage or cerebral infarction (064, 065, 066)	1,479	4
4.	Renal failure (682, 683, 684)	1,443	3.9
5.	Kidney & urinary tract infections (689, 690)	1,437	3.9
6.	Simple pneumonia & pleurisy (193, 194, 195)	1,324	3.6
7.	Chronic obstructive pulmonary disease (190, 191, 192)	975	2.7
8.	Cardiac arrhythmia & conduction disorders (308, 309, 310)	967	2.6
9.	G.I. hemorrhage (377, 378, 379)	862	2.4
10.	Nutritional & misc metabolic disorders (640, 641)	854	2.3
11.	Esophagitis, gastroent & misc digest disorders (391, 392)	786	2.1
12.	Respiratory infections & inflammations (177, 178, 179)	710	1.9
13.	Major gastrointestinal disorders & peritoneal infections (371, 372, 373)	636	1.7
14.	Peripheral vascular disorders (299, 300, 301)	577	1.6
15.	Cellulitis (602, 603)	537	1.5
16.	Hip & femur procedures except major joint (480, 481, 482)	489	1.3
17.	Syncope & collapse (312)	475	1.3
18.	Pulmonary edema & respiratory failure (189)	457	1.2
19.	Postoperative & post-traumatic infections (862, 863)	453	1.2
20.	Red blood cell disorders (811, 812)	446	1.2
	Total Readmissions	**20,288**	**55.1**

SOURCE: RTI analysis of Medicare claims data, 2013 (program reference: jc07_irf_2013_r_MSDRG_Group.xlsx

Table 3A
Top 20 CCS Codes Associated with Hospital Readmissions—LTCH, 2013

CCS Code for Principal Diagnosis		# of Unplanned Readmissions	% of Unplanned Readmissions
1.	Code 2: Septicemia (except in labor)	4,996	23
2.	Code 122: Pneumonia (except that caused by tuberculosis or sexually transmitted disease)	1,414	6.5
3.	Code 237: Complication of device, implant or graft	1,343	6.2
4.	Code 131: Respiratory failure, insufficiency, arrest (adult)	1,317	6.1
5.	Code 108: Congestive heart failure, nonhypertensive	1,226	5.6
6.	Code 238: Complications of surgical procedures or medical care	1,018	4.7
7.	Code 159: Urinary tract infections	784	3.6
8.	Code 129: Aspiration pneumonitis, food/vomitus	723	3.3
9.	Code 157: Acute and unspecified renal failure	696	3.2
10.	Code 127: Chronic obstructive pulmonary disease and bronchiectasis	616	2.8
11.	Code 153: Gastrointestinal hemorrhage	395	1.8
12.	Code 55: Fluid and electrolyte disorders	373	1.7
13.	Code 135: Intestinal infection	361	1.7
14.	Code 197: Skin and subcutaneous tissue infections	332	1.5
15.	Code 50: Diabetes mellitus with complications	326	1.5
16.	Code 106: Cardiac dysrhythmias	286	1.3
17.	Code 59: Deficiency and other anemia	260	1.2
18.	Code 100: Acute myocardial infarction	220	1
19.	Code 99: Hypertension with complications and secondary hypertension	203	0.9
20.	Code 109: Acute cerebrovascular disease	194	0.9
	Total Readmissions	**17.083**	**78.5**

SOURCE: RTI analysis of Medicare claims data, 2013 (program reference: jc07_ltc_2013_r_CCS_SNGL_DX1.xlsx).

Table 3B
Top 20 DRGs Associated with Hospital Readmissions—LTCH, 2013

DRG Family (MS-DRGs)		# of Unplanned Readmissions	% of Unplanned Readmissions
1.	Septicemia w/o MV 96+ hours (871, 872)	3,537	16.3
2.	Heart failure & shock (291, 292, 293)	1,202	5.5
3.	Respiratory infections & inflammations (177, 178, 179)	890	4.1
4.	Simple pneumonia & pleurisy (193, 194, 195)	841	3.9
5.	Septicemia w MV 96+ hours (870)	759	3.5
6.	Renal failure (682, 683, 684)	742	3.4
7.	Kidney & urinary tract infections (689, 690)	739	3.4
8.	Chronic obstructive pulmonary disease (190, 191, 192)	621	2.9
9.	Respiratory system diagnosis w ventilator support <96 hours (208)	595	2.7
10.	Pulmonary edema & respiratory failure (189)	558	2.6
11.	Respiratory system diagnosis w ventilator support 96+ hours (207)	549	2.5
12.	Infectious & parasitic diseases w O.R. procedure (853, 854, 855)	546	2.5
13.	Other circulatory system diagnoses (314, 315, 316)	543	2.5
14.	G.I. hemorrhage (377, 378, 379)	457	2.1
15.	Nutritional & misc metabolic disorders (640, 641)	396	1.8
16.	Other kidney & urinary tract diagnoses (698, 699, 700)	377	1.7
17.	Major gastrointestinal disorders & peritoneal infections (371, 372, 373)	362	1.7
18.	Other digestive system diagnoses (393, 394, 395)	361	1.7
19.	Esophagitis, gastroent & misc digest disorders (391, 392)	316	1.5
20.	Red blood cell disorders (811, 812)	316	1.5
	Total Readmissions	**14,707**	**67.8**

SOURCE: RTI analysis of Medicare claims data, 2013 (program reference: jc07_ltc_2013_r_MSDRG_Group.xlsx)

Table 4A
Top 20 CCS Codes Associated with Hospital Readmissions—HH, 2013

CCS Code for Primary Diagnosis		# of Unplanned Readmissions	% of Unplanned Readmissions
1.	Code 108: Congestive heart failure; nonhypertensive	8,577	9.4
2.	Code 2: Septicemia (except in labor)	7,250	7.9
3.	Code 122: Pneumonia (except that caused by tuberculosis or sexually transmitted disease)	4,476	4.9
4.	Code 127: Chronic obstructive pulmonary disease and bronchiectasis	4,246	4.6
5.	Code 237: Complication of device; implant or graft	3,728	4.1
6.	Code 159: Urinary tract infections	3,268	3.6
7.	Code 157: Acute and unspecified renal failure	3,120	3.4
8.	Code 131: Respiratory failure; insufficiency; arrest (adult)	2,748	3.0
9.	Code 106: Cardiac dysrhythmias	2,459	2.7
10.	Code 109: Acute cerebrovascular disease	2,157	2.4
11.	Code 55: Fluid and electrolyte disorders	2,084	2.3
12.	Code 197: Skin and subcutaneous tissue infections	1,909	2.1
13.	Code 238: Complications of surgical procedures or medical care	1,897	2.1
14.	Code 100: Acute myocardial infarction	1,827	2.0
15.	Code 153: Gastrointestinal hemorrhage	1,716	1.9
16.	Code 226: Fracture of neck of femur (hip)	1,655	1.8
17.	Code 99: Hypertension with complications and secondary hypertension	1,464	1.6
18.	Code 50: Diabetes mellitus with complications	1,438	1.6
19.	Code 135: Intestinal infection	1,310	1.4
20.	Code 145: Intestinal obstruction without hernia	1,294	1.4
	Total Readmissions	**58,623**	**64.2**

SOURCE: Acumen analysis of Medicare claims data, 2013.

Table 4B
Top 20 DRGs Associated with Hospital Readmissions—HH, 2013

DRG Family (MS-DRGs)		# of Unplanned Readmissions	% of Unplanned Readmissions
1.	Heart failure & shock (291, 292, 293)	8,392	9.2
2.	Septicemia w/o MV 96+ hours (871, 872)	6,069	6.6
3.	Chronic obstructive pulmonary disease (190, 191, 192)	4,651	5.1
4.	Simple pneumonia & pleurisy (193, 194, 195)	3,758	4.1
5.	Renal failure (682, 683, 684)	3,457	3.8
6.	Kidney & urinary tract infections (689, 690)	3,080	3.4
7.	Cardiac arrhythmia & conduction disorders (308, 309, 310)	2,406	2.6
8.	Esophagitis, gastroent & misc digest disorders (391, 392)	2,396	2.6
9.	G.I. hemorrhage (377, 378, 379)	2,366	2.6
10.	Nutritional & misc metabolic disorders (640, 641)	2,248	2.5
11.	Intracranial hemorrhage or cerebral infarction (064, 065, 066)	1,812	2.0
12.	Cellulitis (602, 603)	1,733	1.9
13.	Pulmonary edema & respiratory failure (189)	1,731	1.9
14.	Respiratory infections & inflammations (177, 178, 179)	1,575	1.7
15.	Undefined	1,372	1.5
16.	Red blood cell disorders (811, 812)	1,276	1.4
17.	Acute myocardial infarction, discharged alive (280, 281)	1,194	1.3
18.	Hip & femur procedures except major joint (480, 481, 482)	1,150	1.3
19.	Other circulatory system diagnoses (314, 315, 316)	1,134	1.2
20.	Major gastrointestinal disorders & peritoneal infections (371, 372, 373)	1,122	1.2
	Total Readmissions	**52,922**	**57.9**

SOURCE: Acumen analysis of Medicare claims data, 2013.

APPENDIX B
SUMMARY OF TECHNICAL EXPERT PANEL WORKSHEET RATINGS FOR INCLUSION OF CONDITIONS IN THE PPR DEFINITION

Abt and RTI developed a worksheet for TEP members, to obtain their ratings of the importance of including each proposed condition in the list of conditions associated with potentially preventable readmissions (1 = strongly disagree; 2 = disagree; 3 = neither agree nor disagree; 4 = agree; 5 = strongly agree). Summary statistics for TEP members' rating of each proposed PPR condition are presented below. In addition to the conditions proposed in the worksheet, TEP members wrote-in other conditions for which they thought readmissions should be considered potentially preventable. Summaries of the TEP's discussion of these other conditions, are presented in ***Section 3.5.6*** of the main TEP report. Note: All TEP members returned their worksheets with their ratings; however, not all TEP members provided ratings for all conditions, as reflected in the columns labeled "N" summarizing the number.

TEP Ratings for Chronic Conditions

	Within Stay (IRF & LTCH)					Post PAC Discharge					30 Days Post Hospital Discharge (SNF)				
Condition	N	Mean	Min	Max	Mode	N	Mean	Min	Max	Mode	N	Mean	Min	Max	Mode
Adult asthma	17	4.4	3	5	5	26	3.8	1	5	4	12	3.7	1	5	5
Angina without procedure	6	1.7	0	4	1	9	1.8	0	4	1	5	1.2	0	3	1
COPD	17	4.6	3	5	5	26	4.1	2	5	5	12	4.7	4	5	5
CHF	17	4.7	3	5	5	26	4.7	4	5	5	14	4.8	4	5	5
Diabetes long-term complication	8	1.4	0	5	1	10	1	0	2	1	5	0.8	0	1	1
Diabetes short-term complication	17	4.7	3	5	5	26	4.3	1	5	5	12	4.5	3	5	5
Uncontrolled diabetes	12	3.5	0	5	5	17	2.6	0	5	4	8	2.8	0	5	5
Hypertension	15	4.3	1	5	5	25	3.3	1	5	3	12	4.3	3	5	5
Lower extremity amputation among patients with diabetes	7	1.6	0	3	1	11	1.7	0	4	1	5	1.2	0	2	2

TEP Ratings for Infections

	Within Stay (IRF & LTCH)					Post PAC Discharge					30 Days Post Hospital Discharge (SNF)				
Bacterial pneumonia	16	4.3	3	5	5	22	2.8	0	5	4	12	3.9	3	5	4
UTI	15	3.9	1	5	5	22	2.7	0	5	4	11	3.2	1	5	5
C. diff infection	16	4.1	1	5	4	22	3.1	1	5	3	12	4.3	4	5	4
Septicemia	17	4.3	3	5	4	19	2.5	0	5	4	12	3.2	0	5	3
Skin and subcutaneous tissue infection	17	4.2	3	5	5	23	2.7	0	5	4	12	4.3	3	5	5
Kidney infection	14	3.4	1	5	4	21	2.5	0	4	4	9	3.4	1	4	4

TEP Ratings for Other Unplanned Events

	Within Stay (IRF & LTCH)					Post PAC Discharge					30 Days Post Hospital Discharge (SNF)				
Dehydration	16	4.5	1	5	5	26	3.7	1	5	4	12	4	1	5	4
Aspiration pneumonitis; food/vomitus	16	4.4	2	5	5	25	3.3	0	5	4	12	3.8	2	5	5
Fluid and electrolyte disorders	16	4.4	3	5	5	24	3.6	1	5	4	12	4.2	3	5	4
Anticoagulant complications	16	4.5	2	5	5	24	4.4	1	5	5	12	4.4	2	5	5
Acute delirium	7	2.9	1	5	4	12	1.4	0	4	1	6	2.8	1	5	1
Acute renal failure	16	3.9	2	5	4	21	3	0	4	3	13	3.6	2	5	4
Adverse drug events	16	4.3	1	5	5	23	3.8	1	5	5	12	3.8	2	5	5
Arrhythmia	16	4.2	2	5	5	24	3.7	1	5	5	11	3.5	1	5	5

TEP Ratings for Inadequate Prophylaxis

	Within Stay (IRF & LTCH)					Post PAC Discharge					30 Days Post Hospital Discharge (SNF)				
Deficiency and other anemia	7	1.7	1	3	1	10	1.5	0	4	1	6	2	1	5	1
Gastrointestinal hemorrhage	8	1.8	1	4	1	15	1.9	0	4	2	6	1.9	0	4	1
Intestinal impaction	16	4.8	4	5	5	26	4.5	3	5	5	12	4.6	4	5	5
Pressure ulcer	16	4.8	4	5	5	26	4.1	1	5	5	12	4.4	2	5	5
Deep vein thrombosis/ pulmonary embolism	12	4.3	4	5	4	9	1.2	0	3	1	6	4.2	4	5	4

TEP Ratings for Injury Prevention

	Within Stay (IRF & LTCH)					Post PAC Discharge					30 Days Post Hospital Discharge (SNF)				
Fracture of neck of femur (hip)	16	3.3	1	5	4	23	2.7	1	5	1	12	3.3	1	5	4

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APPENDIX C
TECHNICAL EXPERT PANEL WORKGROUP MEETING MATERIALS

1. **TEP Workgroup Meeting Agenda (Appendix C-1)**

2. **Proposed Post-PAC Discharge Potentially Preventable Readmission Conditions (Appendix C-2)**

3. **Proposed Within-PAC Stay Potentially Preventable Readmission Conditions (Appendix C-3)**

4. **Workgroup Meeting Slides (Appendix C-4)**

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APPENDIX C-1
TEP WORKGROUP MEETING AGENDA

Agenda

Technical Expert Panel (TEP) Workgroup Meeting
Development of Potentially Preventable Readmission (PPR) Measures for Post-Acute Care

Location: AT&T Webinar (please read connection instructions on page 2)
Date: October 14th, 2015
Time: 1-3pm EST

Update on PPR Measure Development	▪ Summary of August TEP ▪ Objectives of the TEP Workgroup Meeting
PPR Definition	▪ RTI to present document with final PPR conditions and codes for TEP feedback ▪ RTI & Abt to provide results on additional analyses conducted by PAC provider type
PPR Measure Development: *Home Health (HH)*	▪ Overview of measure specifications ▪ Inclusion & exclusion criteria
PPR Measure Development: *Skilled Nursing Facilities (SNF)*	▪ Overview of measure specifications – Readmission windows (30-days post-SNF discharge; 30-days post-hospital discharge) – Inclusion & exclusion criteria
PPR Measure Development: *Inpatient Rehabilitation Facilities (IRF) & Long-Term Care Hospitals (LTCH)*	▪ Overview of measure specifications – Readmission windows (30-days post-PAC discharge; IRF within stay) – Inclusion & exclusion criteria
Risk Adjustment Discussion	
Wrap-Up	▪ Next steps ▪ Timeline ▪ TEP summary report input

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APPENDIX C-2
PROPOSED POST-PAC DISCHARGE POTENTIALLY PREVENTABLE READMISSION CONDITIONS

RTI's Proposed List of Conditions for Defining Potentially Preventable Hospital Readmissions among Post-Acute Care with ICD-9 Codes[1] (Revised post-August TEP)

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	492.02	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)

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)

Conditions	Diagnosis	ICD-9-CM	30 day post-PAC discharge	Clinical Rationale
Diabetes short-term complication* (continued)	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	

(continued)

Conditions	Diagnosis	ICD-9-CM	30 day post-PAC discharge	Clinical Rationale
Influenza	Influenza	487.X	X	Inadequate management of infection
	Influenza due to identified avian influenza virus	488.X	X	
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	
	Urethr strict:infect NOS	598.00	X	
	Ureth strict:oth infect	598.01	X	
	*Urin tract infection NOS	599.0	X	
	Acute prostatitis	601.0	X	
	Chronic prostatitis	601.1	X	
	Abscess of prostate	601.2	X	
	Prostatocystitis	601.3	X	
	Prostatitis in oth dis	601.4	X	
	Prostatic inflam dis NEC	601.8	X	
	Prostatitis NOS	601.9	X	

(continued)

Conditions	Diagnosis	ICD-9-CM	30 day post-PAC discharge	Clinical Rationale
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	
	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	
	Septicemia [sepsis] of newborn	771.81	X	
	Sepsis	995.91	X	
	Severe sepsis	995.92	X	

(continued)

Conditions	Diagnosis	ICD-9-CM	30 day post-PAC discharge	Clinical Rationale
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	
	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]	*Hypovolemia	276.5	X	Inadequate management of other unplanned events
	Hypopotassemia	276.8	X	
	**Hyperosmolality and/or hypernatremia	276.0	X	
	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	

(continued)

Conditions	Diagnosis	ICD-9-CM	30 day post-PAC discharge	Clinical Rationale
Dehydration*/ Electrolyte imbalance [55] (continued)	*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	
	**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	585.8	X	
	*Acute kidney failure, unspecified	584.9	X	
	*Renal Failure NOS	586	X	
	*Surg Compl-Urinary Tract	997.5	X	

(continued)

Conditions	Diagnosis	ICD-9-CM	30 day post-PAC discharge	Clinical Rationale
Adverse drug events	Poisoning by antibiotics	960	X	Inadequate management of other unplanned events
	Poisoning by other anti-infectives	961	X	
	Poisoning by hormones and synthetic substitutes	962	X	
	Poisoning by primarily systemic agents	963	X	
	Poisoning by agents primarily affecting blood constituents	964	X	
	Poisoning by analgesics antipyretics and antiheumatics	965	X	
	Poisoning by anticonvulsants and anti-parkinsonism drugs	966	X	
	Poisoning by sedatives and hypnotics	967	X	
	Poisoning by other central nervous system depressants and anesthetics	968	X	
	Poisoning by psychotropic agents	969	X	
	Poisoning by central nervous system stimulants	970	X	
	Poisoning by drugs primarily affecting the autonomic nervous system	971	X	
	Poisoning by affecting the cardiovascular system	972	X	
	Poisoning by affecting the gastrointestinal system	973	X	
	Poisoning by water mineral and uric acid metabolism drugs	974	X	
	Poisoning by agents primarily acting on the smooth and skeletal muscles respiratory system	975	X	
	Poisoning by agents primarily affecting skin and mucous membrane ophthalmological otorhinolaryngological and dental drugs	976	X	

(continued)

Conditions	Diagnosis	ICD-9-CM	30 day post-PAC discharge	Clinical Rationale
Adverse drug events (continued)	Poisoning by other and unspecified drugs and medicinal substances	977	X	
	Poisoning by bacterial vaccines	978	X	
	Poisoning by other vaccines and biological substances	979	X	
Arrhythmia	Atrial fibrillation and flutter	427.30	X	Inadequate management of other unplanned events
	Atrial fibrillation	427.31	X	
	Atrial flutter	427.32	X	
Intestinal impaction [145 subset]	Impaction of intestine, unspecified	560.30	X	Inadequate prophylaxis
	Gallstone ileus	560.31	X	
	Fecal impaction	560.32	X	
	Other impaction of intestine	560.39	X	
Pressure ulcers	Chronic ulcer of skin	707.xx	X	Inadequate prophylaxis

[1] Does not take into account any exclusions of diagnoses/ICD-9-CM code for any condition listed.

SOURCE: Proposed list of potentially preventable readmission conditions from RTI International with ICD-9-CM (version: 10/07/2015).

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

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

** Primary diagnosis with dehydration as secondary diagnosis

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APPENDIX C-3
PROPOSED WITHIN-PAC STAY POTENTIALLY PREVENTABLE READMISSION CONDITIONS

RTI's Proposed List of Conditions for Defining Potentially Preventable Hospital Readmissions among Post-Acute Care with ICD 9 Codes[1]

Conditions	Diagnosis	ICD-9-CM	Within Stay	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	492.02	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)

Conditions	Diagnosis	ICD-9-CM	Within Stay	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	
	Diabetes with other specified manifestations (hypoglycemia)	250.8X	X	
	*DM Keto T2, DM Cont	250.10	X	

(continued)

Conditions	Diagnosis	ICD-9-CM	Within Stay	Clinical Rationale
Diabetes short-term complication* (continued)	*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	
	Iatrogenc hypotnsion 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	
Bacterial pneumonia*	*Pneumococcal Pneumonia	481	X	Inadequate management of infection
	*H.Influenzae Pneumonia	482.2	X	

(continued)

Conditions	Diagnosis	ICD-9-CM	Within Stay	Clinical Rationale
Bacterial pneumonia* (continued)	*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	
	Chr interstit cystitis	595.1	X	
	Chronic cystitis NEC	595.2	X	
	Cystitis in oth dis	595.4	X	
	Cystitis NEC	595.89	X	
	*Cystitis NOS	595.9	X	
	Urethral abscess	597.0	X	
	Urethr strict:infect NOS	598.00	X	
	Ureth strict:oth infect	598.01	X	
	*Urin tract infection NOS	599.0	X	
	Acute prostatitis	601.0	X	
	Chronic prostatitis	601.1	X	
	Abscess of prostate	601.2	X	
	Prostatocystitis	601.3	X	
	Prostatitis in oth dis	601.4	X	

(continued)

Conditions	Diagnosis	ICD-9-CM	Within Stay	Clinical Rationale
Urinary tract infection*/ Kidney infection (continued)	Prostatic inflam dis NEC	601.8	X	
	Prostatitis NOS	601.9	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	
	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	

(continued)

Conditions	Diagnosis	ICD-9-CM	Within Stay	Clinical Rationale
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	
	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]	*Hypovolemia	276.5	X	Inadequate management of other unplanned events
	Hypopotassemia	276.8	X	
	**Hyperosmolality and/or hypernatremia	276.0	X	
	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	

(continued)

Conditions	Diagnosis	ICD-9-CM	Within Stay	Clinical Rationale
Dehydration*/ Electrolyte imbalance [55] (continued)	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	
	**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
Anticoagulant complications	Phlebitis and thrombophlebitis	451.X	X	Inadequate management of other unplanned events
	Acute cor pulmonale	415.0	X	
	Pulmonary embolism and infarction	415.1X	X	
	Other venous embolism and thrombosis	453.X	X	
Acute delirium	Delusional disorders	297.X	X	
	Other nonorganic psychoses	298.X	X	

(continued)

Conditions	Diagnosis	ICD-9-CM	Within Stay	Clinical Rationale
Acute delirium (continued)	Senile Dementia with delirium	290.3	X	Inadequate management of other unplanned events
	Vascular dementia, with delirium	290.41	X	
	Other specified senile psychotic condition	290.8	X	
	Delirium due to conditions classified elsewhere	293.0	X	
	Subacute delirium	293.1	X	
Acute renal failure (* with Dehydration)	*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	585.8	X	
	*Acute kidney failure, unspecified	584.9	X	
	*Renal Failure NOS	586	X	
	*Surg Compl-Urinary Tract	997.5	X	
Adverse drug events	Poisoning by antibiotics	960	X	Inadequate management of other unplanned events
	Poisoning by other anti-infectives	961	X	
	Poisoning by hormones and synthetic substitutes	962	X	
	Poisoning by primarily systemic agents	963	X	
	Poisoning by agents primarily affecting blood constituents	964	X	
	Poisoning by analgesics antipyretics and antiheumatics	965	X	
	Poisoning by anticonvulsants and anti-parkinsonism drugs	966	X	
	Poisoning by sedatives and hypnotics	967	X	
	Poisoning by other central nervous system depressants and anesthetics	968	X	
	Poisoning by psychotropic agents	969	X	

(continued)

Conditions	Diagnosis	ICD-9-CM	Within Stay	Clinical Rationale
Adverse drug events (continued)	Poisoning by central nervous system stimulants	970	X	
	Poisoning by drugs primarily affecting the autonomic nervous system	971	X	
	Poisoning by affecting the cardiovascular system	972	X	
	Poisoning by affecting the gastrointestinal system	973	X	
	Poisoning by water mineral and uric acid metabolism drugs	974	X	
	Poisoning by agents primarily acting on the smooth and skeletal muscles respiratory system	975	X	
	Poisoning by agents primarily affecting skin and mucous membrane ophthalmological otorhinolaryngological and dental drugs	976	X	
	Poisoning by other and unspecified drugs and medicinal substances	977	X	
	Poisoning by bacterial vaccines	978	X	
	Poisoning by other vaccines and biological substances	979	X	
Arrhythmia	Atrial fibrillation and flutter	427.30	X	Inadequate management of other unplanned events
	Atrial fibrillation	427.31	X	
	Atrial flutter	427.32	X	
Deficiency and other anemia [59]	Other vitamin B12 deficiency anemia	281.1	X	Inadequate prophylaxis
	Folate-deficiency anemia	281.2	X	
	Protein-deficiency anemia	281.4	X	
	Iron deficiency anemias	280	X	
Intestinal impaction	Impaction of intestine, unspecified	560.30	X	Inadequate prophylaxis
	Gallstone ileus	560.31	X	
	Fecal impaction	560.32	X	
	Other impaction of intestine	560.39	X	
Pressure ulcers	Chronic ulcer of skin	707.X	X	Inadequate prophylaxis

(continued)

Conditions	Diagnosis	ICD-9-CM	Within Stay	Clinical Rationale
Deep vein thrombosis/ Pulmonary embolism	Other venous embolism and thrombosis of inferior vena cava	453.2	X	Inadequate prophylaxis
	Acute venous embolism and thrombosis of deep vessels of lower extremity	453.4	X	
	Acute venous embolism and thrombosis of unspecified deep vessels of lower extremity	453.40	X	
	Acute venous embolism and thrombosis of deep vessels of proximal lower extremity	453.41	X	
	Acute venous embolism and thrombosis of deep vessels of distal lower extremity	453.42	X	
	Acute venous embolism and thrombosis of deep veins of upper extremity	453.82	X	
	Acute venous embolism and thrombosis of upper extremity, unspecified	453.83	X	
	Acute venous embolism and thrombosis of axillary veins	453.84	X	
	Acute venous embolism and thrombosis of other specified veins	453.89	X	
	Other venous embolism and thrombosis of unspecified site	453.9	X	
	Other pulmonary embolism and infarction	415.19	X	
Head injury	Concussion with no loss of consciousness	850.0	X	Inadequate injury prevention
	Concussion, with loss of consciousness of 30 minutes or less	850.11	X	
	Concussion, with loss of consciousness from 31 to 59 minutes	850.12	X	
	Concussion with moderate loss of consciousness	850.2	X	
	Concussion with prolonged loss of consciousness and return to pre-existing conscious level	850.3	X	

(continued)

Conditions	Diagnosis	ICD-9-CM	Within Stay	Clinical Rationale
Head injury (continued)	Concussion with prolonged loss of consciousness, without return to pre-existing conscious level	850.4	X	
	Concussion with loss of consciousness of unspecified duration	850.5	X	
	Concussion, unspecified	850.9	X	
	Cortex (cerebral) contusion without mention of open intracranial wound	851.0X (X=0,1,2,3,4, 5,6,9)	X	
	Cortex (cerebral) contusion with open intracranial wound	851.1X (X=0,1,2,3,4, 5,6,9)	X	
	Cortex (cerebral) laceration without mention of open intracranial wound	851.2X (X=0,1,2,3,4, 5,6,9)	X	
	Cortex (cerebral) laceration with open intracranial wound	851.3X (X=0,1,2,3,4, 5,6,9)	X	
	Cerebellar or brain stem contusion without mention of open intracranial wound	851.4X (X=0,1,2,3,4, 5,6,9)	X	
	Cerebellar or brain stem contusion with open intracranial wound	851.5X (X=0,1,2,3,4,5 ,6,9)	X	
	Cerebellar or brain stem laceration without mention of open intracranial wound	851.6X (X=0,1,2,3,4, 5,6,9)	X	
	Cerebellar or brain stem laceration with open intracranial wound	851.7X (X=0,1,2,3,4, 5,6,9)	X	
	Other and unspecified cerebral laceration and contusion without mention of open intracranial wound	851.8X (X=0,1,2,3,4, 5,6,9)	X	
	Other and unspecified cerebral laceration and contusion with open intracranial wound	851.9X (X=0,1,2,3,4, 5,6,9)	X	
	Subarachnoid hemorrhage following injury without mention of open intracranial wound	852.0X (X=0,1,2,3,4, 5,6,9)	X	
	Subarachnoid hemorrhage following injury with open intracranial wound	852.1X (X=0,1,2,3,4, 5,6,9)	X	

(continued)

Conditions	Diagnosis	ICD-9-CM	Within Stay	Clinical Rationale
Head injury (continued)	Subdural hemorrhage following injury without mention of open intracranial wound	852.2X (X=0,1,2,3,4, 5,6,9)	X	
	Subdural hemorrhage following injury with open intracranial wound	852.3X (X=0,1,2,3,4, 5,6,9)	X	
	Extradural hemorrhage following injury without mention of open intracranial wound	852.4X (X=0,1,2,3,4, 5,6,9)	X	
	Extradural hemorrhage following injury with open intracranial wound	852.5X (X=0,1,2,3,4, 5,6,9)	X	
	Other and unspecified intracranial hemorrhage following injury without mention of open intracranial wound	853.0X (X=0,1,2,3,4, 5,6,9)	X	
	Other and unspecified intracranial hemorrhage following injury with open intracranial wound	853.1X (X=0,1,2,3,4, 5,6,9)	X	
	Intracranial injury of other and unspecified nature without mention of open intracranial wound	854.0X (X=0,1,2,3,4, 5,6,9)	X	
	Intracranial injury of other and unspecified nature with open intracranial wound	854.1X (X=0,1,2,3,4, 5,6,9)	X	
Upper extremity fracture	Closed fracture of clavicle	810.0X (X=0,1,2,3)	X	Inadequate injury prevention
	Open fracture of clavicle	810.1X (X=0,1,2,3)	X	
	Closed fracture of scapula	811.0X (X=0,1,2,3,9)	X	
	Open fracture of scapula	811.1X (X=0,1,2,3,9)	X	
	Fracture of upper end of humerus closed	812.0X (X=0,1,2,3,9)	X	
	Fracture of upper end of humerus open	812.1X (X=0,1,2,3,9)	X	
	Closed fracture of shaft or unspecified part of humerus	812.2X (X=0,1)	X	
	Fracture of shaft or unspecified part of humerus open	812.3X (X=0,1)	X	

(continued)

Conditions	Diagnosis	ICD-9-CM	Within Stay	Clinical Rationale
Upper extremity fracture (continued)	Fracture of lower end of humerus closed	812.4X (X=0,1,2,3,4, 9)	X	
	Fracture of lower end of humerus open	812.5X (X=0,1,2,3,4, 9)	X	
	Fracture of upper end of radius and ulna closed	813.0X (X=0,1,2,3,4, 5,6,7,8)	X	
	Fracture of upper end of radius and ulna open	813.1X (X=0,1,2,3,4, 5,6,7,8)	X	
	Fracture of shaft of radius and ulna closed	813.2X (X=0,1,2,3)	X	
	Fracture of shaft of radius and ulna open	813.3X (X=0,1,2,3)	X	
	Fracture of lower end of radius and ulna closed	813.4X (X=0,1,2,3,4, 5,6,7)	X	
	Fracture of lower end of radius and ulna open	813.5X (X=0,1,2,3,4)	X	
	Fracture of unspecified part of radius with ulna closed	813.8X (X=0,1,2,3)	X	
	Fracture of unspecified part of radius with ulna open	813.9X (X=0,1,2,3)	X	
	Closed fractures of carpal bones	814.0X (X=0,1,2,3,4, 5,6,7,8,9)	X	
	Open fractures of carpal bones	814.1X (X=0,1,2,3,4, 5,6,7,8,9)	X	
	Closed fracture of metacarpal bones	815.0X (X=0,1,2,3,4, 9)	X	
	Open fracture of metacarpal bones	815.1X (X=0,1,2,3,4, 9)	X	
	Closed fracture of one or more phalanges of hand	816.0X (X=0,1,2,3)	X	
	Open fracture of one or more phalanges of hand	816.1X (X=0,1,2,3)	X	
	Multiple closed fractures of hand bones	817.0	X	

(continued)

Conditions	Diagnosis	ICD-9-CM	Within Stay	Clinical Rationale
Upper extremity fracture (continued)	Multiple open fractures of hand bones	817.1	X	
	Ill-defined closed fractures of upper limb	818.0	X	
	Ill-defined open fractures of upper limb	818.1	X	
	Multiple closed fractures involving both upper limbs, and upper limb with rib(s) and sternum	819.0	X	
	Multiple open fractures involving both upper limbs, and upper limb with rib(s) and sternum	819.1	X	
Lower extremity fracture	Transcervical fracture closed	820.0X (X=0,1,2,3,9)	X	Inadequate injury prevention
	Transcervical fracture open	820.1X (X=0,1,2,3,9)	X	
	Pertrochanteric fracture of femur closed	820.2X (X=0,1,2)	X	
	Pertrochanteric fracture of femur open	820.3X (X=0,1,2)	X	
	Closed fracture of unspecified part of neck of femur	820.8	X	
	Open fracture of unspecified part of neck of femur	820.9	X	
	Fracture of shaft or unspecified part of femur closed	821.0X (X=0,1)	X	
	Fracture of shaft or unspecified part of femur open	821.1X (X-0,1)	X	
	Fracture of lower end of femur closed	821.2X (X=0,1,2,3,9)	X	
	Fracture of lower end of femur open	821.3X (X=0,1,2,3,9)	X	
	Closed fracture of patella	822.0	X	
	Open fracture of patella	822.1	X	
	Fracture of upper end of tibia and fibula closed	823.0X (X=0,1,2)	X	
	Fracture of upper end of tibia and fibula open	823.1X (X=0,1,2)	X	
	Fracture of shaft of tibia and fibula open	823.3X (X=0,1,2)	X	
	Fracture of tibia and fibula, torus fracture	823.4X (X=0,1,2)	X	

(continued)

Conditions	Diagnosis	ICD-9-CM	Within Stay	Clinical Rationale
Lower extremity fracture (continued)	Fracture of unspecified part of tibia and fibula closed	823.8X (X=0,1,2)	X	
	Fracture of unspecified part of tibia and fibula open	823.9X (X=0,1,2)	X	
	Fracture of ankle	824.X (X=0,1,2,3,4, 5,6,7,8,9)	X	
	Fracture of calcaneus, closed	825.0	X	
	Fracture of calcaneus, open	825.1	X	
	Fracture of other tarsal and metatarsal bones closed	825.2X (X=0,1,2,3,4, 5,9)	X	
	Fracture of other tarsal and metatarsal bones open	825.3X (X=0,1,2,3,4, 5,9)	X	
	Closed fracture of one or more phalanges of foot	826.0	X	
	Open fracture of one or more phalanges of foot	826.1	X	
	Other, multiple and ill-defined fractures of lower limb, closed	827.0	X	
	Other, multiple and ill-defined fractures of lower limb, open	827.1	X	
	Closed multiple fractures involving both lower limbs, lower with upper limb, and lower limb(s) with rib(s) and sternum	828.0	X	
	Open multiple fractures involving both lower limbs, lower with upper limb, and lower limb(s) with rib(s) and sternum	828.1	X	
	Fracture of unspecified bone, closed	829.0	X	
	Fracture of unspecified bone, open	829.1	X	

[1] Does not take into account any exclusions of diagnoses/ICD-9-CM code for any condition listed.

SOURCE: Proposed list of potentially preventable readmission conditions from RTI International with ICD-9-CM (version: 10/12/2015).

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

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

** Primary diagnosis with dehydration as secondary diagnosis

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APPENDIX C-4
WORKGROUP MEETING SLIDES

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Development of Potentially Preventable Hospital Readmission Measures for Post-Acute Care

Technical Expert Panel
Follow Up Workgroup Meeting

October 14, 2015

RTI International & Abt Associates

CMS Contract No. HHSM-500-2013-13015I Development and Maintenance of Symptom Management Measures & HHSM-500-2013-13001I Outcome and Assessment Information Set Quality Measure Development and Maintenance

Potentially Preventable Readmissions TEP Follow Up Meeting

- Welcome & Introductions
- Reminders:
  - Before speaking, please announce your name.
  - Please mute your phone line when you are not speaking.
  - Please do not put your phone on hold.
- Note:
  - This meeting will be audio recorded. The recording will be used to summarize the meeting proceedings.
  - TEP proceedings open to the public—this meeting is listen only mode.

Welcome and Introductions

CMS:
- Joel Andress
- Charlayne Van
- Michelle Brazil
- Charles Padgett
- Alan Levitt
- Tara McMullen
- Theresa White
- Sofia Martinez

RTI International:
- Laurie Coots
- Mel Ingber
- Chris Beadles
- Maryann Nguyen
- Natalie Chong
- Anne Deutsch
- Shivaani Prakash
- Dan Barch
- Jessica Carichner
- Allison Briggs
- Karen Reilly, Project Director
- Laura Smith, Associate Project Director

Abt Associates:
- Sara Galantowicz (Abt)
- Alrick Edwards (Abt)
- Betty Fout (Abt)
- Marian Essey (OASIS Answers)
- Linda Krulish (OASIS Answers)
- Angela Richard (University of Colorado)
- Stephen McKean (Acumen)
- Wesley Heeter (Acumen)

Welcome and Introductions

TEP Chair:

- Terrence A. O'Malley, MD – *Massachusetts General Hospital, Partners HealthCare System, Inc.*

TEP Members:

- Terrie Black, DNP, MBA, RN, CRRN, FAHA – *Association of Rehabilitation Nurses; University of Massachusetts Amherst; The Joint Commission*
- Peter Boling, MD – *Virginia Commonwealth University*
- Rebecca Boxer, MD, MS – *University of Colorado*
- Mary Carr, RN, MPH – *National Association for Home Care & Hospice*
- David Gifford, MD, MPH – *American Health Care Association*
- Mary Ellen Hatch, MSN, RN, CRRN – *HealthSouth Corporation*
- Warren Hebert, DNP, RN, CAE – *Home Care Association of Louisiana*

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Welcome and Introductions

TEP Members (continued):

- Atul Kamath, MD – *University of Pennsylvania; Pennsylvania Hospital*
- Marjorie King, MD, FACC, MAACVPR – *Helen Hayes Hospital, New York-Presbyterian Hospital Network*
- Ronald (Bud) Langham, PT, MBA, COS-C – *Encompass Home Health*
- Barbara McCann, MA – *Interim HealthCare Inc.*
- Dana B. Mukamel, PhD –*University of California Irvine*
- Arif Nazir, MD, FACP, CMD – *Indiana University School of Medicine*
- Kenneth Ottenbacher, PhD, OTR – *University of Texas Medical Branch*
- Jane Pederson, MD – *Stratis Health; University of Minnesota, School of Public Health*
- Charles Pu, MD, CMD, FACP – *Partners Healthcare System*

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Welcome and Introductions

TEP Members (continued):

- Carol Siem, MSN, RN, BC, GNP – *University of Missouri, Sinclair School of Nursing*
- Burton Silverstein, PhD – *HCR Manor Care*
- Gloria Skinner, MSN, RN, SVP – *Select Medical*
- Patricia Stimac, DHA, MS, RD, LDN, NHA – *Spartanburg Hospital for Restorative Care*
- Carolyn Svehla, RN, BSN, MA, CPRM – *RML Specialty Hospital*
- Linda Valentino, MSN, RN – *Visiting Nurse Service of New York*
- Mary Van de Kamp, MS, CCC-SLP – *RehabCare and Kindred Rehabilitation Services*
- Rachel Werner, MD, PhD – *University of Pennsylvania*
- Gregory Worsowicz, MD, MBA – *University of Missouri*

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Update on PPR Measure Development

- Summary of the August TEP meeting
  - Presented background, existing readmission measure specifications (all-cause), results of environmental scan, and descriptive analyses
  - Received feedback on RTI's PPR definition, including setting-specific and readmission window considerations
  - Obtained feedback on other aspects of the measure specifications, including risk adjustment

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Update on PPR Measure Development

- Progress since August TEP meeting
  - Compiled feedback on PPR definitions and revised based on TEP feedback
  - Conducted additional analyses
  - Continued developing measure specifications
  - Began planning for upcoming public comment period (November)
  - Preparing TEP summary report (will seek TEP review)

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Objectives of the TEP Workgroup Meeting

- Provide update on PPR measure development
- Present revised PPR definitions
  - Summarize results of additional analyses conducted to inform definitions
- Present PPR measure specifications by PAC type, including
  - Readmission windows
  - Inclusion and exclusion criteria
- Present risk adjustment approach, including future plans
- Detail next steps

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Overview of PPR Measures under Development

- Potentially Preventable 30-Day Post-Discharge Readmission Measure for Home Health Agencies (IMPACT)
- Potentially Preventable 30-Day Post-Discharge Readmission Measure for Skilled Nursing Facilities (IMPACT)
- Skilled Nursing Facility 30-Day Potentially Preventable Readmission Measure (SNFPPR) (PAMA)
- Potentially Preventable 30-Day Post-Discharge Readmission Measure for Inpatient Rehabilitation Facilities (IMPACT)
- Potentially Preventable Within-Stay Readmission Measure for Inpatient Rehabilitation Facilities
- Potentially Preventable 30-Day Post-Discharge Readmission Measure for Long-Term Care Hospitals (IMPACT)

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Overview of Revised PPR Definitions

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Overview of Revised PPR Definitions

- Obtained feedback during meeting and via worksheets
- Made several revisions to the definitions based on this feedback (e.g., removing and adding conditions, looking at POA)
- Conducted additional analyses to inform the definition development
- See handout for summary of PPR definitions and ICD-9 coding
- Seeking all TEP feedback by **October 20th**

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Key Findings from Additional Analyses Conducted Since August TEP

- Assessed frequency of readmissions using PPR definitions
- Analyzed readmissions for infections to determine patterns during the 30 day readmission windows
- Other analytic work underway to support measure development

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Probability of Infection Readmission within 30 Days Post PAC Discharge

- Readmission data for patients with diagnoses in the *Inadequate Management of Infections* grouping in 2012/2013 were analyzed to determine:
  - The probability of readmission as a function of days from discharge
  - Potential differences in that function between different diagnoses within the group
- The eight infection categories examined were:
  - No infection diagnosis
  - Influenza
  - Bacterial pneumonia
  - Viral pneumonia
  - UTI/Kidney infections
  - C. difficile
  - Septicemia
  - Skin and subcutaneous tissue infections
- Kaplan-Meier survival curves were generated, indicating the probability of readmission on each day of the 30-day window for patients diagnosed with infections that were readmitted in that timeframe
- Results were fairly consistent among 30-day post discharge readmission window

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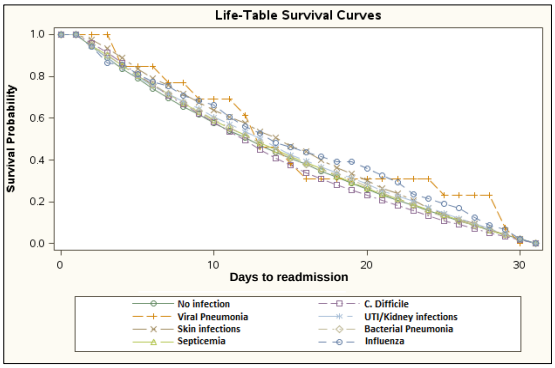
Probability of Readmission within 30 Days for Infection-IRF Example



- As indicated by decreasing survival probability, the probability of readmission increases consistently across the 30-day window for patients readmitted with infection diagnoses.
- Results were consistent for other PAC provider types.

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Measure Specifications: Numerator

Numerator:
The numerator is related to the subset of stays in the denominator, with an unplanned, ***potentially preventable*** acute or LTCH admission occurring during the readmission window.

Numerator Exclusions:
Patients who are readmitted with a planned hospital stay as defined by the Yale/CMS Planned Readmission Algorithm and modified to include additional ICD-9 procedure codes developed with input from prior TEP, clinical review and assistance from an ICD-9 coding consultant**.**

- **CMS Planned Readmission Algorithm (version 3.0) available at:** **https://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/HospitalQualityInits/Measure-Methodology.html**
- **Additional RTI-Added Planned Procedures for PAC available at:** *See Appendix Table B5* **https://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/NursingHomeQualityInits/Downloads/SNFRM-Technical-Report-3252015.pdf**

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Measure Specifications: Readmission Window

Observation Window:

Because transfers are defined as readmissions on the date of PAC discharge or one day after, the 30 day window for this measure runs for 30 days starting the ***second day*** following discharge from the PAC.

IRF Within-Stay Window: The within-stay measure defines readmissions as occurring on the day of discharge or transfer and the day after, and includes program interruptions.

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Data Sources

SNF:

- Medicare inpatient claims (MedPAR) and eligibility files
- Measure is based on admissions during calendar year
- Measure development based on CY 2013

IRF and LTCH:

- Medicare inpatient claims (SAF) and eligibility files
- To increase sample size for the model and the number of cases per facility, a rolling 2 years of data are combined.
- Measure development based on CY 2012-2013

HH:

- Medicare claims (CWF) and eligibility files
- To increase sample size for the model and the number of cases per home health agency, a rolling 3 years of data are combined.
- Measure development based on CY 2011-2013

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Overview of Measure Specifications

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Readmission Windows

PAC Readmission Windows for PPR Measure Development*

PAC	30-days post prior hospitalization† (PAMA)	Within-stay	30-days post PAC discharge (IMPACT)
HHA			X
IRF		X	X
LTCH		On Hold	X
SNF	X		X

* Note these are the initial readmission windows being considered. Additional windows may be considered in future measure development work.

† This window may span the PAC stay and post-PAC discharge period, depending on the patient's length of stay.

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Measure Specifications: Home Health

- **Revised specifications to align with 30 day post discharge window**
- **Measure excludes patients who…**
  - Were under 18 years old – **(0.0%)**
  - Are not continuously enrolled in Part A FFS Medicare for (1) the 12 months before the proximal hospital discharge (measured as enrollment during the month of prior hospital discharge and the 11 months before that month), and (2) for the entire risk period (measured as enrollment from the month of proximal hospital discharge through the month after the month of discharge). – **(10.5%)**
  - Died during the index PAC stay – **(1.5%)**
  - Had HH stays with data missing used for risk adjustment (payment authorization code) – **(0.2%)**

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Measure Specifications: Home Health

- **Measure excludes patients who…(continued)**
  - Were discharged from HH against medical advice (AMA) – **(0.5%)**
  - Were transferred at the end of a stay to another setting (IRF, short-term acute hospital, LTCH) – **(17.2%)**
  - Did not have a short-term acute care stay within 30 days prior to the HH stay admission date – **(55.7%)**
  - Had the following principal diagnoses in the prior proximal hospitalization: medical (nonsurgical) treatment of cancer; primary psychiatric diseases; rehabilitation care/fitting of prostheses and for the adjustment of devices – **(5.3%)**

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Measure Specifications: SNF 30 Days Following Hospital Discharge (PAMA)

- **Measure specifications align with all-cause measure (NQF #2510)**
- **Measure includes patients who…**
  - Were 18 years or older
  - Have been continuously enrolled in Part A FFS Medicare for **(1)** the 12 months before the proximal hospital discharge (measured as enrollment during the month of prior hospital discharge and the 11 months before that month), and **(2)** for the entire risk period (measured as enrollment during the month of proximal hospital discharge and the month after the month of discharge)
  - Had a short-term acute care stay within 1 day prior to a SNF stay admission date
  - Were followed for 30 days after the prior proximal hospital discharge date or the date of death if the patient died within 30 days after the prior proximal discharge date
  - Were located in the U.S., Puerto Rico or a U.S. territory

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Measure Specifications: SNF 30 Days Following Hospital Discharge (PAMA)

- **Measure excludes patients who…**
  - Had any intervening PAC admissions (IRF or LTCH) that occurred either between the prior proximal hospital discharge and SNF admission or after the SNF discharge within the 30-day risk window **(4.0%)**
  - Had multiple SNF admissions after the prior proximal hospitalization within the 30-day risk window **(5.0%)**
  - Were discharged against medical advice (AMA) **(0.4%)**
  - Were located outside of the United States or Puerto Rico [no % is available for this because these patients were excluded upon input in the SNFRM, not subjected to an exclusion flag after being part of the file]
  - Had the following principal diagnoses in the prior proximal hospitalization: medical (nonsurgical) treatment of cancer; rehabilitation care/fitting of prostheses and for the adjustment of devices; pregnancy **(1.4%)**
  - Had SNF stays with data missing on any covariate or variable used for risk adjustment **(0.0%)**

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Measure Specifications: 30 Days Post SNF Discharge (IMPACT)

- **Revised specifications to align with 30 day post discharge window**
- **Measure includes patients who…**
  - Were 18 years or older
  - Have been continuously enrolled in Part A FFS Medicare for the 12 months prior to the SNF admission date, and at least 30 days after SNF stay discharge date
  - Had a short-term acute care stay within 30 days prior to an SNF stay admission date
  - Were discharged from the SNF to the community or a less intense level of care
  - Were followed for 30 days after the SNF discharge date or the date of death if the patient died within 30 days after the SNF discharge date.
  - Were located in the U.S., Puerto Rico or a U.S. territory

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Measure Specifications: 30 Days Post SNF Discharge (IMPACT)

- **Measure excludes patients who…**
  - Were discharged dead from the SNF
  - Were transferred to a federal hospital, an acute care hospital or another SNF
  - Were discharged against medical advice (AMA)
  - Had the following principal diagnoses in the prior proximal hospitalization: medical (nonsurgical) treatment of cancer; pregnancy
  - Exhausted their Medicare SNF benefits
  - Had SNF stays with data missing on any covariate or variable used for risk adjustment or problematic data (e.g., anomalous records for hospital stays that overlap wholly or in part or are otherwise erroneous or contradictory)

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Measure Specifications: 30 Days Post IRF & LTCH Discharge (IMPACT)

- **Measure specifications align with all-cause IRF & LTCH measures (NQF #2502, 2512)**
- **Measure includes patients who…**
  - Were 18 years or older
  - Have been continuously enrolled in Part A FFS Medicare for the 12 months prior to the IRF/LTCH admission date, and at least 30 days after IRF/LTCH stay discharge date
  - Had a short-term acute care stay within 30 days prior to an IRF/LTCH stay admission date
  - Were discharged from the IRF/LTCH to the community or a less intense level of care
  - Were followed for 30 days after the IRF/LTCH discharge date or the date of death if the patient died within 30 days after the IRF/LTCH discharge date.

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Measure Specifications: 30 Days Post IRF & LTCH Discharge (IMPACT)

- **Measure excludes patients who…**
  - Died during the IRF/LTCH stay **(IRF: 0.2%, LTCH: 13.2%)**
  - Were transferred to an acute care hospital or another facility of the same type (IRF/LTCH) **(IRF: 8.1%, LTCH: 8.3%)**
  - Were discharged against medical advice (AMA) **(IRF: 0.4%, LTCH: 0.8%)**
  - For whom the prior acute stay was for medical (nonsurgical) treatment of cancer, as defined by CMS/Inpatient Quality Reporting program **(IRF: 0.5%, LTCH: 0.5%)**
  - 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)

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Measure Specifications: IRF Within-Stay

- **Revised measure specifications for the within-stay window**
- **Measure includes patients who…**
  - Were 18 years or older
  - Have been continuously enrolled in Part A FFS Medicare for the 12 months prior to the IRF admission date, and at least 30 days after IRF discharge date
  - Had a short-term acute care stay within 30 days prior to an IRF admission date

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Measure Specifications: IRF Within-Stay

- **Measure excludes patients who…**
  - Died during the IRF stay
  - Were discharged against medical advice (AMA)
  - For whom the prior acute stay was for medical (nonsurgical) treatment of cancer, as defined by CMS/Inpatient Quality Reporting program
  - IRF 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)

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Risk Adjustment Approach

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Statistical Approach

- The statistical approach will be consistent with that used for SNF, IRF, and LTCH all-cause measures and HWR.
- A hierarchical modeling approach is used to estimate a multi-level model with patients clustered at the facility level. A facility effect is estimated.

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Statistical Approach - continued

- The standardized risk ratio (SRR) is calculated as follows:
  - Numerator measure for each facility: the risk-adjusted predicted *potentially preventable* readmissions for facility patients, including the facility effect.
  - Denominator: the risk-adjusted expected *potentially preventable* readmissions for those same patients, excluding the facility effect.
- The standardized risk ratio is then multiplied by the mean readmission rate in order to calculate the Risk-Standardized Readmission Rate (RSRR) of potentially preventable hospital readmissions.

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Risk Adjustment Approach

- Risk adjustment accounts for differences in estimating risk for various characteristics associated with PAC setting case-mix and different readmission windows.
- The PPR risk adjustment approach is modeled after the approach used to develop the Hospital-Wide Readmission measure that is used by CMS in the Inpatient Quality Reporting Program (i.e. *Hospital Compare*).
- Initial risk adjustment models will be limited to risk adjusters available in the claims data.
- The risk adjustment models will be refined over time based on any changes in policies or availability of data.

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Risk Adjustment Approach

- Each PPR measure's risk adjustment model will begin with the same types of risk adjustment domains (presented next), but will be customized based on effect and prevalence (groupings of medical conditions). For example:
  - risk adjusters may be dropped if not shown to be statistically significant or reliable
  - risk adjusters may be aggregated based on the specific patient population and/or prevalence

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Risk Adjustment Approach

- The risk adjustment models compute each patient's probability of readmission with explanatory variables including demographic factors, diagnoses, surgery indicators, and prior utilization.
- The source of the principal diagnoses for risk-adjustment is the prior acute hospital claim.
- Comorbidities come from the secondary diagnoses on the prior acute claim and from other acute claims occurring in the year prior to the PAC stay.
  - The one year lookback matches what is currently done in the Hospital Wide Readmission (HWR) model.

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Risk Adjustment Approach

Risk Adjusters: *Demographics*

- Age/sex groups
- Original reason for entitlement
  - old age and survivors insurance;
  - disability insurance benefits;
  - ESRD

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Risk Adjustment Approach

Risk Adjusters: *Clinical*

- Receiving dialysis in prior short-term stay
- Principal diagnosis on prior proximal hospital claim
  - grouped using AHRQ Clinical Classification Software (CCS) groups
- Surgery categories
  - if present, grouped using AHRQ CCS procedures
- Comorbidities
  - Grouped using CMS Hierarchical Condition Categories (HCCs)
  - May be from secondary diagnoses on prior hospital claim and/or diagnoses from earlier prior proximal hospital stays up to 1 year before PAC admission
  - Count of comorbidities

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Risk Adjustment Approach

Risk Adjusters: *Prior Utilization*

- Prior acute length of stay
- Prior acute ICU/CCU use
- Prior acute care utilization -- counts of prior short-term discharges within 365 days before admission

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Risk Adjustment Approach

Risk Adjusters: *Setting-Specific*

- IRF: Aggregates of the IRF Case-Mix Groups (CMGs) for IRF patients
- LTCH: Ventilator use — prolonged ventilation in LTCH
- HH
  - Activity of Daily Living Severity Scores
  - May also test prior PAC utilization and ED use

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Risk Adjustment Approach

Risk Adjusters: *SES Risk Adjustment*

- Current policy for SES risk adjustment is being evaluated.
- Measure developers intend to test dual eligibility and race for the PPR measures.
- See meeting materials for measure developers' SES risk adjustment plans to test other SES variables for the all-cause PAC readmission measures.
- Additional SES risk adjusters will be explored for the PPR measures pending results of NQF trial period.

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Risk Adjustment Approach

Risk Adjusters: *Motor & Cognitive Function*

- Several TEP members recommended that the PPR measures be risk adjusted to account for motor and cognitive function.
- Measure developers agree that this would be preferred. However, there are currently no uniform set of PAC measures of function. As measures become available, the developers will evaluate their use in future risk adjustment.
  - The IMPACT Act requires cross-setting standardization for functional status.

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Risk Adjustment Approach

Risk Adjusters: *Motor & Cognitive Function*

- Given the timeline, using assessment-based measures of motor and cognitive function is not feasible for all PPR measures at this time.
- Current plans:
  - IRF PPR measures will be risk adjusted for function using the IRF PPS case-mix groups (available on claims)
  - SNF & LTCH measures will not be adjusted for function
  - HH PPR measure will be risk adjusted for function using the ADL Severity Scores (available on claims)

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Next Steps

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Next Steps

- Welcome TEP feedback after this meeting via email nchong@rti.org
  - Feedback needed by October 20th
- Solicit written TEP input on TEP report prior to posting (November)
- Public comment period in November
- Developers will revise specifications based on TEP and public feedback
  - Given timeline, we may need to incorporate some feedback in the future.

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More Information

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