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All-Cause Admissions and Readmissions, Spring 2020 Cycle: CDP Report

TECHNICAL REPORT
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Contents

Executive Summary

Unplanned and potentially avoidable all-cause and condition-specific returns to the hospital, including emergency department (ED) encounters, continue to pose considerable strain on healthcare expenditure and quality of care for patients.[1–4] The use of performance measures presents opportunities to support the development of accountability applications across multiple care delivery settings. The Centers for Medicare & Medicaid Services (CMS) began publicly reporting condition-specific (i.e., pneumonia, heart failure) hospital-level readmission rates in 2009. CMS also implemented the Hospital Readmissions Reduction Program (HRRP) to drive attention to this important quality program and give hospitals an incentive to improve communication and care coordination.

The review and evaluation of admissions and readmissions measures continue to be a priority, with endorsement of hospital-wide and condition-specific measures for various care settings. Currently, there are 38 National Quality Forum (NQF)-endorsed measures in the All-Cause Admissions and Readmissions portfolio, many of which are part of several federal quality improvement programs. However, concerns about the unintended consequences of using measures in accountability programs have prompted important study and discussion about how to meet quality goals while ensuring accurate comparisons of performance.

For this project, the Standing Committee evaluated two newly submitted measures and three measures undergoing maintenance review against NQF's standard evaluation criteria. The Standing Committee recommended the following four measures for endorsement, and the Consensus Standards Approval Committee (CSAC) upheld the recommendation with a final endorsement.

- **#1463** Standardized Hospitalization Ratio (SHR) for Dialysis Facilities
    - Centers for Medicare & Medicaid Services/University of Michigan Kidney Epidemiology and Cost Center
- **#2539** Facility 7-Day Risk-Standardized Hospital Visit Rate after Outpatient Colonoscopy
    - Centers for Medicare & Medicaid Services/Yale Center for Outcomes Research and Evaluation (CORE)
- **#3565** Standardized Emergency Department Encounter Ratio (SEDR) for Dialysis Facilities
    - Centers for Medicare & Medicaid Services/University of Michigan Kidney Epidemiology and Cost Center
- **#3566** Standardized Ratio of Emergency Department Encounters Occurring Within 30 Days of Hospital Discharge (ED30) for Dialysis Facilities
    - Centers for Medicare & Medicaid Services/University of Michigan Kidney Epidemiology and Cost Center

The Standing Committee did not recommend the following measure for endorsement. The CSAC upheld the Standing Committee's recommendation to not endorse the measure.

- **#2496** Standardized Readmission Ratio (SRR) for Dialysis Facilities
    - Centers for Medicare & Medicaid Services/University of Michigan Kidney Epidemiology and Cost Center

Brief summaries of the measures currently under review are included in the body of the report; detailed summaries of the Standing Committee's discussion and ratings of the criteria for each measure are in Appendix A.

Introduction

Unplanned returns to the hospital, including visits to the emergency department (ED), are costly, common, and potentially avoidable.[3,5] The Agency for Healthcare Research and Quality (AHRQ) found that roughly 3.3 million U.S. readmissions in 2011 occurred within 30 days of discharge and contributed to a total cost of $41.3 billion across all payers.[7] Furthermore, studies have shown that patients discharged from an inpatient hospitalization are at an increased risk of an ED encounter.[8] From 2006-2016, the annual number of ED visits in the U.S. increased by nearly 25 percent, representing an opportunity to improve care transitions that avoid an unnecessary escalation of a patient's condition.[9]

Certain patient populations are at a high-risk of being readmitted to the hospital. Dialysis patients receiving hemodialysis are nearly two times more likely to be readmitted to the hospital than the general Medicare population,[3] accounting for a large proportion of Medicare expenditures.[4] Shared accountability between dialysis facilities and hospitals continues to be a focal point of quality improvement programs that aim to promote high quality facility-based care and reduce rehospitalization.[4]

Consequently, assessment of readmissions and ED encounters as measures of healthcare quality remains a major focus. CMS has expanded accountability for avoidable readmissions and ED use across its quality reporting and payment programs. The Hospital Readmissions Reduction Program (HRRP) reduces payment rates to hospitals with higher-than-expected readmission rates.[10] The Improving Medicare Post-Acute Care Transformation (IMPACT) Act of 2014 required CMS to implement quality measures for potentially preventable readmissions to long-term care hospitals, inpatient rehabilitation facilities, skilled nursing facilities, and home health agencies. The Hospital Outpatient Quality Reporting Program (Hospital OQR) provides results on hospital services, including ED and outpatient quality measures.[11] Given the increased use of readmission and ED measures across settings of care, ensuring their scientific merit is an increasingly important factor in their implementation and use.

Quality performance measures are a key element of value-based purchasing programs to drive improvement and incentivize collaboration in the healthcare delivery system. Shared accountability is required to improve these health outcomes, as many healthcare providers have a role in ensuring a safe patient transition between care settings. For example, the Centers for Medicare & Medicaid Innovation's (CMMI) Comprehensive End-Stage Renal Disease (ESRD) Care model emphasizes care coordination as a central feature of care delivery to reduce healthcare utilization and improve outcomes.[12]

Many factors can influence hospital and ED utilization, including the resources available in the community to support a safe transition between care settings and the social support available to patients. While these factors have an important role, poor care coordination and low-quality care also contribute to higher rates of readmission. Evidence demonstrates that provider interventions can

improve these important patient outcomes, such as improved communication of patient discharge instructions, patient educations, coordination with post-acute care providers and primary care physicians, and the reduction of complications.[13–15]

In this cycle, the NQF All-Cause Admissions and Readmissions Standing Committee evaluated five measures for endorsement consideration. Two new measures focused on ED use for Medicare dialysis patients, and the remaining three maintenance measures focused on hospital use for dialysis patients and those Medicare patients who underwent an outpatient colonoscopy procedure.

NQF Portfolio of Performance Measures for All-Cause Admissions and Readmissions Conditions

The All-Cause Admissions and Readmissions Standing Committee (Appendix C) oversees NQF's portfolio of All-Cause Admissions and Readmissions measures (Appendix B), which includes measures for [Sub-Topic(s)]. This portfolio contains 38 measures: 21 all-cause measures and 17 condition-specific measures.

Table 1. NQF All-Cause Admissions and Readmissions Portfolio of Measures

	All-Cause	Condition-Specific
Hospital	11	13
Home health	2	0
Skilled nursing facility	4	0
Long-term care facility	1	0
Inpatient rehab facility	1	0
Inpatient psychiatric facility	1	0
Population-based	1	1
Hospital outpatient/ambulatory surgery center	0	2
Accountable care organizations (ACO)	0	1
Total	21	17

Additional measures have been assigned to other portfolios. These include NQF #0275 *Chronic Obstructive Pulmonary Disease (COPD) or Asthma in Older Adults Admission Rate*, NQF #0277 *Heart Failure Admission Rate* (both moved to Prevention and Population Health), and NQF #1551 *Hospital-level 30-day, all-cause risk standardized readmission rate (RSRR) following elective primary total hip arthroplasty (THA) and/or total knee arthroplasty (TKA)* (moved to Surgery).

All-Cause Admissions and Readmissions Measure Evaluation

On June 22, 2020, the All-Cause Admissions and Readmissions Standing Committee evaluated two new measures and three measures undergoing maintenance review against NQF's standard measure evaluation criteria (see Table 2 below).

Table 2. All-Cause Admissions and Readmissions Measure Evaluation Summary

	Maintenance	New	Total
Measures under review	3	2	5
Measures endorsed	2	2	4
Measures not endorsed	1	0	1
Reasons for not recommending endorsement	Importance – 0 Scientific Acceptability – 1 Use – 0 Overall Suitability – 0 Competing Measure – 0		

Comments Received Prior to Committee Evaluation

NQF accepts comments on endorsed measures on an ongoing basis through the Quality Positioning System (QPS). In addition, NQF solicits comments for a continuous 16-week period during each evaluation cycle via an online tool located on the project webpage. For this evaluation cycle, the commenting period opened on May 1, 2020, and closed on September 3, 2020. Two comments were submitted and shared with the Standing Committee prior to the measure evaluation meeting (Appendix F).

Comments Received After Committee Evaluation

The continuous 16-week public commenting period with NQF-member support closed on May 24, 2020. Following the Standing Committee's evaluation of the measures under review, NQF received eight comments from organizations (including five NQF-member organizations) and individuals pertaining to the draft report and to the measures under review. All comments for each measure under review have been summarized in Appendix A.

Throughout the 16-week continuous public commenting period, NQF members had the opportunity to express their support (either "*support"* or "*do not support"*) for each measure submitted for endorsement consideration to inform the Standing Committee's recommendations. Three NQF members provided their expression of support.

Overarching Issues

During the Standing Committee's discussion of the measures, several overarching issues emerged that were factored into the Standing Committee's ratings and recommendations for multiple measures and are not repeated in detail with each individual measure.

Reliability and Intended Use

During this review cycle, several measures applied two different reliability methods and statistics concurrently: the inter-unit reliability (IUR) and the profile inter-unit reliability (PIUR). The PIUR assesses the measure's ability to identify outliers rather than between provider differences, which is performed using the IUR. The Scientific Methods Panel (SMP) reviewed these measures and recognized that the

evaluation of reliability, including the methodology and interpretation of results, should be done in the context of how the measure will be used. For example, a lower threshold for a particular statistic may be acceptable if a measure will be used for quality improvement as opposed to a pay-for-performance program. In other cases, the reliability testing approach employed may only demonstrate reliability for a particular application (e.g., identification of outliers). An overview of the PIUR method, including how it compares to the IUR and its interpretation, was presented to better facilitate the Standing Committee's review and evaluation of the PIUR. It was further noted that while NQF considers use and usability in the recommendation for endorsement, assessments of reliability testing do not evaluate the methods used by the program implementers to define categories of performance or performance cut-offs. NQF's use and usability criteria assess the extent to which potential audiences (e.g., consumers, purchasers, and providers) are using or could use performance results for both accountability and performance improvement to achieve the goal of high quality, efficient healthcare for individuals or populations. NQF's current process grants endorsement for use in any application.

Attribution

Four measures under review this cycle focused on dialysis facilities. To supplement the clinical expertise of the Standing Committee, a Renal Technical Expert Panel (TEP) was convened. The TEP provided input on the clinical relevance of the measures, including the inclusion and exclusion criteria, validity testing, and risk adjustment approach. One of the main considerations raised by the TEP was regarding attribution of all-cause readmissions to dialysis facilities. Some TEP members suggested that not all returns to the hospital, including ED encounters, are due to dialysis care; rather, they can be influenced by other factors, including poor discharge planning from the inpatient facility. The Standing Committee considered the TEP's input but noted that improved communication between the dialysis facilities and other care settings has the potential to improve readmissions outcomes for dialysis patients, and dialysis facilities can play an important role in these care transitions. Furthermore, the Standing Committee agreed that the evidence presented for these measures shows interventions and processes that the dialysis facilities can implement and/or improve to have an impact on the outcome (i.e., hospitalizations, ED encounters).

Summary of Measure Evaluation

The following brief summaries of the measure evaluation highlight the major issues that the Standing Committee considered. Details of the Standing Committee's discussion and ratings of the criteria for each measure are included in Appendix A.

#1463 Standardized Hospitalization Ratio for Dialysis Facilities (SHR) (Centers for Medicare & Medicaid Services/University of Michigan Kidney Epidemiology and Cost Center): Endorsed

Description: The standardized hospitalization ratio is defined to be the ratio of the number of hospital admissions that occur for Medicare end-stage renal disease (ESRD) dialysis patients treated at a particular facility to the number of hospitalizations that would be expected given the characteristics of the dialysis facility's patients and the national norm for dialysis facilities. This measure is calculated as a ratio but can also be expressed as a rate. When used for public reporting, the measure calculation will be restricted to facilities with greater than five patient years at risk in the reporting year. This restriction

is required to ensure patients cannot be identified due to small cell size. **Measure Type**: Outcome; **Level of Analysis**: Facility; **Setting of Care**: Other; **Data Source**: Claims, Registry Data

The Standing Committee recommended this measure for continued endorsement. The Standing Committee evaluated the updated evidence, including revisions that showed targeted interventions that dialysis facilities can implement to improve hospitalization rates. The Standing Committee agreed that the evidence supported interventions that can be undertaken to reduce the risk of unplanned hospital visits and that a gap in care exists that warrants a national performance measure. The Standing Committee accepted the SMP's rating for reliability. The Standing Committee discussed several topics related to the validity of the measure, including the use of hospitalists as a primary inpatient care provider and the lack of social factors in the risk adjustment model. The Standing Committee noted that there was limited change in the measure scores based on the social risk factors identified, which may reflect a lack of the appropriate data for social risk adjustment. Ultimately, the Standing Committee upheld the SMP's rating for validity. The Standing Committee did not discuss feasibility, use, and usability and proceeded to pass the measure on these criteria.

#2496 Standardized Readmission Ratio (SRR) for Dialysis Facilities (University of Michigan Kidney Epidemiology and Cost Center): Not Endorsed

Description: The Standardized Readmission Ratio (SRR) for a dialysis facility is the ratio of the number of observed index discharges from acute care hospitals to that facility that resulted in an unplanned readmission to an acute care hospital within four to 30 days of discharge to the expected number of readmissions given the discharging hospitals and the characteristics of the patients and based on a national norm. Note that the measure is based on Medicare-covered dialysis patients. **Measure Type**: Outcome; **Level of Analysis**: Facility; **Setting of Care**: Other; **Data Source**: Claims, Registry Data

The Standing Committee evaluated the updated evidence and agreed that the evidence provided supported interventions that can be undertaken to reduce the risk of unplanned readmissions and that a gap in care exists that warrants a national performance measure. The Standing Committee considered the SMP's discussion on the standards of acceptable reliability for inter-unit reliability, as well as its comparison to profile inter-unit reliability (PIUR) and passed the measure on reliability based on the PIUR. For validity, the SMP raised concerns regarding the adequacy of the correlations of the measure score with other renal-focused quality measures. The Standing Committee agreed with the SMP's concerns and upheld the SMP's vote to not pass the measure on validity. Since validity is a must-pass criterion, the Standing Committee ultimately did not recommend the measure for maintained endorsement.

During the commenting period, the Standing Committee received a reconsideration request from the developer on the basis that the measure evaluation criteria were not applied appropriately. The developer contended that the results from validity testing are sufficient for achieving a moderate score on validity. The developer further stated that the Standing Committee's vote on validity was erroneously influenced by the concerns of the SMP. The Standing Committee considered the request and ultimately voted not to reconsider the measure.

#2539 Facility 7-Day Risk-Standardized Hospital Visit Rate after Outpatient Colonoscopy (Yale New Haven Health Services Corporation – Center for Outcomes Research and Evaluation (CORE)): Endorsed

Description: Facility-level risk-standardized rate of acute, unplanned hospital visits within seven days of a colonoscopy procedure performed at a hospital outpatient department (HOPD) or ambulatory surgical center (ASC) among Medicare Fee-For-Service (FFS) patients aged 65 years and older. An unplanned hospital visit is defined as an emergency department (ED) visit, observation stay, or unplanned inpatient admission. The measure is calculated separately for ASCs and HOPD. **Measure Type**: Outcome; **Level of Analysis**: Facility; **Setting of Care**: Outpatient Services; **Data Source**: Claims, Other

The Standing Committee recommended the measure for maintained endorsement. The Standing Committee evaluated the updated evidence and agreed that the evidence provided supported interventions that can be undertaken to reduce the risk of unplanned hospital visits and that a gap in care exists that warrants a national performance measure. The Standing Committee accepted the SMP's rating for reliability. For validity, the Standing Committee echoed the SMP's concerns that only face validity was conducted, despite this being a maintenance measure. The developer noted that empirical validity testing was not possible at this this time because no existing measures were comparable to the *ASC General Surgery* measure. Ultimately, the Standing Committee agreed to uphold the SMP's rating and passed the measure on validity. The Standing Committee did not have any concerns regarding feasibility, use, and usability and passed the measure on these criteria.

#3565 Standardized Emergency Department Encounter Ratio (SEDR) for Dialysis Facilities (University of Michigan Kidney Epidemiology and Cost Center): Endorsed

Description: The *Standardized Emergency Department Encounter Ratio* is defined to be the ratio of the observed number of emergency department (ED) encounters that occur for adult Medicare ESRD dialysis patients treated at a particular facility to the number of encounters that would be expected given the characteristics of the dialysis facility's patients and the national norm for dialysis facilities. Note that in this document, an "emergency department encounter" always refers to an outpatient encounter that does not end in a hospital admission. This measure is calculated as a ratio but can also be expressed as a rate. When used for public reporting, the measure calculation will be restricted to facilities with greater than five patient years at risk in the reporting year. This restriction is required to ensure patients cannot be identified due to small cell size. **Measure Type**: Outcome; **Level of Analysis**: Facility; **Setting of Care**: Other; **Data Source**: Claims, Registry Data

The Standing Committee recommended the measure for endorsement. The Standing Committee expressed little concern associated with the evidence for both the measure and the performance gap and passed the measure on these criteria. The measure was reviewed by the SMP, and the Standing Committee accepted the rating for reliability. Before upholding the SMP's rating for validity, the Standing Committee requested that the developer respond to a pre-evaluation comment that recommended the addition of two additional exclusions to the measure (i.e., end-stage renal disease [ESRD] patients who seek care in an ED for any reason after a missed dialysis appointment and ESRD patients who reside in a long-term care or nursing home facility); it also recommended that Medicare Advantage patients not be excluded from the measure. The comment also raised concerns about the risk model and its ability to discriminate performance. The developer stated that these factors were considered during development and the specifications were finalized based on the goals of the measure

and the availability of data. The Standing Committee did not have any concerns regarding feasibility, use, and usability and passed the measure on these criteria. The Standing Committee recognized that the measure is not yet implemented in a federal program, but the developer noted that CMS may consider implementing the measure in CMS' Dialysis Facility public reporting program.

#3566 Standardized Ratio of Emergency Department Encounters Occurring Within 30 Days of Hospital Discharge (ED30) for Dialysis Facilities (University of Michigan Kidney Epidemiology and Cost Center): Endorsed

Description: The *Standardized Ratio of Emergency Department Encounters Occurring Within 30 Days of Hospital Discharge for Dialysis Facilities* (ED30) is defined to be the ratio of observed over expected events. The numerator is the observed number of index discharges from acute care hospitals that are followed by an outpatient emergency department encounter within four to 30 days after discharge for eligible adult Medicare dialysis patients treated at a particular dialysis facility. The denominator is the expected number of index discharges followed by an ED encounter within four to 30 days given the discharging hospital's characteristics, characteristics of the dialysis facility's patients, and the national norm for dialysis facilities. Note that in this document, acute care hospital includes critical access hospitals and "emergency department encounter" always refers to an outpatient encounter that does not end in a hospital admission. This measure is calculated as a ratio but can also be expressed as a rate. When used for public reporting, the measure calculation will be restricted to facilities with at least 11 eligible index discharges in the reporting year. This restriction is required to ensure patients cannot be identified due to small cell size. **Measure Type**: Outcome; **Level of Analysis**: Facility; **Setting of Care**: Other; **Data Source**: Claims, Registry Data

The Standing Committee recommended the measure for endorsement. The Standing Committee reviewed the evidence presented by the developer, which demonstrated that dialysis facilities can implement various interventions to reduce the risk of unplanned ED encounters. The Standing Committee agreed that the evidence provided supported interventions that can be undertaken to reduce the risk of unplanned ED encounters within 30 days of a hospital discharge and that a gap in care exists that warrants a national performance measure. The measure was reviewed by NQF's SMP. The Standing Committee considered the differences between the IUR and PIUR statistics, noting that the IUR is less than 0.5. The Standing Committee sought clarity from the developer regarding how this measure may be used, as the PIUR reflects how well the measure reliably flags outliers rather than between provider variation. The developer stated that CMS will decide on how they intend to use the measure, noting that other measures are used by CMS to flag expected versus unexpected providers. The Standing Committee ultimately passed the measure on reliability and upheld the SMP's decision to pass the measure on validity. The Standing Committee did not have any concerns regarding feasibility, use, and usability and passed the measure on these criteria. The Standing Committee recognized that the measure is not yet implemented in a federal program, but the developer noted that CMS may consider implementing the measure in CMS' Dialysis Facility public reporting program.

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Appendix A: Details of Measure Evaluation

Rating Scale: H=High; **M**=Moderate; **L**=Low; **I**=Insufficient; **NA**=Not Applicable

Note: A measure is recommended for endorsement by the Standing Committee when the vote margin on all must-pass criteria (Importance, Scientific Acceptability, Use), and overall, is greater than 60 percent of voting members in favor of endorsement. A measure is not recommended for endorsement when the vote margin on any must-pass criterion or overall is less than 40 percent of voting members in favor of endorsement. The Standing Committee has not reached consensus if the vote margin on any must-pass criterion or overall is between 40 and 60 percent, inclusive, in favor of endorsement. When the Standing Committee has not reached consensus, all measures for which consensus was not reached will be released for NQF member and public comment. The Standing Committee will consider the comments and re-vote on those measures during a webinar convened after the commenting period closes.

The Standing Committee must maintain quorum in order to participate in live voting. Quorum is based on the number of current, active, and voting-eligible Standing Committee members. In order to achieve quorum, 66 percent of the total number of current, active, and voting-eligible Standing Committee members (denominator) must be present (numerator) at the meeting at any given time in order for live voting to occur. Vote totals may differ between measure criteria and between measures because of occasional attendance fluctuation, as Committee members often have to join calls late or leave calls early.

Endorsed Measures

#1463 Standardized Hospitalization Ratio for Dialysis Facilities (SHR)

Submission | Specifications

Description: The standardized hospitalization ratio is defined to be the ratio of the number of hospital admissions that occur for Medicare ESRD dialysis patients treated at a particular facility to the number of hospitalizations that would be expected given the characteristics of the dialysis facility's patients and the national norm for dialysis facilities. This measure is calculated as a ratio but can also be expressed as a rate.

When used for public reporting, the measure calculation will be restricted to facilities with greater than five patient years at risk in the reporting year. This restriction is required to ensure patients cannot be identified due to small cell size.

Numerator Statement: Number of inpatient hospital admissions among eligible patients at the facility during the reporting period.

Denominator Statement: Number of hospital admissions that would be expected among eligible patients at the facility during the reporting period, given the patient mix at the facility.

Exclusions: N/A

Adjustment/Stratification: Statistical risk model

Level of Analysis: Facility

Setting of Care: Other

Type of Measure: Outcome

Data Source: Claims, Registry Data

Measure Steward: Centers for Medicare & Medicaid Services

STANDING COMMITTEE MEETING June 22, 2020

1. Importance to Measure and Report: The measure meets the Importance criteria.

(1a. Evidence, 1b. Performance Gap)

1a. Evidence: Pass-**18**; No Pass-**0** (18/18 – 100%, Pass); 1b. Performance Gap: **H-5**; **M-12**; **L-1**; **I-0** (17/18 – 94%, Pass)

Rationale:

- The Standing Committee reviewed the evidence presented by the developer, which demonstrated that dialysis facilities can implement various interventions to reduce the risk of unplanned hospital visits.
- The Standing Committee reviewed the range of performance for dialysis facilities from 0 to 3.55 in 2018, with a mean of 0.99 and a standard deviation (SD) of 0.25.
- The Standing Committee agreed that the evidence provided supported that interventions can be undertaken to reduce the risk of unplanned hospital visits and that a gap in care exists that warrants a national performance measure.

2. Scientific Acceptability of Measure Properties: The measure meets the Scientific Acceptability criteria.

(2a. Reliability - precise specifications, testing; 2b. Validity - testing, threats to validity

2a. Reliability: **H-2; M-6; L-1; I-0 (SMP)** 8/9 – 89%, Pass; 2b. Validity: **H-3**; **M-5**; **L-1**; **I-0 (SMP)** 8/9 – 89%, Pass

Rationale:

- This measure was deemed as complex and was evaluated by the SMP in spring 2020. The SMP passed the measure on both reliability and validity.
- Committee members requested clarification on the use of inpatient claims only for Medicare Advantage (MA) beneficiaries. In their discussion, the Standing Committee attributed the use of inpatient claims for MA beneficiaries to the outpatient claims being unavailable for most qualifying patients. Therefore, the developer used inpatient claims to adjust for comorbidities for both fee-for-service and MA.
- The Standing Committee expressed concern that social risk factors were excluded from the risk model. The Standing Committee acknowledged that although the developer identified several social factors, when added into the risk adjustment model, there was minimal impact to the measure score. The Standing Committee noted that the right social factors may not be considered for risk adjustment due to data limitations.
- While these considerations were noted on the validity of the measure, the Standing Committee agreed to uphold the SMP's rating on reliability (Y-18, N-0) and validity (Y-18, N-0).

3. Feasibility: H-13; M-5; L-0; I-0 (18/18 – 100%, Pass)

(3a. Clinical data generated during care delivery; 3b. Electronic sources; 3c. Susceptibility to inaccuracies/ unintended consequences identified 3d. Data collection strategy can be implemented)

Rationale:

- The Standing Committee agreed that the measure uses claims data that can be generated or collected during the provision of care and that no fees, licensing, or requirements are needed to use the measure.

4. Use and Usability

4a. Use; 4a1. Accountability and transparency; 4a2. Feedback on the measure by those being measured and others; 4b. Usability; 4b1. Improvement; 4b2. The benefits to patients outweigh evidence of unintended negative consequences to patients)

4a. Use: **Pass-17; No Pass-1** (17/18 – 94%, Pass) 4b. Usability: **H-4; M-12; L-1; I-1** (16/18 – 89%, Pass)

Rationale:

- The Standing Committee acknowledged that this measure is publicly reported nationally in both the Dialysis Facility Compare (DFC) and End-Stage Renal Disease Quality Incentive Program (ESRD QIP).

5. Related and Competing Measures

- This measure is related to the following measures:
    - NQF #0369 Standardized Mortality Ratio (SMR) for Dialysis Facilities
    - NQF #2496 Standardized Readmission Ratio (SRR) for Dialysis Facilities

- The developer notes that the Standardized Hospitalization Ratio for Dialysis Facilities (SHR), the Standardized Mortality Ratio (SMR), and the Standardized Readmission Ratio (SRR) are harmonized to Medicare-covered End-Stage Renal Disease patients, the methods (SMR and SHR), and certain risk adjustment factors specific to the End-Stage Renal Disease population.
- NQF staff noted that related and competing measures would be discussed at a later meeting.

6. Standing Committee Recommendation for Endorsement: Y-18; N-0 (18/18 – 100%, Yes)

7. Public and Member Comment

The comments received pertained to the following points:

- Concern with reliability scores for certain facilities and use of the profile inter-unit reliability (PIUR)
- Medicare Advantage (MA) patient variation and use of in-patient comorbidities
- Validity testing; multicollinearity; risk adjustment c-statistic
- Harmonization of SHR and SRR

The Standing Committee acknowledged the comments and developer responses and did not raise any dissenting points of consideration, nor did it provide any additional feedback.

8. CSAC Review (November 17-18, 2020): Y-11; N-0

9. CSAC Decision: Approved for continued endorsement

10. Appeals: No appeals were received.

#2539 Facility 7-Day Risk-Standardized Hospital Visit Rate after Outpatient Colonoscopy

Submission | Specifications

Description: Facility-level risk-standardized rate of acute, unplanned hospital visits within seven days of a colonoscopy procedure performed at a hospital outpatient department (HOPD) or ambulatory surgical center (ASC) among Medicare Fee-For-Service (FFS) patients aged 65 years and older. An unplanned hospital visit is defined as an emergency department (ED) visit, observation stay, or unplanned inpatient admission. The measure is calculated separately for ASCs and HOPDs.

Numerator Statement: Unplanned hospital visits within seven days of a qualifying colonoscopy.

Denominator Statement: Colonoscopies performed at hospital outpatient departments (HOPDs) and ambulatory surgical centers (ASCs) for Medicare FFS patients aged 65 years and older.

Exclusions: We established the following exclusion criteria after reviewing the literature, examining existing measures, discussing alternatives with the working group and Technical Expert Panel (TEP) members, and reviewing feedback from the national dry run held in July 2015, public reporting in 2018 and 2019, and annual re-evaluation of the measure in 2017, 2018, and 2019. The goal was to be as inclusive as possible. We excluded only those high-risk procedures and patient groups for which risk adjustment would not be adequate or for which hospital visits were not typically a quality signal. The exclusions, based on clinical rationales, prevent unfair distortion of performance results:

1) Colonoscopies for patients who lack continuous enrollment in Medicare FFS Parts A and B in the seven days after the procedure

Rationale: We exclude these patients to ensure full-data availability for outcome assessment.

2) Colonoscopies that occur concurrently with high-risk upper gastrointestinal (GI) endoscopy procedures

Rationale: Patients undergoing concurrent high-risk upper GI endoscopy procedures, such as upper GI endoscopy procedures for the control of bleeding or treatment of esophageal varices, have a higher risk profile than typical colonoscopy patients. Therefore, these patients have a disproportionally higher risk for the outcome.

3) Colonoscopies for patients with a history of inflammatory bowel disease (IBD) or diagnosis of IBD at the time of index colonoscopy or on the subsequent hospital visit outcome claim

Rationale:

#2539 Facility 7-Day Risk-Standardized Hospital Visit Rate after Outpatient Colonoscopy

- IBD is a chronic condition; patients with IBD undergo colonoscopy both for surveillance due to increased cancer risk and for evaluation of acute symptoms. IBD is likely to be coded as the primary diagnosis, prompting the procedure irrespective of whether the patients are undergoing a screening procedure or a diagnostic procedure in the setting of an acute exacerbation of IBD. Therefore, we may not be able to adequately risk adjust for these patients, as we cannot identify relatively well versus acutely unwell patients among visits coded as IBD.
- Our aim is to capture hospital visits, which reflect the quality of care. Admissions for acutely ill IBD patients who are evaluated with an outpatient colonoscopy and are subsequently admitted for medical treatment of an IBD flare do not reflect the quality of the colonoscopy. In our 2010 Medicare 20% FFS Full Development Sample (see the 2014 Facility 7-day Risk-Standardized Hospital Visit Rate after Outpatient Colonoscopy Measure Technical Report posted at https://www.qualitynet.org/files/5d0d37ae764be766b010196e?filename=ClnscpyMsr_TechReport.pdf for full description of the dataset), more than one-third of IBD patients admitted to the hospital with a colonoscopy had a discharge diagnosis of IBD, indicating their admission was for medical treatment of their IBD. Therefore, we excluded this group so that providers who treat a disproportionate number of IBD patients will not be disadvantaged in the measure.
- A post-index diagnosis of IBD, which represents a very small fraction of cases (less than 0.5% of the cohort) in the measure population, indicates that the condition was likely present at the time of the index colonoscopy but not coded.

4) Colonoscopies for patients with a history of diverticulitis or diagnosis of diverticulitis at the time of index colonoscopy or on the subsequent hospital visit outcome claim.

Rationale:

- It is unclear what the health status is of patients coded with a history or current diagnosis of diverticulitis, making it difficult to fully risk adjust for patients' health. Colonoscopies performed on patients with a history or current diagnosis of diverticulitis are likely to be coded as diverticulitis as the primary diagnosis, irrespective of whether the patients are undergoing a screening procedure or a diagnostic procedure (i.e., they are acutely unwell with active disease). Furthermore, the codes for diverticulitis and diverticulosis may not be consistently used; patients with diverticulosis may be erroneously coded as diverticulitis. Therefore, we may not be able to adequately risk adjust as we cannot identify relatively well versus acutely unwell patients among visits coded as diverticulitis.
- Admissions for acutely ill patients with a history or current diagnosis of diverticulitis who are evaluated with an outpatient colonoscopy and are subsequently admitted for medical treatment do not reflect the quality of the colonoscopy. In our 2010 Medicare 20% FFS Full Development Sample (see the *Facility 7-day Risk-Standardized Hospital Visit Rate after Outpatient Colonoscopy Measure* Technical Report posted on the web page provided in data field S.1), more than one-quarter of patients with a history or current diagnosis of diverticulitis admitted to the hospital post-colonoscopy had a discharge diagnosis of diverticulitis, indicating they were admitted for medical treatment of the condition. These admissions are likely unrelated to the quality of the colonoscopy. Therefore, we excluded this group so that providers who treat a disproportionate number of diverticulitis patients will not be disadvantaged in the measure.
- A post-index diagnosis of diverticulitis, which represents a very small fraction of cases (less than 0.5% of the cohort) in the measure population, indicates that the condition was likely present at the time of the index colonoscopy but not coded.

5) Colonoscopies followed by a subsequent outpatient colonoscopy procedure within seven days

Rationale: In these situations, the two colonoscopies are considered part of a single episode of care, for which the subsequent colonoscopy is considered the index procedure.

We also exclude the following for colonoscopies performed at HOPDs:

6) Colonoscopies that occur on the same day and at the same hospital as an emergency department (ED) visit that is billed on a different claim than the index colonoscopy, unless the ED visit has a diagnosis indicative of a complication of care

Rationale: It is unclear whether the colonoscopy or ED visit occurred first. If the ED visit is coded with a diagnosis indicative of a complication of care, the measure assumes the ED visit occurred after the colonoscopy

#2539 Facility 7-Day Risk-Standardized Hospital Visit Rate after Outpatient Colonoscopy

procedure and is counted in the measure. It is unlikely that a patient would experience an ED visit for an acute diagnosis at one facility and then travel to another facility for a routine colonoscopy on the same day. Accordingly, ED visits that are billed on the same day as a colonoscopy but at a different facility are included because they likely represent a routine procedure followed by a complication of care.

7) Colonoscopies that are billed on the same hospital claim as an ED visit and that occur on the same calendar day, unless the ED visit has a diagnosis indicative of a complication of care

Rationale: In these situations, it is not possible to use claims data to determine whether the colonoscopy was the cause of, subsequent to, or during the ED visit. However, if the ED visit is coded with a diagnosis for a complication, the assumption is that it occurred after the colonoscopy procedure.

8) Colonoscopies that are billed on the same hospital outpatient claim and that occur after the ED visit

Rationale: In these situations, we assume that the colonoscopy was subsequent to the ED visit and may not represent a routine colonoscopy procedure. Timing of the ED visits is determined using revenue center dates from the outpatient claim.

9) Colonoscopies that are billed on the same hospital outpatient claim as an observation stay

Rationale: In these situations, it is not possible to use claims data to determine whether the colonoscopy was the cause of, subsequent to, or during the observation stay.

Adjustment/Stratification: Statistical risk model

Level of Analysis: Facility

Setting of Care: Outpatient Services

Type of Measure: Outcome

Data Source: Claims, Other

Measure Steward: Centers for Medicare & Medicaid Services

STANDING COMMITTEE MEETING June 22, 2020

1. Importance to Measure and Report: <u>The measure meets the Importance criteria.</u>

(1a. Evidence, 1b. Performance Gap)

1a. Evidence: **Y-18**; **N-0** (18/18 – 100%, Pass); 1b. Performance Gap: **H-7**; **M-11**; **L-0**; **I-0** (18/18 – 100%, Pass)

<u>Rationale</u>:

- The Standing Committee agreed that the evidence provided demonstrated that facilities can implement various interventions to reduce the risk of unplanned hospital visits.
- The Standing Committee reviewed the range of performance of 11.67-24.27 for HOPDs and 8.59-17.94 for ASCs and agreed that a fairly high degree of variation in these risk-standardized hospital rates between centers still exists, which suggests that a gap in care still remains.

2. Scientific Acceptability of Measure Properties: <u>The measure meets the Scientific Acceptability criteria.</u>

(2a. Reliability - precise specifications, testing; 2b. Validity - testing, threats to validity

2a. Reliability: **H-4**; **M-3**; **L-1**; **I-0 (SMP)** 7/8 – 88%, Pass; 2b. Validity: **H-1**; **M-4**; **L-1**; **I-2 (SMP)** 5/8 – 63%, Pass

<u>Rationale</u>:

- This measure was deemed as complex and was evaluated by the NQF Scientific Methods Panel (SMP) in spring 2020. The SMP passed the measure on both reliability and validity.
- The Standing Committee considered the reliability testing for both HOPDs (the median facility-level reliability score is 0.744 [IQR, 0.489-0.883] for all HOPDs) and ASCs (the median reliability is 0.864 [IQR, 0.628-0.938] for all ASCs).
- The Standing Committee expressed concern that only face validity was conducted for this maintenance measure. While the results indicated good validity (71% of the convened Renal TEP indicated at least moderate agreement that the measure is valid and 86% of the TEP indicated somewhat moderately or *strongly agree* around validity), NQF expects empirical validity testing for maintenance measures.
- The developer noted that empirical validity testing was not possible at this this time because no existing measures were comparable to the ASC General Surgery measure.

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• The Standing Committee stated that the SMP had recommended the developer to consider *Facility-Level 7-Day Hospital Visits after General Surgery Procedures Performed at ASCs* (ASC General Surgery) for facilities that have adequate volumes of target procedures. The developer responded that many ASCs specialize in a single procedure and that few ASCs performing colonoscopies are the same facilities that would be measured in the ASC General Surgery measure. • While several considerations were noted on the validity of the measure, the Standing Committee agreed to uphold the SMP's rating on reliability (Y-18, N-0) and validity (Y-18, N-0).
3. Feasibility: H-11; M-7; L-0; I-0 *(3a. Clinical data generated during care delivery; 3b. Electronic sources; 3c. Susceptibility to inaccuracies/ unintended consequences identified 3d. Data collection strategy can be implemented)* Rationale: • The Standing Committee agreed that the measure uses claims data that can be generated or collected during the provision of care and that no fees, licensing, or requirements are needed to use the measure.
4. Use and Usability *4a. Use; 4a1. Accountability and transparency; 4a2. Feedback on the measure by those being measured and others; 4b. Usability; 4b1. Improvement; 4b2. The benefits to patients outweigh evidence of unintended negative consequences to patients)* 4a. Use: **Pass-17; No Pass-1** (17/18 – 94% - Pass) 4b. Usability: **H-3; M-15; L-0; I-0** (18/18 – 100% - Pass) Rationale: • The Standing Committee acknowledged that this measure is publicly reported nationally in both the Hospital Outpatient Quality Reporting (HOQR) Program and the Ambulatory Surgical Center Quality Reporting (ASCQR) Program.
5. Related and Competing Measures • This measure is related to the following measures: o NQF #0658 Appropriate Follow-Up Interval for Normal Colonoscopy in Average Risk Patients o NQF #2687 Hospital Visits after Hospital Outpatient Surgery o NQF #3357 Facility-Level 7-Day Hospital Visits after General Surgery Procedures Performed at Ambulatory Surgical Centers o NQF #3510 Screening/Surveillance Colonoscopy • The developer noted that the measures are harmonized to the extent possible. • NQF staff noted that related and competing measures would be discussed at a later meeting.
6. Standing Committee Recommendation for Endorsement: Y-18; N-0 (18/18 – 100%, Yes)
7. Public and Member Comment The comments received pertained to the following points: • Approach to risk adjustment approach • Change in national performance across categories with social risk adjustment The Standing Committee acknowledged the comments and developer responses and did not raise any dissenting points of consideration, nor did it provide any additional feedback.
8. CSAC Review (November 17-18, 2020): Y-11; N-0
9. CSAC Decision: Approved for continued endorsement
10. Appeals: No appeals were received.

#3565 Standardized Emergency Department Encounter Ratio (SEDR) for Dialysis Facilities

Submission | Specifications

Description: The Standardized Emergency Department Encounter Ratio is defined to be the ratio of the observed number of emergency department (ED) encounters that occur for adult Medicare ESRD dialysis patients treated at a particular facility to the number of encounters that would be expected given the characteristics of the dialysis facility's patients and the national norm for dialysis facilities. Note that in this document, an "emergency department encounter" always refers to an outpatient encounter that does not end in a hospital admission. This measure is calculated as a ratio but can also be expressed as a rate.

When used for public reporting, the measure calculation will be restricted to facilities with greater than five patient years at risk in the reporting year. This restriction is required to ensure patients cannot be identified due to small cell size.

Numerator Statement: The observed number of outpatient emergency department encounters during the reporting period among eligible adult Medicare patients at a facility

Denominator Statement: The expected number of emergency department encounters among eligible Medicare patients at the facility during the reporting period adjusted for the characteristics of the patients at the facility.

Exclusions: Exclusions that are implicit in the denominator definition include time at risk while a patient:

- Has Medicare Advantage (MA) coverage
- Has had ESRD for 90 days or less
- Is less than 18 years of age

The denominator also excludes patient time at risk for calendar months in which a patient is found to be the following:

- Actively enrolled in hospice at any time during the calendar month

Adjustment/Stratification: Statistical risk model

Level of Analysis: Facility

Setting of Care: Other

Type of Measure: Outcome

Data Source: Claims, Registry Data

Measure Steward: Centers for Medicare & Medicaid Services

STANDING COMMITTEE MEETING June 22, 2020

1. Importance to Measure and Report: <u>The measure meets the Importance criteria.</u>

(1a. Evidence, 1b. Performance Gap)

1a. Evidence: **Y-18; N-0** (18/18 – 100%, Pass); 1b. Performance Gap: **H-5**; **M-12**; **L-1**; **I-0** (17/18 – 94%, Pass)

<u>Rationale</u>:

- The Standing Committee acknowledged a public comment that raised concern that this measure may unfairly penalize dialysis facilities for ED visits that are beyond their control and sphere of influence. However, the Standing Committee determined that the evidence presented by the developer demonstrates that dialysis facilities can implement various interventions to reduce the risk of unplanned ED encounters. The Standing Committee reviewed the range of performance for dialysis facilities from 0 to 4.30, with a mean of 1.00 and a standard deviation of 0.34 and agreed there was enough of a gap in care to warrant a national performance measure.

2. Scientific Acceptability of Measure Properties: <u>The measure meets the Scientific Acceptability criteria.</u>

(2a. Reliability - precise specifications, testing; 2b. Validity - testing, threats to validity

2a. Reliability: **H-2; M-6; L-1; I-0 (SMP)**; 2b. Validity: **H-1; M-5; L-3; I-0 (SMP)**

<u>Rationale</u>:

- This measure was deemed as complex and was evaluated by the NQF Scientific Methods Panel (SMP) in spring 2020. The SMP passed the measure on both reliability and validity.
- The Standing Committee considered the SMP's discussion on the standards of acceptable reliability for IUR, as well as its comparison to PIUR. The IUR was 0.62 and the PIUR was 0.89.

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- The Standing Committee considered the validity testing, in which there was concordance with this measure compared to facility mortality rates (SMR), transfusion events (STrR), AV fistula rates (SFR), Percentage of Prevalent Patients Waitlisted (PPPW), Standardized Hospitalization Mortality Ratio (SHR), and Standardized Ratio of Emergency Department Encounters Occurring Within 30 Days of Hospital Discharge for Dialysis Facilities (ED30).
- The Standing Committee acknowledged a public comment that consisted of the following points: ESRD exclusions should be added to the measure for patients residing in long-term care or nursing homes, the risk models will not adequately discriminate performance, and a minimum c-statistic of 0.8 is a more appropriate indicator of a model's goodness of fit.
- The developer commented that the measure does not exclude patients who reside in long-term care facilities, but the measure does risk adjust for them in the model. The developer further stated that as part of ongoing measure maintenance, they will always seek to improve the risk model fit and make needed adjustments.
- While several considerations were noted on the reliability and validity of the measure, the Standing Committee agreed to uphold the SMP's rating on reliability (Y-18, N-0) and validity (Y-18, N-0).

3. Feasibility: H-9; M-9; L-0; I-0 (18/18 – 100%, Pass)

(3a. Clinical data generated during care delivery; 3b. Electronic sources; 3c. Susceptibility to inaccuracies/ unintended consequences identified 3d. Data collection strategy can be implemented)

Rationale:

- The Standing Committee agreed that the measure uses claims data that can be generated or collected during the provision of care and that no fees, licensing, or requirements are needed to use the measure.

4. Use and Usability

4a. Use; 4a1. Accountability and transparency; 4a2. Feedback on the measure by those being measured and others; 4b. Usability; 4b1. Improvement; 4b2. The benefits to patients outweigh evidence of unintended negative consequences to patients)

4a. Use: **Pass-18; No Pass-0** (18/18 – 100%, Pass) 4b. Usability: **H-1; M-13; L-3; I-1** (14/18 – 78%, Pass)

Rationale:

- The Standing Committee acknowledged that this measure is planned for use as part of CMS' Dialysis Facility public reporting program.
- The Standing Committee noted that this is a new measure and no information is available on performance improvement. This measure is not currently used in a program, but a primary goal of the measure is to provide information necessary to implement focused quality improvement efforts. Once the measure is implemented, the developer plans to examine trends in improvements over time.

5. Related and Competing Measures

  - This measure is related to the following measures: NQF #1463 Standardized Hospitalization Ratio for Dialysis Facilities (SHR)
  - NQF #3566 Emergency Department Encounters Occurring Within 30 Days of Hospital Discharge (ED30) (currently undergoing endorsement review with SEDR)
- The developer noted that this measure is not completely harmonized, as each measure assesses different outcomes and/or target populations but is harmonized to the extent possible.
- NQF staff noted that related and competing measures would be discussed at a later meeting.

6. Standing Committee Recommendation for Endorsement: Y-18; N-0 (18/18 – 100%, Yes)

7. Public and Member Comment

The comments received pertained to the following points:

- Concerns with reliability and appropriateness of PIUR
- Exclusion of Medicare Advantage patients; Risk Adjustment
- Meaningful Differences in Performance

#3565 Standardized Emergency Department Encounter Ratio (SEDR) for Dialysis Facilities
The Standing Committee acknowledged the comments and developer responses and did not raise any dissenting points of consideration, nor did it provide any additional feedback.
7. CSAC Review (November 17-18, 2020): Y-11; N-0
8. CSAC Decision: Approved for endorsement
9. Appeals: No appeals were received.

#3566 Standardized Ratio of Emergency Department Encounters Occurring Within 30 Days of Hospital Discharge (ED30) for Dialysis Facilities
Submission | Specifications
Description: The *Standardized Ratio of Emergency Department Encounters Occurring Within 30 Days of Hospital Discharge for Dialysis Facilities (ED30)* is defined to be the ratio of observed over expected events. The numerator is the observed number of index discharges from acute care hospitals that are followed by an outpatient emergency department encounter within four to 30 days after discharge for eligible adult Medicare dialysis patients treated at a particular dialysis facility. The denominator is the expected number of index discharges followed by an ED encounter within four to 30 days given the discharging hospital's characteristics, characteristics of the dialysis facility's patients, and the national norm for dialysis facilities. Note that in this document, acute care hospital includes critical access hospitals and "emergency department encounter" always refers to an outpatient encounter that does not end in a hospital admission. This measure is calculated as a ratio but can also be expressed as a rate. When used for public reporting, the measure calculation will be restricted to facilities with at least 11 eligible index discharges in the reporting year. This restriction is required to ensure patients cannot be identified due to small cell size. **Numerator Statement**: The observed number of index hospital discharges during a year that are followed by an emergency department encounter within four to 30 days of the discharge among eligible adult Medicare patients at a facility. **Denominator Statement**: The expected number of index hospital discharges for eligible adult Medicare ESRD dialysis patients during the two-year period that are followed by an emergency department encounter within four to 30 days of the discharge among eligible patients at a facility. The expected value is the result of a risk-adjusted predictive model adjusted for the characteristics of the patients, the dialysis facility, and the discharging hospitals. **Exclusions**: Index Discharge exclusions that are implicit in the denominator definition include discharges for which the patient: • Has Medicare Advantage (MA) coverage at the time of the index discharge • Has had ESRD for 90 days or less at time of discharge • Is less than 18 years of age at the time of discharge We also exclude discharges and emergency department encounters for which the patient was found to be the following: • Actively enrolled in hospice at any time during the calendar month of the discharge date or ED encounter admit date. Outpatient Medicare claims are the source of ED encounter data, and since outpatient claims are not available for Medicare Advantage (MA) patients, we cannot identify ED encounters for MA patients. Therefore, we exclude index discharges for patients with MA at the time of discharge. The hospice exclusion is needed because hospice patients are considered to be under the purview of hospice caregivers and may have other reasons for emergency department use, such as pain management. Additionally we exclude hospital discharges that: • do not result in a live discharge;

#3566 Standardized Ratio of Emergency Department Encounters Occurring Within 30 Days of Hospital Discharge (ED30) for Dialysis Facilities

• are against medical advice;

• include a primary diagnosis for cancer, mental health, or rehabilitation (see below for excluded CCSs);

• are from a Prospective Payment System PPS-exempt cancer hospital;

• are followed within three days of discharge by the patient being transplanted, discontinuing dialysis, recovering renal function, being lost to follow-up, having another hospitalization, or having an emergency department visit.

Adjustment/Stratification: Statistical risk model

Level of Analysis: Facility

Setting of Care: Other

Type of Measure: Outcome

Data Source: Claims, Registry Data

Measure Steward: Centers for Medicare & Medicaid Services

STANDING COMMITTEE MEETING June 22, 2020

1. Importance to Measure and Report: <u>The measure meets the Importance criteria.</u>

(1a. Evidence, 1b. Performance Gap)

1a. Evidence: **Y-18**; **N-0** (18/18 – 100%, Pass); 1b. Performance Gap: **H-7**; **M-7**; **L-4**; **I-0** (14/18 – 78%, Pass)

<u>Rationale</u>:

- The Standing Committee reviewed the evidence presented by the developer, which demonstrated that dialysis facilities can implement various interventions to reduce the risk of unplanned ED encounters.
- The Standing Committee asked for clarification on whether this measure included observation stays. The developer responded, stating that the measure combines ED encounters as well as observation stays.
- The Standing Committee reviewed the range of performance for dialysis facilities from 0 to 3.52, with a mean of 1.03 and a standard deviation of 0.37.
- The Standing Committee agreed that the evidence provided supported that interventions can be undertaken to reduce the risk of unplanned ED encounters within 30 days of a hospital discharge and that a gap in care exists that warrants a national performance measure.

2. Scientific Acceptability of Measure Properties: <u>The measure meets the scientific acceptability criteria.</u>

(2a. Reliability - precise specifications, testing; 2b. Validity - testing, threats to validity

2a. Reliability: **H-1**; **M-12**; **L-4**; **I-1** (13/18 – 72%, Pass) 2b. Validity: **H-1; M-4; L-2; I-0 (SMP)**

<u>Rationale</u>:

- This measure was deemed as complex and was evaluated by the NQF Scientific Methods Panel (SMP) in spring 2020. The SMP passed the measure on validity and consensus was not reached on reliability.
- The Standing Committee considered the SMP's discussion on the standards of acceptable reliability for IUR, as well as its comparison to profile PIUR. The IUR was 0.45 and the PIUR was 0.57.
- The Standing Committee acknowledged a public comment that raised concern regarding the measure's reliability as specified due to the IUR of 0.45 and that the reliability for small facilities might be substantially lower.
- The Standing Committee considered the differences in these two reliability statistics, noting that the IUR is less than 0.5. The Standing Committee discussed how this measure may be used, considering that this is a new measure and the PIUR reflects how well the measure reliably flags outliers rather than between provider variation.
- The developer commented that the decision regarding how this measure would be used belongs to CMS in terms of what, if in any, way they want to use the measure.
- The Standing Committee considered the validity testing, in which there was concordance with this measure compared to facility mortality rates (SMR), transfusion events (STrR), AV fistula rates (SFR), Percentage of Prevalent Patients Waitlisted (PPPW), Standardized Hospitalization Mortality Ratio (SHR), and Standardized Emergency Encounter Ratio (SEDR).

#3566 Standardized Ratio of Emergency Department Encounters Occurring Within 30 Days of Hospital Discharge (ED30) for Dialysis Facilities

- While several considerations were noted on the reliability of the measure, the Standing Committee agreed to pass the measure on reliability and uphold the SMP's rating on validity (Y-18, N-0).

3. Feasibility: H-8; M-9; L-1; I-0 (17/18 – 94%, Pass)

(3a. Clinical data generated during care delivery; 3b. Electronic sources; 3c. Susceptibility to inaccuracies/ unintended consequences identified 3d. Data collection strategy can be implemented)

Rationale:

- The Standing Committee agreed that the measure uses claims data that can be generated or collected during the provision of care and that no fees, licensing, or requirements are needed to use the measure.

4. Use and Usability

4a. Use; 4a1. Accountability and transparency; 4a2. Feedback on the measure by those being measured and others; 4b. Usability; 4b1. Improvement; 4b2. The benefits to patients outweigh evidence of unintended negative consequences to patients)

4a. Use: **Pass-18; No Pass-0** (18/18 – 100%, Pass) 4b. Usability: **H-2; M-14; L-2; I-0 (**16/18 – 89%, Pass)

Rationale:

- The Standing Committee acknowledged that this measure is planned for use as part of CMS' Dialysis Facility public reporting program.
- The Standing Committee noted that this is a new measure and no information is available on performance improvement. This measure is not currently used in a program, but a primary goal of the measure is to provide information necessary to implement focused quality improvement efforts. Once the measure is implemented, the developer plans to examine trends in improvements over time.

5. Related and Competing Measures

- This measure is related to the following measures:
  - NQF #3565 Standardized Emergency Department Encounter Ratio (SEDR) for Dialysis Facilities (currently undergoing endorsement review with ED30). Steward: CMS (not NQF-endorsed)
  - NQF #2496 Standardized Readmission Ratio (SRR) for Dialysis Facilities
- The developer noted that this measure is harmonized.
- NQF staff noted that related and competing measures would be discussed at a later meeting.

6. Standing Committee Recommendation for Endorsement: Y-18; N-0 (18/18 – 100%, Yes)

7. Public and Member Comment

The comments received pertained to the following points:

- Concerns with reliability and appropriateness of PIUR
- Exclusion of Medicare Advantage (MA) patients; Risk Adjustment
- Meaningful Differences in Performance

The Standing Committee acknowledged the comments and developer responses and did not raise any dissenting points of consideration, nor did it provide any additional feedback.

8. CSAC Review (November 17-18, 2020): Y-11; N-0

9. CSAC Decision: Approved for endorsement

10. Appeals: No appeals were received.

Measures Not Recommended

#2496 Standardized Readmission Ratio (SRR) for Dialysis Facilities

Submission | Specifications

Description: The Standardized Readmission Ratio (SRR) for a dialysis facility is the ratio of the number of observed index discharges from acute care hospitals to that facility that resulted in an unplanned readmission to an acute care hospital within four to 30 days of discharge to the expected number of readmissions given the

#2496 Standardized Readmission Ratio (SRR) for Dialysis Facilities
discharging hospitals and the characteristics of the patients and is based on a national norm. Note that the measure is based on Medicare-covered dialysis patients. **Numerator Statement**: Each facility's observed number of hospital discharges that are followed by an unplanned hospital readmission within four to 30 days of discharge **Denominator Statement**: The denominator for a given facility is the expected number of the observed index hospital discharges that result in an unplanned readmission in days four to 30 and that are not preceded by an unplanned or competing event. The expectation accounts for patient-level characteristics, including measures of patient comorbidities and the discharging hospital, and is based on estimated readmission rates for an overall population norm that corresponds to an "average" facility. **Exclusions**: Index Discharge Exclusions: A live inpatient hospital discharge is excluded if any of the following hold: • It is associated with a stay of 365 days or longer. • It is against medical advice. • It includes a primary diagnosis of cancer, mental health or rehabilitation. • It includes revenue center codes indicating rehabilitation. • It occurs after a patient's 12th hospital discharge in the calendar year. • It is from a PPS-exempt cancer hospital. • It is followed within three days by any hospitalization (at acute care, long-term care, rehabilitation, or psychiatric hospital or unit) or any other competing event (see S.5). **Adjustment/Stratification**: Statistical risk model **Level of Analysis:** Facility **Setting of Care:** Other **Type of Measure**: Outcome **Data Source**: Claims, Registry Data **Measure Steward**: Centers for Medicare & Medicaid Services
STANDING COMMITTEE MEETING June 22, 2020 **1. Importance to Measure and Report: <u>The measure meets the Importance criteria.</u>** (1a. Evidence, 1b. Performance Gap) 1a. Evidence: **Y-18**; **N-0** (18/18 – 100%, Pass); 1b. Performance Gap: **H-5**; **M-13**; **L-0**; **I-0** (18/18 – 100%, Pass) <u>Rationale</u>: • The Standing Committee agreed with the evidence presented by the developer, which demonstrated that dialysis facilities can implement various interventions to reduce the risk of unplanned ED encounters. • The Standing Committee reviewed the range of performance for dialysis facilities from 2016-2018 and an interquartile range of 0.33 for both 2016 and 2017 and 0.34 for 2018; they agreed that a gap in care exists that warrants a national performance measure.
2. Scientific Acceptability of Measure Properties: <u>The measure does not meet the Scientific Acceptability criteria.</u> (2a. Reliability - precise specifications, testing; 2b. Validity - testing, threats to validity 2a. Reliability: **H-1**; **M-15**; **L-2**; **I-0** (16/18 – 89%, Pass); 2b. Validity**: H-0; M-3; L-5; I-0 (SMP)** <u>Rationale</u>: • This measure was deemed as complex and was evaluated by the NQF Scientific Methods Panel (SMP) in spring 2020. The SMP did not pass the measure on validity and consensus was not reached on reliability. • NQF's policy states that measures that do not pass SMP review are still eligible to be pulled for review by a Standing Committee, as long as the rationale for not passing the measures does not include

#2496 Standardized Readmission Ratio (SRR) for Dialysis Facilities

inappropriate methodology or inadequate testing. The measure was eligible to be pulled so the Standing Committee pulled the measure for reconsideration and voted on the measure.

- The Standing Committee considered the SMP's discussion on the standards of acceptable reliability for IUR, as well as its comparison to profile PIUR. The IUR was 0.35 and the PIUR was 0.61. The Standing Committee passed the measure on reliability based on the PIUR.
- The Standing Committee considered the differences between these two reliability statistics, noting that the IUR is less than 0.5. The Standing Committee discussed how this measure may be used, considering that this is a new measure and the PIUR reflects how well the measure reliably flags outliers rather than between provider variation.
- The developer commented that the decision regarding how this measure would be used belongs to CMS in terms of what, if in any, way they want to use the measure.
- For validity, the SMP's concerns centered on the adequacy of the measure correlations presented for measure score validity testing. The developers provided a detailed response to the panel's concerns. However, the SMP still found that the results did not adequately demonstrate measure score validity and did not pass the measure on validity.
- While several considerations were noted on the reliability, the Standing Committee agreed to pass the measure on reliability. However, the Standing Committee agreed to uphold the SMP's rating on validity (Y-18, N-0), which was to not pass the measure on validity.

3. Feasibility: H-X; M-X; L-X; I-X <u>The Standing Committee did not vote on this criteria because the measure did not pass scientific acceptability.</u>

(3a. Clinical data generated during care delivery; 3b. Electronic sources; 3c. Susceptibility to inaccuracies/ unintended consequences identified 3d. Data collection strategy can be implemented)

4. Use and Usability: <u>The Standing Committee did not vote on these criteria because the measure did not pass scientific acceptability.</u>

4a. Use; 4a1. Accountability and transparency; 4a2. Feedback on the measure by those being measured and others; 4b. Usability; 4b1. Improvement; 4b2. The benefits to patients outweigh evidence of unintended negative consequences to patients)

4a. Use: **Pass-X; No Pass-X** 4b. Usability: **H-X; M-X; L-X; I-X**

5. Related and Competing Measures

6. Standing Committee Recommendation for Endorsement: Y-X; N-X

7. Public and Member Comment

The comments received pertained to the following points:

- Concern with reliability scores for certain facilities and use of the profile inter-unit reliability (PIUR)
- Medicare Advantage (MA) patient variation and use of in-patient comorbidities
- Validity testing; risk adjustment c-statistic
- Harmonization of SHR and SRR

During the commenting period, the Standing Committee received a reconsideration request from the developer on the basis that the measure evaluation criteria were not applied appropriately. The developer contended that the results from validity testing are sufficient for achieving a moderate score on validity. The developer stated that the Standing Committee's decision to uphold the SMP's rating and recommendation to not pass the measure on validity was due to inadequate demonstration of measure score validity based on correlations with other outcome measures. The developer further stated that the Standing Committee's vote on validity was erroneously influenced by the concerns of a specific SMP reviewer who focused significantly on the changes in the magnitude of correlation results and a decrease in the correlation coefficient value from the initial submission in 2014 rather than observing that the direction of the correlations and the statistical significance were both valid. The Standing Committee expressed that NQF staff accurately explained the process, which was

#2496 Standardized Readmission Ratio (SRR) for Dialysis Facilities
followed correctly by the Standing Committee considering the request and ultimately voted not to reconsider the measure.
8. CSAC Review (November 17-18, 2020): Y-11; N-0
9. CSAC Decision: Not approved for endorsement
10. Appeals: No appeals were received.

Appendix B: All-Cause Admissions and Readmissions Portfolio—Use in Federal Programs[a]

NQF #	Title	Federal Programs: Finalized or Implemented as of June 22, 2020
0171	Acute Care Hospitalization During the First 60 Days of Home Health	Home Health Quality Reporting (Implemented)
0173	Emergency Department Use without Hospitalization During the First 60 Days of Home Health	Home Health Quality Reporting (Implemented)
0330	Hospital 30-day, all-cause, risk-standardized readmission rate (RSRR) following heart failure (HF) hospitalization	Hospital Readmissions Reduction Program (Implemented)
0505	Hospital 30-day all-cause risk-standardized readmission rate (RSRR) following acute myocardial infarction (AMI) hospitalization	Hospital Readmissions Reduction Program (Implemented)
0506	Hospital 30-day, all-cause, risk-standardized readmission rate (RSRR) following pneumonia hospitalization	Hospital Readmissions Reduction Program (Implemented)
0695	Hospital 30-Day Risk-Standardized Readmission Rates following Percutaneous Coronary Intervention (PCI)	N/A

[a] Per CMS Measures Inventory Tool, last accessed as of 02/05/2021

NQF #	Title	Federal Programs: Finalized or Implemented as of June 22, 2020
0727	Gastroenteritis Admission Rate (PDI 16)	N/A
0728	728 Asthma Admission Rate (PDI 14)	N/A
1463	Standardized Hospitalization Ratio for Dialysis Facilities (SHR)	End-Stage Renal Disease Quality Incentive Program (Implemented)
1789	Hospital-Wide All-Cause Unplanned Readmission Measure (HWR) - ACO Level	N/A
1789	Hospital-Wide All-Cause Unplanned Readmission (HWR)	Hospital Inpatient Quality Reporting (Implemented)
1891	Hospital 30-Day, All-Cause, Risk-Standardized Readmission Rate (RSRR) following Chronic Obstructive Pulmonary Disease (COPD) Hospitalization	Hospital Readmissions Reduction Program (Implemented)
2375	PointRight ® Pro 30™	N/A
2393	Pediatric All-Condition Readmission Measure	N/A
2414	Pediatric Lower Respiratory Infection Readmission Measure	N/A
2503	Hospitalizations per 1000 Medicare fee-for-service (FFS) Beneficiaries	N/A
2504	30-day Rehospitalizations per 1000 Medicare	N/A

NQF #	Title	Federal Programs: Finalized or Implemented as of June 22, 2020
	fee-for-service (FFS) Beneficiaries	
2510	Skilled Nursing Facility 30-Day All-Cause Readmission Measure	Skilled Nursing Facility Value-Based Purchasing (Implemented)
2513	Hospital 30-Day All-Cause Risk-Standardized Readmission Rate (RSRR) following Vascular Procedures	N/A
2514	Risk-Adjusted Coronary Artery Bypass Graft (CABG) Readmission Rate	N/A
2515	Hospital 30-day, all-cause, unplanned, risk-standardized readmission rate (RSRR) following coronary artery bypass graft (CABG) surgery	Hospital Readmissions Reduction Program (Implemented)
2539	Facility 7-Day Risk-Standardized Hospital Visit Rate after Outpatient Colonoscopy	Ambulatory Surgical Center Quality Reporting (Implemented), Hospital Outpatient Quality Reporting (Implemented)
2827	PointRight® Pro Long Stay (TM) Hospitalization Measure	N/A
2858	Discharge to Community	N/A
2860	Thirty-day all-cause unplanned readmission following psychiatric hospitalization in an inpatient psychiatric facility (IPF)	Inpatient Psychiatric Facility Quality Reporting (Implemented)
2879e	Hybrid Hospital-Wide Readmission (HWR) Measure with Claims	N/A

NQF #	Title	Federal Programs: Finalized or Implemented as of June 22, 2020
	and Electronic Health Record Data	
2880	Excess days in acute care (EDAC) after hospitalization for heart failure (HF)	Hospital Compare, Hospital Inpatient Quality Reporting (Implemented)
2881	Excess days in acute care (EDAC) after hospitalization for acute myocardial infarction (AMI)	Hospital Inpatient Quality Reporting (Implemented)
2882	Excess days in acute care (EDAC) after hospitalization for pneumonia	Hospital Inpatient Quality Reporting (Implemented)
2888	Risk-Standardized Acute Admission Rates for Patients with Multiple Chronic Conditions	Medicare Shared Savings Program (Finalized)
3188	30-Day Unplanned Readmissions for Cancer Patients	Prospective Payment System-Exempt Cancer Hospital Quality Reporting (Implemented)
3366	Hospital Visits after Urology Ambulatory Surgical Center Procedures	Ambulatory Surgical Center Quality Reporting (Finalized)
3449	Hospitalization for Ambulatory Care Sensitive Conditions for Dual Eligible Beneficiaries	N/A
3457	Minimizing Institutional Length of Stay	Medicaid (Implemented)
3470	Hospital Visits after Orthopedic Ambulatory Surgical Center Procedures	Ambulatory Surgical Center Quality Reporting (Finalized)
3495	Hospital-Wide 30-Day, All-Cause, Unplanned Readmission Rate (HWR) for the Merit-Based Incentive Payment System	N/A

NQF #	Title	Federal Programs: Finalized or Implemented as of June 22, 2020
	(MIPS) Eligible Clinician Groups	
3565	Standardized Emergency Department Encounter Ratio (SEDR) for Dialysis Facilities	N/A
3566	Standardized Ratio of Emergency Department Encounters Occurring Within 30 Days of Hospital Discharge (ED30) for Dialysis Facilities	N/A

Appendix C: All-Cause Admissions and Readmissions Standing Committee and NQF Staff

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Appendix D: Measure Specifications

	1463 Standardized Hospitalization Ratio for Dialysis Facilities (SHR)
Steward	Centers for Medicare & Medicaid Services
Description	The standardized hospitalization ratio is defined to be the ratio of the number of hospital admissions that occur for Medicare ESRD dialysis patients treated at a particular facility to the number of hospitalizations that would be expected given the characteristics of the dialysis facility's patients and the national norm for dialysis facilities. This measure is calculated as a ratio but can also be expressed as a rate. When used for public reporting, the measure calculation will be restricted to facilities with greater than 5 patient years at risk in the reporting year. This restriction is required to ensure patients cannot be identified due to small cell size.
Type	Outcome
Data Source	Claims, Registry Data Data are derived from an extensive national ESRD patient database that is primarily based on CROWNWeb facility-reported clinical and administrative data (including CMS-2728 Medical Evidence Form, CMS-2746 Death Notification Form, and CMS-2744 Annual Facility Survey Form and patient tracking data), the Renal Management Information System (REMIS), the Medicare Enrollment Database (EDB), and Medicare claims data. In addition the database includes transplant data from the Scientific Registry of Transplant Recipients (SRTR), and data from the Nursing Home Minimum Dataset, the Quality Improvement Evaluation System (QIES) Business Intelligence Center (QBIC) (which includes Provider and Survey and Certification data from Automated Survey Processing Environment (ASPEN)), and the Dialysis Facility Compare (DFC). The database is comprehensive for Medicare patients not enrolled in Medicare Advantage. Medicare Advantage patients are included in all sources but their Medicare payment records are limited to inpatient claims. Non-Medicare patients are included in all sources except for the Medicare payment records. Tracking by dialysis provider and treatment modality is available for all patients including those with only partial or no Medicare coverage. Information on hospitalizations is obtained from Part A Medicare Inpatient Claims Standard Analysis Files (SAFs), and past-year comorbidity data are obtained from multiple Part A types (inpatient, home health, hospice, skilled nursing facility claims) only.
Level	Facility
Setting	Other Dialysis Facility
Numerator Statement	Number of inpatient hospital admissions among eligible patients at the facility during the reporting period.
Numerator Details	The numerator is calculated through use of Medicare claims data. When a claim is made for an inpatient hospitalization, the patient is identified and attributed to a dialysis facility following rules discussed below in the denominator details. The numerator is the count of all such hospitalizations over the reporting period.
Denominator Statement	Number of hospital admissions that would be expected among eligible patients at the facility during the reporting period, given the patient mix at the facility.
Denominator Details	Assignment of Patients to Facilities UM-KECC's treatment history file provides a complete history of the status, location, and dialysis treatment modality of an ESRD patient from the date of the first ESRD service until the patient dies or the data collection cutoff date is reached. For each patient, a new record is created each time he/she changes facility or treatment modality. Each record represents a time period associated with a specific modality and dialysis facility. CROWNWeb (including CMS Medical Evidence Form (Form CMS-2728), Death Notification Form (Form CMS-2746)) is the primary basis for placing patients at dialysis facilities, and dialysis claims are used as an additional source. Information regarding first ESRD service

	1463 Standardized Hospitalization Ratio for Dialysis Facilities (SHR)
	date, death and transplant is obtained from additional sources including the CMS Enrollment Database (EDB), transplant data from the Organ Procurement and Transplant Network (OPTN), and the Social Security Death Master File. As patients can receive dialysis treatment at more than one facility in a given year, we assign each patient day to a facility (or no facility, in some cases) based on a set of conventions described below, which largely align with those for the Standardized Mortality Ratio (SMR). We detail patient inclusion criteria, facility assignment and how to count days at risk, all of which are required for the risk adjustment model. General Inclusion Criteria for Dialysis Patients Though a patient's follow-up in the database can be incomplete during the first 90 days of ESRD therapy, we only include a patient's follow-up in the tabulations after that patient has received chronic renal replacement therapy for at least 90 days. Thus, hospitalizations, mortality and survival during the first 90 days of ESRD do not enter into the calculations. This minimum 90-day period also assures that most patients are eligible for Medicare, either as their primary or secondary insurer. It also excludes from analysis patients who die or recover renal function during the first 90 days of ESRD. In order to exclude patients who only received temporary dialysis therapy at the facility, we assign patients to a facility only after they have been on dialysis there for the past 60 days. This 60 day period is used both for patients who started ESRD for the first time and for those who returned to dialysis after a transplant. That is, hospitalizations during the first 60 days of dialysis at a facility do not affect the SHR of that facility. Identifying Facility Treatment Histories for Each Patient For each patient, we identify the dialysis provider at each point in time. Starting with day 91 after onset of ESRD, we attribute patients to facilities according to the following rules. A patient is attributed to a facility once the patient has been treated there for the past 60 days. When a patient transfers from one facility to another, the patient continues to be attributed to the original facility for 60 days and then is attributed to the destination facility. In particular, a patient is attributed to his or her current facility on day 91 of ESRD if that facility had treated him or her for the past 60 days. If on day 91, the facility had not treated a patient for the past 60 days, we wait until the patient reaches day 60 of continuous treatment at that facility before attributing the patient to that facility. When a patient is not treated in a single facility for a span of 60 days (for instance, if there were two switches within 60 days of each other), we do not attribute that patient to any facility. Patients are removed from facilities three days prior to transplant in order to exclude the transplant hospitalization. Patients who withdrew from dialysis or recovered renal function remain assigned to their treatment facility for 60 days after withdrawal or recovery. If a period of one year passes with neither paid dialysis claims nor CROWNWeb information to indicate that a patient was receiving dialysis treatment, we consider the patient lost to follow-up and do not include that patient in the analysis. If dialysis claims or other evidence of dialysis reappears, the patient is entered into analysis after 60 days of continuous therapy at a single facility. Days at Risk for Medicare Dialysis Patients After patient treatment histories are defined as described above, periods of follow-up in time since ESRD onset are created for each patient. In order to adjust for duration of ESRD appropriately, we define 6 time intervals with cut points at 6 months, 1 year, 2 years, 3 years and 5 years. A new time period begins each time the patient is determined to be at a different facility, or at the start of each calendar year or when crossing any of the above cut points. In order to assure completeness of information on hospitalizations for all patients included in the analysis, we restrict to Medicare patients who are either enrolled in Medicare Advantage or who reach a certain threshold of Medicare dialysis and inpatient claims. Specifically, months within a given dialysis patient-period are used for SHR calculation when

	1463 Standardized Hospitalization Ratio for Dialysis Facilities (SHR)
	the patient is enrolled in Medicare Advantage or meets the criterion of being within two months after a month with either: (a) $1200+ of Medicare-paid dialysis claims OR (b) at least one Medicare inpatient claim. The number of days at risk in each of these patient-ESRD facility-year time periods is used to calculate the expected number of hospital admissions for the patient during that period. The SHR for a facility is the ratio of the total number of observed hospitalizations to the total number of expected hospitalizations during all time periods at the facility. Based on a risk adjustment model for the overall national hospitalization rates, we compute the expected number of hospitalizations that would occur for each month that each patient is attributed to a given facility. The sum of all such expectations for patients and months yields the overall number of hospital admissions that would be expected given the specific patient mix, and forms the denominator of the measure. The denominator of the SHR is derived from a proportional rates model (Lawless and Nadeau, 1995; Lin et al., 2000; Kalbfleisch and Prentice, 2002). This is the recurrent event analog of the well-known proportional hazards or Cox model (Cox, 1972; Kalbfleisch and Prentice, 2002). To accommodate large-scale data, we adopt a model with piecewise constant baseline rates (e.g. Cook and Lawless, 2007) and the computational methodology developed in Liu, Schaubel and Kalbfleisch (2012). References: Cook, R. and Lawless, J. The Statistical Analysis of Recurrent Events. New York: Springer. 2007. Cox, D.R. (1972) Regression Models and Life Tables (with Discussion). J. Royal statistical Society, Series B, 34, 187-220. Kalbfleisch, J.D. and Prentice, R. L. The Statistical Analysis of Failure Time Data. Wiley, New York, 2002. Lawless, J. F. and Nadeau, C. Some simple and robust methods for the analysis of recurrent events, Technometrics, 37 1995, 355-364. Lin, D.Y., Wei, L.J., Yang, I. and Ying, Z. Semi parametric regression for the mean and rate functions of recurrent events, Journal of the Royal Statistical Society Series B, 62, 2000, 771-730
Exclusions	N/A
Exclusion details	N/A
Risk Adjustment	Statistical risk model
Stratification	N/A
Type Score	Ratio better quality = lower score
Algorithm	See flowchart in appendix. 117654| 132498| 132512| 136622| 141592
Copyright / Disclaimer	Not applicable

	2539 Facility 7-Day Risk-Standardized Hospital Visit Rate after Outpatient Colonoscopy
Steward	Centers for Medicare & Medicaid Services
Description	Facility-level risk-standardized rate of acute, unplanned hospital visits within 7 days of a colonoscopy procedure performed at a hospital outpatient department (HOPD) or ambulatory surgical center (ASC) among Medicare Fee-For-Service (FFS) patients aged 65 years and older. An unplanned hospital visit is defined as an emergency department (ED) visit, observation stay, or unplanned inpatient admission. The measure is calculated separately for ASCs and HOPDs.
Type	Outcome
Data Source	Claims, Other Medicare administrative claims and enrollment data
Level	Facility
Setting	Outpatient Services
Numerator Statement	Unplanned hospital visits within 7 days of a qualifying colonoscopy.
Numerator Details	Outcome Definition The outcome for this measure is all-cause, unplanned hospital visits within 7 days of an outpatient colonoscopy. Hospital visits include ED visits, observation stays, and unplanned inpatient admissions. If more than one unplanned hospital visit occurs, only the first hospital visit within the outcome timeframe is counted in the outcome. Identification of Planned Admissions The measure outcome includes any inpatient admission within the first 7 days after the colonoscopy, unless that admission is deemed a "planned" admission as defined by the measure's PAA. The Centers for Medicare & Medicaid Services (CMS) seeks to count only unplanned admissions in the measure outcome, because variation in "planned" admissions does not reflect quality differences. We based the PAA on the CMS PRA Version 4.0_2019, which CMS created for its hospital-wide readmission measure. In brief, the algorithm identifies admissions that are typically planned and may occur after the patient's index event. The algorithm always considers a few specific, limited types of care planned (e.g., major organ transplant, rehabilitation, or maintenance chemotherapy). Otherwise, the algorithm defines a planned admission as a non-acute admission for a scheduled procedure (e.g., total hip replacement or cholecystectomy), and the algorithm never considers admissions for acute illness or for complications of care planned. For example, the algorithm considers hip replacement unplanned if hip fracture (an acute condition) is the discharge diagnosis, but planned if osteoarthritis (a non-acute condition) is the discharge diagnosis. The algorithm considers admissions that include potentially planned procedures with acute diagnoses or that might represent complications of a colonoscopy unplanned and thus counts these admissions in the measure outcome. For more information about the PAA, please see the Facility 7-day Risk-Standardized Hospital Visit Rate after Outpatient Colonoscopy Measure 2018 Measure Updates and Specifications Report posted on the web page provided in data field S.1. Also see sheets "PAA PA1 always planned Px", "PAA PA2 always planned Dx", "PAA PA3 post planned Px", and "PAA PA4 acute Dx" in the attached Data Dictionary for the most up-to-date sets of codes in the algorithm for "always planned procedures" (PA1), "always planned diagnoses" (PA2), "potentially planned procedures" (PA3), and "acute" diagnoses (PA4). Definition of ED and Observation Stay We defined ED visits and observation stays using one of the specified billing codes or revenue center codes identified in Medicare Part B Outpatient hospital claims. The codes that define ED visits and observation stays are in the attached Data Dictionary, sheet "Colons_Outcome_ED_Obs."
Denominator Statement	Colonoscopies performed at hospital outpatient departments (HOPDs) and ambulatory surgical centers (ASCs) for Medicare FFS patients aged 65 years and older.

	2539 Facility 7-Day Risk-Standardized Hospital Visit Rate after Outpatient Colonoscopy
Denominator Details	Target Population The measure includes colonoscopies performed at HOPDs and ASCs. The measure calculates a facility-level score for all eligible facilities separately for HOPDs, and ASCs. The target population is patients aged 65 years and older who have a colonoscopy, to screen for colorectal cancer, biopsy or remove pre-cancerous lesions, or evaluate non-emergent symptoms and signs of disease. We limited the measure cohort to patients who are 65 and older, enrolled in Medicare FFS, and have been enrolled in Part A and Part B Medicare for the 12 months prior to the date of procedure since national data linking risk factors, procedures, and outcomes across care settings are only available for this group. Eligible colonoscopies were identified using specified Current Procedural Terminology (CPT)/Healthcare Common Procedure Coding System (HCPCS) procedure codes in the Medicare Carrier (Part B Physician) Standard Analytical File (SAF). The CPT and HCPCS procedure codes that define the cohort are in the attached Data Dictionary, sheet "Colonos_Cohort." We considered all colonoscopy codes during development of the measure cohort. We did not include in the measure colonoscopy CPT procedure codes that reflected fundamentally higher-risk or different procedures. Those procedures billed with a qualifying colonoscopy procedure code and a high-risk colonoscopy procedure code (see attached Data Dictionary, sheet "Colonos_Excll") were not included in the measure. Colonoscopy is not possible among patients who have had a prior total colectomy. Any claim for a colonoscopy in a patient with a prior total colectomy is therefore likely to be a coding error. We perform an error check to ensure the measure does not include these patients with a total colectomy recorded in their prior medical history. The CPT and HCPCS procedure codes and International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM) and ICD-10-CM codes that define the total colectomy data reliability check are in the attached Data Dictionary, sheet "Colonos_Excl." Capture of Colonoscopies Affected by the Medicare 3-Day Payment Window Policy: Colonoscopies performed at HOPDs can be affected by the Medicare 3-day payment window policy. The policy states that outpatient services (including all diagnostic services such as colonoscopy) provided by a hospital or any Part B entity wholly owned or wholly operated by a hospital (such as an HOPD) in the three calendar days preceding the date of a beneficiary's inpatient admission are deemed to be related to the admission [1]. For outpatient colonoscopies affected, the facility claim (for the technical portion of the colonoscopy) is bundled with the inpatient claim, although the Medicare Part B physician claim for professional services rendered is still submitted. This policy has implications for the measure because it may lead to: (1) failure to completely capture outpatient colonoscopies performed at HOPDs; and (2) underreporting of outcomes for colonoscopies performed in the HOPD setting. To ensure the capture of HOPD colonoscopies, we identify physician claims for colonoscopy in the HOPD setting from Medicare Part B claims, which had an inpatient admission within three days and lacked a corresponding HOPD facility claim. We then attribute the colonoscopies identified as affected by this policy to the appropriate HOPD facility using the facility provider ID from the inpatient claim. Citations 1. Centers for Medicare & Medicaid Services (CMS). Three Day Payment Window. 2013; http://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/AcuteInpatientPPS/Three_Day_Payment_Window.html
Exclusions	We established the following exclusion criteria after reviewing the literature, examining existing measures, discussing alternatives with the working group and technical expert panel (TEP) members, reviewing feedback from the national dry run held in July 2015, and public reporting in 2018 and 2019, and annual re-evaluation of the measure in 2017, 2018, and 2019. The goal was to be as inclusive as possible; we excluded only those high-risk procedures and

	2539 Facility 7-Day Risk-Standardized Hospital Visit Rate after Outpatient Colonoscopy
	patient groups for which risk adjustment would not be adequate or for which hospital visits were not typically a quality signal. The exclusions, based on clinical rationales, prevent unfair distortion of performance results. 1) Colonoscopies for patients who lack continuous enrollment in Medicare FFS Parts A and B in the 7 days after the procedure. Rationale: We exclude these patients to ensure full data availability for outcome assessment. 2) Colonoscopies that occur concurrently with high-risk upper gastrointestinal (GI) endoscopy procedures. Rationale: Patients undergoing concurrent high-risk upper GI endoscopy procedures, such as upper GI endoscopy procedures for the control of bleeding or treatment of esophageal varices, and have a higher risk profile than typical colonoscopy patients. Therefore, these patients have a disproportionally higher risk for the outcome. 3) Colonoscopies for patients with a history of inflammatory bowel disease (IBD) or diagnosis of IBD at time of index colonoscopy or on the subsequent hospital visit outcome claim. Rationale: We exclude these patients because: • IBD is a chronic condition; patients with IBD undergo colonoscopy both for surveillance due to increased cancer risk and for evaluation of acute symptoms. IBD is likely to be coded as the primary diagnosis prompting the procedure irrespective of whether the patients are undergoing a screening procedure or a diagnostic procedure in the setting of an acute exacerbation of IBD. Therefore, we may not be able to adequately risk adjust for these patients, as we cannot identify relatively well versus acutely unwell patients among visits coded as IBD. • Our aim is to capture hospital visits which reflect the quality of care. Admissions for acutely ill IBD patients who are evaluated with an outpatient colonoscopy and are subsequently admitted for medical treatment of an IBD flare do not reflect the quality of the colonoscopy. In our 2010 Medicare 20% FFS Full Development Sample (see the 2014 Facility 7-day Risk-Standardized Hospital Visit Rate after Outpatient Colonoscopy Measure Technical Report posted at https://www.qualitynet.org/files/5d0d37ae764be766b010196e?filename=ClnscpyMsr_TechReport.pdf for full description of the dataset), more than one-third of IBD patients admitted to the hospital with colonoscopy had a discharge diagnosis of IBD, indicating their admission was for medical treatment of their IBD. We therefore excluded this group so that providers who treat a disproportionate number of IBD patients will not be disadvantaged in the measure. • A post-index diagnosis of IBD, which represents a very small fraction of cases (less than 0.5% of the cohort) in the measure population, indicates that the condition was likely present at the time of the index colonoscopy but not coded. 4) Colonoscopies for patients with a history of diverticulitis or diagnosis of diverticulitis at time of index colonoscopy or on the subsequent hospital visit outcome claim. Rationale: We exclude these patients because: • It is unclear what the health status is of patients coded with a history or current diagnosis of diverticulitis, making it difficult to fully risk adjust for patients' health. Colonoscopies performed on patients with a history or current diagnosis of diverticulitis are likely to be coded as diverticulitis as the primary diagnosis irrespective of whether the patients are undergoing a screening procedure or a diagnostic procedure (i.e., are acutely unwell with active disease). Furthermore, the codes for diverticulitis and diverticulosis may not be consistently used; patients with diverticulosis may be erroneously coded as diverticulitis. Therefore, we may not be able to adequately risk adjust as we cannot identify relatively well versus acutely unwell patients among visits coded as diverticulitis. • Admissions for acutely ill patients with a history or current diagnosis of diverticulitis who are evaluated with an outpatient colonoscopy and are subsequently admitted for medical

	2539 Facility 7-Day Risk-Standardized Hospital Visit Rate after Outpatient Colonoscopy
	treatment of do not reflect the quality of the colonoscopy. In our 2010 Medicare 20% FFS Full Development Sample (see the Facility 7-day Risk-Standardized Hospital Visit Rate after Outpatient Colonoscopy Measure Technical Report posted on the web page provided in data field S.1) more than one-quarter of patients with a history or current diagnosis of diverticulitis admitted to the hospital post colonoscopy had a discharge diagnosis of diverticulitis, indicating they were admitted for medical treatment of the condition. These admissions are likely unrelated to the quality of the colonoscopy. We therefore excluded this group so that providers who treat a disproportionate number of diverticulitis patients will not be disadvantaged in the measure. • A post-index diagnosis of diverticulitis, which represents a very small fraction of cases (less than 0.5% of the cohort) in the measure population, indicates that the condition was likely present at the time of the index colonoscopy but not coded. 5) Colonoscopies followed by a subsequent outpatient colonoscopy procedure within 7 days. Rationale: In these situations, the two colonoscopies are considered part of a single episode of care, for which the subsequent colonoscopy is considered the index procedure. In addition, for colonoscopies performed at HOPDs, we exclude: 6) Colonoscopies that occur on the same day and at the same hospital as an emergency department (ED) visit that is billed on a different claim than the index colonoscopy, unless the ED visit has a diagnosis indicative of a complication of care. Rationale: It is unclear whether the colonoscopy or ED visit occurred first. If the ED visit is coded with a diagnosis indicative of a complication of care, the measure assumes the ED visit occurred after the colonoscopy procedure and is counted in the measure. It is unlikely that a patient would experience an ED visit for an acute diagnosis at 1 facility and then travel to another facility for a routine colonoscopy on the same day. Accordingly, ED visits billed on the same day as a colonoscopy but at a different facility are included because they likely represent a routine procedure followed by a complication of care. 7) Colonoscopies that are billed on the same hospital claim as an ED visit and that occur on the same calendar day, unless the ED visit has a diagnosis indicative of a complication of care. Rationale: In these situations, it is not possible to use claims data to determine whether the colonoscopy was the cause of, subsequent to, or during the ED visit. However, if the ED visit is coded with a diagnosis for a complication, the assumption is that it occurred after the colonoscopy procedure. 8) Colonoscopies that are billed on the same hospital outpatient claim and that occur after the ED visit. Rationale: In these situations, we assume that the colonoscopy was subsequent to the ED visit and may not represent a routine colonoscopy procedure. Timing of the ED visits is determined using revenue center dates from the outpatient claim. 9) Colonoscopies that are billed on the same hospital outpatient claim as an observation stay. Rationale: In these situations, it is not possible to use claims data to determine whether the colonoscopy was the cause of, subsequent to, or during the observation stay.
Exclusion details	1) Colonoscopies for patients who lack continuous enrollment in Medicare FFS Parts A and B in the 7 days after the procedure. Lack of continuous enrollment in Medicare FFS for 7 days after the procedure is determined by patient enrollment status in FFS Parts A and B using the Medicare Enrollment Database. The enrollment indicators must be appropriately marked for the month(s) which fall within 7 days of the procedure date. 2) Colonoscopies that occur concurrently with high-risk upper GI endoscopy procedures. The list of the CPT codes for the upper GI endoscopy procedures identified as “high-risk” are in attached Data Dictionary, sheet “Colonos_Excl”

	2539 Facility 7-Day Risk-Standardized Hospital Visit Rate after Outpatient Colonoscopy
	3) Colonoscopies for patients with a history of IBD or diagnosis of IBD at time of index colonoscopy or on the subsequent hospital visit outcome claim. The ICD-9-CM and ICD-10-CM codes that define IBD are in the attached Data Dictionary, sheet "Colonos_Excl." 4) Colonoscopies for patients with a history of diverticulitis or diagnosis of diverticulitis at time of index colonoscopy or on the subsequent hospital visit outcome claim. The ICD-9-CM and ICD-10-CM codes that define diverticulitis are in the attached Data Dictionary, sheet "Colonos_Excl." 5) Colonoscopies followed by a subsequent outpatient colonoscopy procedure within 7 days. For cases in which a colonoscopy is followed by another colonoscopy within 7 days, the measure will use the subsequent colonoscopy as the index colonoscopy. The following are in addition to those above, but only for HOPDs: 6) Colonoscopies that occur on the same day and at the same hospital as an ED visit that is billed on a separate claim than the index colonoscopy, unless the ED visit has a diagnosis indicative of a complication of care. The billing and revenue center codes that define ED visits are in the attached Data Dictionary, sheet "Colonos_Outcome_ED_Obs." The same facility is defined as having the same CMS Certification Number (CCN). Complications of care codes (shown in tab "Colons_Excl_ED_CoC" include the following AHRQ CCS catgories: AHRQ CCS 257 – Other aftercare; AHRQ CCS 238 – Complications of surgical procedures or medical care; AHRQ CCS 2616 - Adverse effects of medical care; AHRQ CCS 2617 - Adverse effects of medical drugs; and ICD-10-CM G89.18 – Other acute postprocedural pain. 7) Colonoscopies that are billed on the same hospital claim as an ED visit and that occur on the same calendar day, unless the ED visit has a diagnosis indicative of a complication of care. The billing and revenue center codes that define ED visits are in the attached Data Dictionary, sheet "Colonos_Outcome_ED_Obs." Complications of care codes (shown in tab "Colons_Excl_ED_CoC" include the following AHRQ CCS catgories: AHRQ CCS 257 – Other aftercare; AHRQ CCS 238 – Complications of surgical procedures or medical care; AHRQ CCS 2616 - Adverse effects of medical care; AHRQ CCS 2617 - Adverse effects of medical drugs; and ICD-10-CM G89.18 – Other acute postprocedural pain. 8) Colonoscopies that are billed on the same hospital outpatient claim and that occur after the ED visit. The billing and revenue center codes that define ED visits are in the attached Data Dictionary, sheet ""Colonos_Outcome_ED_Obs." 9) Colonoscopies that are billed on the same hospital outpatient claim as an observation stay. The billing and revenue center codes that define observation stays are in the attached Data Dictionary, sheet "Colonos_Outcome_ED_Obs."
Risk Adjustment	Statistical risk model
Stratification	N/A. This measure is not stratified.
Type Score	Rate/proportion better quality = lower score
Algorithm	The measure is calculated separately for HOPDs and ASCs. 1. Identify colonoscopies meeting the inclusion criteria described above in S.7. 2. Exclude procedures meeting any of the exclusion criteria described above in S.9. 3. Identify and create a binary (0/1) flag for an unplanned hospital visit within 7 days of the colonoscopy described above in Section S.5. 4. Use patients' historical and index procedure claims data to create risk adjustment variables.

	2539 Facility 7-Day Risk-Standardized Hospital Visit Rate after Outpatient Colonoscopy
	5. Fit a hierarchical generalized linear model (HGLM) to produce a ratio of the number of "predicted" hospital visits to the number of "expected" hospital visits for each facility, given its case mix. The HGLM is adjusted for clinical risk factors that vary across patient populations, are unrelated to quality, and influence the outcome. 6. Multiply the ratio estimated in step 3 by the observed national 7-day hospital visit rate to obtain a risk-standardized hospital visit (RSHV) rate for each facility. 7. Use bootstrapping to construct a 95% confidence interval estimate for each facility's RSHV rate. For more information about the measure methodology, please see the Facility 7-day Risk-Standardized Hospital Visit Rate after Outpatient Colonoscopy 2018 Measure Updates and Specifications Report posted on the web page provided in data field S.1. 121025| 141592| 144732| 141015| 148806| 149320| 150289
Copyright / Disclaimer	Not applicable

	3565 Standardized Emergency Department Encounter Ratio (SEDR) for Dialysis Facilities
Steward	Centers for Medicare & Medicaid Services
Description	The Standardized Emergency Department Encounter Ratio is defined to be the ratio of the observed number of emergency department (ED) encounters that occur for adult Medicare ESRD dialysis patients treated at a particular facility to the number of encounters that would be expected given the characteristics of the dialysis facility's patients and the national norm for dialysis facilities. Note that in this document an "emergency department encounter" always refers to an outpatient encounter that does not end in a hospital admission. This measure is calculated as a ratio but can also be expressed as a rate. When used for public reporting, the measure calculation will be restricted to facilities with greater than 5 patient years at risk in the reporting year. This restriction is required to ensure patients cannot be identified due to small cell size.
Type	Outcome
Data Source	Claims, Registry Data Data are derived from an extensive national ESRD patient database, which is primarily based on CROWNWeb facility-reported clinical and administrative data (including CMS-2728 Medical Evidence Form, CMS-2746 Death Notification Form, and CMS-2744 Annual Facility Survey Form and patient tracking data), the Renal Management Information System (REMIS), the Medicare Enrollment Database (EDB), and Medicare claims data. In addition the database includes transplant data from the Scientific Registry of Transplant Recipients (SRTR), and data from the Nursing Home Minimum Dataset, the Quality Improvement Evaluation System (QIES) Business Intelligence Center (QBIC) (which includes Provider and Survey and Certification data from Automated Survey Processing Environment (ASPEN)), and the Dialysis Facility Compare (DFC). The database is comprehensive for Medicare patients not enrolled in Medicare Advantage. Medicare Advantage patients are included in all sources but their Medicare payment records are limited to inpatient claims. Non-Medicare patients are included in all sources except for the Medicare payment records. Tracking by dialysis provider and treatment modality is available for all patients including those with only partial or no Medicare coverage. Information on hospitalizations is obtained from Part A Medicare Inpatient Claims Standard Analysis Files (SAFs), and past-year comorbidity data are obtained from multiple Part A types (inpatient, home health, hospice, skilled nursing facility claims) and Part B (outpatient) claims.
Level	Facility
Setting	Other Dialysis Facility
Numerator Statement	The observed number of outpatient Emergency Department encounters during the reporting period among eligible adult Medicare patients at a facility.
Numerator Details	Emergency Department Encounters Emergency department (ED) encounters are identified from Medicare outpatient claims using revenue center codes that indicate an ED visit (0450, 0451, 0452, 0453, 0454, 0455, 0456, 0457, 0458, 0459, 0981). Note that this means that we include both outpatient ED visits and those that result in an observation stay, but not those that result in a hospital admission. Outpatient ED claims that have overlapping or consecutive dates of service are combined and considered as a single ED encounter. To further ensure that these outpatient ED encounters are distinct from those associated with hospitalizations, we exclude ED encounters where there is an inpatient claim for the patient that has dates of service including any of the same time period covered by the ED encounter. The total number of emergency department encounters includes multiple encounters (i.e., second, third, etc.) for the same patient during the reporting period.

	3565 Standardized Emergency Department Encounter Ratio (SEDR) for Dialysis Facilities
	See denominator details for additional criteria for a patient to be assigned to a particular facility and criteria for identifying emergency department encounters. The time period for the measure calculation is one calendar year.
Denominator Statement	The expected number of Emergency Department encounters among eligible Medicare patients at the facility during the reporting period adjusted for the characteristics of the patients at the facility.
Denominator Details	General Inclusion Criteria for Dialysis Patients An eligible Medicare patient is defined as an adult (aged 18 or more) dialysis patient with at least 90 days of ESRD treatment. Because we only include a patient's follow-up in the tabulations for this measure after that patient has received chronic renal replacement therapy for at least 90 days, emergency department encounters during the first 90 days of ESRD are not counted. We assign patients to a particular facility only after they have been on chronic dialysis there for the past 60 days. This 60 day period is used both for patients who started ESRD for the first time and for those who returned to dialysis after a transplant. Emergency Department encounters during the first 60 days of dialysis at a facility do not affect the facility's Standardized Emergency Department Encounter Ratio. We require that patients reach a certain level of Medicare dialysis bills to be included in the emergency department encounter ratio. Specifically, months within a given dialysis patient-period are used for the Standardized Emergency Department Encounter Ratio calculation when they meet the criterion of being within two months after a month with either: (a) $1200+ of Medicare dialysis claims OR (b) at least one Medicare inpatient claim. The intention of this criterion is to assure completeness of information on emergency department encounters for all patients included in the analysis. Months in which a patient is enrolled in Medicare Advantage are excluded from the analysis. This is because outpatient claims for Medicare Advantage patients are not available therefore we do not have information on the outcome of this measure, ED encounters. Identifying Facility Treatment Histories for Each Patient For each patient, we identify the dialysis provider at each point in time. Starting with day 91 after onset of ESRD, we attribute patients to facilities according to the following rules. A patient is attributed to a facility once the patient has been treated there for the past 60 days. When a patient transfers from one facility to another, the patient continues to be attributed to the original facility for 60 days and then is attributed to the destination facility. In particular, a patient is attributed to his or her current facility on day 91 of ESRD if that facility had treated him or her for the past 60 days. If on day 91, the facility had not treated a patient for the past 60 days, we wait until the patient reaches day 60 of continuous treatment at that facility before attributing the patient to that facility. When a patient is not treated in a single facility for a span of 60 days (for instance, if there were two switches within 60 days of each other), we do not attribute that patient to any facility. Patients who withdrew from dialysis or recovered renal function remain assigned to their treatment facility for 60 days after withdrawal or recovery. If a period of one year passes with neither Medicare dialysis claims nor CROWNWeb information to indicate that a patient was receiving dialysis treatment, we consider the patient lost to follow-up and do not include that patient in the analysis. If dialysis claims or other evidence of dialysis reappears, the patient is entered into analysis after 60 days of continuous therapy at a single facility. Days at Risk for Medicare Dialysis Patients After patient treatment histories are defined as described above, periods of follow-up in time since ESRD onset are created for each patient. In order to adjust for duration of ESRD appropriately, we define 6 time intervals with cut points at 6 months, 1 year, 2 years, 3

	3565 Standardized Emergency Department Encounter Ratio (SEDR) for Dialysis Facilities
	years and 5 years. A new time period begins each time the patient is determined to be at a different facility, or at the start of each calendar year or when crossing any of the above cut points. The number of days at risk in each of the six time intervals listed above is used to calculate the expected number of emergency department encounters for the patient during that period. The Standardized Emergency Department Encounter Ratio for a facility is the ratio of the total number of observed emergency department encounters to the total number of expected emergency department encounters during all time periods at the facility. Based on a risk adjustment model for the overall national emergency department encounter rate, we compute the expected number of emergency department encounters that would occur for each month that each patient is attributed to a given facility. The sum of all such expectations for patients and months yields the overall number of emergency department encounters that would be expected at the facility given the specific patient mix. This forms the denominator of the measure. The denominator of the Standardized Emergency Department Encounter Ratio is derived from a proportional rates model (Lawless and Nadeau, 1995; Lin et al., 2000; Kalbfleisch and Prentice, 2002). This is the recurrent event analog of the well-known proportional hazards or Cox model (Cox, 1972; Kalbfleisch and Prentice, 2002). To accommodate large-scale data, we adopt a model with piecewise constant baseline rates (e.g. Cook and Lawless, 2007) and the computational methodology developed in Liu, Schaubel and Kalbfleisch (2012). References: Cook, R. and Lawless, J. The Statistical Analysis of Recurrent Events. New York: Springer. 2007. Cox, D.R. (1972) Regression Models and Life Tables (with Discussion). J. Royal statistical Society, Series B, 34, 187-220. Kalbfleisch, J.D. and Prentice, R. L. The Statistical Analysis of Failure Time Data. Wiley, New York, 2002. Lawless, J. F. and Nadeau, C. Some simple and robust methods for the analysis of recurrent events, Technometrics, 37 1995, 355-364. Lin, D.Y., Wei, L.J., Yang, I. and Ying, Z. Semi parametric regression for the mean and rate functions of recurrent events, Journal of the Royal Statistical Society Series B, 62, 2000, 771-730
Exclusions	Exclusions that are implicit in the denominator definition include time at risk while a patient: • Has Medicare Advantage coverage • Has had ESRD for 90 days or less • Is less than 18 years of age The denominator also excludes patient time at risk for calendar months in which a patient is: • Actively enrolled in hospice at any time during the calendar month
Exclusion details	We exclude from the time at risk for the measure all calendar months in which a patient spends any time enrolled in hospice (enrollment is determined from Medicare hospice claims). Hospice patients are considered to be under the purview of hospice care givers and may have other reasons for Emergency Department use such as pain management. We also exclude from the time at risk all calendar months in which a patients is enrolled in Medicare Advantage (at any point in the month). This is because ED visit information is obtained from outpatient claims and these claims are not available for Medicare Advantage patients. Medicare Advantage payment records are limited to inpatient claims.

	3565 Standardized Emergency Department Encounter Ratio (SEDR) for Dialysis Facilities
Risk Adjustment	Statistical risk model
Stratification	N/A
Type Score	Ratio better quality = lower score
Algorithm	See flowchart in appendix. 139029
Copyright / Disclaimer	Not applicable

	3566 Standardized Ratio of Emergency Department Encounters Occurring Within 30 Days of Hospital Discharge (ED30) for Dialysis Facilities
Steward	Centers for Medicare & Medicaid Services
Description	The Standardized Ratio of Emergency Department Encounters Occurring Within 30 Days of Hospital Discharge for Dialysis Facilities (ED30) is defined to be the ratio of observed over expected events. The numerator is the observed number of index discharges from acute care hospitals that are followed by an outpatient emergency department encounter within 4-30 days after discharge for eligible adult Medicare dialysis patients treated at a particular dialysis facility. The denominator is the expected number of index discharges followed by an ED encounter within 4-30 days given the discharging hospital's characteristics, characteristics of the dialysis facility's patients, and the national norm for dialysis facilities. Note that in this document, acute care hospital includes critical access hospitals and "emergency department encounter" always refers to an outpatient encounter that does not end in a hospital admission. This measure is calculated as a ratio but can also be expressed as a rate. When used for public reporting, the measure calculation will be restricted to facilities with at least 11 eligible index discharges in the reporting year. This restriction is required to ensure patients cannot be identified due to small cell size.
Type	Outcome
Data Source	Claims, Registry Data Data are derived from an extensive national ESRD patient database, which is primarily based on CROWNWeb facility-reported clinical and administrative data (including CMS-2728 Medical Evidence Form, CMS-2746 Death Notification Form, and CMS-2744 Annual Facility Survey Form and patient tracking data), the Renal Management Information System (REMIS), the Medicare Enrollment Database (EDB), and Medicare claims data. In addition the database includes transplant data from the Scientific Registry of Transplant Recipients (SRTR), and data from the Nursing Home Minimum Dataset, the Quality Improvement Evaluation System (QIES) Business Intelligence Center (QBIC) (which includes Provider and Survey and Certification data from Automated Survey Processing Environment (ASPEN)), and the Dialysis Facility Compare (DFC). The database is comprehensive for Medicare patients not enrolled in Medicare Advantage. Medicare Advantage patients are included in all sources but their Medicare payment records are limited to inpatient claims. Non-Medicare patients are included in all sources except for the Medicare payment records. Tracking by dialysis provider and treatment modality is available for all patients including those with only partial or no Medicare coverage. Information on hospitalizations is obtained from Part A Medicare Inpatient Claims Standard Analysis Files (SAFs), and past-year comorbidity data are obtained from multiple Part A types (inpatient, home health, hospice, skilled nursing facility claims) and Part B (outpatient) claims.
Level	Facility

	3566 Standardized Ratio of Emergency Department Encounters Occurring Within 30 Days of Hospital Discharge (ED30) for Dialysis Facilities
Setting	Other Dialysis Facility
Numerator Statement	The observed number of index hospital discharges during a year that are followed by an emergency department encounter within 4–30 days of the discharge among eligible adult Medicare patients at a facility.
Numerator Details	Index Discharges We use Medicare inpatient hospital claims to identify acute hospital discharges. Among these acute hospital discharges, all live discharges of eligible patients in a calendar year are considered eligible for this measure. Those that do not meet one of the index discharge exclusion criteria described in the next section are considered index discharges. Assignment of Index Discharges to Facilities Index discharges are attributed to the facility of record on the day of discharge for the patient. That is, if the patient transfers dialysis facilities at the time of hospital discharge, it is the new facility that is assigned the index discharge. Emergency Department Encounters Emergency department (ED) encounters are identified from Medicare outpatient claims using revenue center codes that indicate an ED visit (0450, 0451, 0452, 0453, 0454, 0455, 0456, 0457, 0458, 0459, 0981). Note that this means that we include both outpatient ED visits and those that result in an observation stay, but not those that result in a hospital admission. Outpatient ED claims that have overlapping or consecutive dates of service are combined and considered as a single ED encounter. To further ensure that these outpatient ED encounters are distinct from those associated with hospitalizations, we exclude ED encounters where there is an inpatient claim that has dates of service included in any of the same time period covered by the ED encounter. An ED encounter "follows" the index discharge only if there is no intervening inpatient hospitalization. In other words, if after hospital discharge there is another inpatient hospitalization and then an ED encounter within the time frame the original index discharge is not counted as having been followed by an ED encounter. If eligible, the second hospitalization could become a new index discharge. The measure does not count the number of ED encounters after each index discharge, but instead determines whether or not there is at least one such encounter. If there are multiple ED encounters during days 4-30 after an index discharge, only the first ED encounter during that time is relevant to determining whether or not the index discharge is counted as having been followed by an ED encounter. ED encounters that occur before the 4th day after index discharge are not considered. The 4-30 day time frame was selected to harmonize with the Standardized Readmission Ratio (NQF #2496) that also uses the same time period after an index hospitalization. This time interval was selected in response to providers and stakeholders concerns that there may be up to 72 hours before a patient is seen at the facility after hospital discharge. The time period for the measure calculation is two calendar years, meaning that index discharges must occur during the two calendar year period. The subsequent ED encounters may occur during the calendar years or the first 30 days of the following calendar year.
Denominator Statement	The expected number of index hospital discharges for eligible adult Medicare ESRD dialysis patients during the two year period that are followed by an emergency department encounter within 4-30 days of the discharge among eligible patients at a facility. The expected value is the result of a risk-adjusted predictive model adjusted for the characteristics of the patients, the dialysis facility, and the discharging hospitals.
Denominator Details	We use Medicare inpatient hospital claims to identify acute hospital discharges. Among these acute hospital discharges, all live discharges of eligible patients in a calendar year are considered eligible for this measure. See Numerator Details section above for definitions index discharges, patients assignment, and ED encounters.

	3566 Standardized Ratio of Emergency Department Encounters Occurring Within 30 Days of Hospital Discharge (ED30) for Dialysis Facilities
	General Inclusion Criteria for Dialysis Patients To be eligible for the measure a patient must be an adult (aged 18 or more) Medicare dialysis patient with at least 90 days of ESRD treatment on date of index discharge. The 90 days of ESRD are counted without regard to which facility, or the number of facilities, a patient received their dialysis treatments. The date of index discharge is considered day 0 when identifying ED visits within 4-30 days of discharge. Expected Calculation We calculate each dialysis facility's expected number of index hospital discharges during the two year period that are followed by an ED encounter within 4-30 days of the discharge. The expected number is calculated by fitting a model with random effects for discharging hospitals, fixed effects for facilities, and regression adjustments for a set of patient-level characteristics. We compute the expectation for the given facility assuming ED encounter rates corresponding to an "average" facility with the same patient characteristics and same discharging hospitals as this facility. Model details are provided in the testing form.
Exclusions	Index Discharge exclusions that are implicit in the denominator definition include discharges for which the patient: • Has Medicare Advantage coverage at the time of the index discharge • Has had ESRD for 90 days or less at time of discharge • Is less than 18 years of age at the time of discharge We also exclude discharges and emergency department encounters for which the patient was: • Actively enrolled in hospice at any time of during the calendar month of the discharge date or ED encounter admit date Outpatient Medicare claims are the source of ED encounter data, and since outpatient claims are not available for Medicare Advantage (MA) patients, we cannot identify ED encounters for MA patients. Therefore, we exclude index discharges for patients with MA at the time of discharge. The hospice exclusion is needed because hospice patients are considered to be under the purview of hospice care givers and may have other reasons for Emergency Department use such as pain management. Additionally we exclude hospital discharges that: • Do not result in a live discharge • Are against medical advice • Include a primary diagnosis for cancer, mental health or rehabilitation (see below for excluded CCSs) • Are from a PPS-exempt cancer hospital • Are followed within three days of discharge by the patient being transplanted, discontinuing dialysis, recovering renal function, being lost to follow-up, having another hospitalization, or having an emergency department visit
Exclusion details	• Death in hospital: We determine a patient's death date from a number of sources: CMS Medicare Enrollment Database, CMS forms 2746 and 2728, OPTN transplant follow-up form, CROWNWeb database, Social Security Death Master File, and Inpatient Claims. In addition, if the discharge status on the index discharge claim indicates death and the death date occurs within 5 days after discharge we consider this a death in the hospital. • Discharged against medical advice: We determine discharge status from the inpatient claim.

	3566 Standardized Ratio of Emergency Department Encounters Occurring Within 30 Days of Hospital Discharge (ED30) for Dialysis Facilities
	• Certain diagnoses: The primary diagnosis at discharge is available on the inpatient claim; we group these diagnoses into more general categories using AHRQ's Clinical Classification Software (CCS; see http://www.hcup-us.ahrq.gov/toolssoftware/ccs/ccs.jsp for descriptions of each CCS). The excluded CCSs for a primary diagnosis for cancer, mental health or rehabilitation are shown below. o Cancer: 42, 19, 45, 44, 17, 38, 39, 14, 40, 35, 16, 13, 29, 15, 18, 12, 11, 27, 33, 32, 24, 43, 25, 36, 21, 41, 20, 23, 26, 28, 34, 37, 22, 31, 30 o Psychiatric: 657, 659, 651, 670, 654, 650, 658, 652, 656, 655, 662 o Rehab for prosthesis: 254 • PPS-exempt cancer hospitals: The following hospitals are listed as PPS-exempt cancer hospitals in the Federal Register (http://www.gpo.gov/fdsys/pkg/FR-2011-07-18/html/2011-16949.htm): 050146, 050660, 100079, 100271, 220162, 330154, 330354, 360242, 390196, 450076, 500138 • Are followed within three days of discharge by the patient being transplanted, discontinuing dialysis, recovering renal function, being lost to follow-up, having another hospitalization, or having an emergency department visit. We determine transplant status from OPTN, CROWNWeb, and dialysis claims, and discontinuation of dialysis or recovery of renal function from CROWNWeb.
Risk Adjustment	Statistical risk model
Stratification	N/A
Type Score	Ratio better quality = lower score
Algorithm	See Flowchart in Appendix. 139029
Copyright / Disclaimer	Not applicable

Appendix E: Related and Competing Measures

Comparison of NQF 1463, 0369, and 2496

	1463 Standardized Hospitalization Ratio for Dialysis Facilities (SHR)	0369 Standardized Mortality Ratio for Dialysis Facilities	2496 Standardized Readmission Ratio (SRR) for dialysis facilities
Steward	Centers for Medicare & Medicaid Services	Centers for Medicare & Medicaid Services	Centers for Medicare & Medicaid Services
Description	The standardized hospitalization ratio is defined to be the ratio of the number of hospital admissions that occur for Medicare ESRD dialysis patients treated at a particular facility to the number of hospitalizations that would be expected given the characteristics of the dialysis facility's patients and the national norm for dialysis facilities. This measure is calculated as a ratio but can also be expressed as a rate. When used for public reporting, the measure calculation will be restricted to facilities with greater than five patient years at risk in the reporting year. This restriction is required to ensure patients cannot be identified due to small cell size.	Standardized mortality ratio is defined to be the ratio of the number of deaths that occur for Medicare ESRD dialysis patients treated at a particular facility to the number of deaths that would be expected given the characteristics of the dialysis facility's patients and the national norm for dialysis facilities. This measure is calculated as a ratio but can also be expressed as a rate. When used for public reporting, the measure calculation will be restricted to facilities with greater than three expected deaths in the reporting year. This restriction is required to ensure patients cannot be identified due to small cell size.	The Standardized Readmission Ratio (SRR) for a dialysis facility is the ratio of the number of observed index discharges from acute care hospitals to that facility that resulted in an unplanned readmission to an acute care hospital within four to 30 days of discharge to the expected number of readmissions given the discharging hospitals and the characteristics of the patients and based on a national norm. Note that the measure is based on Medicare-covered dialysis patients.
Type	Outcome	Outcome	Outcome
Data Source	Claims, Registry Data Data are derived from an extensive national ESRD patient database that is primarily based on CROWNWeb facility-reported clinical and administrative data (including CMS-2728 Medical Evidence Form, CMS-2746 Death Notification Form, and CMS-2744 Annual Facility Survey Form and patient tracking data), the Renal Management	Claims, Registry Data Data are derived from an extensive national ESRD patient database that is primarily based on CROWNWeb facility-reported clinical and administrative data (including CMS-2728 Medical Evidence Form, CMS-2746 Death Notification Form, and CMS-2744 Annual Facility Survey Form and patient tracking data), the Renal Management Information System (REMIS), the Medicare Enrollment Database (EDB), and Medicare claims	Claims, Registry Data Data are derived from an extensive national ESRD patient database, which is primarily based on the Renal Management Information System (REMIS), CROWNWeb facility-reported clinical and administrative data (including CMS-2728 Medical Evidence Form, CMS-2746 Death Notification Form, and CMS-2744 Annual Facility Survey Form and patient tracking data), the Medicare Enrollment Database (EDB), and Medicare claims data. In

	1463 Standardized Hospitalization Ratio for Dialysis Facilities (SHR)	0369 Standardized Mortality Ratio for Dialysis Facilities	2496 Standardized Readmission Ratio (SRR) for dialysis facilities
	Information System (REMIS), the Medicare Enrollment Database (EDB), and Medicare claims data. In addition, the database includes transplant data from the Scientific Registry of Transplant Recipients (SRTR), and data from the Nursing Home Minimum Dataset, the Quality Improvement Evaluation System (QIES) Business Intelligence Center (QBIC) (which includes Provider and Survey and Certification data from Automated Survey Processing Environment (ASPEN)), and the Dialysis Facility Compare (DFC). The database is comprehensive for Medicare patients not enrolled in Medicare Advantage. Medicare Advantage patients are included in all sources, but their Medicare payment records are limited to inpatient claims. Non-Medicare patients are included in all sources except for the Medicare payment records. Tracking by dialysis provider and treatment modality is available for all patients, including those with only partial or no Medicare coverage. Information on hospitalizations is obtained from Part A Medicare Inpatient Claims Standard Analysis Files (SAFs), and past-year comorbidity data are obtained from multiple Part A types (inpatient, home health, hospice, skilled nursing facility claims) only.	data. In addition, the database includes transplant data from the Scientific Registry of Transplant Recipients (SRTR), and data from the Nursing Home Minimum Dataset, the Quality Improvement Evaluation System (QIES) Business Intelligence Center (QBIC) (which includes Provider and Survey and Certification data from Automated Survey Processing Environment (ASPEN)), and the Dialysis Facility Compare (DFC). The database is comprehensive for Medicare patients not enrolled in Medicare Advantage. Medicare Advantage patients are included in all sources, but their Medicare payment records are limited to inpatient claims. Non-Medicare patients are included in all sources except for the Medicare payment records. Tracking by dialysis provider and treatment modality is available for all patients, including those with only partial or no Medicare coverage. Information on hospitalizations is obtained from Part A Medicare Inpatient Claims Standard Analysis Files (SAFs), and past-year comorbidity data are obtained from multiple Part A types (inpatient, home health, hospice, skilled nursing facility claims) only. No data collection instrument provided Attachment 0369_Code_List.xlsx	addition, the database includes transplant data from the Scientific Registry of Transplant Recipients (SRTR), and data from the Nursing Home Minimum Dataset, the Quality Improvement Evaluation System (QIES) Business Intelligence Center (QBIC) (which includes Provider and Survey and Certification data from Automated Survey Processing Environment (ASPEN)), and the Dialysis Facility Compare (DFC). The database is comprehensive for Medicare patients not enrolled in Medicare Advantage. Medicare Advantage patients are included in all sources, but their Medicare payment records are limited to inpatient claims. Non-Medicare patients are included in all sources except for the Medicare payment records. Tracking by dialysis provider and treatment modality is available for all patients, including those with only partial or no Medicare coverage. Information on hospitalizations is obtained from Part A Medicare Inpatient Claims Standard Analysis Files (SAFs). No data collection instrument provided Attachment 2496_Data_Dictionary_Code_Table.xlsx

	1463 Standardized Hospitalization Ratio for Dialysis Facilities (SHR)	0369 Standardized Mortality Ratio for Dialysis Facilities	2496 Standardized Readmission Ratio (SRR) for dialysis facilities
	No data collection instrument provided Attachment 1463_Code_List.xlsx		
Level	Facility	Facility	Facility
Setting	Other Dialysis Facility	Other Dialysis Facility	Other Dialysis Facility
Numerator Statement	Number of inpatient hospital admissions among eligible patients at the facility during the reporting period.	Number of deaths among eligible patients at the facility during the time period.	Each facility's observed number of hospital discharges that are followed by an unplanned hospital readmission within four to 30 days of discharge.
Numerator Details	The numerator is calculated through use of Medicare claims data. When a claim is made for an inpatient hospitalization, the patient is identified and attributed to a dialysis facility following rules discussed below in the denominator details. The numerator is the count of all such hospitalizations over the reporting period.	Information on death is obtained from several sources which include the CMS ESRD Program Medical Management Information System, the Death Notification Form (CMS Form 2746), and the Social Security Death Master File. The number of deaths that occurred among eligible dialysis patients during the time period is calculated. This count includes only Medicare patients, as detailed below. It does not include deaths from street drugs or accidents unrelated to treatment as indicated on CMS form 2746 since these deaths are unlikely to have been due to treatment facility characteristics.	The numerator for a given facility is the total number of index hospital discharges that are followed by unplanned readmissions within four to 30 days of discharge and that are not preceded by a "planned" readmission or other competing event that also occurred within four to 30 days of discharge. Terms in this definition are described below. A readmission is considered "planned" under two scenarios as outlined more completely in [1]: i). The patient undergoes a procedure that is always considered planned (e.g., kidney transplant) or has a primary diagnosis that always indicates the hospitalization is planned (e.g., maintenance chemotherapy). ii). The patient undergoes a procedure that MAY be considered planned if it is not accompanied by an acute diagnosis. For example, a hospitalization involving a heart valve procedure accompanied by a primary diagnosis of diabetes would be considered planned, whereas a hospitalization involving a heart valve procedure accompanied by a primary diagnosis of acute myocardial infarction (AMI) would be considered unplanned. 1. Centers for Medicare & Medicaid Services. 2018 All-Cause Hospital Wide Measure Updates and

	1463 Standardized Hospitalization Ratio for Dialysis Facilities (SHR)	0369 Standardized Mortality Ratio for Dialysis Facilities	2496 Standardized Readmission Ratio (SRR) for dialysis facilities
			Specifications Report Hospital-Level 30-Day Risk-Standardized Readmission Measure – Version 7.0. https://www.qualitynet.org/files/5d0d375a764be766b010141f?filename=2018_Rdmsn_Updates%26Specs_Rpts.zip Other competing events include admissions to rehabilitation or psychiatric hospitals, death, transplant, loss to follow up, withdrawal from dialysis, and recovery of renal function.
Denominator Statement	Number of hospital admissions that would be expected among eligible patients at the facility during the reporting period, given the patient mix at the facility.	Number of deaths that would be expected among eligible dialysis patients at the facility during the time period, given the national average mortality rate and the patient mix at the facility.	The expected number of the observed index hospital discharges that result in an unplanned readmission in days four to 30 and that are not preceded by an unplanned or competing event. The expectation accounts for patient-level characteristics, including measures of patient comorbidities and the discharging hospital, and is based on estimated readmission rates for an overall population norm that corresponds to an "average" facility.
Denominator Details	Assignment of Patients to Facilities UM-KECC's treatment history file provides a complete history of the status, location, and dialysis treatment modality of an ESRD patient from the date of the first ESRD service until the patient dies or the data collection cutoff date is reached. For each patient, a new record is created each time he/she changes facility or treatment modality. Each record represents a time period associated with a specific modality and dialysis facility. CROWNWeb (including CMS Medical Evidence Form (Form CMS-2728), Death Notification Form (Form	Assignment of Patients to Facilities We detail patient inclusion criteria, facility assignment, and how to count days at risk, all of which are required for the risk adjustment model. As patients can receive dialysis treatment at more than one facility in a given year, we assign each patient day to a facility (or no facility, in some cases) based on a set of conventions below. General Inclusion Criteria for Dialysis Patients Since a patient's follow-up in the database can be incomplete during the first 90 days of ESRD therapy, we only include a patient's follow-up into the tabulations after that patient has received chronic renal replacement therapy for at least 90 days. Thus, hospitalizations, mortality, and survival during the first 90 days of ESRD do not enter into	We use Medicare inpatient hospital claims to identify acute hospital discharges. All Medicare covered live inpatient discharges of ESRD dialysis patients in a calendar year are considered eligible for this measure. An index hospital discharge is a discharge from an acute care hospital that is not followed by a readmission whether planned or unplanned or by any competing event in the first three days following discharge. Index discharges are attributed to the facility of record on the day of discharge for the patient. That is, if the patient transfers dialysis facilities at the time of hospital discharge, it is the new facility that is assigned the index discharge.

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	CMS-2746)) is the primary basis for placing patients at dialysis facilities, and dialysis claims are used as an additional source. Information regarding first ESRD service date, death, and transplant is obtained from additional sources including the CMS Enrollment Database (EDB), transplant data from the Organ Procurement and Transplant Network (OPTN), and the Social Security Death Master File. As patients can receive dialysis treatment at more than one facility in a given year, we assign each patient day to a facility (or no facility, in some cases) based on a set of conventions described below, which largely align with those for the Standardized Mortality Ratio (SMR). We detail patient inclusion criteria, facility assignment, and how to count days at risk, all of which are required for the risk adjustment model. General Inclusion Criteria for Dialysis Patients Though a patient's follow-up in the database can be incomplete during the first 90 days of ESRD therapy, we only include a patient's follow-up in the tabulations after that patient has received chronic renal replacement therapy for at least 90 days. Thus, hospitalizations, mortality, and survival during the first 90 days of ESRD do not enter into the calculations. This minimum 90-day period also assures	the calculations. This minimum 90-day period also assures that most patients are eligible for Medicare, either as their primary or secondary insurer. It also excludes from analysis patients who die or recover renal function during the first 90 days of ESRD. In order to exclude patients who only received temporary dialysis therapy, we assign patients to a facility only after they have been on dialysis there for the past 60 days. This 60-day period is used both for patients who started ESRD for the first time and for those who returned to dialysis after a transplant. That is, deaths and survival during the first 60 days of dialysis at a facility do not affect the SMR of that facility. Identifying Facility Treatment Histories for Each Patient For each patient, we identify the dialysis provider at each point in time. Starting with day 91 after onset of ESRD, we attribute patients to facilities according to the following rules. A patient is attributed to a facility once the patient has been treated there for the past 60 days. When a patient transfers from one facility to another, the patient continues to be attributed to the original facility for 60 days and then is attributed to the destination facility from day 61. In particular, a patient is attributed to their current facility on day 91 of ESRD if that facility had treated him or her for the past 60 days. If on day 91, the facility had not treated a patient for the past 60 days, we wait until the patient reaches day 60 of continuous treatment at that facility before attributing the patient to that facility. When a patient is not treated in a single facility for a span of 60 days (for instance, if there were two switches within 60	Expected Calculation: We calculate each dialysis facility's expected number of index hospital discharges during the one-year period that are followed by an unplanned readmission within four to 30 days of the discharge. The expected number is calculated by fitting a model with random effects for discharging hospitals, fixed effects for facilities, and regression adjustments for a set of patient-level characteristics. We compute the expectation for the given facility assuming readmission rates corresponding to an "average" facility with the same patient characteristics and same discharging hospitals as this facility. Model details are provided in the testing form.

	1463 Standardized Hospitalization Ratio for Dialysis Facilities (SHR)	0369 Standardized Mortality Ratio for Dialysis Facilities	2496 Standardized Readmission Ratio (SRR) for dialysis facilities
	that most patients are eligible for Medicare, either as their primary or secondary insurer. It also excludes from analysis patients who die or recover renal function during the first 90 days of ESRD. In order to exclude patients who only received temporary dialysis therapy at the facility, we assign patients to a facility only after they have been on dialysis there for the past 60 days. This 60-day period is used both for patients who started ESRD for the first time and for those who returned to dialysis after a transplant. That is, hospitalizations during the first 60 days of dialysis at a facility do not affect the SHR of that facility. Identifying Facility Treatment Histories for Each Patient For each patient, we identify the dialysis provider at each point in time. Starting with day 91 after onset of ESRD, we attribute patients to facilities according to the following rules. A patient is attributed to a facility once the patient has been treated there for the past 60 days. When a patient transfers from one facility to another, the patient continues to be attributed to the original facility for 60 days and then is attributed to the destination facility. In particular, a patient is attributed to his or her current facility on day 91 of ESRD if that facility had treated him or her for the past 60 days.	days of each other), we do not attribute that patient to any facility. Patients were removed from a facility's analysis upon receiving a transplant. Patients who withdrew from dialysis or recovered renal function remain assigned to their treatment facility for 60 days after withdrawal or recovery. If a period of one year passes with neither paid dialysis claims nor CROWNWeb information to indicate that a patient was receiving dialysis treatment, we consider the patient lost to follow-up and do not include that patient in the analysis. If dialysis claims or other evidence of dialysis reappears, the patient is entered into analysis after 60 days of continuous therapy at a single facility. Days at Risk for Each Patient-Record After patient treatment histories are defined as described above, periods of follow-up time (or patient-records) are created for each patient. A patient-record begins each time the patient is determined to be at a different facility or at the start of each calendar year. The number of days at risk starts over at zero for each patient record so that the number of days at risk for any patient-record is always a number between 0 and 365 (or 366 for leap years). Therefore, a patient who is in one facility for all four years gives rise to four patient-records and is analyzed the same way as would be four separate patients in that facility for one year each. This measure is limited to Medicare dialysis patients who are either enrolled in Medicare Advantage or who reach a certain threshold of Medicare dialysis and inpatient claims. Specifically,	

	1463 Standardized Hospitalization Ratio for Dialysis Facilities (SHR)	0369 Standardized Mortality Ratio for Dialysis Facilities	2496 Standardized Readmission Ratio (SRR) for dialysis facilities
	If on day 91, the facility had not treated a patient for the past 60 days, we wait until the patient reaches day 60 of continuous treatment at that facility before attributing the patient to that facility. When a patient is not treated in a single facility for a span of 60 days (for instance, if there were two switches within 60 days of each other), we do not attribute that patient to any facility. Patients are removed from facilities three days prior to transplant in order to exclude the transplant hospitalization. Patients who withdrew from dialysis or recovered renal function remain assigned to their treatment facility for 60 days after withdrawal or recovery. If a period of one year passes with neither paid dialysis claims nor CROWNWeb information to indicate that a patient was receiving dialysis treatment, we consider the patient lost to follow-up and do not include that patient in the analysis. If dialysis claims or other evidence of dialysis reappears, the patient is entered into analysis after 60 days of continuous therapy at a single facility. Days at Risk for Medicare Dialysis Patients After patient treatment histories are defined as described above, periods of follow-up in time since ESRD onset are created for each patient. In order to adjust for duration of ESRD	months within a given dialysis patient-period are used for SMR calculation when the patient is enrolled in Medicare Advantage or meets the criterion of being within two months after a month with either: (a) $1200+ of Medicare-paid dialysis claims OR (b) at least one Medicare inpatient claim. Then we use the number of days at risk in each of these patient-records to calculate the expected number of deaths for that patient-record, and sum the total number of expected deaths during all patient-records at the facility as the expected number of deaths for that facility. Detailed methodology is described in the testing form.	

	1463 Standardized Hospitalization Ratio for Dialysis Facilities (SHR)	0369 Standardized Mortality Ratio for Dialysis Facilities	2496 Standardized Readmission Ratio (SRR) for dialysis facilities
	appropriately, we define six time intervals with cut points at six months, one year, two years, three years, and five years. A new time period begins each time the patient is determined to be at a different facility, or at the start of each calendar year, or when crossing any of the above cut points. In order to assure completeness of information on hospitalizations for all patients included in the analysis, we restrict to Medicare patients who are either enrolled in Medicare Advantage or who reach a certain threshold of Medicare dialysis and inpatient claims. Specifically, months within a given dialysis patient-period are used for SHR calculation when the patient is enrolled in Medicare Advantage or meets the criterion of being within two months after a month with either: (a) $1200+ of Medicare-paid dialysis claims OR (b) at least one Medicare inpatient claim. The number of days at risk in each of these patient-ESRD facility-year time periods is used to calculate the expected number of hospital admissions for the patient during that period. The SHR for a facility is the ratio of the total number of observed hospitalizations to the total number of expected hospitalizations during all time periods at the facility. Based on a risk adjustment model for the overall national hospitalization rates, we compute the expected number of		

	1463 Standardized Hospitalization Ratio for Dialysis Facilities (SHR)	0369 Standardized Mortality Ratio for Dialysis Facilities	2496 Standardized Readmission Ratio (SRR) for dialysis facilities
	hospitalizations that would occur for each month that each patient is attributed to a given facility. The sum of all such expectations for patients and months yields the overall number of hospital admissions that would be expected given the specific patient mix, and forms the denominator of the measure. The denominator of the SHR is derived from a proportional rates model (Lawless and Nadeau, 1995; Lin et al., 2000; Kalbfleisch and Prentice, 2002). This is the recurrent event analog of the well-known proportional hazards or Cox model (Cox, 1972; Kalbfleisch and Prentice, 2002). To accommodate large-scale data, we adopt a model with piecewise constant baseline rates (e.g. Cook and Lawless, 2007) and the computational methodology developed in Liu, Schaubel and Kalbfleisch (2012). References: Cook, R. and Lawless, J. The Statistical Analysis of Recurrent Events. New York: Springer. 2007. Cox, D.R. (1972) Regression Models and Life Tables (with Discussion). J. Royal statistical Society, Series B, 34, 187-220. Kalbfleisch, J.D. and Prentice, R. L. The Statistical Analysis of Failure Time Data. Wiley, New York, 2002. Lawless, J. F. and Nadeau, C. Some simple and robust methods for the		

	1463 Standardized Hospitalization Ratio for Dialysis Facilities (SHR)	0369 Standardized Mortality Ratio for Dialysis Facilities	2496 Standardized Readmission Ratio (SRR) for dialysis facilities
	analysis of recurrent events, Technometrics, 37 1995, 355-364. Lin, D.Y., Wei, L.J., Yang, I. and Ying, Z. Semi parametric regression for the mean and rate functions of recurrent events, Journal of the Royal Statistical Society Series B, 62, 2000, 771-730		
Exclusions	N/A	N/A	Index Discharge Exclusions: A live inpatient hospital discharge is excluded if any of the following hold: • It is associated with a stay of 365 days or longer • It is against medical advice • It Includes a primary diagnosis of cancer, mental health or rehabilitation • It Includes revenue center codes indicating rehabilitation • It occurs after a patient's 12th hospital discharge in the calendar year • It is from a PPS-exempt cancer hospital • It is followed within three days by any hospitalization (at acute care, long-term care, rehabilitation, or psychiatric hospital or unit) or any other competing event (see S.5).
Exclusion Details	N/A	N/A	• Discharged against medical advice: We determine discharge status from the inpatient claim. • Certain diagnoses: The primary diagnosis at discharge is available on the inpatient claim; we group these diagnoses into more general categories using AHRQ's Clinical Classification Software (CCS; see http://www.hcup-us.ahrq.gov/toolssoftware/ccs/ccs.jsp for descriptions of each CCS). The excluded CCSs are shown below.

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			o Cancer: 42, 19, 45, 44, 17, 38, 39, 14, 40, 35, 16, 13, 29, 15, 18, 12, 11, 27, 33, 32, 24, 43, 25, 36, 21, 41, 20, 23, 26, 28, 34, 37, 22, 31, 30 o Psychiatric: 657, 659, 651, 670, 654, 650, 658, 652, 656, 655, 662 o Rehab for prosthesis: 254 o Presence of one or more of the following revenue center codes: 0024, 0118, 0128, 0138, 0148, 0158 • Number of admissions: We remove any records for a patient after his/her 12th discharge in the calendar year. • PPS-exempt cancer hospitals: The following hospitals are listed as PPS-exempt cancer hospitals in the Federal Register (http://www.gpo.gov/fdsys/pkg/FR-2011-07-18/html/2011-16949.htm): 050146, 050660, 100079, 100271, 220162, 330154, 330354, 360242, 390196, 450076, 500138 • Any index discharge with an inpatient readmission of any type, a death, a transplant, loss to follow-up, withdrawal from dialysis, or recovery of renal function occurring within the first zero to three days following the index discharge.
Risk Adjustment	Statistical risk model	Statistical risk model	Statistical risk model
Stratification	N/A	N/A	N/A
Type Score	Ratio better quality = lower score	Ratio better quality = lower score	Ratio better quality = lower score
Algorithm	See flowchart in appendix.	See flowchart in appendix.	See flowchart in appendix.
Submission items	5.1 Identified measures: 0369 Standardized Mortality Ratio for Dialysis Facilities	5.1 Identified measures: 2496 Standardized Readmission Ratio (SRR) for dialysis facilities	5.1 Identified measures: 0369 Standardized Mortality Ratio for Dialysis Facilities

	1463 Standardized Hospitalization Ratio for Dialysis Facilities (SHR)	0369 Standardized Mortality Ratio for Dialysis Facilities	2496 Standardized Readmission Ratio (SRR) for dialysis facilities
	2496 Standardized Readmission Ratio (SRR) for dialysis facilities 5a.1 Are specs completely harmonized? No 5a.2 If not completely harmonized, identify difference, rationale, impact: SHR is a related measure to the standardized mortality ratio (SMR) and the standardized readmission ration (SRR). SHR, SMR, and SRR are harmonized to the target population they measure (Medicare-covered ESRD patients), methods (SMR and SHR) and certain risk adjustment factors specific to the ESRD population, while each measure assesses different outcomes as reflected in their respective measure specifications. SHR and SMR adjust for the same prevalent comorbidity risk factors, a similar set of patient characteristics, and use fixed effects in their modeling approach. The differences between SHR, SMR, and SRR reflect adjustment for factors specific to the outcome of each respective measure. Both SHR and SMR adjust for a set of prevalent comorbidities (observed in a prior year). However, the complete set of comorbidities differs for SRR. SRR excludes planned readmissions and adjusts for discharging hospital, acknowledging that for readmission,	1463 Standardized Hospitalization Ratio for Dialysis Facilities (SHR) 5a.1 Are specs completely harmonized? No 5a.2 If not completely harmonized, identify difference, rationale, impact: SMR is a related measure to the standardized hospitalization ratio (SHR) and the standardized readmission ratio (SRR). SMR, and SHR and SRR are harmonized to the target population they measure (Medicare-covered ESRD patients on chronic dialysis), methods (SMR and SHR) and certain risk adjustment factors specific to the ESRD population. SMR and SHR adjust for the same comorbidity risk factors, a similar set of patient characteristics, and use fixed effects in their modeling approach. The differences between SMR and SHR and SRR reflect adjustment for factors specific to the outcome of each respective measure. Both SMR and SHR adjust for a set of prevalent comorbidities (observed in a prior year). However, the complete set of comorbidities for SMR differs from SRR. SRR, a measure of hospital utilization adjusts for planned readmissions and for discharging hospital, acknowledging that for readmission, hospitals also bear accountability for properly coordinating care with the dialysis facility. These risk adjustments in SRR account for those characteristics specifically associated with readmission, and do not apply to SMR. Only SMR adjusts for state death rates, race, and ethnicity to account for these respective differences related to mortality outcomes and that are deemed outside of a facility's control.	1463 Standardized Hospitalization Ratio for Dialysis Facilities (SHR) 1789 Hospital-Wide All-Cause Unplanned Readmission Measure (HWR) 2510 Skilled Nursing Facility 30-Day All-Cause Readmission Measure (SNFRM) 5a.1 Are specs completely harmonized? No 5a.2 If not completely harmonized, identify difference, rationale, impact: SRR is harmonized with the *Standardized Hospitalization Ratio for Admissions* (NQF #1463) and Standardized Mortality Ratio (NQF #0369) currently undergoing measure maintenance. The SRR applies to the same population—Medicare-covered ESRD patients—as SHR and SMR. SRR, SMR, and SHR include Medicare Advantage patients as they constitute a growing population of ESRD beneficiaries (approaching 20%); both SRR and SHR include an indicator accounting for the proportion of Medicare Advantage coverage in order to minimize potential bias due to incomplete comorbidity ascertainment for MA patients. SRR, SHR, and SMR all restrict to inpatient claims for comorbidity risk adjustment and all measures adjust for a similar set of patient characteristics as the SRR and utilize fixed effects in their modeling approach. However, SRR adjusts for a different set of comorbidities that are associated with a high risk of readmission. There are several NQF endorsed measures that share the same focus with SRR but target different patient populations and/or care settings. The proposed SRR has the same measure focus—unplanned 30-day readmissions—as CMS' *Hospital-Wide All-Cause*

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	hospitals also bear accountability for properly coordinating care with the dialysis facility. These risk adjustments in SRR account for those characteristics specifically associated with readmission, and do not apply to SHR or SMR. SHR, SRR, and SMR all include an adjustment for sex, while only SMR also adjusts for state death rates, race, and ethnicity. 5b.1 If competing, why superior or rationale for additive value: N/A	5b.1 If competing, why superior or rationale for additive value: N/A	*Readmission Rate* (NQF #1789), and the *Skilled Nursing Facility 30-Day All-Cause Readmission Measure* (SNF; NQF #2510). SRR is harmonized with both the HWR and SNF measures in restricting to the use of inpatient Medicare claims for comorbidity risk adjustment, and exclusion of planned readmissions. There are several differences between the SRR and the existing CMS HWR and SNF measures. Some of the differences are intended to account for unique features of the ESRD chronic dialysis population: Inclusion/Exclusion 1) SRR includes patients with incomplete claims history from the prior year. We do this to allow capture of incident ESRD patients that may not have a complete year of Medicare coverage 2) SRR includes Medicare Advantage patients (approaching 20% of ESRD dialysis patients) while HWR and SNF are restricted to Medicare FFS patients with Part A only 3) only SRR excludes discharges that follow a patient's 12th admission in the year 4) SRR excludes from the numerator planned readmissions that include a diagnosis of "fluid and electrolyte disorders" (CCS 55) that meet other criteria for planned readmissions (see Appendix). Risk Adjustment 1) SRR does not adjust for comorbidities that are highly prevalent in the ESRD population, such as acute renal failure, dialysis status, kidney transplant, fluid/electrolyte disorders, and iron deficiency 2) SRR additionally adjusts for diagnoses (grouped by the Clinical Classification Software [CCS] method)

	1463 Standardized Hospitalization Ratio for Dialysis Facilities (SHR)	0369 Standardized Mortality Ratio for Dialysis Facilities	2496 Standardized Readmission Ratio (SRR) for dialysis facilities
			that are relatively rare but have a high risk of 30-day readmission in the ESRD population 3) SRR adjusts for length of hospital stay, diabetes as the primary cause of ESRD, time on dialysis, and sex 4) only SRR includes an indicator for Medicare Advantage coverage at time of index discharge 5) SRR adjusts for comorbidities identified during the index hospitalization which were not present on admission whereas HWR does not. Additional differences between the SRR and SNF are that the SNF includes a different target population (though we recognize a notable proportion of ESRD dialysis patients reside in nursing homes); and SNF includes readmissions within one day of discharge while SRR excludes readmissions within three days of discharge. 5b.1 If competing, why superior or rationale for additive value: N/A

Comparison of NQF 2539, 0658, 2687, 2257, 3510

	2539 Facility 7-Day Risk-Standardized Hospital Visit Rate after Outpatient Colonoscopy	0658 Appropriate Follow-Up Interval for Normal Colonoscopy in Average Risk Patients	2687 Hospital Visits after Hospital Outpatient Surgery	3357 Facility-Level 7-Day Hospital Visits after General Surgery Procedures Performed at Ambulatory Surgical Centers	3510 Screening/Surveillance Colonoscopy
Steward	Centers for Medicare & Medicaid Services	American Gastroenterological Association	The Centers for Medicare & Medicaid Services (CMS)	Centers for Medicare & Medicaid Services (CMS)	Centers for Medicare & Medicaid Services (CMS)
Description	Facility-level risk-standardized rate of acute, unplanned hospital visits within seven days of a colonoscopy procedure performed at a hospital outpatient department (HOPD) or ambulatory surgical center (ASC) among Medicare Fee-For-Service (FFS) patients aged 65 years and older. An unplanned hospital visit is defined as an emergency department (ED) visit, observation stay, or unplanned inpatient admission. The measure is calculated separately for ASCs and HOPDs.	Percentage of patients aged 50 years to 75 years receiving a screening colonoscopy without biopsy or polypectomy who had a recommended follow-up interval of at least 10 years for repeat colonoscopy documented in their colonoscopy report.	Facility-level risk-standardized rate of acute, unplanned hospital visits within seven days of a procedure performed at a hospital outpatient department (HOPD) among Medicare Fee-For-Service (FFS) patients aged 65 years and older. An unplanned hospital visit is defined as an emergency department (ED) visit, observation stay, or unplanned inpatient admission.	Facility-level risk-standardized ratio of acute, unplanned hospital visits within seven days of a general surgery procedure performed at an ambulatory surgical center (ASC) among Medicare Fee-For-Service (FFS) patients aged 65 years and older. An unplanned hospital visit is defined as an emergency department (ED) visit, observation stay, or unplanned inpatient admission.	Facility-level risk-standardized ratio of acute, unplanned hospital visits within seven days of a general surgery procedure performed at an ambulatory surgical center (ASC) among Medicare Fee-For-Service (FFS) patients aged 65 years and older. An unplanned hospital visit is defined as an emergency department (ED) visit, observation stay, or unplanned inpatient admission.
Type	Outcome	Process	Outcome	Outcome	Cost/Resource Use
Data Source	Claims, Other Medicare administrative claims and enrollment data No data collection instrument provided	Claims, Electronic Health Data, Electronic Health Records, Other, Registry Data Not applicable.	Claims, Enrollment Data Medicare administrative claims and enrollment data No data collection instrument provided Attachment	Claims, Enrollment Data Medicare administrative claims and enrollment data.	All the data used to calculate the Screening/Surveillance Colonoscopy cost measure are included on Medicare claims data. The data fields used to calculate measure (e.g.,

	Attachment Colonoscopy_Measure_Data_Dictionary_v2019a.xlsx		HOPD_Surgery_Measure_Data_Dictionary_v2019a.xlsx	No data collection instrument provided Attachment Copy_of_General_surgery_ASC_code_set_file_033120_ForNQF.XLSX	payment amounts, diagnosis and procedure codes, etc.) are included in all Medicare claims because clinicians only receive payments for complete claims. Additional information regarding the reliability of diagnostic information on claims is available on the Testing Form in Section 2a2.2. We have complete data for each beneficiary who opens an episode by receiving a triggering service, since beneficiaries are excluded if they are not continuously enrolled in only Medicare Parts A and B or if Medicare is not the primary payer during an episode. This ensures that we have all claims data for beneficiaries included in the Screening/Surveillance Colonoscopy cost measure. Inpatient services: Inpatient facility services; Inpatient services: Evaluation and management; Inpatient services: Procedures and surgeries; Inpatient services: Imaging and diagnostic; Inpatient services: Lab services; Inpatient services: Admissions/discharges; Other inpatient services; Ambulatory services: Outpatient facility services; Ambulatory services: emergency department;

					Ambulatory services: Evaluation and management; Ambulatory services: Procedures and surgeries; Ambulatory services: Imaging and diagnostic; Ambulatory services: Lab services; Other ambulatory services See Measure Codes List The Screening/Surveillance Colonoscopy measure uses Medicare Part A and Part B claims data, which is maintained by CMS. Part A and B claims data are used to build episodes of care, calculate episode costs, and construct risk adjustors. Data from the Medicare Enrollment Database (EDB) are used to determine beneficiary-level exclusions and supplemental risk adjustors, specifically Medicare Parts A, B, and C enrollment; primary payer; disability status; end-stage renal disease (ESRD); beneficiary birth dates; and beneficiary death dates. Data from the Provider Enrollment, Chain and Ownership System (PECOS) database provide identifying information on all Medicare clinicians (TINs and TIN-NPIs), such as provider name, specialty, and place of business, which is used to determine clinician eligibility. The risk adjustment model also

					accounts for expected differences in payment for services provided to beneficiaries in long-term care, and that information comes from the Minimum Data Set (MDS). The MDS is used to create the Long Term Care Indicator variable in risk adjustment. For measure testing, data from the American Census, American Community Survey (ACS), and Common Medicare Enrollment (CME) are used in the analyses evaluating social risk factors in risk adjustment. S_5_2_DataSourceReference-636824811484783296.docx
Level	Facility	Clinician : Individual	Facility	Facility	See Measure Codes List
Setting	Outpatient Services	Outpatient Services	Outpatient Services	Outpatient Services	The *Screening/Surveillance Colonoscopy* measure assesses the standardized allowed amounts of services performed by clinicians and other healthcare providers during an episode, which includes all assigned services from Part A and Part B Medicare claims that occur within the time period from the episode trigger through 14 days after the trigger. The assigned services for this measure are within the following service categories: emergency department, outpatient facility and clinician

					services, inpatient facility, long term care hospital, and inpatient rehabilitation facility. The codes to identify these services (e.g., CPT/HCPCS, DRG, and RIC codes) are contained in the Measure Codes List file (see Section S.1), along with the logic conditions for assigning these services.
Numerator Statement	Unplanned hospital visits within seven days of a qualifying colonoscopy.	Patients who had a recommended follow-up interval of at least 10 years for repeat colonoscopy documented in their colonoscopy report	The outcome is all-cause, unplanned hospital visits, defined as 1) an inpatient admission directly after the surgery or 2) an unplanned hospital visit (emergency department [ED] visit, observation stay, or unplanned inpatient admission) occurring after discharge and within seven days of the surgical procedure.	The outcome being measured is acute, unplanned hospital visits (ED visit, observation stay, or unplanned inpatient admission) occurring within seven days of a general surgery procedure performed at an ASC. Additional details are provided in S.5 Numerator Details.	
Numerator Details	Outcome Definition The outcome for this measure is all-cause, unplanned hospital visits within seven days of an outpatient colonoscopy. Hospital visits include ED visits, observation stays, and unplanned inpatient admissions. If more than one unplanned hospital visit occurs, only the first hospital visit within the outcome timeframe is counted in the outcome.	Patients will be counted in the numerator if it is documented in the final colonoscopy report that the appropriate follow-up interval for the next colonoscopy is at least 10 years from the date of the current colonoscopy (i.e., the colonoscopy performed during the measurement period).	Outcome Definition The outcome is all-cause, unplanned hospital visits, defined as 1) an inpatient admission directly after the surgery or 2) an unplanned hospital visit (ED visit, observation stay, or unplanned inpatient admission) occurring after discharge and within seven days of the surgical procedure. If more than one unplanned hospital visit occurs in the seven days following the surgical procedure, only the first hospital visit within the	Outcome Definition The outcome is unplanned hospital visits, defined as an ED visit, observation stay, or unplanned inpatient admission, occurring within seven days of the general surgery procedure performed at an ASC identified using Centers for Medicare & Medicaid Services (CMS) Medicare administrative claims data. Time Period for Data	2019_01_07_testing_form_appendix_ss_clnscpy.xlsx

	Identification of Planned Admissions The measure outcome includes any inpatient admission within the first seven days after the colonoscopy, unless that admission is deemed a "planned" admission as defined by the measure's PAA. The Centers for Medicare & Medicaid Services (CMS) seeks to count only unplanned admissions in the measure outcome, because variation in "planned" admissions does not reflect quality differences. We based the PAA on the CMS PRA Version 4.0_2019, which CMS created for its hospital-wide readmission measure. In brief, the algorithm identifies admissions that are typically planned and may occur after the patient's index event. The algorithm always considers a few specific, limited types of care planned (e.g., major organ transplant, rehabilitation, or maintenance chemotherapy). Otherwise, the algorithm defines a planned admission as a non-acute admission for a scheduled procedure (e.g., total hip replacement or		outcome timeframe is counted in the outcome. If there are two surgical procedures within a seven-day period, we adjust the follow up period of the first procedure to be the time between the first procedure and the second procedure. The second procedure's follow-up period remains seven days post-procedure. Thus, hospital visit outcomes are assigned to the first procedure if they occur during the time between procedures, while outcomes in the seven days following the second procedure are assigned to the second procedure. Planned Admission Algorithm For inpatient admissions occurring after Day 1 following surgery, we only include unplanned admissions in the measure outcome. We consider admissions occurring on the day of the surgery (Day 0) and Day 1 post-surgery "unplanned" as the vast majority of these admissions are inpatient admissions directly following surgery. "Planned" admissions are those planned by providers for anticipated medical treatment or procedures that must be provided in the inpatient setting. We do not count these in the outcome because variation in planned	Numerator time window: seven days after ASC procedures for unplanned hospital visits. Denominator: All general surgery ASC procedures performed during the measurement period. Identification of Planned Admissions The measure outcome includes hospital visits within the first seven days following the procedure, unless that inpatient admission is deemed a "planned" admission. We applied CMS's Planned Readmission Algorithm Version 4.0 to identified planned admissions [1]. Planned admissions are defined as those planned by providers for anticipated medical treatment or procedures that must be provided in the inpatient setting. CMS seeks to count only unplanned admissions in the measure outcome because variation in planned admissions does not reflect quality differences. The algorithm identifies inpatient admissions that are typically planned and	

	cholecystectomy), and the algorithm never considers admissions for acute illness or for complications of care planned. For example, the algorithm considers hip replacement unplanned if hip fracture (an acute condition) is the discharge diagnosis, but planned if osteoarthritis (a non-acute condition) is the discharge diagnosis. The algorithm considers admissions that include potentially planned procedures with acute diagnoses or that might represent complications of a colonoscopy unplanned and thus counts these admissions in the measure outcome. For more information about the PAA, please see the Facility 7-day Risk-Standardized Hospital Visit Rate after Outpatient Colonoscopy Measure 2018 Measure Updates and Specifications Report posted on the web page provided in data field S.1. Also see sheets "PAA PA1 always planned Px", "PAA PA2 always planned Dx", "PAA PA3 post planned Px", and "PAA PA4 acute Dx" in the attached Data Dictionary for the most up-to-date sets of codes in		admissions does not reflect quality differences. To identify admissions as planned or unplanned we use an algorithm we previously developed for CMS's hospital readmission measures, CMS Planned Readmission Algorithm (PRA) Version 4.0. In brief, the algorithm uses the procedure codes and principal discharge diagnosis code on each hospital claim to identify admissions that are typically planned and may occur after a surgery. A few specific, limited types of care are always considered planned (for example, major organ transplant, rehabilitation, or maintenance chemotherapy). Otherwise, a planned admission is defined as a non-acute admission for a scheduled procedure (for example, total hip replacement or cholecystectomy). Post-discharge admissions for an acute illness or for complications of care are never considered planned. Also, the measure never considers ED visits or observation stays as planned. The most recently published methodology report provides a detailed description of the planned admission algorithm adapted for the surgery	may occur after the patient's index general surgery procedure, considering a few specific and limited types of care as "planned" (e.g., major organ transplant, rehabilitation, or maintenance chemotherapy). Otherwise, the algorithm defines a planned admission as a non-acute inpatient admission for a scheduled procedure (e.g., total hip replacement or cholecystectomy), and the algorithm never considers inpatient admissions for acute illness or for complications of care as "planned." The algorithm considers inpatient admissions that include potentially planned procedures with acute diagnoses, or with diagnoses that might represent complications of a surgery, as "unplanned" and thus counts these inpatient admissions in the measure outcome. Details of the planned admission algorithm and codes to identify planned admissions are in the attached Data Dictionary	

	the algorithm for "always planned procedures" (PA1), "always planned diagnoses" (PA2), "potentially planned procedures" (PA3), and "acute" diagnoses (PA4). Definition of ED and Observation Stay We defined ED visits and observation stays using one of the specified billing codes or revenue center codes identified in Medicare Part B Outpatient hospital claims. The codes that define ED visits and observation stays are in the attached Data Dictionary, sheet "Colons_Outcome_ED_Obs."		measure: https://www.qualitynet.org/files/5d0d367e764be766b01006a7?filename=HOPD_Surg_MsrUpdtRpt_2018.pdf. The codes that define ED visits and observation stays are in the attached data dictionary, sheet "HOPD_Surgy__ED_Obs_Stay_Def"	entitled "Planned Admission Algorithm_v2019." Definition of ED Visits and Observation Stay The measure defines ED visits and observation stays using one of the specified billing codes or revenue center codes identified in Medicare Part B Outpatient hospital claims. The codes used to define ED visits and observation stays are in the attached Data Dictionary sheet labeled "ASC Surg Outcome ED Obs." Citation 1. Horwitz L, Grady J, Cohen D, et al. Development and validation of an algorithm to identify planned readmissions from claims data. Journal of Hospital Medicine. Oct 2015;10(10):670-677.	
Denominator Statement	Colonoscopies performed at hospital outpatient departments (HOPDs) and ambulatory surgical centers (ASCs) for Medicare FFS patients aged 65 years and older.	All patients aged 50 years to 75 years and receiving screening colonoscopy without biopsy or polypectomy	Outpatient same-day surgeries performed at HOPDs for Medicare FFS patients aged 65 years and older.	The target population for this measure is Medicare FFS patients aged 65 years and older, undergoing outpatient general surgery procedures in ASCs.	The *Screening/Surveillance Colonoscopy* measure is the sum of the ratio of observed to-expected payment-standardized cost to Medicare averaged across the episodes attributed to a clinician or clinician group. This is then

					multiplied by the national average observed episode cost to generate a dollar figure. The measure can be calculated for an individual TIN-NPI (clinician) or a TIN (clinician group practice). A Screening/Surveillance Colonoscopy episode is a unit or specific instance of the measure for a given clinician and beneficiary that can then be aggregated to assess a clinician's performance across all their episodes. The episode is triggered or opened by Current Procedural Terminology / Healthcare Common Procedure Coding System CPT/HCPCS codes, and includes certain services in Medicare Parts A and B claims related to the procedure in the period from the expense date of the episode trigger to 14 days after the episode trigger. The cost measure numerator is the sum of the ratio of observed-to-expected payment-standardized cost to Medicare for all Screening/Surveillance Colonoscopy episodes attributed to a clinician. This sum is then multiplied by the national average observed episode cost to generate a dollar figure.

					The cost measure denominator is the total number of episodes from the Screening/Surveillance Colonoscopy episode group attributed to a clinician within a performance period (i.e., MIPS performance year). Cost figures are standardized to remove the effect of differences in Medicare payment among health care providers that are the result of differences in regional health care provider expenses measured by hospital wage indexes and geographic price cost indexes (GPCIs) or other payment adjustments such as those for teaching hospitals. This standardization is intended to isolate cost differences that result from healthcare delivery choices, allowing for more accurate resource use comparisons between health care providers.
Denominator Details	Target Population The measure includes colonoscopies performed at HOPDs and ASCs. The measure calculates a facility-level score for all eligible facilities separately for HOPDs and ASCs. The target population is patients aged 65 years and older who have a	All patients aged 50 to 75 years of age receiving a screening colonoscopy without biopsy or polypectomy during the measurement period. ICD-10-CM: Z12.11 AND Patient encounter during the reporting period (CPT or	The surgery measure was developed to improve the quality of care delivered to patients undergoing hospital outpatient surgeries. In brief, the surgery measure includes all hospital outpatient departments (HOPDs) that performed qualifying surgeries during the performance period.	Included patients: The target population for this measure is Medicare FFS patients aged 65 years and older, undergoing outpatient general surgery procedures in ASCs that are within the scope of general surgery training. Specifically, the cohort of procedures includes the	Step 1. Trigger and Define an Episode Screening/Surveillance Colonoscopy episodes are defined by Current Procedural Terminology / Healthcare Common Procedure Coding System (CPT/HCPCS) codes on Part B Physician/Supplier (Carrier) claims that open, or trigger an episode.

	colonoscopy to screen for colorectal cancer, biopsy, or remove pre-cancerous lesions, or evaluate non-emergent symptoms and signs of disease. We limited the measure cohort to patients who are 65 and older, enrolled in Medicare FFS, and have been enrolled in Part A and Part B Medicare for the 12 months prior to the date of procedure since national data linking risk factors, procedures, and outcomes across care settings are only available for this group. Eligible colonoscopies were identified using specified Current Procedural Terminology (CPT)/Healthcare Common Procedure Coding System (HCPCS) procedure codes in the Medicare Carrier (Part B Physician) Standard Analytical File (SAF). The CPT and HCPCS procedure codes that define the cohort are in the attached Data Dictionary, sheet "Colonos_Cohort." We considered all colonoscopy codes during development of the measure cohort. We did not include in the measure colonoscopy CPT procedure codes that	HCPCS): 44388, 45378, G0121 WITHOUT CPT Category I Modifiers: 52, 53, 73, 74	Further information on the measure development process is available in the Hospital Visits After Hospital Outpatient Surgeries: Measure Technical Report (2014) and 2016 Technical Report Addendum: https://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/HospitalQualityInits/Downloads/Hospital-Visits-after-Hospital-Outpatient-Surgery-Measure.pdf Inclusion Criteria 1. Surgeries and procedures that are substantial and are typically performed as same-day surgeries Rationale: The target cohort is low-to-moderate-risk surgeries that can be safely performed as same-day surgeries and do not typically require an overnight stay or an inpatient admission. In addition, they do not occur in conjunction with a same-day emergency department (ED) visit or observation stay. We define same-day surgeries using the CMS's list of covered ambulatory surgery center (ASC) procedures. The list is comprised of procedures for which the patients are expected to return home the same day as their procedure. We further restrict Medicare's list of	following types of surgeries: abdominal, alimentary tract, breast, skin/soft tissue, wound, and varicose vein. The Medicare FFS population was chosen because of the availability of a national dataset (Medicare claims) that could be used develop, test, and publicly report the measure. We limit the measure to patients who have been enrolled in Medicare FFS Parts A and B for the 12 months prior to the date of surgery to ensure that we have adequate data for identifying comorbidities for risk adjustment. Included procedures: The target group of procedures is surgical procedures that (1) are routinely performed at ASCs, (2) involve risk of post-surgery hospital visits, and (3) are within the scope of general surgery training. The scope of general surgery overlaps with that of other specialties (for example, vascular surgery and, plastic surgery). For this measure, we targeted surgeries that general	The steps for defining an episode for the Screening/Surveillance Colonoscopy episode group are as follows: • Identify Part B Physician/Supplier claim lines with positive standardized payment that have a trigger code. • Trigger an episode if all the following conditions are met for an identified Part B Physician/Supplier claim line: o It was billed by a clinician of a specialty that is eligible for MIPS. o It is the highest cost claim line across any Screening/Surveillance Colonoscopy trigger code billed for the beneficiary on that day. o It does not have a post-operative modifier code. [1] • Establish the episode window as follows: o Establish the episode trigger date as the expense date of the trigger code. o Establish the episode start date as the episode trigger date. o Establish the episode end date as 14 days after the episode trigger date.

	reflected fundamentally higher-risk or different procedures. Those procedures billed with a qualifying colonoscopy procedure code and a high-risk colonoscopy procedure code (see attached Data Dictionary, sheet "Colonos_Excll") were not included in the measure. Colonoscopy is not possible among patients who have had a prior total colectomy. Any claim for a colonoscopy in a patient with a prior total colectomy is therefore likely to be a coding error. We perform an error check to ensure the measure does not include these patients with a total colectomy recorded in their prior medical history. The CPT and HCPCS procedure codes and International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM) and ICD-10-CM codes that define the total colectomy data reliability check are in the attached Data Dictionary, sheet "Colonos_Excl." Capture of Colonoscopies Affected by the Medicare Three-Day Payment Window Policy:		covered ASC procedures using the Global Surgical Package (GSP) indicator and include two types of procedures from this list: o Substantive surgeries performed at HOPDs (except eye surgeries) Rationale: Ambulatory procedures include a heterogeneous mix of non-surgical procedures, minor surgeries, and more substantive surgeries. We want to include substantive surgeries but not very low-risk (minor) surgeries or non-surgical procedures, which typically have a high volume and a very low outcome rate. We define substantive procedures using the Medicare Physician Fee Schedule (MPFS) global surgery indicator (GSI) code 090. o Cystoscopy procedures with intervention Rationale: All endoscopy procedures are considered non-surgical procedures based on Medicare coding (GSI code 000). However, we include cystoscopy with intervention because it is a common procedure, often performed for therapeutic intervention by surgical teams, and the outcome rate and causes of hospital visits post-procedure are similar to those	surgeons are trained to perform with the understanding that other subspecialists may also be performing many of these surgeries at ASCs. Since the type of surgeon performing a particular procedure may vary across ASCs in ways that affect quality, the measure is neutral to surgeons' specialty training. To identify eligible ASC general surgery procedures, we identify the list of procedures from Medicare's most current list of ASC covered procedures, which include procedures for which ASCs can be reimbursed under the ASC payment system. This list of surgeries is publicly available at: https://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/ASCPayment/11_Addenda_Updates (download ASC Approved HCPCS Code and Payment Rates, Addendum AA). Surgeries on the ASC list of covered procedures do not involve or require: major or prolonged invasion of body cavities, extensive	• Define trigger exclusions based on information available at the time of the trigger, if applicable. Once a Screening/Surveillance Colonoscopy episode is triggered, the episode is placed into one of the episode sub-groups to enable meaningful clinical comparisons. This cost measure has three sub-groups: • HOPD • ASC • Office Step 2. Attribute Episodes to a Clinician Once an episode has been triggered and defined, it is attributed to one or more clinicians of a specialty that is eligible for MIPS. Clinicians are identified by Taxpayer Identification Number (TIN) and National Provider Identifier (NPI) pairs (TIN-NPI), and clinician groups are identified by TIN. Only clinicians of a specialty that is eligible for MIPS or clinician groups where the triggering clinician is of a specialty that is eligible for MIPS are attributed episodes. The steps for attributing a Screening/Surveillance

	Colonoscopies performed at HOPDs can be affected by the Medicare three-day payment window policy. The policy states that outpatient services (including all diagnostic services such as colonoscopy) provided by a hospital or any Part B entity wholly owned or wholly operated by a hospital (such as an HOPD) in the three calendar days preceding the date of a beneficiary's inpatient admission are deemed to be related to the admission [1]. For outpatient colonoscopies affected, the facility claim (for the technical portion of the colonoscopy) is bundled with the inpatient claim, although the Medicare Part B physician claim for professional services rendered is still submitted. This policy has implications for the measure because it may lead to: (1) failure to completely capture outpatient colonoscopies performed at HOPDs; and (2) underreporting of outcomes for colonoscopies performed in the HOPD setting. To ensure the capture of HOPD colonoscopies, we identify physician claims for		for surgeries in the measure cohort. Please refer to the data dictionary "HOPD_Surg_Cohort" to review the list of qualifying same-day surgeries, including cystoscopy procedures with intervention. The data dictionary "HOPD_Surg_Eye_Exclusions" provides the list of eye surgeries that are excluded from the measure cohort. 2. Surgeries on patients aged 65 or over Rationale: Medicare beneficiaries under age 65, typically, are a highly diverse group with a higher burden of disability, and it is therefore difficult to adequately risk adjust for the under 65 population. 3. When multiple procedures occur concurrently, only surgeries that are not performed concurrently with a high-risk procedure are included. Rationale: Occasionally, more than one surgery may be performed and some of these surgeries may be higher-risk procedures. When multiple procedures occur, we only include surgeries that are not performed concurrently with high-risk procedures. Please	blood loss, major blood vessels, or care that is either emergent or life-threatening. The ASC list is annually reviewed and updated by Medicare, and includes a transparent public comment submission and review process for the addition and/or removal of procedure codes. Using an existing, defined list of surgeries, rather than defining surgeries de novo, is useful for long-term measure maintenance. Procedures listed in Medicare's list of covered ASC procedures are defined using Healthcare Common Procedure Coding System (HCPCS) and Common Procedural Terminology (CPT®) codes. Ambulatory procedures include a heterogeneous mix of non-surgical procedures, minor surgeries, and more substantive surgeries. The measure is not intended to include very low-risk surgeries or non-surgical procedures, which typically have a high volume and a very low outcome rate. Therefore,	Colonoscopy episode are as follows: • Identify claim lines with positive standardized payment for any trigger codes that occur on the episode trigger day. • Designate a TIN-NPI as a main clinician if the following conditions are met: o No assistant modifier code is found on one or more claim lines billed by the clinician. o No exclusion modifier code is found on the same claim line. • Designate a TIN-NPI as an assistant clinician if the following conditions are met: o The TIN-NPI was not designated as a main clinician. o An assistant modifier code is found. o No exclusion modifier code is found. • Attribute an episode to any TIN-NPI designated as a main or assistant clinician. • Attribute episodes to the TIN by aggregating all episodes attributed to NPIs that bill to that TIN. If the same episode is attributed to more than one NPI within a TIN, the episode is attributed only once to that TIN.

	colonoscopy in the HOPD setting from Medicare Part B claims, which had an inpatient admission within three days and lacked a corresponding HOPD facility claim. We then attribute the colonoscopies identified as affected by this policy to the appropriate HOPD facility using the facility provider ID from the inpatient claim. Citations 1. Centers for Medicare & Medicaid Services (CMS). Three Day Payment Window. 2013; http://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/AcuteInpatientPPS/Three_Day_Payment_Window.html		refer to the data dictionary "HOPD_Surg_High_Risk_Exclusions" tab to review the list of high-risk procedures. High-risk procedures are identified using the Hospital Outpatient PPS Addendum B. A procedure is considered high-risk if it is flagged as "Inpatient Only" (not paid under OPPS) or "Outpatient Only" (paid under OPPS, but not on the list of ASC-approved procedures). Removal of these procedures aids with alignment of the measure's restriction to only include ASC-covered procedures. 4. Surgeries for patients with continuous enrollment in Medicare Fee-for-Service (FFS) Parts A and B in the 12 months prior to the surgery. Rationale: Patients with full enrollment have all claims available for identifying comorbidities for risk adjustment. 5. Surgeries for patients with continuous enrollment in Medicare Fee-for-Service (FFS) Parts A and B in the 12 months prior to the surgery. Rationale: Patients with full enrollment have all claims available for identifying comorbidities for risk adjustment. Citations	to focus the measure only on the subset of surgeries on Medicare's list of covered ASC procedures that impose a meaningful risk of post-procedure hospital visits, the measure includes only "major" and "minor" procedures, as indicated by the Medicare Physician Fee Schedule global surgery indicator (GSI) values of 090 and 010, respectively. The GSI code reflects the number of post-operative days that are included in a given procedure's global surgical payment and identifies surgical procedures of greater complexity and follow-up care. This list of GSI values is publicly available at: https://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/PhysicianFeeSched/PFS-Relative-Value-Files.html. Finally, to identify the subset of general surgery ASC procedures, we reviewed with consultants and Technical Expert Panel (TEP) members the Clinical Classifications Software	Step 3. Assign Costs of Services to an Episode and Calculate Total Observed Episode Cost For the Screening/Surveillance Colonoscopy episode group, only services performed in the following service categories are considered for assignment to the episode costs: • Emergency Department (ED) • Outpatient (OP) Facility and Clinician Services • Long Term Care Hospital (LTCH) - Medical • LTCH - Surgical • IP - Medical • IP - Surgical • Inpatient Rehabilitation Facility (IRF) - Medical Service assignment rules may be modified based on the service category in which the service is performed, as listed above. Service assignment rules may also vary based on (i) additional criteria determined by other diagnosis, procedure, or billing codes appearing alongside the service code, or (ii) the specific timing of the service. Services may be assigned to the episode based on the following additional criteria:

			1. Centers for Medicare & Medicaid Services (CMS). Three Day Payment Window. 2013; http://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/AcuteInpatientPPS/Three_Day_Payment_Window.html	(CCS) categories of procedures developed by the Agency for Healthcare Research and Quality (AHRQ). We identified and included CCS categories within the scope of general surgery, and only included individual procedures within the CCS categories at the procedure (CPT® code) level if they were within the scope of general surgery practice. We did not include in the measure gastrointestinal endoscopy, endocrine, or vascular procedures, other than varicose vein procedures, because reasons for hospital visits are typically related to patients' underlying comorbidities. See the attached Data Dictionary, Tab 1 "Asc Surg Cohort" for a complete list of all CPT procedure codes included in the measure cohort.	• Services may be assigned to the episode based on the following additional criteria: o Service code alone o Service code in combination with other diagnosis, procedure, or billing codes such as: The first three digits of the International Classification of Diseases – Tenth Revision diagnosis code (3-digit ICD-10 DGN) The full ICD-10 DGN Additional service information • Services may be assigned only with specific timing: o Services may be assigned based on whether or not the service and/or diagnosis is newly occurring o Services may be assigned only if they occur within a particular number of days from the trigger within the episode window, and services may be assigned for a period shorter than the full duration of the episode window.

					The steps for assigning costs are as follows: • Identify all services on claims with positive standardized payment that occur within the episode window. • Assign identified services to the episode based on the types of service assignment rules described above. • Sum standardized Medicare allowed amounts for all claims assigned to each episode to obtain the standardized total observed episode cost. Step 4. Exclude Episodes • Exclude episodes from measure calculation if: o The beneficiary has a primary payer other than Medicare for any time overlapping the episode window or 120-day lookback period prior to the trigger day. o The beneficiary was not enrolled in Medicare Parts A and B for the entirety of the lookback period plus episode window, or was enrolled in Part C for any part of the lookback plus episode window. o No main clinician is attributed the episode.

					o The beneficiary's date of birth is missing. o The beneficiary's death date occurred before the episode ended. o The episode trigger claim was not performed in an ambulatory/office-based care, OP hospital, or ASC setting based on its place of service. • Apply measure-specific exclusions, which check the beneficiary's Medicare claims history for certain billing codes (as specified in the Measure Codes List file) that indicate the presence of a particular procedure, condition, or characteristic. Step 5. Estimate Expected Costs through Risk Adjustment Steps for defining risk adjustment variables and estimating the risk adjustment model are as follows: • Define HCC and episode group-specific risk adjustors using service and diagnosis information found on the beneficiary's Medicare claims history in the 120-day period prior to the episode trigger day for certain billing codes that indicate the presence of a procedure, condition, or characteristic.

					• Define other risk adjustors that rely upon Medicare beneficiary enrollment and assessment data as follows: o Identify beneficiaries who are originally “Disabled without end-stage renal disease (ESRD)” or “Disabled with ESRD” using the original reason for joining Medicare field in the Medicare beneficiary enrollment database. o Identify beneficiaries with ESRD if their enrollment indicates ESRD coverage, ESRD dialysis, or kidney transplant in the Medicare beneficiary enrollment database in the lookback period. o Identify beneficiaries who have spent at least 90 days in a long-term care institution without having been discharged to the community for 14 days, based on MDS assessment data. • Drop risk adjustors that are defined for less than 15 episodes nationally for each subgroup to avoid using very small samples. • Categorize beneficiaries into age ranges using their date of birth information in the Medicare beneficiary enrollment

					database. If an age range has a cell count less than 15, collapse this with the next adjacent higher age range category. • Run an ordinary least squares (OLS) regression model to estimate the relationship between all the risk adjustment variables and the dependent variable, the standardized observed episode cost, to obtain the risk-adjusted expected episode cost. A separate OLS regression is run for each episode subgroup nationally. • Winsorize expected costs as follows [2]. o Assign the value of the 0.5th percentile to all expected episode costs below the 0.5th percentile. o Renormalize values by multiplying each episode's winsorized expected cost by the subgroup's average expected cost, and dividing the resultant value by the subgroup's average winsorized expected cost. [3] • Exclude episodes with outliers as follows [4]. This step is performed separately for each subgroup. o Calculate each episode's residual as the difference between the re-

					normalized, winsorized expected cost computed above and the observed cost. o Exclude episodes with residuals below the first percentile or above the 99th percentile of the residual distribution. o Renormalize the resultant expected cost values by multiplying each episode's winsorized expected costs after excluding outliers by the subgroup's average standardized observed cost across all episodes originally in the risk adjustment model, and dividing by the subgroup's average winsorized expected cost after excluding outliers. 6. Calculate Measure Scores Measure scores are calculated for a TIN or TIN-NPI as follows: • Calculate the ratio of observed-to-expected episode cost for each episode attributed to the clinician/clinician group. • Calculate the average ratio of observed-to-expected episode cost across the total number of episodes attributed to the clinician/clinician group. • Multiply the average ratio of observed-to-expected episode cost by the national average observed episode cost

					to generate a dollar figure representing risk-adjusted average episode cost. [1] Post-operative modifier codes indicate that a clinician billing the service was not involved in the main procedure but was involved in the post-operative care for that procedure, and as such the post-operative clinician would not be responsible for the trigger. [2] Winsorization aims to limit the effects of extreme values on expected costs. Winsorization is a statistical transformation that limits extreme values in data to reduce the effect of possible outliers. Winsorization of the lower end of the distribution (i.e., bottom coding) involves setting extremely low predicted values below a predetermined limit to be equal to that predetermined limit. [3] Renormalization is performed after adjustments are made to the episode's expected cost, such as bottom-coding or residual outlier exclusion. This process multiplies the adjusted values by a scalar ratio to ensure that the resulting average is equal

					to the average of the original value. [4] This step excludes episodes based on outlier residual values from the calculation and renormalizes the resultant values to maintain a consistent average episode cost level.
Exclusions	We established the following exclusion criteria after reviewing the literature, examining existing measures, discussing alternatives with the working group and Technical Expert Panel (TEP) members, reviewing feedback from the national dry run held in July 2015, public reporting in 2018 and 2019, and annual re-evaluation of the measure in 2017, 2018, and 2019. The goal was to be as inclusive as possible. We excluded only those high-risk procedures and patient groups for which risk adjustment would not be adequate or for which hospital visits were not typically a quality signal. The exclusions, based on clinical rationales, prevent unfair distortion of performance results. 1) Colonoscopies for patients who lack continuous enrollment in Medicare FFS	Documentation of medical reason(s) for not recommending at least a 10 year follow-up interval (eg, inadequate prep,familial or personal history of colonic polyps, patient had no adenoma and age is greater than or equal to 66 years old, or life expectancy < 10 years, other medical reasons)	1. Surgeries for patients without continuous enrollment in Medicare FFS Parts A and B in the seven days after the surgery. 2. Surgeries for patients who have an ED visit on the same day but billed on a separate claim, unless the ED visit has a diagnosis indicative of a complication of care. 3. Surgeries that are billed on the same hospital claim as an emergency department (ED) visit and that occur on the same calendar day, unless the ED visit has a diagnosis indicative of a complication of care. 4. Surgeries that are billed on the same hospital outpatient claim and that occur after the ED visit. 5. Surgeries that are billed on the same outpatient claim as an observation stay.	The measure excludes surgeries for patients without seven or more days of continuous enrollment in Medicare FFS Parts A and B after the surgery. The measure excludes these patients to ensure all patients have full data available for outcome assessment.	Attachment

	Parts A and B in the seven days after the procedure. Rationale: We exclude these patients to ensure full data availability for outcome assessment. 2) Colonoscopies that occur concurrently with high-risk upper gastrointestinal (GI) endoscopy procedures. Rationale: Patients undergoing concurrent high-risk upper GI endoscopy procedures, such as upper GI endoscopy procedures for the control of bleeding or treatment of esophageal varices have a higher risk profile than typical colonoscopy patients. Therefore, these patients have a disproportionally higher risk for the outcome. 3) Colonoscopies for patients with a history of inflammatory bowel disease (IBD) or diagnosis of IBD at time of index colonoscopy or on the subsequent hospital visit outcome claim. Rationale: • IBD is a chronic condition; patients with IBD undergo colonoscopy both for surveillance due to increased cancer risk and for evaluation of acute				

	symptoms. IBD is likely to be coded as the primary diagnosis prompting the procedure irrespective of whether the patients are undergoing a screening procedure or a diagnostic procedure in the setting of an acute exacerbation of IBD. Therefore, we may not be able to adequately risk adjust for these patients, as we cannot identify relatively well versus acutely unwell patients among visits coded as IBD. • Our aim is to capture hospital visits which reflect the quality of care. Admissions for acutely ill IBD patients who are evaluated with an outpatient colonoscopy and are subsequently admitted for medical treatment of an IBD flare do not reflect the quality of the colonoscopy. In our 2010 Medicare 20% FFS Full Development Sample (see the 2014 Facility 7-day Risk-Standardized Hospital Visit Rate after Outpatient Colonoscopy Measure Technical Report posted at https://www.qualitynet.org/files/5d0d37ae764be766b010196e?filename=ClnscpyMsr_TechReport.pdf for full				

	description of the dataset), more than one-third of IBD patients admitted to the hospital with colonoscopy had a discharge diagnosis of IBD, indicating their admission was for medical treatment of their IBD. We therefore excluded this group so that providers who treat a disproportionate number of IBD patients will not be disadvantaged in the measure. • A post-index diagnosis of IBD, which represents a very small fraction of cases (less than 0.5% of the cohort) in the measure population, indicates that the condition was likely present at the time of the index colonoscopy but not coded. 4) Colonoscopies for patients with a history of diverticulitis or diagnosis of diverticulitis at time of index colonoscopy or on the subsequent hospital visit outcome claim. Rationale: We exclude these patients because: • It is unclear what the health status is of patients coded with a history or current diagnosis of diverticulitis, making it difficult to fully risk adjust for				

	patients' health. Colonoscopies performed on patients with a history or current diagnosis of diverticulitis are likely to be coded as diverticulitis as the primary diagnosis irrespective of whether the patients are undergoing a screening procedure or a diagnostic procedure (i.e., are acutely unwell with active disease). Furthermore, the codes for diverticulitis and diverticulosis may not be consistently used; patients with diverticulosis may be erroneously coded as diverticulitis. Therefore, we may not be able to adequately risk adjust as we cannot identify relatively well versus acutely unwell patients among visits coded as diverticulitis. • Admissions for acutely ill patients with a history or current diagnosis of diverticulitis who are evaluated with an outpatient colonoscopy and are subsequently admitted for medical treatment of do not reflect the quality of the colonoscopy. In our 2010 Medicare 20% FFS Full Development Sample (see the Facility 7-day Risk-				

	Standardized Hospital Visit Rate after Outpatient Colonoscopy Measure Technical Report posted on the web page provided in data field S.1) more than one-quarter of patients with a history or current diagnosis of diverticulitis admitted to the hospital post colonoscopy had a discharge diagnosis of diverticulitis, indicating they were admitted for medical treatment of the condition. These admissions are likely unrelated to the quality of the colonoscopy. We therefore excluded this group so that providers who treat a disproportionate number of diverticulitis patients will not be disadvantaged in the measure. • A post-index diagnosis of diverticulitis, which represents a very small fraction of cases (less than 0.5% of the cohort) in the measure population, indicates that the condition was likely present at the time of the index colonoscopy but not coded. 5) Colonoscopies followed by a subsequent outpatient				

	colonoscopy procedure within seven days. Rationale: In these situations, the two colonoscopies are considered part of a single episode of care, for which the subsequent colonoscopy is considered the index procedure. In addition, for colonoscopies performed at HOPDs, we exclude: 6) Colonoscopies that occur on the same day and at the same hospital as an emergency department (ED) visit that is billed on a different claim than the index colonoscopy, unless the ED visit has a diagnosis indicative of a complication of care. Rationale: It is unclear whether the colonoscopy or ED visit occurred first. If the ED visit is coded with a diagnosis indicative of a complication of care, the measure assumes the ED visit occurred after the colonoscopy procedure and is counted in the measure. It is unlikely that a patient would experience an ED visit for an acute diagnosis at one facility and then travel to another facility for a routine				

	colonoscopy on the same day. Accordingly, ED visits billed on the same day as a colonoscopy but at a different facility are included because they likely represent a routine procedure followed by a complication of care. 7) Colonoscopies that are billed on the same hospital claim as an ED visit and that occur on the same calendar day, unless the ED visit has a diagnosis indicative of a complication of care. Rationale: In these situations, it is not possible to use claims data to determine whether the colonoscopy was the cause of, subsequent to, or during the ED visit. However, if the ED visit is coded with a diagnosis for a complication, the assumption is that it occurred after the colonoscopy procedure. 8) Colonoscopies that are billed on the same hospital outpatient claim and that occur after the ED visit. Rationale: In these situations, we assume that the colonoscopy was subsequent to the ED visit and may not represent a routine colonoscopy procedure. Timing of the ED visits is determined using revenue				

	center dates from the outpatient claim. 9) Colonoscopies that are billed on the same hospital outpatient claim as an observation stay. Rationale: In these situations, it is not possible to use claims data to determine whether the colonoscopy was the cause of, subsequent to, or during the observation stay.				
Exclusion Details	1) Colonoscopies for patients who lack continuous enrollment in Medicare FFS Parts A and B in the seven days after the procedure. Lack of continuous enrollment in Medicare FFS for seven days after the procedure is determined by patient enrollment status in FFS Parts A and B using the Medicare Enrollment Database. The enrollment indicators must be appropriately marked for the month(s) which fall within seven days of the procedure date. 2) Colonoscopies that occur concurrently with high-risk upper GI endoscopy procedures. The list of the CPT codes for the upper GI endoscopy	The measure exception categories are not uniformly relevant across all measures; for each measure, there must be a clear rationale to permit an exception for a medical, patient, or system reason. Examples are provided in the measure exception language of instances that may constitute an exception and are intended to serve as a guide to clinicians. For measure #0658, exceptions may include medical reason(s) (eg, inadequate prep, other medical reasons) for not recommending at least a 10 year follow-up interval. Examples of exceptions are included in the measure language.	Exclusion Criteria 1. Surgeries for patients without continuous enrollment in Medicare FFS Parts A and B in the seven days after the surgery. Rationale: We exclude these patients to ensure all patients have full data available for outcome assessment. 2. Surgeries for patients who have an ED visit on the same day but billed on a separate claim, unless the ED visit has a diagnosis indicative of a complication of care. Rationale: It is unclear whether a same-day ED visit occurred before or after an eligible same-day surgery. However, the measure will not exclude surgeries with same-day, separate-claim ED visits if the diagnoses are indicative of a	Lack of seven or more days of continuous enrollment in Medicare FFS after the ASC surgery is determined by patient enrollment status in FFS Parts A and B using the Medicare enrollment file (unless lack of enrollment was due to death). The procedure must be seven or more days from the end of the month or the enrollment indicators must be appropriately marked for the month that falls within seven days of the procedure date (unless disenrollment is due to death), otherwise the procedure is excluded.	

	procedures identified as "high-risk" are in attached Data Dictionary, sheet "Colonos_Excl" 3) Colonoscopies for patients with a history of IBD or diagnosis of IBD at time of index colonoscopy or on the subsequent hospital visit outcome claim. The ICD-9-CM and ICD-10-CM codes that define IBD are in the attached Data Dictionary, sheet "Colonos_Excl." 4) Colonoscopies for patients with a history of diverticulitis or diagnosis of diverticulitis at time of index colonoscopy or on the subsequent hospital visit outcome claim. The ICD-9-CM and ICD-10-CM codes that define diverticulitis are in the attached Data Dictionary, sheet "Colonos_Excl." 5) Colonoscopies followed by a subsequent outpatient colonoscopy procedure within seven days. For cases in which a colonoscopy is followed by another colonoscopy within seven days, the measure will use the subsequent colonoscopy as the index colonoscopy.		complication of care because we want to continue to capture these outcomes. The ICD-9-CM and ICD-10-CM codes that define complications of care are in the attached Data Dictionary, sheet " HOPD_Surg_ED_Excl_CoC". 3. Surgeries that are billed on the same hospital claim as an emergency department (ED) visit and that occur on the same calendar day, unless the ED visit has a diagnosis indicative of a complication of care. Rationale: In these situations, it is not possible to use claims data to determine whether the surgery was the cause of, subsequent to, or during the ED visit. However, if the ED visit is coded with a diagnosis for a complication, the assumption is that it occurred after the surgery. The ICD-9-CM and ICD-10-CM codes that define complications of care are in the attached Data Dictionary, sheet " HOPD_Surg_ED_Excl_CoC". 4. Surgeries that are billed on the same hospital outpatient claim and that occur after the ED visit. Rationale: In these situations, we assume that the surgery was subsequent to the ED visit and may not represent a routine surgery. Timing of the ED visits		

	The following are in addition to those above, but only for HOPDs: 6) Colonoscopies that occur on the same day and at the same hospital as an ED visit that is billed on a separate claim than the index colonoscopy, unless the ED visit has a diagnosis indicative of a complication of care. The billing and revenue center codes that define ED visits are in the attached Data Dictionary, sheet "Colonos_Outcome_ED_Obs. " The same facility is defined as having the same CMS Certification Number (CCN). Complications of care codes (shown in tab "Colons_Excl_ED_CoC" include the following AHRQ CCS catgories: AHRQ CCS 257 – Other aftercare; AHRQ CCS 238 – Complications of surgical procedures or medical care; AHRQ CCS 2616 - Adverse effects of medical care; AHRQ CCS 2617 - Adverse effects of medical drugs; and ICD-10-CM G89.18 – Other acute postprocedural pain. 7) Colonoscopies that are billed on the same hospital claim as an ED visit and that		is determined using revenue center dates from the outpatient claim. 5. Surgeries that are billed on the same outpatient claim as an observation stay. Rationale: We do not include these cases in the calculation because the sequence of events is not clear.		

	occur on the same calendar day, unless the ED visit has a diagnosis indicative of a complication of care. The billing and revenue center codes that define ED visits are in the attached Data Dictionary, sheet "Colonos_Outcome_ED_Obs." Complications of care codes (shown in tab "Colons_Excl_ED_CoC" include the following AHRQ CCS catgories: AHRQ CCS 257 – Other aftercare; AHRQ CCS 238 – Complications of surgical procedures or medical care; AHRQ CCS 2616 - Adverse effects of medical care; AHRQ CCS 2617 - Adverse effects of medical drugs; and ICD-10-CM G89.18 – Other acute postprocedural pain. 8) Colonoscopies that are billed on the same hospital outpatient claim and that occur after the ED visit. The billing and revenue center codes that define ED visits are in the attached Data Dictionary, sheet ""Colonos_Outcome_ED_Obs." 9) Colonoscopies that are billed on the same hospital outpatient claim as an observation stay.				

	The billing and revenue center codes that define observation stays are in the attached Data Dictionary, sheet "Colonos_Outcome_ED_Obs."				
Risk Adjustment	Statistical risk model	No risk adjustment or risk stratification	Statistical risk model	Statistical risk model	S_7_2_Construction_Logic-636927598099183262.docx
Stratification	N/A. This measure is not stratified.	We encourage the results of this measure to be stratified by race, ethnicity, gender, and primary language.	Not applicable. This is not a stratified measure.	Not applicable.	
Type Score	Rate/proportion better quality = lower score	Rate/proportion better quality = higher score	Ratio better quality = lower score	Ratio better quality = lower score	This measure is designed to allow episodes to overlap with other episodes. Overlapping episodes are different episodes that are triggered for the same patient with overlapping episode windows. The advantage of this is that each episode can reflect attributed clinicians' different roles in providing care services throughout a patient's care trajectory. For example, a patient could have a Screening/Surveillance Colonoscopy episode triggered when the attributed clinician performs the procedure, and five days later be admitted to hospital for pneumonia as a complication of the colonoscopy procedure, triggering an episode for a

					different cost measure that is attributed to the hospitalist providing care for pneumonia. Each episode (i.e., the Screening/Surveillance Colonoscopy episode and the pneumonia episode) includes only the cost of assigned services (i.e., those that are within the reasonable influence of the attributed clinician) to reflect each attributed clinician's role. In addition, costs are not double counted as the measure calculation is based on the ratio of observed over expected spending for each episode, then averaged across all of an attributed clinician's episodes. The measure accounts for disease interactions through its risk adjustment model based on the CMS Hierarchical Condition Category Version 22 (CMS-HCC V22) 2016 model. In addition to the HCCs, the model includes disease interactions (e.g., Cancer * Immune Disorders). Further details about the risk adjustment model and disease interaction terms are included in Section S.8.6. This measure includes the cost of services that are clinically related to the procedure for

					screening/surveillance colonoscopy. The rationale for only including specific costs is to ensure that the attributed clinician is evaluated only on his or her performance on services over which they have reasonable influence. For instance, the cost of anesthesia for abdominal procedures following lower gastrointestinal hemorrhage is included in a clinician's episode cost if it occurs any time during the episode window. These services that are assigned to the measure have been identified as being related to the procedure and within the influence of the attributed clinician through consideration of detailed input from clinician experts and broader feedback from stakeholders from the clinician community. Specifically, a Gastrointestinal Disease Management - Medical and Surgical Clinical Subcommittee was convened from May 2017 to January 2018 to discuss and provide detailed recommendations on aspects of measure construction, including the services to be included in this measure. This subcommittee was composed

					of 35 clinician experts affiliated with 23 specialty societies. Members reviewed analyses of the utilization and timing of all Medicare Parts A and B services in broad timeframes extending before and after the episode trigger to provide recommendations on the services and associated conditions for including these as part of the episode costs. Conditions could include requiring additional codes to be present on services to ensure clinical relevance or assigning for a shorter timeframe within the overall episode window. The draft measure was field tested from October to November 2017. During this time, stakeholders reviewed the measure specifications, including a list of assigned services and associated logic conditions, field test reports containing details of attributed clinician performance, and supplemental documentation. Over 65,000 TIN and TIN-NPI field test reports were available during this time for review and feedback. During field testing, a National Summary Data Report, later updated to include reliability analyses, was posted along

					with the measure specifications: • National Summary Data Report (July 2018) – this document contains summary data about the Screening/Surveillance Colonoscopy cost measure, along with other episode-based cost measures. These summary statistics supplement the testing analyses contained in this submission: https://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/Value-Based-Programs/MACRA-MIPS-and-APMs/2017-field-test-materials.zip, filename: 2018-07-12-national-summary-data-report.pdf Stakeholder feedback gathered during field testing was summarized into the Field Testing Feedback Summary Report: • Field Testing Feedback Summary Report (June 2018) – this document summarizes the feedback received during a stakeholder feedback period during measure development. The Screening/Surveillance Colonoscopy cost measure has been developed with extensive input from the clinician community:

					https://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/Value-Based-Programs/MACRA-MIPS-and-APMs/2018-field-testing-feedback-summary-report.pdf
Algorithm	The measure is calculated separately for HOPDs and ASCs. 1. Identify colonoscopies meeting the inclusion criteria described above in S.7. 2. Exclude procedures meeting any of the exclusion criteria described above in S.9. 3. Identify and create a binary (0/1) flag for an unplanned hospital visit within seven days of the colonoscopy described above in Section S.5. 4. Use patients' historical and index procedure claims data to create risk adjustment variables. 5. Fit a hierarchical generalized linear model (HGLM) to produce a ratio of the number of "predicted" hospital visits to the number of "expected" hospital visits for each facility, given its case mix. The HGLM is adjusted for clinical risk factors that vary across	To calculate performance rates: 1) Find the patients who meet the initial patient population (i.e., the general group of patients that the performance measure is designed to address). 2) From the patients within the initial patient population criteria, find the patients who qualify for the denominator (i.e., the specific group of patients for inclusion in a specific performance measure based on defined criteria). Note: in some cases the initial patient population and denominator are identical. 3) From the patients within the denominator, find the patients who qualify for the Numerator (i.e., the group of patients in the denominator for whom a process or outcome of care occurs). Validate that the number of patients in the numerator is less than or equal to the	1. Identify surgeries meeting the inclusion criteria described above in S.7. 2. Exclude procedures meeting any of the exclusion criteria described above in S.8/S.9. 3. Identify a binary flag for an unplanned hospital visit within seven days of index procedures as described above in S.5. 4. Use patients' historical and index procedure claims data to create risk-adjustment variables. 5. Fit a hierarchical generalized linear model (HGLM) and calculate the ratio of the number of "predicted" hospital visits to the number of "expected" hospital visits for each facility, given its case/procedure mix using the results. This is the risk-standardized hospital visit ratio (RSHVR). The HGLM is adjusted for age, clinical risk factors, and procedure RVU and body system that vary across patient populations, are unrelated to quality, and influence the	The measure uses a two-level hierarchical logistic regression model to estimate ASC-level risk-standardized hospital visit ratios (RSHVRs). This approach accounts for the clustering of patients within ASCs and variation in sample size across ASCs. The RSHVR is calculated as the ratio of the predicted to the expected number of postsurgical unplanned hospital visits among ASC's patients. For each ASC, the numerator of the ratio is the number of hospital visits predicted for the ASC's patients, accounting for its observed rate, the number and complexity of general surgery procedures performed at the ASC, and the case mix. The denominator is the number of hospital visits expected nationally for the ASC's case/procedure mix. To calculate an ASC's	

	patient populations, are unrelated to quality, and influence the outcome. 6. Multiply the ratio estimated in step 3 by the observed national 7-day hospital visit rate to obtain a risk-standardized hospital visit (RSHV) rate for each facility. 7. Use bootstrapping to construct a 95% confidence interval estimate for each facility's RSHV rate. For more information about the measure methodology, please see the Facility 7-day Risk-Standardized Hospital Visit Rate after Outpatient Colonoscopy 2018 Measure Updates and Specifications Report posted on the web page provided in data field S.1. 121025| 141592| 144732| 141015| 148806| 149320| 150289	number of patients in the denominator 4) From the patients who did not meet the numerator criteria, determine if the physician has documented that the patient meets any criteria for denominator exception when exceptions have been specified [for this measure: medical reason(s) (eg, inadequate prep, familial or personal history of colonic polyps, patient had no adenoma and age is >= 66 years old, life expectancy < 10 years, other medical reasons)]. If the patient meets any exception criteria, they should be removed from the denominator for performance calculation. Although the exception cases are removed from the denominator population for the performance calculation, the number of patients with valid exceptions should be calculated and reported along with performance rates to track variations in care and highlight possible areas of focus for QI. If the patient does not meet the numerator and a valid exception is not present, this case represents performance	outcome. Details about the risk-adjustment model can be found in the measure methodology report: Hospital Visits after Hospital Outpatient Surgery Measure Technical Report at https://www.qualitynet.org/files/5d0d3a7e764be766b0104644?filename=2016HOPDSurgeryTechReport.pdf 6. Use statistical bootstrapping to construct a 95% confidence interval estimate for each facility's RSHVR. For more information about the measure methodology, please see the Hospital Visits after Hospital Outpatient Surgery Measure Technical Report posted on the web page provided in data field S.1.	predicted-to-expected (P/E) ratio, the measure uses a two-level hierarchical logistic regression model. The log-odds of the outcome for an index procedure is modeled as a function of the patient demographic, comorbidity, procedure characteristics, and a random ASC-specific intercept. A ratio greater than one indicates that the ASC's patients have more postsurgical visits than expected, compared to an average ASC with similar patient and procedural complexity. A ratio less than one indicates that the ASC's patients have fewer postsurgical visits than expected, compared to an average ASC with similar patient and procedural complexity. This approach is analogous to an observed-to-expected ratio, but accounts for within-facility correlation of the observed outcome and sample size differences and accommodates the assumption that underlying differences in quality across ASCs lead to	

		not met. 136611| 124667| 141015		systematic differences in outcomes, and is tailored to and appropriate for a publicly reported outcome measure as articulated in published scientific guidelines [1-3]. Citations 1. Normand S-LT, Shahian DM. Statistical and clinical aspects of hospital outcomes profiling. Statistical Science. 2007;22(2):206-226. 2. Krumholz HM, Brindis RG, Brush JE, et al. Standards for Statistical Models Used for Public Reporting of Health Outcomes An American Heart Association Scientific Statement From the Quality of Care and Outcomes Research Interdisciplinary Writing Group: Cosponsored by the Council on Epidemiology and Prevention and the Stroke Council Endorsed by the American College of Cardiology Foundation. Circulation. 2006;113(3):456-462. 3. National Quality Forum. Measure Evaluation Criteria and Guidance for	

				Evaluating Measures for Endorsement. 2015; http://www.qualityforum.org/Measuring_Performance/Submitting_Standards/2015_Measure_Evaluation_Criteria.aspx. Accessed July 26, 2016. 146313| 121025| 148806	
Submission items	5.1 Identified measures: 0658 Appropriate Follow-Up Interval for Normal Colonoscopy in Average Risk Patients 3357 Facility-Level 7-Day Hospital Visits after General Surgery Procedures Performed at Ambulatory Surgical Centers 2687 Hospital Visits after Hospital Outpatient Surgery 3510 Screening/Surveillance Colonoscopy 5a.1 Are specs completely harmonized? Yes 5a.2 If not completely harmonized, identify difference, rationale, impact: We identified two colonoscopy-related measures that are currently endorsed by NQF. One (NQF #0658) is a process measure that identifies the percentage of patients aged	5.1 Identified measures: 0659 Colonoscopy Interval for Patients with a History of Adenomatous Polyps-Avoidance of Inappropriate Use 0572 Follow-up after initial diagnosis and treatment of colorectal cancer: colonoscopy 5a.1 Are specs completely harmonized? No 5a.2 If not completely harmonized, identify difference, rationale, impact: The list of measures above, includes several different populations and capture different elements in the numerator. None of them are aiming to capture the same information as measure #0658. NQF #0572, ACP-018-10, and NQF #0392 actually aim to capture specific elements within the	5.1 Identified measures: 3357 Facility-Level 7-Day Hospital Visits after General Surgery Procedures Performed at Ambulatory Surgical Centers 3470 Hospital Visits after Orthopedic Ambulatory Surgical Center Procedures 2539 Facility 7-Day Risk-Standardized Hospital Visit Rate after Outpatient Colonoscopy 3366 Hospital Visits after Urology Ambulatory Surgical Center Procedures 3490 Admission and Emergency Department (ED) Visits for Patients Receiving Outpatient Chemotherapy 1789 Hospital-Wide All-Cause Unplanned Readmission Measure (HWR) 0697 Risk Adjusted Case Mix Adjusted Elderly Surgery Outcomes Measure 5a.1 Are specs completely harmonized? Yes	5.1 Identified measures: 2539 Facility 7-Day Risk-Standardized Hospital Visit Rate after Outpatient Colonoscopy 2687 Hospital Visits after Hospital Outpatient Surgery 5a.1 Are specs completely harmonized? Yes 5a.2 If not completely harmonized, identify difference, rationale, impact: Not applicable. The measures' outcomes are harmonized. 5b.1 If competing, why superior or rationale for additive value: Not applicable. There are no competing measures.	5.1 Identified measures: Episodes are opened by the presence of trigger codes on Part B physician/supplier claims, so the clinician peer group is limited to those clinicians performing this procedure. This ensures that clinician cost performance for this procedure is being assessed on a homogeneous patient cohort. While this measure was developed for use in MIPS, it can be expanded to other clinician programs. 5a.1 Are specs completely harmonized? The measure has not been reported yet, as it will be used in the MIPS cost performance category for the 2019 performance period onwards. Reporting this measure as part of the cost performance category helps to measure clinicians' resource use for the

	50 years to 75 years who received a screening colonoscopy and who had a recommended follow-up interval of at least 10 years for repeat colonoscopy documented in their colonoscopy report. The second measure (NQF #3510) is a cost measure. Both measures are process measures related to screening, and while both measures address colonoscopy, these measures differ from the CMS colonoscopy measure, which is an outcome measure. More information on each of the related colonoscopy measures is provided below. 1. NQF 0034 Colorectal Cancer Screening (electronic clinical quality measure [eCQM]): Identifies the proportion of patients in the recommended age group for colonoscopy screenings (50-75) who have had the procedure. NQF #0034 focuses on colonoscopy screening in patients aged 50-75, therefore the targeted population overlaps with the CMS colonoscopy measure and reflects overall screening guidelines. The CMS colonoscopy outcome	colonoscopy report or pathology report (after colon/rectum resection). NQF #0034 intends to capture one of four different types of colorectal cancer screening tests, instead of looking specifically at the interval between colonoscopies. NQF #0659 focuses on a different patient population, as the patients in NQF #0659 have had a history of a prior colonic polyp(s) in previous colonoscopy findings. The patient population in NQF #0659 has a different follow-up interval recommendation, according to evidence-based guidelines. 5b.1 If competing, why superior or rationale for additive value: There are no competing measures.	5a.2 If not completely harmonized, identify difference, rationale, impact: The measures are harmonized to the extent possible with other CMS claims-based measures. The *HOPD* Surgery measure is a claims-based measure, therefore any differences in measure specifications create no burden to facilities as the measures are calculated from data produced during the billing process. We identified the following related NQF-endorsed measures: 1. NQF 3357 Facility-Level 7-Day Hospital Visits after General Surgery Procedures Performed at ASCs (ASC General Surgery) 2. NQF 3470 Hospital Visits after Orthopedic Ambulatory Surgical Center Procedures (ASC Orthopedic) 3. NQF 3366 Hospital Visits after Urology Ambulatory Surgical Center Procedures (ASC Urology) 4. NQF 3490 Admission and Emergency Department (ED) Visits for Patients Receiving Outpatient Chemotherapy (Chemotherapy) 5. NQF 2539 Facility 7-Day Risk-Standardized Hospital Visit Rate after Outpatient Colonoscopy 6. NQF 1789 Hospital-Wide All-Cause Unplanned Readmission Measure (HWR). 7. NQF 0697		screening/surveillance colonoscopy procedure in the Medicare population, and thereby hold clinicians accountable for their cost effectiveness. There is no reporting/data submission requirement. Combined with measures in the other MIPS performance categories, such as the quality performance category, the *Screening/Surveillance Colonoscopy* measure allows CMS to assess the value of care and incentivize both achievement and improvement in the provision of high-quality, cost-effective care. 5a.2 If not completely harmonized, identify difference, rationale, impact: The screening colonoscopy has become the most common screening test for colorectal cancer in the US, and the colorectal cancer screening guidelines released by the United States Preventive Services Task force recommend either a screening colonoscopy every 10 years or other screening methods for adults aged 50-75 who are at average risk for developing colorectal cancer.[1] The Screening/Surveillance

	measure's purpose is to measure outcomes from colonoscopy procedures in Medicare-aged patients. 2. NQF 3510 Screening/Surveillance Colonoscopy: *The Screening/Surveillance Colonoscopy* cost measure evaluates clinicians' risk-adjusted cost to Medicare for beneficiaries who receive this procedure and includes costs of services that are clinically related to the attributed clinician's role in managing care for 14 days from the "trigger" of the episode. NQF #3510 has the same target population (Medicare beneficiaries) and would capture the physician-controlled costs related to hospital visits identified in the CMS colonoscopy measure. The timeframe for the two measures differs (seven days for the outcome measure vs. 14 days for the cost measure), and the level of measurement differs (facility level for the outcome measure, and clinician or group level for the cost measure). We also identified two related NQF-endorsed outcome measures: 1. NQF 3357: Facility-Level 7-Day		Risk Adjusted Case Mix Adjusted Elderly Surgery Outcomes Measure The outcome in measures #1-5 are the same as the outcome of CMS's HOPD Surgery measure presented in this re-endorsement application; an unplanned hospital visit is defined as an emergency department (ED) visit, observation stay (for NQF #3357, #3470, #3366, #2539), or unplanned inpatient admission. Hence, these related measures target the same quality domains as the HOPD Surgery measure. The patient cohort is also similar in that the related measures target Medicare Fee-For-Service (FFS) patients aged 65 years and older. For those measures that focus on the same facility (HOPD) as the target, the procedure/clinical cohorts however, differ. For example, the HOPD Surgery measure includes patients undergoing general surgery at an HOPD, but not colonoscopy procedures; the chemotherapy measure includes patients undergoing chemotherapy treatment at an HOPD, but not surgery or colonoscopy. The ASC-related measures have a different target (ASCs instead of HOPDs), and are divided into separate measures for general surgery,		Colonoscopy episode-based cost measure was recommended for development by an expert clinician committee—the Gastrointestinal Disease Management - Medical and Surgical Clinical Subcommittee—because of its high impact in terms of patient population and Medicare spending, and the opportunity for incentivizing cost-effective, high-quality clinical care in this area. The Clinical Subcommittee provided extensive, detailed input on this measure. [1] Bibbins-Domingo, K., D. C. Grossman, S.J. Curry, K. W. Davidson, J. W. Epling, Jr., F. A. Garcia, M. W. Gillman, et al. "Screening for Colorectal Cancer: Us Preventive Services Task Force Recommendation Statement." [In eng]. JAMA 315, no. 23 (Jun 21, 2016): 2564-75. 5b.1 If competing, why superior or rationale for additive value: Performance scores are provided for 4,142 clinician group practices (identified by Tax Identification Number [TIN]) and 13,447 practitioners (identified by

	Hospital Visits after General Surgery Procedures Performed at ASCs (ASC General Surgery), 2. NQF 2687 Hospital Visits after Hospital Outpatient Surgery (HOPD Surgery). The outcome of both measures is the same as CMS's colonoscopy measure presented in this re-endorsement application; an unplanned hospital visit is defined as an emergency department (ED) visit, observation stay, or unplanned inpatient admission. Hence, these related measures target the same quality domains as the CMS colonoscopy measure. The patient cohort is also somewhat similar in that the related measures target Medicare Fee-For-Service (FFS) patients aged 65 years and older. The cohorts however, have no overlap with the colonoscopy measure, because they include patients undergoing surgical procedures, not colonoscopy. The CMS colonoscopy measure is a claims-based measure, therefore any differences in measure specifications create no burden to facilities		orthopedic surgery, and urologic surgery. The HWR measure and HOPD Surgery include overlapping but distinct surgeries (inpatient vs. outpatient) and overlapping but distinct patient outcomes (hospital visits within seven days vs. readmissions within 30 days). They address a similar patient cohort (Medicare FFS patients 65 years of age and older). NQF #0687 overlaps with the HOPD Surgery measure in terms of target (patients over 65) and has an overlapping outcome. However, NQF #0687 includes all surgeries (in- and outpatient) and is not limited to outpatient surgeries. In addition, the outcomes that are part of NQF #0687 include complications that may result in an ED visit, observation stay, or inpatient admission (such as sepsis, surgical site infection, wound disruption, and urinary tract infection). It also includes mortality as an outcome, which is not included in the HOPD Surgery measure. 5b.1 If competing, why superior or rationale for additive value: Not applicable. None of the measures are competing measures.		combination of TIN and National Provider Identifier [NPI]). Clinicians and clinician groups are included if they are attributed 10 or more Screening/Surveillance Colonoscopy episodes, as identified in Medicare Parts A and B claims data, ending from January 1, 2017, to December 31, 2017. Episodes are included from all 50 States and D.C. in the following settings: ambulatory surgical centers (ASC), ambulatory/office-based care, and hospital outpatient department (HOPD). TIN Level Scores • Mean score: $936 • Standard deviation: $132 • Min score: $18 • Max score: $1,940 • Score IQR: $176 • Score percentiles o 10th: $778 o 20th: $827 o 30th: $861 o 40th: $902 o 50th: $939 o 60th: $973 o 70th: $1,004 o 80th: $1,039 o 90th: $1,092 • Number of beneficiaries: 814,501

	as the measures are calculated from data produced during the billing process. In terms of interpretability, the CMS colonoscopy measure is an outcome measure, and therefore is conceptually distinct from the process measure and the cost measure. The cost measure also targets a different level of measurement (provider, not facility). The outcome for the CMS colonoscopy measure is harmonized with the related NQF-endorsed outcome measures for these settings (ASCs/HOPDs), as discussed in section 5a1. 5b.1 If competing, why superior or rationale for additive value: Not applicable. There are no competing measures, only related measures.		The measures selected in the drop down are related, but not competing.		TIN-NPI Level Scores • Mean score: $979 • Standard deviation: $130 • Min score: $32 • Max score: $1,941 • Score IQR: $173 • Score percentiles o 10th: $817 o 20th: $867 o 30th: $911 o 40th: $947 o 50th: $979 o 60th: $1,011 o 70th: $1,044 o 80th: $1,083 o 90th: $1,142 • Number of beneficiaries: 795,819

Comparison of NQF 3565, 3566, 1463

	3565 Standardized Emergency Department Encounter Ratio (SEDR) for Dialysis Facilities	3566 Emergency Department Encounters Occurring Within 30 Days of Hospital Discharge	1463 Standardized Hospitalization Ratio for Dialysis Facilities (SHR)
Steward	Centers for Medicare & Medicaid Services	Centers for Medicare & Medicaid Services	Centers for Medicare & Medicaid Services
Description	The *Standardized Emergency Department Encounter Ratio* is defined to be the ratio of the observed number of emergency department (ED) encounters that occur for adult Medicare ESRD dialysis patients treated at a particular facility to the number of encounters that would be expected given the characteristics of the dialysis facility's patients and the national norm for dialysis facilities. Note that in this document an "emergency department encounter" always refers to an outpatient encounter that does not end in a hospital admission. This measure is calculated as a ratio but can also be expressed as a rate. When used for public reporting, the measure calculation will be restricted to facilities with greater than five patient years at risk in the reporting year. This restriction is required to ensure patients cannot be identified due to small cell size.	The *Standardized Ratio of Emergency Department Encounters Occurring Within 30 Days of Hospital Discharge for Dialysis Facilities (ED30*) is defined to be the ratio of observed over expected events. The numerator is the observed number of index discharges from acute care hospitals that are followed by an outpatient emergency department encounter within four to 30 days after discharge for eligible adult Medicare dialysis patients treated at a particular dialysis facility. The denominator is the expected number of index discharges followed by an ED encounter within four to 30 days given the discharging hospital's characteristics, characteristics of the dialysis facility's patients, and the national norm for dialysis facilities. Note that in this document, acute care hospital includes critical access hospitals and "emergency department encounter" always refers to an outpatient encounter that does not end in a hospital admission. This measure is calculated as a ratio but can also be expressed as a rate. When used for public reporting, the measure calculation will be restricted to facilities with at least 11 eligible index discharges in the reporting year. This restriction is required to ensure patients cannot be identified due to small cell size.	The *Standardized Hospitalization Ratio* is defined to be the ratio of the number of hospital admissions that occur for Medicare ESRD dialysis patients treated at a particular facility to the number of hospitalizations that would be expected given the characteristics of the dialysis facility's patients and the national norm for dialysis facilities. This measure is calculated as a ratio. When used for public reporting, the measure calculation will be restricted to facilities with greater than five patient years at risk in the reporting year. This restriction is required to ensure patients cannot be identified due to small cell size but can also be expressed as a rate.
Type	Outcome	Outcome	Outcome
Data Source	Claims, Registry Data	Claims, Registry Data	Claims, Registry Data

	Data are derived from an extensive national ESRD patient database, which is primarily based on CROWNWeb facility-reported clinical and administrative data (including CMS-2728 Medical Evidence Form, CMS-2746 Death Notification Form, and CMS-2744 Annual Facility Survey Form and patient tracking data), the Renal Management Information System (REMIS), the Medicare Enrollment Database (EDB), and Medicare claims data. In addition, the database includes transplant data from the Scientific Registry of Transplant Recipients (SRTR), and data from the Nursing Home Minimum Dataset, the Quality Improvement Evaluation System (QIES) Business Intelligence Center (QBIC) (which includes Provider and Survey and Certification data from Automated Survey Processing Environment (ASPEN)), and the Dialysis Facility Compare (DFC). The database is comprehensive for Medicare patients not enrolled in Medicare Advantage. Medicare Advantage patients are included in all sources, but their Medicare payment records are limited to inpatient claims. Non-Medicare patients are included in all sources except for the Medicare payment records. Tracking by dialysis provider and treatment modality is available for all patients, including those with only partial or no Medicare coverage.	Data are derived from an extensive national ESRD patient database, which is primarily based on CROWNWeb facility-reported clinical and administrative data (including CMS-2728 Medical Evidence Form, CMS-2746 Death Notification Form, and CMS-2744 Annual Facility Survey Form and patient tracking data), the Renal Management Information System (REMIS), the Medicare Enrollment Database (EDB), and Medicare claims data. In addition, the database includes transplant data from the Scientific Registry of Transplant Recipients (SRTR), and data from the Nursing Home Minimum Dataset, the Quality Improvement Evaluation System (QIES) Business Intelligence Center (QBIC) (which includes Provider and Survey and Certification data from Automated Survey Processing Environment (ASPEN)), and the Dialysis Facility Compare (DFC). The database is comprehensive for Medicare patients not enrolled in Medicare Advantage. Medicare Advantage patients are included in all sources, but their Medicare payment records are limited to inpatient claims. Non-Medicare patients are included in all sources except for the Medicare payment records. Tracking by dialysis provider and treatment modality is available for all patients, including those with only partial or no Medicare coverage. Information on hospitalizations is obtained from Part A Medicare Inpatient Claims Standard Analysis Files (SAFs), and past-year comorbidity data are obtained from multiple Part A types (inpatient, home health, hospice, skilled nursing facility claims) and Part B (outpatient) claims.	Data are derived from an extensive national ESRD patient database that is primarily based on CROWNWeb facility-reported clinical and administrative data (including CMS-2728 Medical Evidence Form, CMS-2746 Death Notification Form, and CMS-2744 Annual Facility Survey Form and patient tracking data), the Renal Management Information System (REMIS), the Medicare Enrollment Database (EDB), and Medicare claims data. In addition, the database includes transplant data from the Scientific Registry of Transplant Recipients (SRTR), and data from the Nursing Home Minimum Dataset, the Quality Improvement Evaluation System (QIES) Business Intelligence Center (QBIC) (which includes Provider and Survey and Certification data from Automated Survey Processing Environment (ASPEN)), and the Dialysis Facility Compare (DFC). The database is comprehensive for Medicare patients not enrolled in Medicare Advantage. Medicare Advantage patients are included in all sources, but their Medicare payment records are limited to inpatient claims. Non-Medicare patients are included in all sources except for the Medicare payment records. Tracking by dialysis provider and treatment modality is available for all patients, including those with only partial or no Medicare coverage. Information on hospitalizations is obtained from Part A Medicare Inpatient Claims Standard Analysis Files (SAFs), and past-year comorbidity data are obtained from multiple Part A types (inpatient, home health, hospice, skilled nursing facility claims) only. No data collection instrument provided Attachment 1463_Code_List.xlsx

	Information on hospitalizations is obtained from Part A Medicare Inpatient Claims Standard Analysis Files (SAFs), and past-year comorbidity data are obtained from multiple Part A types (inpatient, home health, hospice, skilled nursing facility claims) and Part B (outpatient) claims. No data collection instrument provided Attachment SEDR_Data_Dictionary_Code_Table.xlsx	No data collection instrument provided Attachment ED30_Data_Dictionary_Code_Table.xlsx	
Level	Facility	Facility	Facility
Setting	Other Dialysis Facility	Other Dialysis Facility	Other Dialysis Facility
Numerator Statement	The observed number of outpatient emergency department encounters during the reporting period among eligible adult Medicare patients at a facility.	The observed number of index hospital discharges during a year that are followed by an emergency department encounter within four to 30 days of the discharge among eligible adult Medicare patients at a facility.	Number of inpatient hospital admissions among eligible patients at the facility during the reporting period.
Numerator Details	Emergency Department Encounters Emergency department (ED) encounters are identified from Medicare outpatient claims using revenue center codes that indicate an ED visit (0450, 0451, 0452, 0453, 0454, 0455, 0456, 0457, 0458, 0459, 0981). Note that this means that we include both outpatient ED visits and those that result in an observation stay, but not those that result in a hospital admission. Outpatient ED claims that have overlapping or consecutive dates of service are combined and considered as a single ED encounter. To further ensure that these outpatient ED encounters are distinct from those associated with	Index Discharges We use Medicare inpatient hospital claims to identify acute hospital discharges. Among these acute hospital discharges, all live discharges of eligible patients in a calendar year are considered eligible for this measure. Those that do not meet one of the index discharge exclusion criteria described in the next section are considered index discharges. Assignment of Index Discharges to Facilities Index discharges are attributed to the facility of record on the day of discharge for the patient. That is, if the patient transfers dialysis facilities at the time of hospital discharge, it is the new facility that is assigned the index discharge. Emergency Department Encounters	The numerator is calculated through use of Medicare claims data. When a claim is made for an inpatient hospitalization, the patient is identified and attributed to a dialysis facility following rules discussed below in the denominator details. The numerator is the count of all such hospitalizations over the reporting period.

	hospitalizations, we exclude ED encounters where there is an inpatient claim for the patient that has dates of service including any of the same time period covered by the ED encounter. The total number of emergency department encounters includes multiple encounters (i.e., second, third, etc.) for the same patient during the reporting period. See denominator details for additional criteria for a patient to be assigned to a particular facility and criteria for identifying emergency department encounters. The time period for the measure calculation is one calendar year.	Emergency department (ED) encounters are identified from Medicare outpatient claims using revenue center codes that indicate an ED visit (0450, 0451, 0452, 0453, 0454, 0455, 0456, 0457, 0458, 0459, 0981). Note that this means that we include both outpatient ED visits and those that result in an observation stay, but not those that result in a hospital admission. Outpatient ED claims that have overlapping or consecutive dates of service are combined and considered as a single ED encounter. To further ensure that these outpatient ED encounters are distinct from those associated with hospitalizations, we exclude ED encounters where there is an inpatient claim that has dates of service included in any of the same time period covered by the ED encounter. An ED encounter "follows" the index discharge only if there is no intervening inpatient hospitalization. In other words, if after hospital discharge there is another inpatient hospitalization and then an ED encounter within the time frame the original index discharge is not counted as having been followed by an ED encounter. If eligible, the second hospitalization could become a new index discharge. The measure does not count the number of ED encounters after each index discharge, but instead determines whether or not there is at least one such encounter. If there are multiple ED encounters during days four to 30 after an index discharge, only the first ED encounter during that time is relevant to determining whether or not the index discharge is counted as having been followed by an ED encounter. ED encounters that occur	

		before the fourth day after index discharge are not considered. The four to 30 day time frame was selected to harmonize with the Standardized Readmission Ratio (NQF #2496) that also uses the same time period after an index hospitalization. This time interval was selected in response to providers and stakeholders concerns that there may be up to 72 hours before a patient is seen at the facility after hospital discharge. The time period for the measure calculation is two calendar years, meaning that index discharges must occur during the two calendar year period. The subsequent ED encounters may occur during the calendar years or the first 30 days of the following calendar year.	
Denominator Statement	The expected number of Emergency department encounters among eligible Medicare patients at the facility during the reporting period adjusted for the characteristics of the patients at the facility.	The expected number of index hospital discharges for eligible adult Medicare ESRD dialysis patients during the two year period that are followed by an emergency department encounter within four to 30 days of the discharge among eligible patients at a facility. The expected value is the result of a risk-adjusted predictive model adjusted for the characteristics of the patients, the dialysis facility, and the discharging hospitals.	Number of hospital admissions that would be expected among eligible patients at the facility during the reporting period, given the patient mix at the facility.
Denominator Details	General Inclusion Criteria for Dialysis Patients An eligible Medicare patient is defined as an adult (aged 18 or more) dialysis patient with at least 90 days of ESRD treatment. Because we only include a patient's follow-up in the tabulations for this measure after that patient has received chronic renal replacement therapy for at least 90 days, emergency department encounters	We use Medicare inpatient hospital claims to identify acute hospital discharges. Among these acute hospital discharges, all live discharges of eligible patients in a calendar year are considered eligible for this measure. See Numerator Details section above for definitions index discharges, patients assignment, and ED encounters. General Inclusion Criteria for Dialysis Patients To be eligible for the measure a patient must be an adult (aged 18 or more) Medicare	Assignment of Patients to Facilities UM-KECC's treatment history file provides a complete history of the status, location, and dialysis treatment modality of an ESRD patient from the date of the first ESRD service until the patient dies or the data collection cutoff date is reached. For each patient, a new record is created each time he/she changes facility or treatment modality. Each record represents a time period associated with a specific modality and dialysis facility. CROWNWeb (including CMS

	during the first 90 days of ESRD are not counted. We assign patients to a particular facility only after they have been on chronic dialysis there for the past 60 days. This 60-day period is used both for patients who started ESRD for the first time and for those who returned to dialysis after a transplant. Emergency department encounters during the first 60 days of dialysis at a facility do not affect the facility's Standardized Emergency Department Encounter Ratio. We require that patients reach a certain level of Medicare dialysis bills to be included in the emergency department encounter ratio. Specifically, months within a given dialysis patient-period are used for the Standardized Emergency Department Encounter Ratio calculation when they meet the criterion of being within two months after a month with either: (a) $1200+ of Medicare dialysis claims OR (b) at least one Medicare inpatient claim. The intention of this criterion is to assure completeness of information on emergency department encounters for all patients included in the analysis. Months in which a patient is enrolled in Medicare Advantage are excluded from the analysis. This is because outpatient claims for Medicare Advantage patients are not available therefore we do not have information on the	dialysis patient with at least 90 days of ESRD treatment on date of index discharge. The 90 days of ESRD are counted without regard to which facility, or the number of facilities, a patient received their dialysis treatments. The date of index discharge is considered day zero when identifying ED visits within four to 30 days of discharge. Expected Calculation We calculate each dialysis facility's expected number of index hospital discharges during the two year period that are followed by an ED encounter within four to 30 days of the discharge. The expected number is calculated by fitting a model with random effects for discharging hospitals, fixed effects for facilities, and regression adjustments for a set of patient-level characteristics. We compute the expectation for the given facility assuming ED encounter rates corresponding to an "average" facility with the same patient characteristics and same discharging hospitals as this facility. Model details are provided in the testing form.	Medical Evidence Form (Form CMS-2728), Death Notification Form (Form CMS-2746)) is the primary basis for placing patients at dialysis facilities, and dialysis claims are used as an additional source. Information regarding first ESRD service date, death and transplant is obtained from additional sources including the CMS Enrollment Database (EDB), transplant data from the Organ Procurement and Transplant Network (OPTN), and the Social Security Death Master File. As patients can receive dialysis treatment at more than one facility in a given year, we assign each patient day to a facility (or no facility, in some cases) based on a set of conventions described below, which largely align with those for the Standardized Mortality Ratio (SMR). We detail patient inclusion criteria, facility assignment and how to count days at risk, all of which are required for the risk adjustment model. General Inclusion Criteria for Dialysis Patients Though a patient's follow-up in the database can be incomplete during the first 90 days of ESRD therapy, we only include a patient's follow-up in the tabulations after that patient has received chronic renal replacement therapy for at least 90 days. Thus, hospitalizations, mortality and survival during the first 90 days of ESRD do not enter into the calculations. This minimum 90-day period also assures that most patients are eligible for Medicare, either as their primary or secondary insurer. It also excludes from analysis patients who die or recover renal function during the first 90 days of ESRD.

	outcome of this measure - ED encounters. Identifying Facility Treatment Histories for Each Patient For each patient, we identify the dialysis provider at each point in time. Starting with day 91 after onset of ESRD, we attribute patients to facilities according to the following rules. A patient is attributed to a facility once the patient has been treated there for the past 60 days. When a patient transfers from one facility to another, the patient continues to be attributed to the original facility for 60 days and then is attributed to the destination facility. In particular, a patient is attributed to his or her current facility on day 91 of ESRD if that facility had treated him or her for the past 60 days. If on day 91, the facility had not treated a patient for the past 60 days, we wait until the patient reaches day 60 of continuous treatment at that facility before attributing the patient to that facility. When a patient is not treated in a single facility for a span of 60 days (for instance, if there were two switches within 60 days of each other), we do not attribute that patient to any facility. Patients who withdrew from dialysis or recovered renal function remain assigned to their treatment facility for 60 days after withdrawal or recovery. If a period of one year passes with neither Medicare dialysis claims nor		In order to exclude patients who only received temporary dialysis therapy at the facility, we assign patients to a facility only after they have been on dialysis there for the past 60 days. This 60 day period is used both for patients who started ESRD for the first time and for those who returned to dialysis after a transplant. That is, hospitalizations during the first 60 days of dialysis at a facility do not affect the SHR of that facility. Identifying Facility Treatment Histories for Each Patient For each patient, we identify the dialysis provider at each point in time. Starting with day 91 after onset of ESRD, we attribute patients to facilities according to the following rules. A patient is attributed to a facility once the patient has been treated there for the past 60 days. When a patient transfers from one facility to another, the patient continues to be attributed to the original facility for 60 days and then is attributed to the destination facility. In particular, a patient is attributed to his or her current facility on day 91 of ESRD if that facility had treated him or her for the past 60 days. If on day 91, the facility had not treated a patient for the past 60 days, we wait until the patient reaches day 60 of continuous treatment at that facility before attributing the patient to that facility. When a patient is not treated in a single facility for a span of 60 days (for instance, if there were two switches within 60 days of each other), we do not attribute that patient to any facility. Patients are removed from facilities three days prior to transplant in order to exclude the transplant hospitalization. Patients

	CROWNWeb information to indicate that a patient was receiving dialysis treatment, we consider the patient lost to follow-up and do not include that patient in the analysis. If dialysis claims or other evidence of dialysis reappears, the patient is entered into analysis after 60 days of continuous therapy at a single facility. Days at Risk for Medicare Dialysis Patients After patient treatment histories are defined as described above, periods of follow-up in time since ESRD onset are created for each patient. In order to adjust for duration of ESRD appropriately, we define six time intervals with cut points at six months, one year, two years, three years, and five years. A new time period begins each time the patient is determined to be at a different facility, or at the start of each calendar year or when crossing any of the above cut points. The number of days at risk in each of the six time intervals listed above is used to calculate the expected number of emergency department encounters for the patient during that period. The Standardized Emergency Department Encounter Ratio for a facility is the ratio of the total number of observed emergency department encounters to the total number of expected emergency department encounters during all time periods at the facility. Based on a risk		who withdrew from dialysis or recovered renal function remain assigned to their treatment facility for 60 days after withdrawal or recovery. If a period of one year passes with neither paid dialysis claims nor CROWNWeb information to indicate that a patient was receiving dialysis treatment, we consider the patient lost to follow-up and do not include that patient in the analysis. If dialysis claims or other evidence of dialysis reappears, the patient is entered into analysis after 60 days of continuous therapy at a single facility. Days at Risk for Medicare Dialysis Patients After patient treatment histories are defined as described above, periods of follow-up in time since ESRD onset are created for each patient. In order to adjust for duration of ESRD appropriately, we define 6 time intervals with cut points at 6 months, 1 year, 2 years, 3 years and 5 years. A new time begins each time the patient is determined to be at a different facility, or at the start of each calendar year or when crossing any of the above cut points. In order to assure completeness of information on hospitalizations for all patients included in the analysis, we restrict to Medicare patients who are either enrolled in Medicare Advantage or who reach a certain threshold of Medicare dialysis and inpatient claims. Specifically, months within a given dialysis patient-period are used for SHR calculation when the patient is enrolled in Medicare Advantage or meets the criterion of being within two months after a month with either: (a) $1200+ of Medicare-paid

	adjustment model for the overall national emergency department encounter rate, we compute the expected number of emergency department encounters that would occur for each month that each patient is attributed to a given facility. The sum of all such expectations for patients and months yields the overall number of emergency department encounters that would be expected at the facility given the specific patient mix. This forms the denominator of the measure. The denominator of the Standardized Emergency Department Encounter Ratio is derived from a proportional rates model (Lawless and Nadeau, 1995; Lin et al., 2000; Kalbfleisch and Prentice, 2002). This is the recurrent event analog of the well-known proportional hazards or Cox model (Cox, 1972; Kalbfleisch and Prentice, 2002). To accommodate large-scale data, we adopt a model with piecewise constant baseline rates (e.g. Cook and Lawless, 2007) and the computational methodology developed in Liu, Schaubel and Kalbfleisch (2012). References: Cook, R. and Lawless, J. The Statistical Analysis of Recurrent Events. New York: Springer. 2007. Cox, D.R. (1972) Regression Models and Life Tables (with Discussion). J. Royal statistical Society, Series B, 34, 187-220.		dialysis claims OR (b) at least one Medicare inpatient claim. The number of days at risk in each of these patient-ESRD facility-year time periods is used to calculate the expected number of hospital admissions for the patient during that period. The SHR for a facility is the ratio of the total number of observed hospitalizations to the total number of expected hospitalizations during all time periods at the facility. Based on a risk adjustment model for the overall national hospitalization rates, we compute the expected number of hospitalizations that would occur for each month that each patient is attributed to a given facility. The sum of all such expectations for patients and months yields the overall number of hospital admissions that would be expected given the specific patient mix, and forms the denominator of the measure. The denominator of the SHR is derived from a proportional rates model (Lawless and Nadeau, 1995; Lin et al., 2000; Kalbfleisch and Prentice, 2002). This is the recurrent event analog of the well-known proportional hazards or Cox model (Cox, 1972; Kalbfleisch and Prentice, 2002). To accommodate large-scale data, we adopt a model with piecewise constant baseline rates (e.g. Cook and Lawless, 2007) and the computational methodology developed in Liu, Schaubel and Kalbfleisch (2012). References:

	Kalbfleisch, J.D. and Prentice, R. L. The Statistical Analysis of Failure Time Data. Wiley, New York, 2002. Lawless, J. F. and Nadeau, C. Some simple and robust methods for the analysis of recurrent events, Technometrics, 37 1995, 355-364. Lin, D.Y., Wei, L.J., Yang, I. and Ying, Z. Semi parametric regression for the mean and rate functions of recurrent events, Journal of the Royal Statistical Society Series B, 62, 2000, 771-730		Cook, R. and Lawless, J. The Statistical Analysis of Recurrent Events. New York: Springer. 2007. Cox, D.R. (1972) Regression Models and Life Tables (with Discussion). J. Royal statistical Society, Series B, 34, 187-220. Kalbfleisch, J.D. and Prentice, R. L. The Statistical Analysis of Failure Time Data. Wiley, New York, 2002. Lawless, J. F. and Nadeau, C. Some simple and robust methods for the analysis of recurrent events, Technometrics, 37 1995, 355-364. Lin, D.Y., Wei, L.J., Yang, I. and Ying, Z. Semi parametric regression for the mean and rate functions of recurrent events, Journal of the Royal Statistical Society Series B, 62, 2000, 771-730
Exclusions	Exclusions that are implicit in the denominator definition include time at risk while a patient: • Has Medicare Advantage coverage • Has had ESRD for 90 days or less • Is less than 18 years of age The denominator also excludes patient time at risk for calendar months in which a patient is: • Actively enrolled in hospice at any time during the calendar month	Index Discharge exclusions that are implicit in the denominator definition include discharges for which the patient: • Has Medicare Advantage coverage at the time of the index discharge • Has had ESRD for 90 days or less at time of discharge • Is less than 18 years of age at the time of discharge We also exclude discharges and emergency department encounters for which the patient was: • Actively enrolled in hospice at any time of during the calendar month of the discharge date or ED encounter admit date Outpatient Medicare claims are the source of ED encounter data, and since outpatient claims are not available for Medicare Advantage (MA) patients, we cannot identify ED encounters for MA patients. Therefore, we	N/A

		exclude index discharges for patients with MA at the time of discharge. The hospice exclusion is needed because hospice patients are considered to be under the purview of hospice care givers and may have other reasons for emergency department use such as pain management. Additionally we exclude hospital discharges that: • Do not result in a live discharge • Are against medical advice • Include a primary diagnosis for cancer, mental health or rehabilitation (see below for excluded CCSs) • Are from a PPS-exempt cancer hospital • Are followed within three days of discharge by the patient being transplanted, discontinuing dialysis, recovering renal function, being lost to follow-up, having another hospitalization, or having an emergency department visit	
Exclusion Details	We exclude from the time at risk for the measure all calendar months in which a patient spends any time enrolled in hospice (enrollment is determined from Medicare hospice claims). Hospice patients are considered to be under the purview of hospice care givers and may have other reasons for emergency department use such as pain management. We also exclude from the time at risk all calendar months in which a patients is enrolled in Medicare Advantage (at any point in the	• Death in hospital: We determine a patient's death date from a number of sources: CMS Medicare Enrollment Database, CMS forms 2746 and 2728, OPTN transplant follow-up form, CROWNWeb database, Social Security Death Master File, and Inpatient Claims. In addition, if the discharge status on the index discharge claim indicates death and the death date occurs within five days after discharge we consider this a death in the hospital. • Discharged against medical advice: We determine discharge status from the inpatient claim.	N/A

	month). This is because ED visit information is obtained from outpatient claims and these claims are not available for Medicare Advantage patients. Medicare Advantage payment records are limited to inpatient claims.	• Certain diagnoses: The primary diagnosis at discharge is available on the inpatient claim; we group these diagnoses into more general categories using AHRQ's Clinical Classification Software (CCS; see http://www.hcup-us.ahrq.gov/toolssoftware/ccs/ccs.jsp for descriptions of each CCS). The excluded CCSs for a primary diagnosis for cancer, mental health or rehabilitation are shown below. o Cancer: 42, 19, 45, 44, 17, 38, 39, 14, 40, 35, 16, 13, 29, 15, 18, 12, 11, 27, 33, 32, 24, 43, 25, 36, 21, 41, 20, 23, 26, 28, 34, 37, 22, 31, 30 o Psychiatric: 657, 659, 651, 670, 654, 650, 658, 652, 656, 655, 662 o Rehab for prosthesis: 254 • PPS-exempt cancer hospitals: The following hospitals are listed as PPS-exempt cancer hospitals in the Federal Register (http://www.gpo.gov/fdsys/pkg/FR-2011-07-18/html/2011-16949.htm): 050146, 050660, 100079, 100271, 220162, 330154, 330354, 360242, 390196, 450076, 500138 • Are followed within three days of discharge by the patient being transplanted, discontinuing dialysis, recovering renal function, being lost to follow-up, having another hospitalization, or having an emergency department visit. We determine transplant status from OPTN, CROWNWeb, and dialysis claims, and discontinuation of dialysis or recovery of renal function from CROWNWeb.	
Risk Adjustment	Statistical risk model	Statistical risk model	Statistical risk model
Stratification	N/A	N/A	N/A

Type Score	Ratio better quality = lower score	Ratio better quality = lower score	Ratio better quality = lower score
Algorithm	See flowchart in appendix.	See Flowchart in Appendix.	See flowchart in appendix.

Comparison of NQF 3566, 3565, 2496

	3566 Emergency Department Encounters Occurring Within 30 Days of Hospital Discharge	3565 Standardized Emergency Department Encounter Ratio (SEDR) for Dialysis Facilities	2496 Standardized Readmission Ratio (SRR) for dialysis facilities
Steward	Centers for Medicare & Medicaid Services	Centers for Medicare & Medicaid Services	Centers for Medicare & Medicaid Services
Description	The *Standardized Ratio of Emergency Department Encounters Occurring Within 30 Days of Hospital Discharge for Dialysis Facilities (ED30)* is defined to be the ratio of observed over expected events. The numerator is the observed number of index discharges from acute care hospitals that are followed by an outpatient emergency department encounter within four to 30 days after discharge for eligible adult Medicare dialysis patients treated at a particular dialysis facility. The denominator is the expected number of index discharges followed by an ED encounter within four to 30 days given the discharging hospital's characteristics, characteristics of the dialysis facility's patients, and the national norm for dialysis facilities. Note that in this document, acute care hospital includes critical access hospitals and "emergency department encounter" always refers to an outpatient encounter that does not end in a hospital admission. This measure is calculated as a ratio but can also be expressed as a rate. When used for public reporting, the measure calculation will be restricted to facilities with at least 11 eligible index discharges in the reporting year. This restriction is required to ensure patients	The *Standardized Emergency Department Encounter Ratio* (SEDR) *for Dialysis Facilities* is defined to be the ratio of the observed number of emergency department (ED) encounters that occur for adult Medicare ESRD dialysis patients treated at a particular facility to the number of encounters that would be expected given the characteristics of the dialysis facility's patients and the national norm for dialysis facilities. Note that in this document an "emergency department encounter" always refers to an outpatient encounter that does not end in a hospital admission. This measure is calculated as a ratio but can also be expressed as a rate. When used for public reporting, the measure calculation will be restricted to facilities with greater than five patient years at risk in the reporting year. This restriction is required to ensure patients cannot be identified due to small cell size.	The *Standardized Readmission Ratio (SRR*) for a dialysis facility is the ratio of the number of observed index discharges from acute care hospitals to that facility that resulted in an unplanned readmission to an acute care hospital within four to 30 days of discharge to the expected number of readmissions given the discharging hospitals and the characteristics of the patients and based on a national norm. Note that the measure is based on Medicare-covered dialysis patients.

	cannot be identified due to small cell size.		
Type	Outcome	Outcome	Outcome
Data Source	Claims, Registry Data Data are derived from an extensive national ESRD patient database, which is primarily based on CROWNWeb facility-reported clinical and administrative data (including CMS-2728 Medical Evidence Form, CMS-2746 Death Notification Form, and CMS-2744 Annual Facility Survey Form and patient tracking data), the Renal Management Information System (REMIS), the Medicare Enrollment Database (EDB), and Medicare claims data. In addition, the database includes transplant data from the Scientific Registry of Transplant Recipients (SRTR), and data from the Nursing Home Minimum Dataset, the Quality Improvement Evaluation System (QIES) Business Intelligence Center (QBIC) (which includes Provider and Survey and Certification data from Automated Survey Processing Environment (ASPEN)), and the Dialysis Facility Compare (DFC). The database is comprehensive for Medicare patients not enrolled in Medicare Advantage. Medicare Advantage patients are included in all sources, but their Medicare payment records are limited to inpatient claims. Non-Medicare patients are included in all sources except for the Medicare payment records. Tracking by dialysis provider and treatment modality is available for all patients, including those with only partial or no Medicare coverage.	Claims, Registry Data Data are derived from an extensive national ESRD patient database, which is primarily based on CROWNWeb facility-reported clinical and administrative data (including CMS-2728 Medical Evidence Form, CMS-2746 Death Notification Form, and CMS-2744 Annual Facility Survey Form and patient tracking data), the Renal Management Information System (REMIS), the Medicare Enrollment Database (EDB), and Medicare claims data. In addition, the database includes transplant data from the Scientific Registry of Transplant Recipients (SRTR), and data from the Nursing Home Minimum Dataset, the Quality Improvement Evaluation System (QIES) Business Intelligence Center (QBIC) (which includes Provider and Survey and Certification data from Automated Survey Processing Environment (ASPEN)), and the Dialysis Facility Compare (DFC). The database is comprehensive for Medicare patients not enrolled in Medicare Advantage. Medicare Advantage patients are included in all sources, but their Medicare payment records are limited to inpatient claims. Non-Medicare patients are included in all sources except for the Medicare payment records. Tracking by dialysis provider and treatment modality is available for all patients, including those with only partial or no Medicare coverage. Information on hospitalizations is obtained from Part A Medicare Inpatient Claims Standard Analysis Files (SAFs), and past-year comorbidity data are obtained from multiple Part A	Claims, Registry Data Data are derived from an extensive national ESRD patient database, which is primarily based on the Renal Management Information System (REMIS), CROWNWeb facility-reported clinical and administrative data (including CMS-2728 Medical Evidence Form, CMS-2746 Death Notification Form, and CMS-2744 Annual Facility Survey Form and patient tracking data), the Medicare Enrollment Database (EDB), and Medicare claims data. In addition, the database includes transplant data from the Scientific Registry of Transplant Recipients (SRTR), and data from the Nursing Home Minimum Dataset, the Quality Improvement Evaluation System (QIES) Business Intelligence Center (QBIC) (which includes Provider and Survey and Certification data from Automated Survey Processing Environment (ASPEN)), and the Dialysis Facility Compare (DFC). The database is comprehensive for Medicare patients not enrolled in Medicare Advantage. Medicare Advantage patients are included in all sources, but their Medicare payment records are limited to inpatient claims. Non-Medicare patients are included in all sources except for the Medicare payment records. Tracking by dialysis provider and treatment modality is available for all patients, including those with only partial or no Medicare coverage. Information on hospitalizations is obtained from Part A Medicare Inpatient Claims Standard Analysis Files (SAFs). No data collection instrument provided Attachment 2496_Data_Dictionary_Code_Table.xlsx

	Information on hospitalizations is obtained from Part A Medicare Inpatient Claims Standard Analysis Files (SAFs), and past-year comorbidity data are obtained from multiple Part A types (inpatient, home health, hospice, skilled nursing facility claims) and Part B (outpatient) claims. No data collection instrument provided Attachment ED30_Data_Dictionary_Code_Table.xlsx	types (inpatient, home health, hospice, skilled nursing facility claims) and Part B (outpatient) claims. No data collection instrument provided Attachment SEDR_Data_Dictionary_Code_Table.xlsx	
Level	Facility	Facility	Facility
Setting	Other Dialysis Facility	Other Dialysis Facility	Other Dialysis Facility
Numerator Statement	The observed number of index hospital discharges during a year that are followed by an emergency department encounter within four to 30 days of the discharge among eligible adult Medicare patients at a facility.	The observed number of outpatient emergency department encounters during the reporting period among eligible adult Medicare patients at a facility.	Each facility's observed number of hospital discharges that are followed by an unplanned hospital readmission within four to 30 days of discharge.
Numerator Details	Index Discharges We use Medicare inpatient hospital claims to identify acute hospital discharges. Among these acute hospital discharges, all live discharges of eligible patients in a calendar year are considered eligible for this measure. Those that do not meet one of the index discharge exclusion criteria described in the next section are considered index discharges. Assignment of Index Discharges to Facilities Index discharges are attributed to the facility of record on the day of discharge for the patient. That is, if the patient transfers dialysis facilities at the time of hospital discharge, it is the new facility that is assigned the index discharge. Emergency Department Encounters	Emergency Department Encounters Emergency department (ED) encounters are identified from Medicare outpatient claims using revenue center codes that indicate an ED visit (0450, 0451, 0452, 0453, 0454, 0455, 0456, 0457, 0458, 0459, 0981). Note that this means that we include both outpatient ED visits and those that result in an observation stay, but not those that result in a hospital admission. Outpatient ED claims that have overlapping or consecutive dates of service are combined and considered as a single ED encounter. To further ensure that these outpatient ED encounters are distinct from those associated with hospitalizations, we exclude ED encounters where there is an inpatient claim for the patient that has dates of service including any of the same time period covered by the ED encounter.	The numerator for a given facility is the total number of index hospital discharges that are followed by unplanned readmissions within four to 30 days of discharge and that are not preceded by a "planned" readmission or other competing event that also occurred within four to 30 days of discharge. Terms in this definition are described below. A readmission is considered "planned" under two scenarios as outlined more completely in [1]: i). The patient undergoes a procedure that is always considered planned (e.g., kidney transplant) or has a primary diagnosis that always indicates the hospitalization is planned (e.g., maintenance chemotherapy). ii). The patient undergoes a procedure that MAY be considered planned if it is not accompanied by an acute diagnosis. For example, a hospitalization involving a heart valve procedure accompanied by a primary diagnosis of diabetes would be considered planned, whereas a hospitalization involving a heart valve procedure accompanied by a primary

	Emergency department (ED) encounters are identified from Medicare outpatient claims using revenue center codes that indicate an ED visit (0450, 0451, 0452, 0453, 0454, 0455, 0456, 0457, 0458, 0459, 0981). Note that this means that we include both outpatient ED visits and those that result in an observation stay, but not those that result in a hospital admission. Outpatient ED claims that have overlapping or consecutive dates of service are combined and considered as a single ED encounter. To further ensure that these outpatient ED encounters are distinct from those associated with hospitalizations, we exclude ED encounters where there is an inpatient claim that has dates of service included in any of the same time period covered by the ED encounter. An ED encounter "follows" the index discharge only if there is no intervening inpatient hospitalization. In other words, if after hospital discharge there is another inpatient hospitalization and then an ED encounter within the time frame the original index discharge is not counted as having been followed by an ED encounter. If eligible, the second hospitalization could become a new index discharge. The measure does not count the number of ED encounters after each index discharge, but instead determines whether or not there is at least one such encounter. If there are multiple ED encounters during days four to 30 after an index discharge, only the first ED encounter during that time is relevant to determining whether or not the index discharge is counted as having	The total number of emergency department encounters includes multiple encounters (i.e., second, third, etc.) for the same patient during the reporting period. See denominator details for additional criteria for a patient to be assigned to a particular facility and criteria for identifying emergency department encounters. The time period for the measure calculation is one calendar year.	diagnosis of acute myocardial infarction (AMI) would be considered unplanned. 1. Centers for Medicare & Medicaid Services. 2018 All-Cause Hospital Wide Measure Updates and Specifications Report Hospital-Level 30-Day Risk-Standardized Readmission Measure – Version 7.0. https://www.qualitynet.org/files/5d0d375a764be766b010141f?filename=2018_Rdmsn_Updates%26Specs_Rpts.zip Other competing events include admissions to rehabilitation or psychiatric hospitals, death, transplant, loss to follow-up, withdrawal from dialysis, and recovery of renal function.

	been followed by an ED encounter. ED encounters that occur before the fourth day after index discharge are not considered. The four to 30 day time frame was selected to harmonize with the Standardized Readmission Ratio (NQF #2496) that also uses the same time period after an index hospitalization. This time interval was selected in response to providers and stakeholders concerns that there may be up to 72 hours before a patient is seen at the facility after hospital discharge. The time period for the measure calculation is two calendar years, meaning that index discharges must occur during the two calendar year period. The subsequent ED encounters may occur during the calendar years or the first 30 days of the following calendar year.		
Denominator Statement	The expected number of index hospital discharges for eligible adult Medicare ESRD dialysis patients during the two year period that are followed by an emergency department encounter within four to 30 days of the discharge among eligible patients at a facility. The expected value is the result of a risk-adjusted predictive model adjusted for the characteristics of the patients, the dialysis facility, and the discharging hospitals.	The expected number of emergency department encounters among eligible Medicare patients at the facility during the reporting period adjusted for the characteristics of the patients at the facility.	The expected number of the observed index hospital discharges that result in an unplanned readmission in days four to 30 and that are not preceded by an unplanned or competing event. The expectation accounts for patient-level characteristics, including measures of patient comorbidities and the discharging hospital, and is based on estimated readmission rates for an overall population norm that corresponds to an "average" facility.
Denominator Details	We use Medicare inpatient hospital claims to identify acute hospital discharges. Among these acute hospital discharges, all live discharges of eligible patients in a calendar year are considered eligible for this measure. See Numerator Details section	General Inclusion Criteria for Dialysis Patients An eligible Medicare patient is defined as an adult (aged 18 or more) dialysis patient with at least 90 days of ESRD treatment. Because we only include a patient's follow-up in the tabulations for this measure after	We use Medicare inpatient hospital claims to identify acute hospital discharges. All Medicare covered live inpatient discharges of ESRD dialysis patients in a calendar year are considered eligible for this measure. An index hospital discharge is a discharge from an acute care hospital that is not followed by a readmission whether

	above for definitions index discharges, patients assignment, and ED encounters. General Inclusion Criteria for Dialysis Patients To be eligible for the measure a patient must be an adult (aged 18 or more) Medicare dialysis patient with at least 90 days of ESRD treatment on date of index discharge. The 90 days of ESRD are counted without regard to which facility, or the number of facilities, a patient received their dialysis treatments. The date of index discharge is considered day zero when identifying ED visits within four to 30 days of discharge. Expected Calculation We calculate each dialysis facility's expected number of index hospital discharges during the two year period that are followed by an ED encounter within four to 30 days of the discharge. The expected number is calculated by fitting a model with random effects for discharging hospitals, fixed effects for facilities, and regression adjustments for a set of patient-level characteristics. We compute the expectation for the given facility assuming ED encounter rates corresponding to an "average" facility with the same patient characteristics and same discharging hospitals as this facility. Model details are provided in the testing form.	that patient has received chronic renal replacement therapy for at least 90 days, emergency department encounters during the first 90 days of ESRD are not counted. We assign patients to a particular facility only after they have been on chronic dialysis there for the past 60 days. This 60-day period is used both for patients who started ESRD for the first time and for those who returned to dialysis after a transplant. Emergency department encounters during the first 60 days of dialysis at a facility do not affect the facility's Standardized Emergency Department Encounter Ratio. We require that patients reach a certain level of Medicare dialysis bills to be included in the emergency department encounter ratio. Specifically, months within a given dialysis patient-period are used for the Standardized Emergency Department Encounter Ratio calculation when they meet the criterion of being within two months after a month with either: (a) $1200+ of Medicare dialysis claims OR (b) at least one Medicare inpatient claim. The intention of this criterion is to assure completeness of information on emergency department encounters for all patients included in the analysis. Months in which a patient is enrolled in Medicare Advantage are excluded from the analysis. This is because outpatient claims for Medicare Advantage patients are not available therefore we do not have information on the outcome of this measure - ED encounters. Identifying Facility Treatment Histories for Each Patient For each patient, we identify the dialysis provider at each point in time. Starting with day 91 after onset of ESRD, we attribute	planned or unplanned or by any competing event in the first three days following discharge. Index discharges are attributed to the facility of record on the day of discharge for the patient. That is, if the patient transfers dialysis facilities at the time of hospital discharge, it is the new facility that is assigned the index discharge. Expected Calculation: We calculate each dialysis facility's expected number of index hospital discharges during the one-year period that are followed by an unplanned readmission within four to 30 days of the discharge. The expected number is calculated by fitting a model with random effects for discharging hospitals, fixed effects for facilities, and regression adjustments for a set of patient-level characteristics. We compute the expectation for the given facility assuming readmission rates corresponding to an "average" facility with the same patient characteristics and same discharging hospitals as this facility. Model details are provided in the testing form.

		patients to facilities according to the following rules. A patient is attributed to a facility once the patient has been treated there for the past 60 days. When a patient transfers from one facility to another, the patient continues to be attributed to the original facility for 60 days and then is attributed to the destination facility. In particular, a patient is attributed to his or her current facility on day 91 of ESRD if that facility had treated him or her for the past 60 days. If on day 91, the facility had not treated a patient for the past 60 days, we wait until the patient reaches day 60 of continuous treatment at that facility before attributing the patient to that facility. When a patient is not treated in a single facility for a span of 60 days (for instance, if there were two switches within 60 days of each other), we do not attribute that patient to any facility. Patients who withdrew from dialysis or recovered renal function remain assigned to their treatment facility for 60 days after withdrawal or recovery. If a period of one year passes with neither Medicare dialysis claims nor CROWNWeb information to indicate that a patient was receiving dialysis treatment, we consider the patient lost to follow-up and do not include that patient in the analysis. If dialysis claims or other evidence of dialysis reappears, the patient is entered into analysis after 60 days of continuous therapy at a single facility. Days at Risk for Medicare Dialysis Patients After patient treatment histories are defined as described above, periods of follow-up in time since ESRD onset are created for each patient. In order to adjust for duration of ESRD appropriately, we define six time intervals with	

		cut points at six months, one year, two years, three years, and five years. A new time period begins each time the patient is determined to be at a different facility, or at the start of each calendar year or when crossing any of the above cut points. The number of days at risk in each of the six time intervals listed above is used to calculate the expected number of emergency department encounters for the patient during that period. The Standardized Emergency Department Encounter Ratio for a facility is the ratio of the total number of observed emergency department encounters to the total number of expected emergency department encounters during all time periods at the facility. Based on a risk adjustment model for the overall national emergency department encounter rate, we compute the expected number of emergency department encounters that would occur for each month that each patient is attributed to a given facility. The sum of all such expectations for patients and months yields the overall number of emergency department encounters that would be expected at the facility given the specific patient mix. This forms the denominator of the measure. The denominator of the Standardized Emergency Department Encounter Ratio is derived from a proportional rates model (Lawless and Nadeau, 1995; Lin et al., 2000; Kalbfleisch and Prentice, 2002). This is the recurrent event analog of the well-known proportional hazards or Cox model (Cox, 1972; Kalbfleisch and Prentice, 2002). To accommodate large-scale data, we adopt a model with piecewise constant baseline rates (e.g. Cook and Lawless, 2007) and the computational	

		methodology developed in Liu, Schaubel and Kalbfleisch (2012). References: Cook, R. and Lawless, J. The Statistical Analysis of Recurrent Events. New York: Springer. 2007. Cox, D.R. (1972) Regression Models and Life Tables (with Discussion). J. Royal statistical Society, Series B, 34, 187-220. Kalbfleisch, J.D. and Prentice, R. L. The Statistical Analysis of Failure Time Data. Wiley, New York, 2002. Lawless, J. F. and Nadeau, C. Some simple and robust methods for the analysis of recurrent events, Technometrics, 37 1995, 355-364. Lin, D.Y., Wei, L.J., Yang, I. and Ying, Z. Semi parametric regression for the mean and rate functions of recurrent events, Journal of the Royal Statistical Society Series B, 62, 2000, 771-730	
Exclusions	The following Index Discharge exclusions are implicit in the denominator definition: • If the patient has Medicare Advantage coverage at the time of the index discharge • If the patient has had ESRD for 90 days or less at time of discharge • If the patient is less than 18 years of age at the time of discharge We also exclude discharges and emergency department encounters for which the patient was actively enrolled in hospice at any time of during the calendar month of the discharge date or ED encounter admit date. Outpatient Medicare claims are the source of ED encounter data, and since outpatient claims are not available for Medicare Advantage (MA) patients, we	Exclusions that are implicit in the denominator definition include time at risk while a patient: • Has Medicare Advantage coverage • Has had ESRD for 90 days or less • Is less than 18 years of age The denominator also excludes patient time at risk for calendar months in which a patient is: • Actively enrolled in hospice at any time during the calendar month	Index Discharge Exclusions: A live inpatient hospital discharge is excluded if any of the following hold: • Associated with a stay of 365 days or longer • It is against medical advice • It Includes a primary diagnosis of cancer, mental health or rehabilitation • It Includes revenue center codes indicating rehabilitation • It occurs after a patient's 12th hospital discharge in the calendar year • It is from a PPS-exempt cancer hospital • It is followed within 3 days by any hospitalization (at acute care, long-term care, rehabilitation, or psychiatric hospital or unit) or any other competing event (see S.5).

	cannot identify ED encounters for MA patients. Therefore, we exclude index discharges for patients with MA at the time of discharge. The hospice exclusion is needed because hospice patients are considered to be under the purview of hospice care givers and may have other reasons for emergency department use such as pain management. Additionally, we exclude hospital discharges that: • Do not result in a live discharge • Are against medical advice • Include a primary diagnosis for cancer, mental health or rehabilitation (see below for excluded CCSs) • Are from a PPS-exempt cancer hospital • Are followed within three days of discharge by the patient being transplanted, discontinuing dialysis, recovering renal function, being lost to follow-up, having another hospitalization, or having an emergency department visit		
Exclusion Details	• Death in hospital: We determine a patient's death date from a number of sources: CMS Medicare Enrollment Database, CMS forms 2746 and 2728, OPTN transplant follow-up form, CROWNWeb database, Social Security Death Master File, and Inpatient Claims. In addition, if the discharge status on the index discharge claim indicates death and the death date occurs within five days after discharge we consider this a death in the hospital. • Discharged against medical advice: We determine	We exclude from the time at risk for the measure all calendar months in which a patient spends any time enrolled in hospice (enrollment is determined from Medicare hospice claims). Hospice patients are considered to be under the purview of hospice care givers and may have other reasons for emergency department use such as pain management. We also exclude from the time at risk all calendar months in which a patients is enrolled in Medicare Advantage (at any point in the month). This is because ED visit information is obtained from outpatient claims and these	• Discharged against medical advice: We determine discharge status from the inpatient claim. • Certain diagnoses: The primary diagnosis at discharge is available on the inpatient claim; we group these diagnoses into more general categories using AHRQ's Clinical Classification Software (CCS; see http://www.hcup-us.ahrq.gov/toolssoftware/ccs/ccs.jsp for descriptions of each CCS). The excluded CCSs are shown below. o Cancer: 42, 19, 45, 44, 17, 38, 39, 14, 40, 35, 16, 13, 29, 15, 18, 12, 11, 27, 33, 32, 24, 43, 25, 36, 21, 41, 20, 23, 26, 28, 34, 37, 22, 31, 30 o Psychiatric: 657, 659, 651, 670, 654, 650, 658, 652, 656, 655, 662

	discharge status from the inpatient claim. • Certain diagnoses: The primary diagnosis at discharge is available on the inpatient claim; we group these diagnoses into more general categories using AHRQ's Clinical Classification Software (CCS; see http://www.hcup-us.ahrq.gov/toolssoftware/ccs/ccs.jsp for descriptions of each CCS). The excluded CCSs for a primary diagnosis for cancer, mental health or rehabilitation are shown below. o Cancer: 42, 19, 45, 44, 17, 38, 39, 14, 40, 35, 16, 13, 29, 15, 18, 12, 11, 27, 33, 32, 24, 43, 25, 36, 21, 41, 20, 23, 26, 28, 34, 37, 22, 31, 30 o Psychiatric: 657, 659, 651, 670, 654, 650, 658, 652, 656, 655, 662 o Rehab for prosthesis: 254 • PPS-exempt cancer hospitals: The following hospitals are listed as PPS-exempt cancer hospitals in the Federal Register (http://www.gpo.gov/fdsys/pkg/FR-2011-07-18/html/2011-16949.htm): 050146, 050660, 100079, 100271, 220162, 330154, 330354, 360242, 390196, 450076, 500138 • Are followed within three days of discharge by the patient being transplanted, discontinuing dialysis, recovering renal function, being lost to follow-up, having another hospitalization, or having an emergency department visit. We determine transplant status from OPTN, CROWNWeb, and dialysis claims, and discontinuation of dialysis or recovery of renal function from CROWNWeb.	claims are not available for Medicare Advantage patients. Medicare Advantage payment records are limited to inpatient claims.	o Rehab for prosthesis: 254 o Presence of one or more of the following revenue center codes: 0024, 0118, 0128, 0138, 0148, 0158 • Number of admissions: We remove any records for a patient after his/her 12th discharge in the calendar year. • PPS-exempt cancer hospitals: The following hospitals are listed as PPS-exempt cancer hospitals in the Federal Register (http://www.gpo.gov/fdsys/pkg/FR-2011-07-18/html/2011-16949.htm): 050146, 050660, 100079, 100271, 220162, 330154, 330354, 360242, 390196, 450076, 500138 • Any index discharge with an inpatient readmission of any type, a death, a transplant, loss to follow-up, withdrawal from dialysis, or recovery of renal function occurring within the first zero to three days following the index discharge.
Risk Adjustment	Statistical risk model	Statistical risk model	Statistical risk model

	139029	139029	
Stratification	N/A	N/A	N/A
Type Score	Ratio better quality = lower score	Ratio better quality = lower score	Ratio better quality = lower score
Algorithm	See Flowchart in Appendix.	See flowchart in appendix.	See flowchart in appendix.
Submission items	5.1 Identified measures: 2496 Standardized Readmission Ratio (SRR) for dialysis facilities 2505 Emergency Department Use without Hospital Readmission During the First 30 Days of Home Health 5a.1 Are specs completely harmonized? 5a.2 If not completely harmonized, identify difference, rationale, impact: These measures are not completely harmonized. Each measure assesses different outcomes and/or target populations as reflected in certain differences across the measure specifications. The proposed *Standardized Ratio of Emergency Department Encounters Occurring Within 30 Days of Hospital Discharge (ED30) for Dialysis Facilities* and *Standardized Emergency Department Encounter Ratio (SEDR) for Dialysis Facilities* measures both focus on dialysis facilities' ED use, but they measure different aspects of ED use. The SEDR measures the overall rate of ED use while the ED30 focuses on ED use closely following a hospitalization. The ED30 and SRR are both intended to encourage care coordination for patients recently discharged from an inpatient admission, but measure two different outcomes after discharge. The ED30 applies to the same target population	5.1 Identified measures: 1463 Standardized Hospitalization Ratio for Dialysis Facilities (SHR) 2505 Emergency Department Use without Hospital Readmission During the First 30 Days of Home Health 5a.1 Are specs completely harmonized? Yes 5a.2 If not completely harmonized, identify difference, rationale, impact: These measures are not completely harmonized. Each measure assesses different outcomes and/or target populations as reflected in the measure specifications. The proposed *Standardized Emergency Department Encounter Ratio (SEDR) for Dialysis Facilities* and *Standardized Ratio of Emergency Department Encounters Occurring Within 30 Days of Hospital Discharge (ED30) for Dialysis Facilities* measures both the dialysis facilities' ED use but they measure different aspects of ED use. The SEDR measures the overall rate of ED use while the ED30 focuses on ED utilization closely following a hospitalization. Both SEDR and ED30 apply to the same target population—adult Medicare-covered dialysis patients who have had ESRD for more than 90 days. The SEDR and SHR are both intended to encourage appropriate management of acute conditions but measure	5.1 Identified measures: 0369 Standardized Mortality Ratio for Dialysis Facilities 1463 Standardized Hospitalization Ratio for Dialysis Facilities (SHR) 1789 Hospital-Wide All-Cause Unplanned Readmission Measure (HWR) 2510 Skilled Nursing Facility 30-Day All-Cause Readmission Measure (SNFRM) 5a.1 Are specs completely harmonized? No 5a.2 If not completely harmonized, identify difference, rationale, impact: SRR is harmonized with the Standardized Hospitalization *Ratio for Admissions (NQF #1463) and Standardized Mortality Ratio (NQF #0369)* currently undergoing measure maintenance. The SRR applies to the same population—Medicare-covered ESRD patients—as SHR and SMR. SRR, SMR, and SHR include Medicare Advantage patients as they constitute a growing population of ESRD beneficiaries (approaching 20%); both SRR and SHR include an indicator accounting for the proportion of Medicare Advantage coverage in order to minimize potential bias due to incomplete comorbidity ascertainment for MA patients. SRR, SHR, and SMR all restrict to inpatient claims for comorbidity risk adjustment and all measures adjust for a similar set of patient characteristics as the SRR and utilize fixed effects in their modeling approach. However, SRR adjusts for a different set of comorbidities that are associated with a high risk of readmission. There are several NQF endorsed measures that share the same focus with SRR but target different patient populations and/or care settings. The proposed SRR has the same measure focus—unplanned 30-day

	as SEDR—adult Medicare-covered dialysis patients who have had ESRD for more than 90 days. The target population for CMS's *Standardized Readmission Ratio (SRR) for dialysis facilities* (NQF #2496) is similar but also includes pediatric patients and the first 90 days of ESRD treatment. ED30, SRR, and SEDR adjust for a similar set of patient characteristics. All three measures adjust for prior-year comorbidities although the SRR set of comorbidity risk factors is different than that for the ED30 and SEDR. Only the SEDR also includes adjustment for comorbidities at ESRD incidence. The ED30 and SRR adjust for a number of factors related to the index discharge that are not included in the SEDR model because index discharges are not relevant in that context. The definition of index discharges is very similar for SRR and ED30 but there are some differences: 1) SRR excludes index discharges that follow a patient's 12th admission in the year 2) ED30 excludes index discharges that occur in a calendar month in which the patient was enrolled in hospice; and patients with Medicare Advantage at the time of the index discharge because Medicare Advantage outpatient encounter data (i.e., ED encounters) are not available from CMS claims therefore we are not able to capture data for the measure outcome 3) ED30 excludes index discharges that result in another hospitalization, emergency department visit, or transplant within three days of discharge; or loss to	two different acute care outcomes. SEDR measures overall outpatient acute care services while SHR measure inpatient acute care services. SEDR is harmonized with SHR and ED30 in several aspects. All are harmonized to the population they measure (eligible Medicare-covered ESRD patients); however SHR also includes pediatric patients. All three measures have risk adjustment for prevalent comorbidities while only SEDR and SHR also adjust for incident comorbidities taken from CMS form 2728. Exclusions: 1) Only SEDR and ED30 exclude hospice patients 2) ED30 includes additional exclusions based on discharge type, that are not part of SEDR or SHR 3) ED30 adjusts for discharging hospital, acknowledging that for ED encounters after a hospital discharge, that hospitals also bear accountability for properly coordinating care with the dialysis facility 4) both SEDR and ED30 exclude patient time at risk, or index discharges, respectively, that are covered by Medicare Advantage. We do this because Medicare Advantage outpatient encounter data (i.e., ED encounters) are not available from CMS claims therefore we are not able to capture data for the measure outcome. SEDR and NQF #2505 Emergency Department Use without Hospital Readmission *During the First 30 Days of Home Health* have the same focus (emergency department encounters). Differences: 1) Home Health is focused on emergency department use within the first 30 days of home health	readmissions—as CMS' *Hospital-Wide All-Cause Readmission Rate* (NQF #1789), and the *Skilled Nursing Facility 30-Day All-Cause Readmission Measure* (SNF; NQF #2510). SRR is harmonized with both the HWR and SNF measures in restricting to the use of inpatient Medicare claims for comorbidity risk adjustment, and exclusion of planned readmissions. There are several differences between the SRR and the existing CMS HWR and SNF measures. Some of the differences are intended to account for unique features of the ESRD chronic dialysis population: Inclusion/Exclusion 1) SRR includes patients with incomplete claims history from the prior year. We do this to allow capture of incident ESRD patients that may not have a complete year of Medicare coverage 2) SRR includes Medicare Advantage patients (approaching 20% of ESRD dialysis patients) while HWR and SNF are restricted to Medicare FFS patients with Part A only 3) Only SRR excludes discharges that follow a patient's 12th admission in the year 4) SRR excludes from the numerator planned readmissions that include a diagnosis of "fluid and electrolyte disorders" (CCS 55) that meet other criteria for planned readmissions (see Appendix). Risk Adjustment 1) SRR does not adjust for comorbidities that are highly prevalent in the ESRD population, such as acute renal failure, dialysis status, kidney transplant, fluid/electrolyte disorders, and iron deficiency 2) SRR additionally adjusts for diagnoses (grouped by the Clinical Classification Software [CCS] method) that are relatively rare but have a high risk of 30-day readmission in the ESRD population 3) SRR adjusts for length of hospital stay, diabetes as the primary cause of ESRD, time on dialysis, and sex; 4) Only SRR includes an indicator for Medicare Advantage coverage at time of index discharge;

	follow-up, withdrawal from dialysis, or recovery of renal function while SRR further excludes only those that result in a patient dying within 30 days with no readmission. ED30 and Emergency Department Use without Hospital Readmission During the First 30 Days of Home Health also have the same focus (emergency department encounters). Differences: 1) Home Health is focused on emergency department use within the first 30 days of home health 2) each measure has different target populations 3) risk adjustment factors; 4) model type (logistic vs multinomial logistic model). For example, the Home Health 30 measure adjusts for over 400 covariates that were statistically significantly predictive of acute care hospitalization or emergency use (without admission). Because of the different care settings and comorbidity profile of Home Health patients, different risk adjustment approaches are justified. 5b.1 If competing, why superior or rationale for additive value: N/A	2) Each measure has distinct target populations 3) Risk adjustment factors; 4) Model type (two-stage Cox model vs multinomial logistic model). For example, the Home Health 30 measure adjusts for over 400 covariates that were statistically significantly predictive of acute care hospitalization or emergency use (without admission). SEDR currently adjusts for a set of comorbidities present at ESRD incidence and for a set of prevalent comorbidities. Because of the different care settings and comorbidity profile of Home Health patients, different risk adjustment approaches are justified. 5b.1 If competing, why superior or rationale for additive value: N/A	5) SRR adjusts for comorbidities identified during the index hospitalization which were not present on admission whereas HWR does not. Additional differences between the SRR and SNF are that the SNF includes a different target population (though we recognize a notable proportion of ESRD dialysis patients reside in nursing homes); and SNF includes readmissions within one day of discharge while SRR excludes readmissions within three days of discharge. 5b.1 If competing, why superior or rationale for additive value: N/A

Appendix F: Pre-Evaluation Comments

Comments received as of June 12, 2020.

Topic	Commenter	Comment
3565: Standardized Emergency Department Encounter Ratio (SEDR) for Dialysis Facilities	Submitted by Kidney Care Partners (KCP)	Kidney Care Partners (KCP) appreciates the opportunity to comment on the measures under consideration for endorsement in the National Quality Forum's (NQF) All-Cause Admissions and Readmissions Project, Spring 2020 Cycle. KCP is a coalition of more than 30 organizations, comprised of patient advocates, dialysis professionals, care providers, researchers, and manufacturers, dedicated to working together to improve quality of care for individuals with Chronic Kidney Disease (CKD) and End-Stage Renal Disease (ESRD). This letter addresses the two new measures submitted for review within the project, the Standardized Emergency Department Encounter Ratio (SEDR) for Dialysis Facilities (NQF 3565) and the Standardized Ratio for Emergency Department Encounters Occurring within 30 Days of Hospital Discharge (ED30) for Dialysis Facilities (NQF 3566). I. Overarching Concerns KCP recognizes the importance of assessing emergency department (ED) utilization by individuals with ESRD. Nevertheless, we have numerous concerns about the proposed *Standardized Ratio for ED Encounters Occurring within 30 Days of Hospital Discharge (ED30)* and *Standardized ED Encounter Ratio for Dialysis Facilities (SEDR)* metrics. We believe the measures as currently specified will not improve the quality of care or outcomes for dialysis patients—and may in fact exacerbate existing sociodemographic status (SDS) and geographic disparities. Below we detail several overarching concerns and make several recommendations applicable to both metrics; concerns specific to the individual measures are then addressed. i. Medicare Advantage (MA) Patients. Unlike CMS's other standardized measures for dialysis facilities, the SEDR and ED30 (and Standardized Transfusion Ratio) exclude MA patients because their numerator case identification relies on outpatient claims, which are largely unavailable for these patients. We appreciate the difficulty CMS faces adapting its measures to the changing Medicare environment, but have substantial concerns with this approach. Specifically, we believe the exclusion of MA patients will create an untenable scenario in which these ED measures will effectively address a population that diverges considerably from that of the other QIP measures. This may be of particular importance with the ED30 measure, as CMS promotes it as the complement to the *Standardized Readmission Ratio for Dialysis Facilities* (NQF #2496), wherein the two measures together provide a full picture of patients who require emergent care following hospital discharge. But as the

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		SRR includes MA patients and the ED30 does not, the denominator populations are inherently different, and the picture provided by these complementary measures would be misleading. Additionally, CMS notes in its measure submission materials that at the end of 2017, 27 percent of dialysis patients had MA coverage (presumably higher now), and this varied widely across states—from about 2 percent in Wyoming to 34 percent in Rhode Island, and more than 44 percent in Puerto Rico. We believe that such variability in coverage patterns compromises the validity of the measures, putting states, regions, and individual facilities with a low proportion of MA patients at a substantial disadvantage with the ED measures. ii. All-Cause Construct. As proposed, ED30 and SEDR capture all ED visits by ESRD patients, regardless of cause. KCP strongly objects to this construction, believing that it is too expansive in scope and will unfairly penalize dialysis facilities for random ED visits that are beyond their control and sphere of influence. Our analysis of ED encounters during 2015 (prior to implementation of ICD-10 diagnosis coding) showed that approximately 30 percent of encounters among dialysis patients were accompanied by principal discharge diagnoses in the range from 780.x to 799.x (Symptoms, Signs, And Ill-Defined Conditions). This lack of specificity about the nature of morbidity in the ED demonstrates that ED encounters cannot be readily attributed to any one healthcare provider, let alone an outpatient dialysis provider. iii. Ratio Construct. As we have done with CMS's other standardized ratio measures (the SMR, SHR, SRR, and STrR), KCP again strongly recommends that ratio measures be avoided and that risk-adjusted rates or year-over-year normalized rates be used. For the ED30 and SEDR measures in particular, we note that there is precedent for this approach; specifically, CMS has developed and actively maintains stewardship of two NQF-endorsed home health ED utilization measures (NQF 0173 and 2505) that use the type of risk-adjusted rate to which we're referring. iv. Exclusions. KCP recommends incorporating two additional exclusions into the ED30 and SEDR measure specifications: 1) ESRD patients who seek care in an ED for any reason (including those related to ESRD and dialysis care) after missing their most recent scheduled dialysis session; and 2) ESRD patients who reside in/are discharged to a Long-Term Care or Skilled Nursing Facility. We make the former recommendation on the basis that it is unreasonable to penalize a facility for medical issues for which it has not had the opportunity to intervene or arising from lack of adherence to prescribed care, and the latter because a dialysis facility should not

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		be held accountable for medical decisions made by another provider (i.e., the LTC or SNF) and are beyond its realm of control. v. Urgent Care Centers. KCP recommends that urgent care center revenue codes be included in the ED30 and SEDR numerators. The ED measures are inextricably tied to geographic locale, including but not limited to availability of EDs vs. urgent care centers. Because urgent care is not encompassed by the two measures (with the exception of centers located within an existing emergency room), facilities where an ED option is more readily available geographically than urgent care will be inordinately penalized by these measures as compared to facilities with the same patient mix where urgent care is available. We believe this will exacerbate existing SDS and geographic disparities of the type documented by the December 2016 report issued by the Office of the Assistant Secretary for Planning and Evaluation.1 vi. Risk Models. We note that risk model testing yielded an overall C-statistic of 0.665 for the ED30 and 0.61 for the SEDR, raising concerns that the models will not adequately discriminate performance. Smaller units, in particular, might look worse than their actual performance. We reiterate our long-held position that a minimum C-statistic of 0.8 is a more appropriate indicator of a model's goodness of fit, predictive ability, and validity to represent meaningful differences among facilities. I. Standardized ED Encounter Ratio (SEDR) for Dialysis Facilities KCP had identified a number of concerns and makes recommendations specific to the SEDR, as below. i. Reliability. Reliability testing for the SEDR yielded an overall IUR ranging from 0.62 to 0.63—a decrease from a previous version of the measure we reviewed 2017, then 0.64 to 0.72. We have significant concerns with a measure for which reliability has demonstrably decreased. And as with the ED30, reliability statistics were not stratified by facility size, again raising concerns about inadequate measure performance in small facilities, as has been the case with other CMS standardized ratio measures. With no evidence to the contrary, we cannot simply assume that the SEDR will provide reliable, meaningful information in this group of providers and urge CMS to supply reliability data by facility size. Finally, as with the ED30, KCP concurs with the SMP's conclusion that the developer's proposal to use the PIUR in lieu of a poor or declining IUR is wholly inappropriate. We again posit that a measure

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		incapable of discerning performance between providers approximating the norm is not a meaningful or valid measure. ii. Stratification of Reliability Results by Facility Size. As with the ED30, CMS has not provided stratification of SEDR reliability scores by facility size, making it impossible to discern how widely reliability varies across the spectrum of facility sizes. Again, we are concerned that the reliability for small facilities may be substantially lower than the overall IUR, as has been the case with other standardized ratio measures and that small facilities with even one or two patients who utilize ED services might be unfairly characterized as poor performers. KCP believes it is incumbent on CMS to demonstrate reliability for all facilities by providing data by facility size. iii. Meaningful Differences in Performance. KCP posits that the validity of the SEDR is low. Again, an essential component of the NQF's evaluation of validity is a demonstration of meaningful differences in performance. Empirical testing indicates that the SEDR can only distinguish differences in performance in approximately 5.65 percent of facilities (0.60 percent were characterized as "better than expected" and 5.05 percent as "worse than expected"); the measure was unable to assess meaningful variations in performance in the overwhelming majority (94.35 percent) of facilities. This inability to discriminate between facilities illustrates the futility of using this measure, as specified, in a public reporting or value-based purchasing program—end-users will ultimately be unable to effectively compare or make informed decisions about the quality of care provided in various facilities. We also note that the SEDR discrimination is substantially more skewed towards poor performers than the ED30, providing additional evidence that the model is not performing well. We reiterate our recognition of the importance of assessing ED utilization by individuals with ESRD. Testing results, however, do not support the validity (or reliability, as noted above) of the SEDR; it will not provide an accurate and meaningful representation of quality as currently specified. KCP again thanks you for the opportunity to comment on this important work. If you have any questions, please do not hesitate to contact Lisa McGonigal, MD, MPH (lmcgon@msn.com or 203.530.9524). Sincerely, Kidney Care Partners Akebia American Kidney Fund, Inc. American Nephrology Nurses Association American Renal Associates

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		American Society of Nephrology American Society of Pediatric Nephrology Amgen, Inc. Ardelyx AstraZeneca Atlantic Dialysis Management Services, LLC Baxter International, Inc. Board of Nephrology Examiners Nursing Technology B. Braun Medical, Inc. Cara Therapeutics, Inc. Centers for Dialysis Care DaVita, Inc. Dialysis Patient Citizens, Inc. DialyzeDirect Fresenius Medical Care North America Fresenius Medical Care Renal Therapies Group Greenfield Health Systems Kidney Care Council National Kidney Foundation, Inc. National Renal Administrators Association Nephrology Nursing Certification Commission Renal Physicians Association Renal Support Network Rockwell Medical Rogosin Institute Satellite Healthcare, Inc. US Renal Care Vertex Vifor Pharma
3566: Standardized Ratio of Emergency Department Encounters Occurring Within 30 Days of Hospital Discharge (ED30) for Dialysis Facilities	Submitted by Kidney Care Partners (KCP)	Kidney Care Partners (KCP) appreciates the opportunity to comment on the measures under consideration for endorsement in the National Quality Forum's (NQF) All-Cause Admissions and Readmissions Project, Spring 2020 Cycle. KCP is a coalition of more than 30 organizations, comprised of patient advocates, dialysis professionals, care providers, researchers, and manufacturers, dedicated to working together to improve quality of care for individuals with Chronic Kidney Disease (CKD) and End-Stage Renal Disease (ESRD). This letter addresses the two new measures submitted for review within the project, the Standardized Emergency Department Encounter Ratio (SEDR) for Dialysis Facilities (NQF 3565) and the Standardized Ratio for Emergency Department Encounters Occurring within 30 Days of Hospital Discharge (ED30) for Dialysis Facilities (NQF #3566).

Topic	Commenter	Comment
		I. Overarching Concerns KCP recognizes the importance of assessing emergency department (ED) utilization by individuals with ESRD. Nevertheless, we have numerous concerns about the proposed *Standardized Ratio for ED Encounters Occurring within 30 Days of Hospital Discharge (ED30)* and *Standardized ED Encounter Ratio for Dialysis Facilities (SEDR)* metrics. We believe the measures as currently specified will not improve the quality of care or outcomes for dialysis patients—and may in fact exacerbate existing sociodemographic status (SDS) and geographic disparities. Below we detail several overarching concerns and make several recommendations applicable to both metrics; concerns specific to the individual measures are then addressed. i. Medicare Advantage (MA) Patients. Unlike CMS's other standardized measures for dialysis facilities, the SEDR and ED30 (and Standardized Transfusion Ratio) exclude MA patients because their numerator case identification relies on outpatient claims, which are largely unavailable for these patients. We appreciate the difficulty CMS faces adapting its measures to the changing Medicare environment, but have substantial concerns with this approach. Specifically, we believe the exclusion of MA patients will create an untenable scenario in which these ED measures will effectively address a population that diverges considerably from that of the other QIP measures. This may be of particular importance with the ED30 measure, as CMS promotes it as the complement to the Standardized Readmission Ratio for Dialysis Facilities (NQF #2496), wherein the two measures together provide a full picture of patients who require emergent care following hospital discharge. But as the SRR includes MA patients and the ED30 does not, the denominator populations are inherently different, and the picture provided by these complementary measures would be misleading. Additionally, CMS notes in its measure submission materials that at the end of 2017, 27 percent of dialysis patients had MA coverage (presumably higher now), and this varied widely across states—from about 2 percent in Wyoming to 34 percent in Rhode Island, and more than 44 percent in Puerto Rico. We believe that such variability in coverage patterns compromises the validity of the measures, putting states, regions, and individual facilities with a low proportion of MA patients at a substantial disadvantage with the ED measures. ii. All-Cause Construct. As proposed, ED30 and SEDR capture all ED visits by ESRD patients, regardless of cause. KCP strongly objects to this construction, believing that it is too expansive in scope and will unfairly penalize dialysis facilities for random ED visits that are beyond their control and sphere of influence. Our analysis of ED encounters during 2015 (prior to implementation of ICD-10 diagnosis coding), showed that approximately 30 percent of encounters among dialysis patients were accompanied by principal discharge diagnoses in the range from 780.x to 799.x (Symptoms,

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		Signs, And Ill-Defined Conditions). This lack of specificity about the nature of morbidity in the ED demonstrates that ED encounters cannot be readily attributed to any one healthcare provider, let alone an outpatient dialysis provider. iii. Ratio Construct. As we have done with CMS's other standardized ratio measures (the SMR, SHR, SRR, and STrR), KCP again strongly recommends that ratio measures be avoided and that risk-adjusted rates or year-over-year normalized rates be used. For the ED30 and SEDR measures in particular, we note that there is precedent for this approach; specifically, CMS has developed and actively maintains stewardship of two NQF-endorsed home health ED utilization measures (NQF #0173 and #2505) that use the type of risk-adjusted rate to which we're referring. iv. Exclusions. KCP recommends incorporating two additional exclusions into the ED30 and SEDR measure specifications: 1) ESRD patients who seek care in an ED for any reason (including those related to ESRD and dialysis care) after missing their most recent scheduled dialysis session; and 2) ESRD patients who reside in/are discharged to a Long-Term Care or Skilled Nursing Facility. We make the former recommendation on the basis that it is unreasonable to penalize a facility for medical issues for which it has not had the opportunity to intervene or arising from lack of adherence to prescribed care, and the latter because a dialysis facility should not be held accountable for medical decisions made by another provider (i.e., the LTC or SNF) and are beyond its realm of control. v. Urgent Care Centers. KCP recommends that urgent care center revenue codes be included in the ED30 and SEDR numerators. The ED measures are inextricably tied to geographic locale, including but not limited to availability of EDs vs. urgent care centers. Because urgent care is not encompassed by the two measures (with the exception of centers located within an existing emergency room), facilities where an ED option is more readily available geographically than urgent care will be inordinately penalized by these measures as compared to facilities with the same patient mix where urgent care is available. We believe this will exacerbate existing SDS and geographic disparities of the type documented by the December 2016 report issued by the Office of the Assistant Secretary for Planning and Evaluation.1 vi. Risk Models. We note that risk model testing yielded an overall C-statistic of 0.665 for the ED30 and 0.61 for the SEDR, raising concerns that the models will not adequately discriminate performance. Smaller units, in particular, might look worse than their actual performance. We reiterate our long-held position that a minimum C-statistic of 0.8 is a more appropriate indicator of a model's goodness of fit, predictive ability, and validity to represent meaningful differences among facilities.

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		I. Standardized Ratio for ED Encounters Occurring within 30 Days of Hospital Discharge (ED30) KCP has identified a number of concerns and makes recommendations specific to the ED30, as follows: i. Reliability. KCP posits the ED30 is not reliable as specified. Reliability testing for measure yielded an overall IUR of 0.451 across all facilities, indicating that only 45 percent of the variation in a score can be attributed to between-facility differences (signal) and 55 percent to within-facility differences (noise)—by statistical convention, a "poor" degree of measure reliability.2,3 KCP believes it is incumbent on CMS to address the measure's empirically demonstrated lack of reliability and use an adjuster or otherwise account for the poor reliability before the measure receives further consideration. Moreover, we fear the reliability for small facilities in particular might be substantially lower than the overall IURs, as has been the case with other CMS standardized ratio measures. To illustrate our concern, the Standardized Hospitalization Ratio for Dialysis Facilities (NQF 1463) was reported in 2013 (the most recent stratified data provided by CMS) to have an overall IUR of 0.70. However, the IUR was only 0.46 ("poor" reliability) for the nearly 35 percent of facilities (n = 2,028) meeting CMS's definition of "small" (<=50 patients, for the SHR). Without evidence to the contrary, KCP is concerned that the ED30 reliability is similarly lower for small facilities, effectively rendering the metric meaningless for use in performance measurement in this sizeable group of providers. Consistent with our previous stance on this matter, we believe it is incumbent on CMS to demonstrate reliability for all facilities by providing data by facility size and use its testing data to assess the impact of a "small numbers" (1 U.S. Department of Health and Human Services, Office of Assistant Secretary for Planning and Evaluation Report to Congress: Social Risk Factors and Performance Under Medicare's Value-Based Purchasing Programs, December 2016. https://aspe.hhs.gov/system/files/pdf/253971/ASPESESRTCfull.pdf. Last accessed May 19, 2020. 2 A reliability statistic of 0.70 is generally considered as "acceptable" reliability. 3 Adams, JL. The Reliability of Provider Profiling: A Tutorial. Santa Monica, California:RAND Corporation. TR-653-NCQA, 2009.) effect on reliability and to empirically determine appropriate facility-level exclusion parameters and adjust the specifications accordingly. Finally, we note that CMS has incorporated a new reliability statistic into its testing protocol, the "Profile IUR", or "PIUR". The PIUR, which itself is quite low for this measure at 0.570, was developed by CMS's measure developer contractor UM-KECC to address the unacceptably low measure reliability "that can result when many

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		facilities have outcomes similar to the national norm, even though the measure is still very useful to identify facilities with extreme outcomes." However, NQF's Scientific Methods Panel (SMP) noted in its April 1, 2020 conference call that the QIP measures are not intended to identify facility outliers, but rather to distinguish performance between providers. The Panel disagreed with the developer's assertion that the PIUR is an appropriate measure of reliability for the QIP measures, maintaining that the applicable statistic is the IUR. We concur with this assessment and further propose that a measure incapable of discerning performance between providers approximating the norm is not a meaningful or valid measure. ii. Stratification of Reliability Results by Facility Size. KCP notes that unlike testing results provided for its other standardized ratio measures, CMS has provided no stratification of ED30 reliability scores by facility size; we are thus unable to discern how widely reliability varies across the spectrum of facility sizes. In particular, we are concerned that the reliability for small facilities is substantially lower than the overall IUR of 0.45 (already poor), as has been the case with other standardized ratio measures. For instance, the Standardized Transfusion Ratio for Dialysis Facilities (STrR) measure (NQF #2979) was found to have an overall IUR of 0.60—a "moderate" degree of reliability—however, the IUR for the STrR was only 0.3 for small facilities ("poor" reliability), which were defined by CMS for this measure as less than or equal to 46 patients. KCP is thus concerned that the already-unacceptably low overall ED30 reliability (IUR = 0.45) is likely even lower for small facilities, effectively rendering the metric meaningless for use in performance measurement in this group of providers. We believe it highly likely that small facilities with as few as one or two patients who utilize ED services will be unfairly characterized as poor performers. KCP believes it is incumbent on CMS to demonstrate reliability for all facilities by providing data by facility size. iii. Meaningful Differences in Performance. KCP posits that validity of the ED30 is low. An essential component of NQF's evaluation of validity is a demonstration of meaningful differences in performance. Testing results indicate that the ED30 can only distinguish differences in performance in less than 6 percent of facilities—specifically, 2.85 percent of facilities were classified as "better than expected" and 3.05 percent as "worse than expected." Simply put, the measure is unable to assess meaningful variations in performance in the overwhelming majority (94.10 percent) of facilities. This inability to discriminate between facilities illustrates the futility of using this measure, as specified, in a public reporting or value-based purchasing program—end-users will ultimately be unable to effectively compare or make informed decisions about the quality of care provided in various facilities. Again, KCP recognizes the importance of assessing ED utilization by individuals with ESRD;

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		however, testing results do not support the premise that the proposed ED30 metric will provide a valid (or reliable, as just noted) representation of quality. KCP again thanks you for the opportunity to comment on this important work. If you have any questions, please do not hesitate to contact Lisa McGonigal, MD, MPH (lmcgon@msn.com or 203.530.9524). Sincerely, Kidney Care Partners Akebia American Kidney Fund, Inc. American Nephrology Nurses Association American Renal Associates American Society of Nephrology American Society of Pediatric Nephrology Amgen, Inc. Ardelyx AstraZeneca Atlantic Dialysis Management Services, LLC Baxter International, Inc. Board of Nephrology Examiners Nursing Technology B. Braun Medical, Inc. Cara Therapeutics, Inc. Centers for Dialysis Care DaVita, Inc. Dialysis Patient Citizens, Inc. DialyzeDirect Fresenius Medical Care North America Fresenius Medical Care Renal Therapies Group Greenfield Health Systems Kidney Care Council National Kidney Foundation, Inc. National Renal Administrators Association Nephrology Nursing Certification Commission Renal Physicians Association Renal Support Network Rockwell Medical Rogosin Institute Satellite Healthcare, Inc. US Renal Care Vertex Vifor Pharma

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