Measure Information Form

1. Measure Name/Title (CMS Consensus-Based Entity [CBE] Measure Submission Form, Measure Specifications sp.01)

Standardized Transfusion Ratio for Dialysis Facilities

2. Descriptive Information

2.1 Measure Type

- ☐ process
- ☒ outcome
- ☐ PRO-PM
- ☐ cost /resource use
- ☐ efficiency
- ☐ structure
- ☐ intermediate outcome
- ☐ population health
- ☐ composite
  - ☐ process
  - ☐ outcome
  - ☐ other
- ☐ other

2.2 Brief Description of Measure (CMS CBE Measure Submission Form, Measure Specifications sp.02 and sp.06)

The risk adjusted facility level transfusion ratio "STrR" is specified for all adult Medicare dialysis patients (CBE ID 2979). It is a ratio of the number of eligible red blood cell transfusion events observed in patients dialyzing at a facility, to the number of eligible transfusion events that would be expected under a national norm, after accounting for the patient characteristics within each facility. Eligible transfusions are those that do not have any claims pertaining to the comorbidities identified for exclusion in the one-year look-back period prior to each observation window. STrR can be expressed as a risk-standardized rate, which is the product of the facility STrR and the national average transfusion rate.

2.3 If Paired or Grouped (CMS CBE Measure Submission Form, Measure Specifications sp.03)

N/A

3. Measure Specifications

3.1 Measure-Specific Webpage (CMS CBE Measure Submission Form, Measure Specifications sp.09)

N/A

3.2 If this is an electronic clinical quality measure (eCQM) (CMS CBE Measure Submission Form, Measure Specifications sp.10)

N/A

3.3 Data Dictionary, Code Table, or Value Sets (CMS CBE Measure Submission Form, Measure Specifications sp.11)

See attached

3.4 For an instrument-based measure (CMS CBE Measure Submission Form, Measure Specifications sp.23 and sp.24)

N/A

3.5 Updates since last submission (CMS CBE Measure Submission Form, Specifications: Maintenance Update spma.01 and spma.02)

N/A

3.6 Numerator Statement (CMS CBE Measure Submission Form, Measure Specifications sp.12)

Number of eligible observed red blood cell transfusion events: An event is defined as the transfer of one or more units of blood or blood products into a recipient's blood stream (code set is provided in the attached code list) among patients dialyzing at the facility during the inclusion episodes of the reporting period. Inclusion episodes are those that do not have any claims pertaining to the comorbidities identified for exclusion, in the one year look back period prior to each observation window and during which patient is not enrolled in Medicare Advantage according to the Medicare Enrollment Database.

3.7 Numerator Details (CMS CBE Measure Submission Form, Measure Specifications sp.13)

The method for counting transfusion events relies on a conservative counting algorithm and, because of the way transfusion information is reported in Medicare claims, uses different rules for counting transfusion events, depending on whether or not the event occurs in the inpatient setting, or an outpatient setting. The most common way that events are reported on claims is by

reporting a revenue center, procedure, or value code (inpatient claims), or for outpatient claims, reporting HCPCS codes with at least one revenue center code, or value code.

One "transfusion event" is counted per inpatient claim if one or more transfusion-related procedure, revenue center, or value codes are present. A single transfusion event for an inpatient claim is counted regardless of the number of transfusion revenue center, procedure, and value codes reported so that the number of discrete events counted is the same whether the claim indicates one unit of blood or multiple units of blood. This results in a very conservative estimate of blood transfusions from inpatient claims.

Transfusion events are not common in outpatient settings, but similar rules apply. One or more transfusion-related HCPCS codes with at least one transfusion-related revenue center code, or one or more transfusion-related value codes listed on an outpatient claim are counted as a single transfusion event regardless of the number of units of blood recorded. In other words, three units of blood would be counted as a single transfusion event. If there is more than one event on a given day for a patient, this is counted as a single transfusion event.

Because we identify transfusions only if they appear in Medicare inpatient and outpatient claims, we only want to include patients during time periods in which all of the patients' transfusions are included in Medicare billing records. To achieve this goal, we require that patients either reach a certain level of Medicare-paid dialysis bills or have Medicare-paid inpatient claims during the period. Specifically, patient-months within a given dialysis patient-period are used for STrR calculation when they meet the criterion of being within two months after a month with either: (a) $1,200+ of Medicare-paid dialysis claims OR (b) at least one Medicare inpatient (hospital and SNF) claim. Additionally, months identified as having Medicare Advantage according to the Medicare Enrollment Database (EDB) coverage were excluded. The intention of this criterion is to assure completeness of information on transfusions for all patients included in the analysis. The detailed procedures to determine unique transfusion events at the claim level are presented in a flow chart later in this section.

3.8 Denominator Statement (CMS CBE Measure Submission Form, Measure Specifications sp.14)

Number of eligible red blood cell transfusion events (as defined in the numerator statement) that would be expected among patients at a facility during the reporting period, given the patient mix at the facility. Inclusion episodes are those that do not have any claims pertaining to the comorbidities identified for exclusion, in the one year look back period prior to each observation window and during which patient is not enrolled in Medicare Advantage according to the Medicare Enrollment Database.

3.9 Denominator Details (CMS CBE Measure Submission Form, Measure Specifications sp.15)

Starting with day 91 of ESRD, a patient is attributed to a facility according to the following rules. A patient is attributed to a facility once the patient has been treated there for 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 their current facility on day 91 of ESRD if that facility had treated them for at least 60 days. If on day 91, the facility had treated a patient for fewer than 60 days, we wait until the patient reaches day 60 of 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 EQRS 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.

3.10 Denominator Exclusions (CMS CBE Includes "Exception" in the "Exclusion" Field) (CMS CBE Measure Submission Form, Measure Specifications sp.16)

For all patients, time at risk begins at the start of the facility treatment period and continues until the earliest occurrence of the following: three days prior to a transplant; date of death; end of facility treatment; or December 31 of the year. This convention is used with other Dialysis Facility Measures developed and previously endorsed by the CBE (like SHR CBE ID 1463 http://www.qualityforum.org/QPS/1463). Patient time at risk is excluded for:

- Patients less than 18 years old.
- Patients in the first 90 days of ESRD treatment.
- Patients on dialysis at the facility for fewer than 60 days.
- Time during which patient has a functioning kidney transplant (exclusion begins three days prior to the date of transplant).
- Patients who have not been treated by any facility for a year or longer.
- Time during which patient is enrolled in Medicare Advantage according to the Medicare Enrollment Database.
- Patients with a Medicare claim (Part A inpatient, home health, hospice, and SNF claims; Part B outpatient and physician supplier) for one of the following conditions in one-year look-back period:
  - Hemolytic and aplastic anemia
  - Solid organ cancer (breast, prostate, lung, digestive tract and others)
  - Lymphoma
  - Carcinoma in situ
  - Coagulation disorders
  - Multiple myeloma
  - Myelodysplastic syndrome and myelofibrosis
  - Leukemia
  - Head and neck cancer
  - Other cancers (connective tissue, skin, and others)
  - Metastatic cancer

- Sickle cell anemia

3.11 Denominator Exclusion Details (CMS CBE Includes “Exception” in the “Exclusion” Field) (CMS CBE Measure Submission Form, Measure Specifications sp.17)

Figure 10 describes the inclusion and exclusion period of a hypothetical patient.

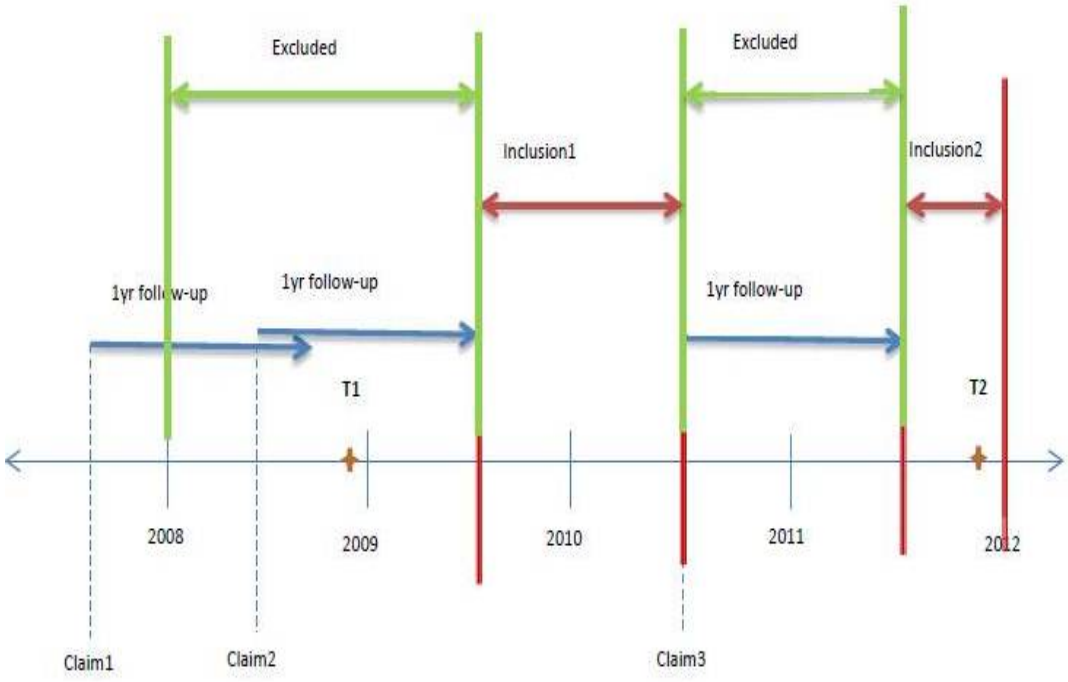

Figure 1: Algorithm for Exclusion of Periods of Time Within 1 Year of an Exclusion Comorbidity

In the figure, a hypothetical patient has patient-years at risk at a facility from 1/1/2008 to 12/31/2011. Review of Medicare claims identified presence of one or more exclusion comorbidities in 2007 (Claim1), 2008 (Claim2) and 2010 (Claim3). Each claim is followed by a one-year exclusion period. The revised inclusion periods are defined as risk windows with at least one year of claim-free period (Inclusion1 and Inclusion2 in figure). The patient has two transfusion events, marked as T1 and T2 in late 2008 and late 2011 respectively. However, since T1 falls in the exclusion period, it will not be counted towards the facility’s transfusion count as presence of exclusion comorbidity claims within a year might have increased the risk of transfusion unrelated to dialysis facility anemia management practice. However, T2, which occurs in late 2011 and in Inclusion2 period, will be counted since there is at least a year gap between this transfusion event and the last claim observed.

3.12 Stratification Details/Variables (CMS CBE Measure Submission Form, Measure Specifications sp.18)

N/A

3.13 Risk Adjustment Type (CMS CBE Measure Submission Form, Measure Specifications sp.19)

☐ no risk adjustment or risk stratification
☐ stratification by risk category/subgroup
☒ statistical risk model
☐ other

The patient characteristics included in the stage 1 model as covariates also include COVID-19 diagnosis determined from Medicare claims or EQRS data sources, as well as the following:

- Age: Determine each patient's age for the birth date provided in the EQRS database, Medicare Claims, and the Medical Evidence Form (CMS-2728). Patients are grouped into the following categories: 18-24 years old, 25-44 years old, 45-59 years old, 60-74 years old, or 75+ years old.
- Diabetes as cause of ESRD: Determine each patient's primary cause of ESRD from his/her CMS-2728, and EQRS.
- Duration of ESRD: Determine each patient's length of time since start of ESRD treatment using patient's CMS-2728, claims history (all claim types), the EQRS patient events file, and OPTN (Dialysis Facility Measures only). Duration is categorized as 90 days- < 6 months, 6 months- < 1 year, 1- < 2 years, 2- < 3 years, 3- < 5 years, or 5+ years as of the period start date.
- Nursing home status: Uses multiple sources* including the Nursing Home MDS. Determine each patient's nursing home status in previous 365 days and categorize as none (0 days), short-term nursing home (0-89 days), or long-term nursing home (>=90 days) as of the period start date.
- BMI at incidence: Calculate each patient's BMI based on the height and weight provided on his/her CMS 2728 and group patients into the following categories: BMI < 18.5, 18.5 ≤ BMI < 25, 25 ≤ BMI < 30, or BMI ≥ 30. BMI is imputed when either missing, or outside the range of 10 to 70 for adults or 5 to 70 for children. Missing and out-of-range BMIs are categorized into the mode group (i.e., >=30).
- Comorbidities at incidence are determined using a selection of comorbidities reported on the CMS-2728 namely, alcohol dependence, atherosclerotic heart disease, cerebrovascular disease, chronic obstructive pulmonary disease, congestive heart failure, diabetes (includes currently on insulin, on oral medications, without medications, and diabetic retinopathy), drug dependence, inability to ambulate, inability to transfer, malignant neoplasm, cancer, other cardiac disease, peripheral vascular disease, and tobacco use (current smoker). Each comorbidity is included as a separate covariate in the model.

- COVID-19 diagnosis: Information on COVID-19 diagnosis is obtained from Medicare claims Part A and Part B. Since this measure uses outpatient claims for some transfusions, the measure is based on all Medicare fee for services patients. MA patients are excluded. A claim record confirms a COVID-19 diagnosis if any COVID-19 diagnosis codes (ICD-10-CM: U071, B9729, J1282, Z8616, U099) are included as primary or secondary diagnoses. Secondary diagnoses include 2nd through 25th ordered diagnoses. COVID-19 diagnoses also come from the Medical Evidence Form (CMS

Form-2728) and the ESRD DEATH NOTIFICATION Form (CMS-2746). Patients with a COVID-19 event on February 20, 2020 or later (including during the ECE period of March-June 2020) are identified as COVID-19 patients. The COVID-19 clock starts at the claim from date of the first COVID-19 diagnosis and is assumed to continue after this date. We divided the period following the first COVID-19 diagnosis into three stages: the first month (days 1-30) after the first COVID-19 diagnosis is defined as "COVID1"; the second month (days 31-60) is defined as "COVID2"; more than two months (> 60 days) after the first diagnosis date is defined as "COVID3". In this way, STrR allows for separate parameters measuring the COVID-19 effect during the 1st month, the 2nd month, and more than two months. COVID1, COVID2, and COVID3 are all included as covariates in the model, while No COVID is the reference group.

* This may include information from: EQRS (including the Medical Evidence Form (CMS 2728) and Medicare Claims).

Categorical indicator variables are included as covariates in the stage 1 model to account for records with missing values for cause of ESRD and comorbidities at incidence (missing Medical Evidence Form (CMS-2728)). These variables have a value of 1 if the patient is missing the corresponding variable and a value of 0 otherwise. Another categorical indicator variable is included as a covariate in the stage 1 model to flag records where the patient has at least one of the incident comorbidities listed earlier. This variable has a value of 1 if the patient has at least one of the comorbidities and a value of 0 otherwise.

Besides main effects, two-way interaction terms between age and duration and diabetes as cause of ESRD are also included:

- Diabetes as cause of ESRD and Duration of ESRD.
- Diabetes as cause of ESRD and Age.

3.14 Type of Score (CMS CBE Measure Submission Form, Measure Specifications sp.20)

☐ count
☐ rate/proportion
☒ ratio
☐ categorical (e.g., yes or no)
☐ continuous variable (CV) (e.g., an average)
☐ composite/scale
☐ other (specify) Click or tap here to enter text.

3.15 Interpretation of Score (CMS CBE Measure Submission Form, Measure Specifications sp.21)

Better quality = Lower score

3.16 Calculation Algorithm/Measure Logic (CMS CBE Measure Submission Form, Measure Specifications sp.22)

See flowchart

3.17 Sampling (CMS CBE Measure Submission Form, Measure Specifications sp.25 and sp.26)

N/A

3.18 Survey/Patient-Reported Data (CMS CBE Measure Submission Form, Measure Specifications sp.27)

N/A

3.19 Data Source (CMS CBE Measure Submission Form, Measure Specifications sp.28)

☐ administrative data
☒ claims data
☐ paper patient medical records
☐ electronic patient medical records
☐ electronic clinical data
☒ registries
☐ standardized patient assessments
☐ patient-reported data and surveys
☐ non-medical data
☐ other—describe in 3.20 (CMS CBE Measure Submission Form, Measure Specifications sp.29)

3.20 Data Source or Collection Instrument (CMS CBE Measure Submission Form, Measure Specifications sp.29)

Multiple data sources are used for the calculation of this measure, including EQRS and Medicare claims. See attached data dictionary for more details.

3.21 Data Source or Collection Instrument (Reference) (CMS CBE Measure Submission Form, Measure Specifications sp.30)

N/A

3.22 Level of Analysis (CMS CBE Measure Submission Form, Measure Specifications sp.07)

☐ individual clinician
☐ group/practice
☒ hospital/facility/agency
☐ health plan
☐ accountable care organization
☐ geographic population
☐ other (specify) Click or tap here to enter text.

3.23 Care Setting (CMS CBE Measure Submission Form, Measure Specifications sp.08)

☐ ambulatory surgery center
☐ clinician office/clinic

☐ outpatient rehabilitation
☐ urgent care – ambulatory
☐ behavioral health: inpatient
☐ behavioral health: outpatient
☒ dialysis facility
☐ emergency medical services/ambulance
☐ emergency department
☐ home health
☐ hospice
☐ hospital
☐ hospital: critical care
☐ hospital: acute care facility
☐ imaging facility
☐ laboratory
☐ pharmacy
☐ nursing home/skilled nursing facility (SNF)
☐ inpatient rehabilitation facility (IRF)
☐ long-term acute care
☐ birthing center
☐ no applicable care setting
☐ other (specify) Click or tap here to enter text.

3.24 Composite Measure (CMS CBE Composite Measure Submission Form, Measure Specifications sp.30)

N/A

REFERENCES