

The Centers for Medicare & Medicaid Services (CMS) has implemented several claims-based measures comparing hospital performance on 30-day mortality, 30-day readmission, and complications following hospitalization for several conditions and procedures in the Hospital Inpatient Quality Reporting, Hospital Readmissions Reductions, and Hospital Value-Based Purchasing Programs. Although these measures have been shown to provide valid information about hospital performance, the clinical community continues to express the opinion that data gathered directly from patients and used by clinicians to guide diagnostic decisions and treatment are preferable for risk adjustment of hospital outcome measures. In response to clinicians' and providers' feedback during public comment periods, and keeping with CMS's goal to move toward the use of electronic health records (EHRs) for electronic quality measure reporting throughout their programs, where feasible, CMS has identified a set of 21 clinical variables, referred to as the core clinical data elements, which are routinely collected on hospitalized adults and feasibly extracted from hospital EHRs. During testing, we found that these 21 core clinical data elements can be used to risk adjust 30-day mortality and 30-day readmission outcome measures. For more information please see the 2013 Core Clinical Data Elements Technical Report (Version 1.1), available on our Measure Methodology Web page, under the "Downloads" section in Core Clinical Data Elements and Hybrid Measures zip file found on our Web site at: <http://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/HospitalQualityInits/Measure-Methodology.html>. CMS envisions using core clinical data elements in conjunction with other sources of data, such as administrative claims, to calculate "hybrid" outcome measures, which are quality measures that utilize more than one source of data.

These core clinical data elements include demographic information (age, gender), vital signs (heart rate, systolic and diastolic blood pressure, respiratory rate, temperature, oxygen saturation), weight, and laboratory results (hemoglobin, hematocrit, platelet, WBC count, potassium, sodium, chloride, bicarbonate, BUN, creatinine, glucose, and troponin) shown during pilot testing to be consistently captured for a high proportion of admissions within 24 hours (two hours for vital signs). For more information please see the 2013 Core Clinical Data Elements Technical Report (Version 1.1).

These core clinical data elements have been electronically specified using the Measure Authoring Tool (MAT). Those specifications are listed in Table 1. The corresponding value sets are listed in Table 2.

Table 1. Measure Authoring Tool (MAT) Specifications Header

eMeasure Title	Hospital Core Clinical Data Elements		
eMeasure Identifier (Measure Authoring Tool)	396	eMeasure Version number	0.0.031
NQF Number	N/A	GUID	d4e4ea3d-acbe-41b2-82b8-b8d346bb76ce

Measurement Period	January 1, 20XX through December 31, 20XX
Measure Steward	Centers for Medicare & Medicaid Services (CMS)
Measure Developer	Mathematica Policy Research, Inc.
Measure Developer	Yale New Haven Health Service Corporation/ Center for Outcomes Research and Evaluation
Endorsed By	None
Description	This is not a measure. This is an electronic clinical quality tool intended to extract the first captured set of vital signs and basic laboratory results measured in adult patients admitted to acute care short stay hospitals. These data will be used with claims data to risk-adjust hospital outcome measures.
Copyright	<p>Limited proprietary coding is contained in these specifications for user convenience. Users of proprietary code sets should obtain all necessary licenses from the owners of the code sets.</p> <p>CPT(R) contained in the Measure specifications is copyright 2004-2013 American Medical Association. LOINC(R) copyright 2004-2013 Regenstrief Institute, Inc. This material contains SNOMED Clinical Terms(R) (SNOMED CT[R]) copyright 2004-2013 International Health Terminology Standards Development Organisation. ICD-10 copyright 2013 World Health Organization. All Rights Reserved.</p>
Disclaimer	<p>These performance specifications are not clinical guidelines and do not establish a standard of medical care, and have not been tested for all potential applications.</p> <p>THE MEASURES AND SPECIFICATIONS ARE PROVIDED AS IS WITHOUT WARRANTY OF ANY KIND.</p> <p>Due to technical limitations, registered trademarks are indicated by (R) or [R] and unregistered trademarks are indicated by (TM) or [TM].</p>
Measure Scoring	Proportion
Measure Type	
Stratification	None
Risk Adjustment	None
Rate Aggregation	None
Rationale	<p>Although we are using the "proportion" function in the Measure Authoring Tool, this is not a measure. The intent of this tool is to extract a set of clinical data elements from hospital EHRs and use them to risk adjust hospital outcome measures. This work addresses concerns expressed by many stakeholders that data gathered directly from patients and used by clinicians to guide diagnostic decisions and treatment are preferable to data from claims derived from chart abstraction after a patient has been discharged. The core clinical data elements include the first set of vital signs and basic laboratory test results captured on adult hospitalized patients after they arrive at the hospital to which they are subsequently admitted. This first set of data values are often captured in the emergency department or in the pre-operative area sometimes hours before a patient is admitted to that same facility. The time of arrival is often captured in the patient management or registration database when patients have their first encounter with the hospitals' administrative staff. These data elements</p>

	were selected because they reflect patients' clinical status when they first present to the hospital, are relevant to patient outcomes, consistently obtained on adult inpatients based on current clinical practice; captured with a standard definition and recorded in a standard format across providers; and entered in structured fields that are feasibly retrieved from current EHR systems, The core clinical data elements also include some demographic data elements that are used as both risk adjustment variables as well as to link EHR data files with claims data to calculate measure results.
Clinical Recommendation Statement	The purpose of this tool is to extract clinical data that are already routinely captured in EHRs among hospitalized adult patients. It is not intended to require that clinical staff perform additional measurements or tests that are not needed for diagnostic assessment or treatment of patients. This is not meant to guide or alter the care patientsâ€™ receive.
Improvement Notation	No actual measure score will be generated. These core clinical data elements will be combined with claims data and used to risk adjust hospital outcome measures.
Reference	
Definition	Core Clinical Data Elements - CCDE
Guidance	<p>This tool supports extraction of the first-captured values for basic vital signs, weight, and the results of a complete blood count and basic chemistry panel for all patients directly admitted to the hospital or admitted to the same facility after an Emergency Department stay or surgical procedure. The tool also supports extraction of troponin level for patients admitted with acute myocardial infarction. The logic in this document supports extraction of the first vital signs captured within 2 hours of a patient having registered as arrived at the hospital and first laboratory test results captured within 24 hours of arrival. This timing is relative to the time a patient is registered in the electronic system as having arrived, usually by administrative staff and not relative to the time of admission.</p> <p>The first values are frequently captured before a decision or order to admit a patient, for example, in the Emergency Department or pre-operative area. Proper use of this tool requires mapping of first-captured values in these locations in addition to other inpatient locations for directly admitted patients.</p>
Transmission Format	To be determined
Initial Population	All patients age 65 and older with an inpatient admission (length of stay <=365 days) and Medicare as the payer during the measurement period.
Denominator	Same as IP
Denominator Exclusions	None
Numerator	<p>For patients in the denominator, report the first value for vital signs captured within 2 hours of arrival at the same facility to which the patient is subsequently admitted, and for laboratory test results within 24 hours of arrival. First values for the following data elements are captured in the Emergency Department or outpatient area before a patient is subsequently admitted to the same hospital or on an inpatient unit for directly admitted patients:</p> <p>Heart rate Systolic blood pressure</p>

	Diastolic blood pressure Respiratory rate Temperature Oxygen saturation Weight Hemoglobin Hematocrit Platelet White blood cell count Potassium Sodium Chloride Bicarbonate BUN Creatinine Glucose Troponin level From initial time of hospital entry
Numerator Exclusions	None
Denominator Exceptions	None
Measure Population	N/A
Measure Population Exclusions	N/A
Measure Observations	N/A
Supplemental Data Elements	Patient date of birth Gender

Population Criteria

- **Initial Population =**
 - AND: Age \geq 65 year(s) at: "Measurement Period"
 - AND: "Encounter, Performed: Inpatient encounter CCDE (length of stay \leq 365 day(s))" during "Measurement Period"
 - AND: "Patient Characteristic: Medicare payer"
- **Denominator =**
 - AND: Initial Population
 - AND: \$HospitalArrival
- **Denominator Exclusions =**
 - None
- **Numerator =**
 - AND:
 - OR: First: "Physical Exam, Performed: Heart rate (result)" \leq 120 minute(s) starts after start of Occurrence A of \$HospitalArrival

- OR: First: "Physical Exam, Performed: Systolic blood pressure (result)" <= 120 minute(s) starts after start of Occurrence A of \$HospitalArrival
- OR: First: "Physical Exam, Performed: Diastolic Blood Pressure (result)" <= 120 minute(s) starts after start of Occurrence A of \$HospitalArrival
- OR: First: "Physical Exam, Performed: Respiratory Rate LOINC (result)" <= 120 minute(s) starts after start of Occurrence A of \$HospitalArrival
- OR: First: "Physical Exam, Performed: Body Temperature LOINC (result)" <= 120 minute(s) starts after start of Occurrence A of \$HospitalArrival
- OR: First: "Physical Exam, Performed: O2 Saturation by Pulse Oximetry (result)" <= 120 minute(s) starts after start of Occurrence A of \$HospitalArrival
- OR: First: "Physical Exam, Performed: Body Weight (result)" <= 1440 minute(s) starts after start of Occurrence A of \$HospitalArrival
- OR: First: "Laboratory Test, Performed: Hemoglobin blood serum plasma (result)" <= 1440 minute(s) starts after start of Occurrence A of \$HospitalArrival
- OR: First: "Laboratory Test, Performed: Hematocrit Blood Serum Plasma Volume Fraction (result)" <= 1440 minute(s) starts after start of Occurrence A of \$HospitalArrival
- OR: First: "Laboratory Test, Performed: Platelet Count Lab Test Blood Serum Plasma Number Per Volume (result)" <= 1440 minute(s) starts after start of Occurrence A of \$HospitalArrival
- OR: First: "Laboratory Test, Performed: White Blood Cells Count Lab Test Blood Serum Plasma Number Per Volume (result)" <= 1440 minute(s) starts after start of Occurrence A of \$HospitalArrival
- OR: First: "Laboratory Test, Performed: Potassium Lab Test Blood Serum Plasma Moles Per Volume (result)" <= 1440 minute(s) starts after start of Occurrence A of \$HospitalArrival
- OR: First: "Laboratory Test, Performed: Sodium Lab Test Blood Serum Plasma Moles Per Volume (result)" <= 1440 minute(s) starts after start of Occurrence A of \$HospitalArrival
- OR: First: "Laboratory Test, Performed: Chloride Lab Test Blood Serum Plasma Moles Per Volume (result)" <= 1440 minute(s) starts after start of Occurrence A of \$HospitalArrival
- OR: First: "Laboratory Test, Performed: Bicarbonate Lab Test Blood Serum Plasma Moles per volume (result)" <= 1440 minute(s) starts after start of Occurrence A of \$HospitalArrival
- OR: First: "Laboratory Test, Performed: Blood urea nitrogen serum plasma (result)" <= 1440 minute(s) starts after start of Occurrence A of \$HospitalArrival

- OR: First: "Laboratory Test, Performed: Creatinine Level Lab Test Group (result)" <= 1440 minute(s) starts after start of Occurrence A of \$HospitalArrival
- OR: First: "Laboratory Test, Performed: Troponin Lab Test Blood Serum Plasma Mass per Volume" <= 1440 minute(s) starts after start of Occurrence A of \$HospitalArrival
- OR: First: "Laboratory Test, Performed: Glucose blood serum plasma (result)" <= 1440 minute(s) starts after start of Occurrence A of \$HospitalArrival
- **Numerator Exclusions =**
 - None
- **Denominator Exceptions =**
 - None
- **Stratification =**
 - None

Data Criteria (QDM Variables)

- **\$HospitalArrival =**
 - Union of:
 - "Encounter, Performed: Inpatient encounter CCDE" satisfies all
 - (length of stay <= 365 day(s))
 - (facility location arrival datetime)
 - "Encounter, Performed: ED Encounter CCDE" satisfies all
 - <= 60 minute(s) ends before or concurrent with start of "Encounter, Performed: Inpatient encounter CCDE (length of stay <= 365 day(s))"
 - (facility location arrival datetime)
 - "Encounter, Performed: Ambulatory" satisfies all
 - <= 60 minute(s) ends before start of "Encounter, Performed: Inpatient encounter CCDE (length of stay <= 365 day(s))"
 - (facility location arrival datetime)
 - during "Measurement Period"

Data Criteria (QDM Data Elements)

- "Encounter, Performed: Ambulatory" using "Ambulatory SNOMEDCT Value Set (2.16.840.1.113883.3.464.1003.122.11.1003)"
- "Encounter, Performed: ED Encounter CCDE" using "ED Encounter CCDE Grouping Value Set (2.16.840.1.113762.1.4.1104.9)"
- "Encounter, Performed: Inpatient encounter CCDE" using "Inpatient encounter CCDE Grouping Value Set (2.16.840.1.113762.1.4.1104.8)"
- "Laboratory Test, Performed: Bicarbonate Lab Test Blood Serum Plasma Moles per volume" using "Bicarbonate Lab Test Blood Serum Plasma Moles per volume LOINC Value Set (2.16.840.1.113762.1.4.1045.138)"

- "Laboratory Test, Performed: Blood urea nitrogen serum plasma" using "Blood urea nitrogen serum plasma Grouping Value Set (2.16.840.1.113762.1.4.1104.5)"
- "Laboratory Test, Performed: Chloride Lab Test Blood Serum Plasma Moles Per Volume" using "Chloride Lab Test Blood Serum Plasma Moles Per Volume LOINC Value Set (2.16.840.1.113762.1.4.1045.123)"
- "Laboratory Test, Performed: Creatinine Level Lab Test Group" using "Creatinine Level Lab Test Group Grouping Value Set (2.16.840.1.113883.3.666.5.2364)"
- "Laboratory Test, Performed: Glucose blood serum plasma" using "Glucose blood serum plasma Grouping Value Set (2.16.840.1.113762.1.4.1104.6)"
- "Laboratory Test, Performed: Hematocrit Blood Serum Plasma Volume Fraction" using "Hematocrit Blood Serum Plasma Volume Fraction LOINC Value Set (2.16.840.1.113762.1.4.1045.114)"
- "Laboratory Test, Performed: Hemoglobin blood serum plasma" using "Hemoglobin blood serum plasma Grouping Value Set (2.16.840.1.113762.1.4.1104.4)"
- "Laboratory Test, Performed: Platelet Count Lab Test Blood Serum Plasma Number Per Volume" using "Platelet Count Lab Test Blood Serum Plasma Number Per Volume LOINC Value Set (2.16.840.1.113762.1.4.1045.127)"
- "Laboratory Test, Performed: Potassium Lab Test Blood Serum Plasma Moles Per Volume" using "Potassium Lab Test Blood Serum Plasma Moles Per Volume LOINC Value Set (2.16.840.1.113762.1.4.1045.117)"
- "Laboratory Test, Performed: Sodium Lab Test Blood Serum Plasma Moles Per Volume" using "Sodium Lab Test Blood Serum Plasma Moles Per Volume LOINC Value Set (2.16.840.1.113762.1.4.1045.119)"
- "Laboratory Test, Performed: Troponin Lab Test Blood Serum Plasma Mass per Volume" using "Troponin Lab Test Blood Serum Plasma Mass per Volume LOINC Value Set (2.16.840.1.113883.13.190.5.3)"
- "Laboratory Test, Performed: White Blood Cells Count Lab Test Blood Serum Plasma Number Per Volume " using "White Blood Cells Count Lab Test Blood Serum Plasma Number Per Volume LOINC Value Set (2.16.840.1.113762.1.4.1045.129)"
- "Patient Characteristic: Medicare payer" using "Medicare payer SOP Value Set (2.16.840.1.113762.1.4.1104.10)"
- "Physical Exam, Performed: Body Temperature LOINC" using "Body Temperature LOINC LOINC Value Set (2.16.840.1.113762.1.4.1045.152)"
- "Physical Exam, Performed: Body Weight" using "Body Weight LOINC Value Set (2.16.840.1.113762.1.4.1045.159)"
- "Physical Exam, Performed: Diastolic Blood Pressure" using "Diastolic Blood Pressure Grouping Value Set (2.16.840.1.113883.3.526.3.1033)"
- "Physical Exam, Performed: Heart rate" using "Heart rate Grouping Value Set (2.16.840.1.113762.1.4.1104.1)"
- "Physical Exam, Performed: O2 Saturation by Pulse Oximetry" using "O2 Saturation by Pulse Oximetry Grouping Value Set (2.16.840.1.113762.1.4.1104.3)"

- "Physical Exam, Performed: Respiratory Rate LOINC" using "Respiratory Rate LOINC LOINC Value Set (2.16.840.1.113762.1.4.1045.130)"
- "Physical Exam, Performed: Systolic blood pressure" using "Systolic blood pressure Grouping Value Set (2.16.840.1.113762.1.4.1104.2)"

Supplemental Data Elements

- "Patient Characteristic Ethnicity: Ethnicity" using "Ethnicity CDCREC Value Set (2.16.840.1.114222.4.11.837)"
- "Patient Characteristic Race: Race" using "Race CDCREC Value Set (2.16.840.1.114222.4.11.836)"
- "Patient Characteristic Sex: ONC Administrative Sex" using "ONC Administrative Sex AdministrativeSex Value Set (2.16.840.1.113762.1.4.1)"

Risk Adjustment Variables

- None

The value sets for the measure can be found in the VSAC (<https://vsac.nlm.nih.gov/>). The following value set OID's are used in the Core Clinical Data Elements specifications:

Table 2. Value Set OID's

Value Set Name	Value Set OID
Ambulatory SNOMEDCT Value Set	2.16.840.1.113883.3.464.1003.122.11.1003
ED Encounter CCDE Grouping Value Set	2.16.840.1.113762.1.4.1104.9
Inpatient encounter CCDE Grouping Value Set	2.16.840.1.113762.1.4.1104.8
Bicarbonate Lab Test Blood Serum Plasma Moles per volume LOINC Value Set	2.16.840.1.113762.1.4.1045.138
Blood urea nitrogen serum plasma Grouping Value Set	2.16.840.1.113762.1.4.1104.5
Chloride Lab Test Blood Serum Plasma Moles Per Volume LOINC Value Set	2.16.840.1.113762.1.4.1045.123
Creatinine Level Lab Test Group Grouping Value Set	2.16.840.1.113883.3.666.5.2364
Glucose blood serum plasma Grouping Value Set	2.16.840.1.113762.1.4.1104.6
Hematocrit Blood Serum Plasma Volume Fraction LOINC Value Set	2.16.840.1.113762.1.4.1045.114
Hemoglobin blood serum plasma Grouping Value Set	2.16.840.1.113762.1.4.1104.4
Platelet Count Lab Test Blood Serum Plasma Number Per Volume LOINC Value Set	2.16.840.1.113762.1.4.1045.127
Potassium Lab Test Blood Serum Plasma Moles Per Volume LOINC Value Set	2.16.840.1.113762.1.4.1045.117
Sodium Lab Test Blood Serum Plasma Moles Per Volume LOINC Value Set	2.16.840.1.113762.1.4.1045.119
Troponin Lab Test Blood Serum Plasma Mass per Volume LOINC Value Set	2.16.840.1.113883.13.190.5.3
White Blood Cells Count Lab Test Blood Serum Plasma Number Per Volume LOINC Value Set	2.16.840.1.113762.1.4.1045.129
Body Temperature LOINC LOINC Value Set	2.16.840.1.113762.1.4.1045.152

Value Set Name	Value Set OID
Body Weight LOINC Value Set	2.16.840.1.113762.1.4.1045.159
Diastolic Blood Pressure Grouping Value Set	2.16.840.1.113883.3.526.3.1033
Heart rate Grouping Value Set	2.16.840.1.113762.1.4.1104.1
O2 Saturation by Pulse Oximetry Grouping Value Set	2.16.840.1.113762.1.4.1104.3
Respiratory Rate LOINC LOINC Value Set	2.16.840.1.113762.1.4.1045.130
Systolic blood pressure Grouping Value Set	2.16.840.1.113762.1.4.1104.2