Guide for Reading Eligible Provider (EP) and Hospital eMeasures

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NATIONAL QUALITY FORUM

Contents

1. Introduction

This document provides guidance for understanding and using the electronically specified measures identified as 'retooled' that were published as Eligible Provider (EP) and Hospital Measures in .xml and .html format.

Collecting and reporting accurate, comparable healthcare performance data is complex and largely a time consuming, manual process. Much of the information required for performance measurement is available in electronic health records (EHRs) but it has not been routinely available for export and use to compute measures. Performance measures most frequently address data that is routinely available. Claims data, laboratory results and pharmaceutical usage data are most commonly drawn on for these measures.

Truly accessing the rich clinical data residing in EHRs requires that measures are specified to account for the way data are expressed in EHRs. The National Quality Forum (NQF), through the Health Information Technology Expert Panel (HITEP), established the Quality Data Model (QDM) to enable such expression of data requirements in the context of EHR usage. To further enable electronic measurement, NQF supported the development of an electronic standard based on the Quality Data Model (QDM) known as the eMeasure representation of the Health Quality Measure Format (HQMF). HQMF is a standard for representing a health quality measure as an electronic document. This electronic standard will allow EHR vendors to more directly manage information required for measurement in their products and share data electronically with other entities in a standardized format.

The Department of Health and Human Services (HHS) asked NQF to convert, or "retool," a number of existing NQF-endorsed measures from a paper-based format to an electronic eMeasure format so they can be more easily interpreted by EHRs. NQF worked with the original stewards of these measures to assure the intent and meaning was preserved and to avoid substantive change that would require re-evaluation of measure evidence and intent. This project was specifically scoped to redefine the measures 'as is,' but in the context of EHR data. The initial versions of several of the ambulatory measures (44 in number) were published in July 2010 in a human readable format. All retooled ambulatory and hospital measures were released in early 2011, in full HQMF format for public comment and review. Working with the measure steward, NQF processed updates to those measures based on comments; the updates were released in late 2011. This guide should assist the reader in interpreting and understanding these eMeasures.

The retooling process involves many complex steps and key stakeholder involvement. Specifically, measure retooling consists of measure developers evaluating each selected measure and applying the QDM to each data element. Once a QDM data element is assigned to each measure element, value sets (lists of codes) are created to further define the QDM data elements. The resulting quality data elements are then configured to address the measure

logic. This protocol was performed manually for the 2010 project. In November 2010, NQF contracted with an external vendor to co-develop and launch a fully tested web-based measure authoring tool. The Measure Authoring Tool (MAT) was implemented and available for use in September 2011. The MAT enables measure developers to author e-measures directly using the QDM or, when necessary, to retool existing measures for EHR usage.

This document, the retooled measures, and the MAT Basic and 2012 update release, reference an interim version of the QDM that provides the functional requirements.

2. Documents You Will Need

Each measure folder contains **four** files that are necessary to understand the electronic measure.

eMeasure specification and value sets

1. The HQMF standard .xml format (example: NQF_nnnn_XML _Updated_Dec_2011.xml) The HQMF file contains the eMeasure specifications including measure background information, required data elements, measure logic, and measure calculation instructions. This file uses the eMeasure Health Quality Measure Format (HQMF).

2. A *style sheet,* a related file that allows the .xml format to open directly in a web browser (example: eMeasure_Updated_Dec_2011.xsl). It is best to download these files into the same folder on your system.

3. The human readable format of the eMeasure in **html** to open directly in a web browser. This file does not include the underlying .xml format (example: NQF_nnnn_Human Readable_Updated_Dec_2011.html).

4. The Excel spreadsheet (example: NQF_nnnn_Value Sets_Updated_Dec_2011.xls) with the value sets (synonymous with code sets) used for the measure. The value sets also contain code descriptors for all taxonomies except CPT.

3. Opening the Documents

eMeasure specification (examples: NQF_nnnn_XML _Updated_Dec_2011. xml and eMeasure_Updated_Dec_2011.xsl)

1. To view the xml structure: The HQMF standard .xml format can be opened using an XML editor program or can be viewed in any text editor (e.g., Note Pad). To open in a text editor, right click on the file and select "Open with," then select the text editor of your choice.
2. To view the human readable format in a web browser:
    a. Double click on the .xml file to open in human readable format in a browser such as Internet Explorer or Firefox. This step *only* works if the .xsl file (called a style sheet) provided with the measure is located in the **same** folder on your computer as the .xml file. Please note that not all browsers behave the same way with .xml style sheets. Note, the identical HQMFreader.xsl style sheet is provided with each HQMF.
    b. The HQMF is also provided in an .html format. Double click on the .html file to open the measure in human readable format in a browser such as Internet Explorer or Firefox. This step will work *without* the.xsl file mentioned above, but it does not contain the .xml.

eMeasure value sets (NQF_nnnn_Value Sets _Updated_Dec_2011.xls)

To view the value sets (synonymous with code sets), codes, and descriptors, you may open this Excel spreadsheet in any spreadsheet reader that understands Excel, such as Microsoft Excel or Open Office.

4. Reviewing the Documents

eMeasure specification (example: NQF_nnnn_Human Readable_Updated_Dec_2011.html)

The human readable eMeasure contains four sections**: header, population criteria, data criteria, and supplemental data elements.**

Header

The header, (refer to Figure 1 below) contains pertinent information about the measure and includes the following components:

1. eMeasure Title – Represents the title of the quality measure.
2. GUID –Assigned to the measure at creation, this identifier remains consistent throughout all versions and drafts of a measure. It is a unique number assigned by the MAT that is required by the HL7 HQMF standard.
3. eMeasure Identifier (MAT) – a number that will remain as the identifier permanently for that measure and is assigned by the MAT. This is an optional field.
4. eMeasure Version number – A positive integer value used to indicate the version of the eMeasure.
5. NQF Number – Specifies the NQF number if one has been assigned. The assigned NQF number can be cross- referenced with NQF's Quality Positioning System (QPS) via the NQF website to verify measure endorsement status.
6. Measurement Period – The time period for which the eMeasure applies.
7. Measure Steward – The organization responsible for the measure content and maintenance of the eMeasure.
8. Measure Developer – The organization that developed the eMeasure.
9. Endorsed by – The organization that has endorsed the eMeasure through a consensus- based process.
10. Description – A general description of the eMeasure intent.
11. Copyright – Identifies the organization(s) who own the intellectual property represented in the eMeasure.
12. Disclaimer – Disclaimer information for the eMeasure.

13. Measure Scoring – Indicates how the calculation is performed for the eMeasure (e.g., proportion, continuous variable, or ratio).

14. Measure Type – Indicates whether the eMeasure is used to examine a process or an outcome over time (i.e., structural, process, or outcome measure). Measures may have more than one process or outcome type.

15. Stratification – Defines the logic for the strata for which the measure is to be evaluated. There are three currently recognized reasons for stratification. These include but are not limited to: (1) evaluate the measure based on different age groupings within the population described in the measure; (2) evaluate the eMeasure based on either a specific condition, a specific discharge location, or both; (3) evaluate the eMeasure based on different locations within a facility.

16. Risk Adjustment – The method of adjusting for clinical severity and conditions present at the start of care that can influence patient outcomes for making valid comparisons of outcome measures across providers. Risk adjustment indicates whether an eMeasure is subject to the statistical process for reducing, removing, or clarifying the influences of confounding factors to allow more useful comparisons.

17. Rate Aggregation –Describes how to combine information calculated based on logic in each of several populations into one summarized result. It can also be used to describe how to risk adjust the data based on supplemental data elements described in the eMeasure.

18. Rationale – Succinct statement of the need for the measure. Usually includes statements pertaining to importance criterion: impact, gap in care and/or evidence.

19. Clinical Recommendation Statement - Summary of relevant clinical guidelines or other clinical recommendations supporting this eMeasure.

20. Improvement Notation – Information on whether an increase or decrease in score is the preferred result (e.g., a higher score indicates better quality OR a lower score indicates better quality OR quality is within a range).

21. Reference(s) – Identifies bibliographic citations or references to clinical practice guidelines, sources of evidence, or other relevant materials supporting the intent and rationale of the eMeasure.

22. Definition – Please refer to the 'Definition of Population Criteria' on page 12 of this document for further explanation of this section of the header.

23. Guidance – Used to allow measure developers to provide additional guidance for implementers to understand greater specificity than could be provided in the logic for data criteria.

24. Transmission Format – Used to provide guidance regarding how the measure data are to be transmitted for reporting purposes.

Figure 1. The figure below is an example with headers displayed to show retooled Hospital Measure 0300, Cardiac Surgery Patients With Controlled 6 A.M. Postoperative Blood Glucose (NQF 300) (measure developer, Oklahoma Foundation for Medical Quality). The figure includes eMeasure name, eMeasure Id, version number, eMeasure Set Id, available date, measurement period, measure steward, endorsed by, description, copyright, measure scoring, measure type, stratification, risk adjustment, data aggregation, rationale, clinical recommendation statement, improvement notation, measurement duration, reference, guidance and supplemental data elements (each defined in the text above).

Cardiac Surgery Patients with Controlled 6 A.M. Postoperative Blood Glucose (NQF 0300)

eMeasure Title	Cardiac Surgery Patients with Controlled 6 am Postoperative Blood Glucose (NQF 0300)		
eMeasure Identifier (Measure Authoring Tool)		**eMeasure Version number**	1
NQF Number	0300	**GUID**	da4ba74c-1db4-447c-8283-191dbdce93e8
Measurement Period	January 1, 20xx through December 31, 20xx		
Measure Steward	Oklahoma Foundation for Medical Quality		
Measure Developer	Oklahoma Foundation for Medical Quality		
Endorsed By	National Quality Forum		
Description	Cardiac surgery patients with controlled 6 A.M. blood glucose (less than or equal to 200 mg/dL) on postoperative day one (POD 1) and postoperative day two (POD 2) with Anesthesia End Date being postoperative day zero (POD 0).		
Copyright	None		
Disclaimer	None		
Measure Scoring	Proportion		
Measure Type	Process		
Stratification	None		
Risk Adjustment	None		
Rate Aggregation	None		

Rationale	Hyperglycemia has been associated with increased in-hospital morbidity and mortality for multiple medical and surgical conditions. In a study by Zerr, et al (1997), the risk of infection was significantly higher for patients undergoing coronary artery bypass graft (CABG) if blood glucose levels were elevated. Furthermore, Zerr, et al (2001), demonstrated that the incidence of deep wound infections in diabetic patients undergoing cardiac surgery was reduced by controlling mean blood glucose levels below 200mg/dL in the immediate postoperative period. Latham, et al (2001), found that hyperglycemia in the immediate postoperative phase increases the risk of infection in both diabetic and nondiabetic patients and the higher the level of hyperglycemia, the higher the potential for infection in both patient populations. A study conducted in Leuven, Belgium (Van den Berghe, 2001), demonstrated that intensive insulin therapy not only reduced overall in-hospital mortality but also decreased blood stream infections, acute renal failure, red cell transfusions, ventilator support, and intensive care. Hyperglycemia is a risk factor that, once identified, could minimize adverse outcomes for cardiac surgical patients.
Clinical Recommendation Statement	Controlling hyperglycemia can reduce adverse effects after surgery. Studies have shown that hyperglycemia has been associated with increased in-hospital morbidity and mortality for multiple medical and surgical conditions.
Improvement Notation	Higher score indicates better quality.
Reference	Gordon SM, Serkey JM, Barr C, et al. The relationship between glycosylated hemoglobin (HgA1c) levels and postoperative infections in patients undergoing primary coronary artery bypass surgery (CABG.) Infect Control Hosp Epidemiol. 1997;18(No.5, Part 2):29(58.) PMID: 00000.
Reference	Furnary AP, Zerr KJ, Grunkemeier GL, et al. Continuous intravenous insulin infusion reduces the incidence of deep sternal wound infection in diabetic patients after cardiac surgical procedures. Ann Thorac Surg. 1999:67:352-360. PMID: 10197653.
Reference	Trick WE, Scheckler WE, Tokars JI, et al. Modifiable risk factors associated with deep sternal site infection after coronary artery bypass grafting. J Thorac Cardiovasc Surg. 2000 Jan;119(1):108-114. PMID: 10612768.
Reference	Trick WE, Scheckler WE, Tokars JI, et al. Risk factors for radial artery harvest site infection following coronary artery bypass graft surgery. Clin Infect Dis. 2000 Feb;30(2):270-275.PMID: 10671327.
Reference	Menzin J, Langly-Hawthron C, Friedman M, et al. Potential short-term economic benefits of improved glycemic control: a managed care prospective. Diabetes Care. 2001 Jan;24(1):51-55. PMID: 11194241.
Reference	Dellinger E. Preventing Surgical-Site Infections: The importance of timing and glucose control. Infect Control Hosp Epidemiol. 2001;22(10):604-606. PMID: 11776344.
Reference	Latham R, Lancaster AD, Covington JF, etal. The association of diabetes and glucose control with surgical-site infections among cardiothoracic surgery Specifications Manual for National Hospital Inpatient Quality Measures Discharges 10-01-10 (4Q10) through 03-31-11 (1Q11) SCIP-Inf-4-3 patients. Infect Control Hosp Epidemiol. 2001 Oct;22(10):607-612. PMID: 11776345.
Reference	McAlister FA, Man J, Bistritz L, et al. Diabetes and coronary artery bypass surgery: an examination of perioperative glycemic control and outcomes. Diabetes Care. 2003 May;26(5):1518-1524. PMID:

	12716815.
Reference	Estrada CA, Young JA, Nifong LW, et al. Outcomes and perioperative hyperglycemia in patients with or without diabetes mellitus undergoing coronary artery bypass grafting. Ann Thorac Surg. 2003 May;75(5):1392-1399. PMID: 12735552.
Reference	Terranova A. The effects of diabetes mellitus on wound healing. Plast Surg Nurs. 1991:11(1):20-25. PMID: 2034714.
Reference	Woodruff RE, Lewis SB, McLeskey CH, et al. Avoidance of surgical hyperglycemia in diabetic patients. JAMA. 1980 Jul 1;244(2):166-168. PMID: 6991732.
Reference	Dellinger EP, Gross PA, Barrett TL, et al: Quality standard for antimicrobial prophylaxis in surgical procedures. Infectious Diseases Society of America. Clin Infect Dis. 1994;18: 422-427. PMID: 8207176.
Reference	Zerr KJ, Furnary AP, Grunkemeier GL, et al. Glucose control lowers the risk of wound infection in diabetics after open heart operations. Ann Thorac Surg. 1997 Feb;63(2):356-361. PMID: 9033300.
Reference	Pomposelli JJ, Baxter JK 3rd, Babineau TJ, et al. Early postoperative glucose control predicts nosocomial infection rate in diabetic patients. J Parenter Enteral Nutr. 1998 Mar-Apr;22(2):77-81. PMID: 9527963.
Reference	Van den Berghe G, Wouters P, Weekers F, et al. Intensive insulin therapy in the critically ill patients. N Engl J Med. 2001 Nov 8;345(19):1359-1367. PMID: 11794168.
Definition	None
Guidance	The measurement period is one calendar year but the reporting period is 3 months as a calendar quarter; Q1 = Jan – Mar, Q2 = Apr – Jun, Q3 = Jul – Sep, Q4 is Oct – Dec. Patients for whom there are missing or inaccurate data (e.g., arrival time, medication administration, etc.) are considered to have failed the measure; the total number of patients with missing or erroneous (e.g., a time of 03:69 or a date of 10/26/2035) data (i.e., measure failures) must be reported with the results of the measure. General guidance: The original measure excludes patients who have had a laparoscopic procedure unless the laparoscopic incision has been extended during the procedure. ICD-10 allows definition of such extension with procedure codes; ICD-9 does not. For those using ICD-9 any laparoscopic procedure that extends the incision should be included. In this measure the value sets that describe types of surgical procedures remain only in ICD-9 or ICD-10 because the concepts that apply are limited to a very specific subset of all surgical procedures. Exclusion element guidance: The exclusion for patients who are clinical trial participants is limited to patients participating in a clinical trial for the same conditions as covered by the measure. Other clinical trials are not valid reasons for exclusions. The measure as initially specified excludes all patients who die peri-operatively. The exclusion in this measure covers the same peri-operative scenario, the death time is the same as the discharge time. AND NOT [Encounter: encounter inpatient].discharge date starts after

	the end of [Procedure, Performed: Joint Commission Evidence a surgical procedure requiring general or neuraxial anesthesia].end date starts after the end of [Procedure, Performed: cardiac surgery].date < 2 days. By convention, discharge date post "encounter inpatient" is used to describe the hospital discharge date. Where logic needs to indicate discharge (or transfer) from one inpatient location to another, the logic uses "Transfer From" or "Transfer To" as the QDM data type.
Transmission Format	None
Initial Patient Population	All hospital discharges for cardiac surgery with hospital stays <= 120 days during the measurement year for patients age 18 and older at the time of hospital admission and no evidence of prior infection 18 years of age and older.
Denominator	Cardiac surgery patients with no evidence of prior infection 18 years of age and older with An ICD-9-CM Principal Procedure Code of selected surgeries AND An ICD-9-CM Principal Procedure Code of selected surgeries.
Denominator Exclusions	Patients who had a principal diagnosis suggestive of preoperative infectious diseases. Burn and transplant patients. Patients whose ICD-9-CM principal procedure was performed entirely by Laparoscope. Patients enrolled in clinical trials. Patients whose ICD-9-CM principal procedure occurred prior to the date of admission. Patients with physician/advanced practice nurse/physician assistant (physician/APN/PA) documented infection prior to surgical procedure of interest. Patients who expired perioperatively.
Numerator	Surgery patients with controlled 6 A.M. blood glucose (less than or equal to 200 mg/dL) on post-operative day (POD) 1 and postoperative day (POD) 2.
Numerator Exclusions	N/A
Denominator Exceptions	N/A
Measure Population	N/A
Measure Observations	N/A
Supplemental Data Elements	Report "Patient Characteristic: Gender" using "Gender HL7 Value Set (2.16.840.1.113883.1.11.1)"; Report "Patient Characteristic: Race" using "Race CDC Value Set (2.16.840.1.114222.4.11.836)"; Report "Patient Characteristic: Ethnicity" using "Ethnicity CDC Value Set (2.16.840.1.114222.4.11.837)"; Report "Patient Characteristic: Payer" using "Payer Source of Payment Typology Value Set (2.16.840.1.113883.3.221.5)".

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Population criteria

- **Initial Patient Population =**
  - AND NOT: "Laboratory Test, Result: SBP" >= 140 hour(s) starts before or during "Measurement Period"
  - AND: "Occurrence A of Encounter, Performed: Hospital Measures Inpatient" during "Measurement Period"
  - AND: Count <= 120 day(s) of:"Occurrence A of Encounter, Performed: Hospital Measures Inpatient"
  - AND: IMMEDIATE PRIOR "Patient Characteristic: birth date"
  - AND: CURRENT "Patient Characteristic: birth date"
- **Denominator =**
  - AND: "Initial Patient Population"
  - AND NOT: "Diagnosis, Active: Hospital Measures Infection" during ("Occurrence A of Procedure, Performed: Cardiac Surgery (incision datetime)" during "Occurrence A of Encounter, Performed: Hospital Measures Inpatient (admission datetime)")
  - AND NOT: "Diagnosis, Active: Hospital Measures Infection (ordinality: 'Ordinality: Principal')" during "Occurrence A of Encounter, Performed: Hospital Measures Inpatient"
  - AND NOT: "Diagnosis, Active: Hospital Measures Burn (ordinality: 'Ordinality: Principal')" during "Occurrence A of Encounter, Performed: Hospital Measures Inpatient"
  - AND: Time >= 1 minute(s) of:"Occurrence A of Procedure, Performed: Cardiac Surgery" starts after start of "Occurrence A of Encounter, Performed: Hospital Measures Inpatient"
- **Denominator Exclusions =**
  - AND:
    - OR: AND: "Patient Characteristic: Patient Characteristic: Clinical trial participant" during "Occurrence A of Encounter, Performed: Hospital Measures Inpatient"
    - OR: AND: "Occurrence A of Encounter, Performed: Hospital Measures Inpatient (discharge datetime < 2 day(s))" starts after start of "Occurrence A of Procedure, Performed: Cardiac Surgery (ordinality: 'Ordinality: Principal')"
    - OR: OR:
      - AND: "Patient Characteristic: Patient Characteristic: Expired" starts after start of "Occurrence A of Procedure, Performed: Cardiac Surgery (incision datetime)"
      - AND: Time difference <= 6 hour(s) of:"Patient Characteristic: Patient Characteristic: Expired" starts after end of ("Occurrence A of Procedure, Performed: Hospital Measures JC" during "Occurrence A of Encounter, Performed: Hospital Measures Inpatient")
- **Numerator =**
  - AND: Difference between dates = 2 day(s) of:"Laboratory Test, Result: Laboratory Test Hospital Measures Glucose (result <= 200 mg/dL)" starts after end of ("Occurrence A of Procedure, Performed: Hospital Measures JC" during "Occurrence A of Procedure, Performed: Cardiac Surgery")
  - AND: Difference between dates < 1 day(s) of:"Laboratory Test, Result: Laboratory Test Hospital Measures Glucose (result < 200 mg/dL)" starts after end of ("Occurrence A of Procedure, Performed: Hospital Measures JC" during "Occurrence A of Procedure, Performed: Cardiac Surgery")
- **Denominator Exceptions =**
  - None

Data criteria (QDM Data Elements)

- "Diagnosis, Active: Hospital Measures Burn" using "Hospital Measures Burn Grouping Value Set (2.16.840.1.113883.3.666.05.813)"
- "Diagnosis, Active: Hospital Measures Infection" using "Hospital Measures Infection Grouping Value Set (2.16.840.1.113883.3.666.05.695)"

- "Encounter, Performed: Hospital Measures Inpatient" using "Hospital Measures Inpatient SNOMED-CT Value Set (2.16.840.1.113883.3.666.05.625)"
- "Laboratory Test, Result: Laboratory Test Hospital Measures Glucose" using "Laboratory Test Hospital Measures Glucose SNOMED-CT Value Set (2.16.840.1.113883.3.666.05.816)"
- "Laboratory Test, Result: SBP" using "SBP CPT Value Set (2.16.840.11.113883.3.560.4.20.105)"
- "Patient Characteristic: birth date" using "birth date LOINC Value Set (2.16.840.1.113883.3.560.100.4)"
- "Patient Characteristic: Patient Characteristic: Expired" using "Patient Characteristic: Expired Grouping Value Set (2.16.840.1.113883.3.666.05.730)"
- "Patient Characteristic: Patient Characteristic: Clinical trial participant" using "Patient Characteristic: Clinical trial participant SNOMED-CT Value Set (2.16.840.1.113883.3.526.02.643)"
- "Procedure, Performed: Cardiac Surgery" using "Cardiac Surgery Grouping Value Set (2.16.840.1.113883.3.526.03.371)"
- "Procedure, Performed: Hospital Measures JC" using "Hospital Measures JC SNOMED-CT Value Set (1.3.6.1.4.1.33895.1.3.0.31)"
- Attribute: "Ordinality: Ordinality: Principal" using "Ordinality: Principal SNOMED-CT Value Set (2.16.840.1.113883.3.526.02.8001)"

Reporting Stratification

- None

Supplemental Data Elements

- "Patient Characteristic Ethnicity: Ethnicity" using "Ethnicity CDC Value Set (2.16.840.1.114222.4.11.837)"
- "Patient Characteristic Gender: Gender" using "Gender HL7 (2.16.840.1.113883.5.1) Value Set (2.16.840.1.113883.1.11.1)"
- "Patient Characteristic Payer: Payer" using "Payer Source of Payment Typology Value Set (2.16.840.1.113883.221.5)"
- "Patient Characteristic Race: Race" using "Race CDC Value Set (2.16.840.1.114222.4.11.836)"

Measure Set	CLINICAL QUALITY MEASURE SET 2011-2012

Population Criteria

The following figure (figure 2) contains the main components of the population criteria for a measure. For proportion measures, the components are initial patient population, denominator, denominator exclusions, numerator, denominator exceptions, stratification and supplemental data elements. For continuous variable measures, the components are initial patient population, measure population, measure observations, stratification and supplemental data elements. Ratio measures components include initial patient population, denominator, denominator exclusions, numerator, numerator exclusions, stratification and supplemental data elements. Each component contains measure elements that are joined together with OR, AND, and NOT. Each measure element or statement also includes one or more QDM data elements and information about how these elements compare to others. For example, in Figure 2 below, the patient population contains a QDM data element (“Patient characteristic: birth date”) and additional

comparison logic (">=18 year(s) starts before the start of "Occurrence A of Encounter: Hospital Measures – Encounter Inpatient"").

Figure 2. *Sample from eMeasure population criteria:* containing initial patient population, denominator, denominator exclusions, numerator and denominator exceptions criteria and related logic. More specific information about each is included in the text. The complete logic for Hospital Measure 0300, Cardiac Surgery Patients With Controlled 6 A.M. Postoperative Blood Glucose (NQF 300) (measure developer, Oklahoma Foundation for Medical Quality) measure is shown as an example.

Population criteria

- **Initial Patient Population** =
  - AND: "Patient Characteristic: birth date" >= 18 year(s) starts before start of "Occurrence A of Encounter: Hospital Measures - Encounter Inpatient"
  - AND: "Occurrence A of Encounter: Hospital Measures - Encounter Inpatient (discharge datetime)" during "Measurement period"
  - AND: "Occurrence A of Encounter: Hospital Measures - Encounter Inpatient (length of stay <= 120 day(s))"
- **Denominator** =
  - AND: "Initial Patient Population"
  - AND: "Occurrence A of Procedure, Performed: Cardiac Surgery (ordinality: 'Hospital Measures-Principal')" >= 1 minute(s) starts after start of "Occurrence A of Encounter: Hospital Measures - Encounter Inpatient"
  - AND NOT: "Diagnosis, Active: Hospital Measures - Any infection" >= 1 minute(s) starts before start of ("Occurrence A of Procedure, Performed: Cardiac Surgery (incision datetime)" during "Occurrence A of Encounter: Hospital Measures - Encounter Inpatient (admission datetime)")
  - AND NOT: "Diagnosis, Active: Hospital Measures-Infection diagnosis (ordinality: 'Hospital Measures-Principal')" during "Occurrence A of Encounter: Hospital Measures - Encounter Inpatient"
  - AND NOT: "Diagnosis, Active: Hospital Measures - Burn diagnosis (ordinality: 'Hospital Measures-Principal')" during "Occurrence A of Encounter: Hospital Measures - Encounter Inpatient"
  - AND NOT: "Diagnosis, Active: Hospital Measures-Transplant" starts before start of "Occurrence A of Encounter: Hospital Measures - Encounter Inpatient"
- **Denominator Exclusions** =
  - AND:
    - OR: "Patient Characteristic: Clinical trial participant" during "Occurrence A of Encounter: Hospital Measures - Encounter Inpatient"
    - OR:
      - AND: "Patient Characteristic: Expired" starts after start of "Occurrence A of Procedure, Performed: Cardiac Surgery (incision datetime)"
      - AND: "Patient Characteristic: Expired" <= 6 hour(s) starts after end of ("Occurrence A of Procedure, Performed: Hospital Measures-Joint Commission Evidence of a surgical procedure requiring general or neuraxial anesthesia" during "Occurrence A of Encounter: Hospital Measures - Encounter Inpatient")
    - OR: "Occurrence A of Encounter: Hospital Measures - Encounter Inpatient (discharge datetime)" < 2 day(s) starts after start of "Occurrence A of Procedure, Performed: Cardiac Surgery (ordinality: 'Hospital Measures-Principal')"
- **Numerator** =
  - AND: "Laboratory Test, Result: Hospital Measures-Glucose (result <= 200 mg/dL)" = 1 day(s) starts after end of ("Occurrence A of Procedure, Performed: Hospital Measures-Joint Commission Evidence of a surgical procedure requiring general or neuraxial anesthesia" during "Occurrence A of Procedure, Performed: Cardiac Surgery")
  - AND: "Laboratory Test, Result: Hospital Measures-Glucose (result <= 200 mg/dL)" = 2 day(s) starts after end of ("Occurrence A of Procedure, Performed: Hospital Measures-Joint Commission Evidence of a surgical procedure requiring general or neuraxial anesthesia" during "Occurrence A of Procedure, Performed: Cardiac Surgery")
- **Denominator Exceptions** =
  - None

The Population Criteria section further describes how to calculate age using the birth date as compared to a unit of time or in comparison to another data element (e.g., *start before start of* "*Encounter*"). In this example, "all patients who are 18 years or older before the start of the inpatient hospital encounter" defines the initial patient population.

Note that a number of measures require stratification by age groups or by procedures performed. Each stratum is defined as a distinct population. Therefore, in stratified measures, there are multiple populations (e.g., Population 1, Population 2…). Each population contains an initial patient population, a denominator, one or more numerators, and an exclusion section as defined below. Each population is also calculated separately.

Definitions of Population Criteria elements:

1. **Initial Patient Population** – The *initial patient population* refers to all patients to be evaluated by a specific performance eMeasure. These patients share a common set of specified characteristics within a specific measurement set to which a given measure belongs. This initial patient population is present regardless of the measure scoring type; i.e., proportion, ratio and continuous variable measures all have an initial patient population section. Details often include information based upon specific age groups, diagnoses, diagnostic and procedure codes, and enrollment periods.

2. **Denominator** – The *denominator* can be the same as the initial patient population or a subset of the initial patient population, to further constrain the population for the purpose of the eMeasure. Different measures within a set may have the same initial patient population but different denominators. Continuous variable measures do not have a denominator, but instead define a Measure Population (see number 7 below for further definition). For proportion or ratio measures, the verbiage "Equals Initial Patient Population" with no additional criteria indicates the denominator is identical to the initial patient population.

3. **Denominator Exclusions** – Patients who should be removed from the eMeasure population and denominator before determining if numerator criteria are met. Denominator exclusions are used in proportion and ratio measures to help narrow the denominator

4. **Numerator** – Numerators are **used in proportion and ratio measures**. In proportion measures, the numerator criteria are the processes or outcomes expected for each patient, procedure, or other unit of measurement defined in the denominator. In ratio measures, the numerator is related, but not directly derived from the denominator (e.g., a numerator listing the number of central line blood stream infections and a denominator indicating the expected number of infections based on central line usage in a specific time period).

5. **Numerator exclusions** – Numerator Exclusions are **used only in ratio eMeasures** to define instances that should not be included in the numerator data.

6. **Denominator Exceptions** – Denominator exceptions are those conditions that should remove a patient, procedure or unit of measurement from the denominator, only if the numerator criteria are not met. Denominator exceptions allow for adjustment of the calculated score for those providers with higher risk populations. Denominator exceptions are **used only in proportion eMeasures**. They are not appropriate for ratio or continuous variable eMeasures.

   Denominator exceptions allow for the exercise of clinical judgment and should be specifically defined. Generic denominator exception reasons used in proportion eMeasures fall into three general categories:
   - Medical reasons
   - Patient reasons
   - System reasons

7. **Measure Population**- Measure population **is used only in continuous variable eMeasures**. It is a narrative description of the eMeasure population. (e.g., all patients seen in the Emergency Department during the measurement period). For continuous variable eMeasures, include the text "Equals All in Initial *Patient* Population" and then add any specific additional criteria if needed.

8. **Measure Observations**- Measure observations are **used only in continuous variable eMeasures.** They provide the description of how to evaluate performance (e.g., the mean time across all Emergency Department visits during the measurement period from arrival to departure). Measure observations are generally described using a statistical methodology such as: count, median, mean, etc.

9. **Supplemental Data Elements** - Supplemental data elements are those that should be identified for each patient for whom the measure is applicable. Such additional data can be used to evaluate for disparities in care or to risk adjust with the data listed in this section. CMS defines four supplemental

data elements for each measure (payer, ethnicity, race and gender). Additional elements can be defined by each measure developer. See Figure 3 on page 25 for an example of supplemental data elements.

Measure Structure: Example Format of a Proportion eMeasure

eMeasure Title			
eMeasure Identifier (Measure Authoring Tool)		**eMeasure Version number**	1
NQF Number		**GUID**	
Measurement Period	January 1, 20xx through December 31, 20xx		
Measure Steward			
Measure Developer			
Endorsed By	National Quality Forum		
Description			
Copyright			
Disclaimer			
Measure Scoring	Proportion		
Measure Type	Process		
Stratification	None		
Risk Adjustment	None		
Rate Aggregation	None		
Rationale			
Clinical			

Recommendation Statement	
Improvement Notation	Higher score indicates better quality.
Reference	
Definition	
Guidance	
Transmission Format	None
Initial Patient Population	
Denominator	
Denominator Exclusions	
Numerator	
Numerator Exclusions	N/A
Denominator Exceptions	N/A
Measure Population	N/A
Measure Observations	N/A
Supplemental Data Elements	Report "Patient Characteristic: Gender" using "Gender HL7 Value Set (2.16.840.1.113883.1.11.1)"; Report "Patient Characteristic: Race" using "Race CDC Value Set (2.16.840.1.114222.4.11.836)"; Report "Patient Characteristic: Ethnicity" using "Ethnicity CDC Value Set (2.16.840.1.114222.4.11.837)"; Report "Patient Characteristic: Payer" using "Payer Source of Payment Typology Value Set (2.16.840.1.113883.3.221.5)".

Table of Contents

Population criteria

- **Initial Patient Population =**
- **Denominator =**
- **Denominator Exclusions =**
- **Numerator =**
- **Denominator Exceptions =**

Data criteria (QDM Data Elements)

Supplemental Data Elements

Measure set	CLINICAL QUALITY MEASURE SET 2011-2012

Logic Description

1. Logical Operators – AND, OR, NOT are used to connect or create relationships between elements or statements in a measure.
    a. The AND operator means all elements joined by the AND are present for consideration by the measure.
    b. The OR operator means any one element may be present for consideration by the measure.
    c. The NOT operator means that one to many elements are excluded from consideration by the measure. (e.g., Diagnosis, Active: Hospital Measures-Infection diagnosis)

EXAMPLE:

- **Initial Patient Population (from NQF 300) =**
    - AND: "Patient Characteristic: birth date" >= 18 year(s) starts before start of "Occurrence A of Encounter: Hospital Measures - Encounter Inpatient"
    - AND: "Occurrence A of Encounter: Hospital Measures - Encounter Inpatient (discharge datetime)" during "Measurement period"
    - AND: "Occurrence A of Encounter: Hospital Measures - Encounter Inpatient (length of stay <= 120 day(s))

This example taken from Hospital Measure 300, Cardiac Surgery Patients with Controlled 6 A.M. Postoperative Blood Glucose (measure developer, Oklahoma Foundation for Medical Quality), is used to explain the use of AND operator. The AND operator requires that the statement following it is true. In this case:

1. the patient must be at least 18 or older before the first identified inpatient encounter (occurrence A),

2. *and O*ccurrence A of the inpatient encounter must occur during the measurement period,
3. *and* the length of stay for Occurrence A of the inpatient encounter must be less than or equal to 120 days.

EXAMPLE:

- **Denominator (from NQF 300) =**
  - AND: "Initial Patient Population"
  - AND: "Occurrence A of Procedure, Performed: Cardiac Surgery (ordinality: 'Hospital Measures-Principal')" >= 1 minute(s) starts after start of "Occurrence A of Encounter: Hospital Measures - Encounter Inpatient"
  - AND NOT: "Diagnosis, Active: Hospital Measures - Any infection" >= 1 minute(s) starts before start of ("Occurrence A of Procedure, Performed: Cardiac Surgery (incision datetime)" during "Occurrence A of Encounter: Hospital Measures - Encounter Inpatient (admission datetime)")
  - AND NOT: "Diagnosis, Active: Hospital Measures-Infection diagnosis (ordinality: 'Hospital Measures-Principal')" during "Occurrence A of Encounter: Hospital Measures - Encounter Inpatient"
  - AND NOT: "Diagnosis, Active: Hospital Measures - Burn diagnosis (ordinality: 'Hospital Measures-Principal')" during "Occurrence A of Encounter: Hospital Measures - Encounter Inpatient"
  - AND NOT: "Diagnosis, Active: Hospital Measures-Transplant" starts before start of "Occurrence A of Encounter: Hospital Measures - Encounter Inpatient"

In this example taken from Hospital Measure 300, Cardiac Surgery Patients with Controlled 6 A.M. Postoperative Blood Glucose (measure developer, Oklahoma Foundation for Medical Quality), an excerpt from the denominator is shown.

1. The initial patient population is included into the denominator,
2. The index procedure (cardiac surgery) is identified as Occurrence A and the start of this procedure is at least greater than 1 minute after the start of the inpatient encounter,
3. The measure logic is written to exclude (AND NOT) an active principal diagnosis of infection that started before the start of the index procedure cardiac surgery during the inpatient encounter
4. The measure logic is written to exclude (AND NOT) an active principal diagnosis of burn during the inpatient encounter
5. The measure logic is written to exclude (AND NOT) any transplant procedure performed prior to the inpatient encounter (Occurrence A).

2. Data Element Interrelationships – defines specific relationships between two or more data elements (e.g., element A starts before the start of element B) or periods of time (e.g., element A <= 12 months starts before the start of element B). Multiple relationships between data elements are found in each measure. Thirteen relationships (see below) are used to associate one data element with another in the retooled measures as listed below. The timing of some relationships is self-explanatory (e.g., A

during B); others require more definition. When detail about allowable timing is required, the acceptable time difference is listed before the relationship statement (e.g., A <= 10 months *starts before start of* B). If no timing is specified (e.g., A *starts before the start of* B) the statement indicates there is no time limit (e.g., A starts before the start of B means A can occur *any time* before B starts).

- ends after end of
- ends after start of
- ends during
- ends before or during
- ends before start of
- ends concurrent with
- starts after end of
- starts after start of
- starts during
- starts before or during
- starts before start of
- starts concurrent with
- concurrent with

3. Parentheses - Multiple phrases may be joined in one logic statement by a series of relationship types (e.g. starts before the start of) and timeframes (e.g.<=10 months). Parentheses are used to clarify which elements, timing type, and timeframe belong to which phrase, similar to how parentheses are used in mathematical equations. As a result, at the end of one statement you may see one or more parentheses. Careful examination of the statement will reveal the nested phrases and timing relationship to which the parenthesis belongs.

Numerator (Portion from NQF 300) =

- AND: "Laboratory Test, Result: Hospital Measures-Glucose (result <= 200 mg/dL)" = 1 day(s) starts after end of ("Occurrence A of Procedure, Performed: Hospital Measures-Joint Commission Evidence of a surgical procedure requiring general or neuraxial anesthesia" during "Occurrence A of Procedure, Performed: Cardiac Surgery")

In the example provided above:

"Laboratory Test, Result: Hospital Measures-Glucose" is expected to start after the end of "Procedure, Performed: Hospital Measures-Joint Commission Evidence of a surgical procedure requiring general or neuraxial anesthesia" during the "Procedure, Performed: Cardiac Surgery". Parentheses are added to clarify the relationship to the reader of the lab test (A) that must occur after an (Procedure, Performed (B) that must be during the Procedure, Performed (C)), hence in simple mathematical logic:

A starts after (B during C)

4. Indentation - In general, indents are used to show items that are grouped together. The relationship statement at the end of a series of items indented at the same level applies to all elements in the series. In the example below from NQF 300 Denominator Exclusions, the circled portion shows that to be included in that portion of the exclusion, the patient expired after the start of the cardiac surgery but no more than six hours after the end of

the general anesthesia during the inpatient encounter.

- **Denominator Exclusions (from NQF 300)=**
  - AND:
    - OR: "Patient Characteristic: Clinical trial participant" during "Occurrence A of Encounter: Hospital Measures - Encounter Inpatient"
    - OR:
      - AND: "Patient Characteristic: Expired" starts after start of "Occurrence A of Procedure, Performed: Cardiac Surgery (incision datetime)"
      - AND: "Patient Characteristic: Expired" <= 6 hour(s) starts after end of ("Occurrence A of Procedure, Performed: Hospital Measures-Joint Commission Evidence of a surgical procedure requiring general or neuraxial anesthesia" during "Occurrence A of Encounter: Hospital Measures - Encounter Inpatient")

5. Occurrence of an Element - A QDM element can be referenced several times in a measure and represent one to many episodes or occurrences of that element. To differentiate to the reader if each episode of that element is the same as or different from a prior episode referenced elsewhere in the measure, a label of "Occurrence" will be placed before the element. The concept of an occurrence of an element is employed as follows:
   a. If a QDM element is reused multiple times in the measure and the measure means to use the same occurrence of that element, the element will be referred to as Occurrence X of element, i.e. Occurrence A of the element. For example: "Occurrence A of encounter inpatient".
   b. If that same QDM element is used again in the measure and references another specific occurrence of that same element, it is referred to as Occurrence B of the element. For example: "Occurrence B of encounter inpatient".
   c. If that same QDM element is used again in the measure but references no specific occurrence of that same element, it is referred to as Any Occurrence of the element. For example: "Any Occurrence of encounter inpatient".

6. Data Attributes – characteristics of data elements that help specify more precisely what information is required to determine adherence to the measure criteria. Each attribute is defined in the following table:

Attribute	Description / Examples
Admission datetime	Start time for admissions.
Anatomical structure	An anatomical body part (e.g., foot).
Cumulative medication duration	The total number of days of medication is required to comply with the measure criteria.
Date	Date
Discharge datetime	The end time for admissions.
Discharge status	The disposition of the patient at the time of discharge (generally used in the existing measure set to express exclusions, e.g., left against medical advice, expired).
Dose	The amount of therapeutic agent that was indicated to be given during a procedure, diagnostic test, or medication or substance administration.
Duration	No longer in the MAT, see attribute Length of Stay.
Duration from arrival	No longer in the MAT, see attribute Length of Stay.
Environment	The setting in which an action or event takes place (e.g., home, school, work, etc.)
Incision datetime	The time of a surgical incision related to the relevant surgical procedure.
Facility location	The healthcare setting in which an encounter occurs; e.g., ICU, or non-ICU.
Facility location arrival datetime	The time the patient presents to the location. For example, for hospital admissions, the arrival time is the start time assigned to a location in the hospital; the location is an attribute of the encounter. Also in this measure set, for emergency department encounters, the start time is the arrival time.
Facility location departure time	The time the patient departs the location. For example, for hospital admissions, the departure time is the stop time assigned to a location in the hospital; the location is an attribute of the encounter. Also in this measure set, for emergency department encounters, the stop time is the departure time.
Frequency	Relates to frequency of a medication or intervention; generally in hours (ex. Every 4 hours or q4h).
Laterality	The side (left or right) of an anatomical structure.

Length of stay	The difference of the admission datetime and the discharge datetime.
Method	A procedure, technique or way of doing something especially in accordance with a definite plan.
Negation rationale	Negates the preceding data element (ex. Medication, Administration (negation rationale: patient reason) means that the medication administration was not performed due to a patient reason.)
Number	Indicates a whole number or count.
Ordinality	The order in which an element is expected; e.g., "principal" diagnosis or procedure for an inpatient admission.
Patient Preference	Individual's expression of desirability or value of one course of action, outcome, or selection in contrast to others.[1]
Provider Preference	Preference related to experience and education with treatment modalities in direct patient care.
Radiation dosage	The total dosage of radiation received during a procedure or diagnostic test; e.g., fluoroscopy.
Radiation duration	The elapsed time (duration) of radiation exposure during a procedure or diagnostic test; e.g., fluoroscopy.
Reaction	The effect or consequence experienced by a patient as a response to a medication, device, diagnostic study, intervention, laboratory test, procedure, or non-medication substance.
Reason	The documented purpose for performing an action (or for not performing an action).
Refills	A component of a medication prescription authorizing the pharmacy dispensing the medication to replenish the supply of medication ordered for a specified number of re-dispensing events (refills). Each refill includes the same instructions as the original dispensing event.
Related to	Pertaining to another subject or issue. Commonly used with the categories of *care goal and patient education*: Example: *Education, performed (related to: diabetic foot care, receiver: patient)*.
Removal datetime	The time a device is removed (also the end time for the device).
Result	The findings determined by a laboratory test, diagnostic test, procedure or physical examination.
Route	The method by which a medication or substance is administered; e.g., IV, IM or orally.

[1] http://www.nlm.nih.gov/cgi/mesh/2012/MB_cgi?mode=&term=Patient+Preference&field=entry

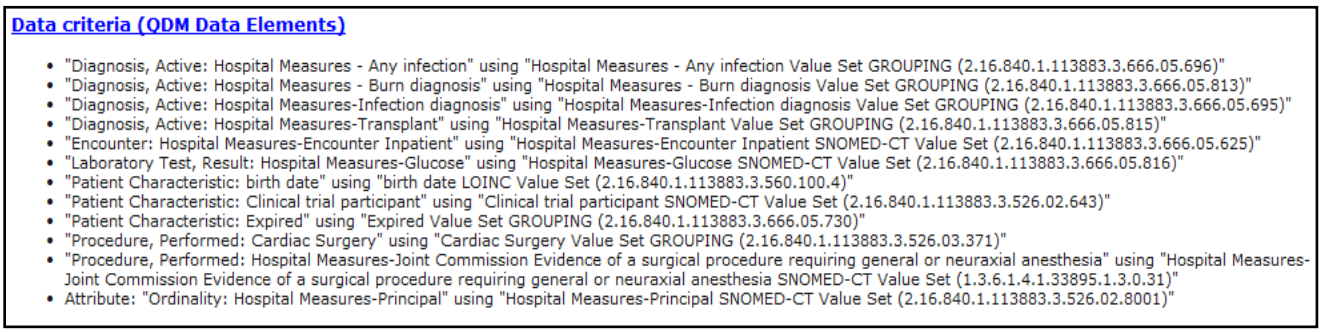
6	Severity	The intensity of illness required to be criteria for the data element; the severity attribute is always followed by a specific definition (e.g., persistent, moderate, or severe).
	Start datetime	The time the related data element starts.
	Status	The state of a data element, (e.g., final report, on hold (medication), discontinued (medication), discharged).
	Stop datetime	The time the related data element ends.
	Time	*Time* refers to the occurrence required for a specific QDM element. Each element has an initiation time and an ending time. In some cases, the initiation and the end are the same, and there is no intervening interval.

7. Additional Logic Relationships:
   a. counts of events
   b. first and last occurrences of an event, and
   c. maximum or minimum results.

Data Criteria (QDM Data Elements)

This section covers QDM data element requirements from the population criteria. Each element is composed of a QDM data type ("Diagnostic study performed," "Procedure performed," etc.) and refers to a value set. Each value set can be identified by its name. For the individual list of codes that are contained in this value set, please refer to the eMeasure value set spreadsheet (see below).

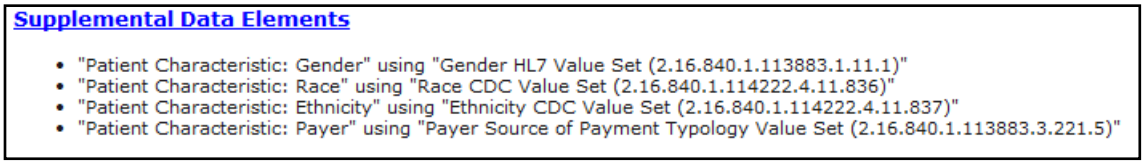
Examples: 1) A QDM data element of QDM data type "Diagnostic study, **performed**" refers to a value set with a standard category of "Diagnostic study." 2) QDM data element of QDM data type "Procedure, **performed**" refers to a value set with a standard category of "Procedure." The QDM data type is used to identify the location of the electronic information for the measure. The value set identifies what codes should be searched within that location.



Data criteria (QDM Data Elements)

- "Diagnosis, Active: Hospital Measures - Any infection" using "Hospital Measures - Any infection Value Set GROUPING (2.16.840.1.113883.3.666.05.696)"
- "Diagnosis, Active: Hospital Measures - Burn diagnosis" using "Hospital Measures - Burn diagnosis Value Set GROUPING (2.16.840.1.113883.3.666.05.813)"
- "Diagnosis, Active: Hospital Measures-Infection diagnosis" using "Hospital Measures-Infection diagnosis Value Set GROUPING (2.16.840.1.113883.3.666.05.695)"
- "Diagnosis, Active: Hospital Measures-Transplant" using "Hospital Measures-Transplant Value Set GROUPING (2.16.840.1.113883.3.666.05.815)"
- "Encounter: Hospital Measures-Encounter Inpatient" using "Hospital Measures-Encounter Inpatient SNOMED-CT Value Set (2.16.840.1.113883.3.666.05.625)"
- "Laboratory Test, Result: Hospital Measures-Glucose" using "Hospital Measures-Glucose SNOMED-CT Value Set (2.16.840.1.113883.3.666.05.816)"
- "Patient Characteristic: birth date" using "birth date LOINC Value Set (2.16.840.1.113883.3.560.100.4)"
- "Patient Characteristic: Clinical trial participant" using "Clinical trial participant SNOMED-CT Value Set (2.16.840.1.113883.3.526.02.643)"
- "Patient Characteristic: Expired" using "Expired Value Set GROUPING (2.16.840.1.113883.3.666.05.730)"
- "Procedure, Performed: Cardiac Surgery" using "Cardiac Surgery Value Set GROUPING (2.16.840.1.113883.3.526.03.371)"
- "Procedure, Performed: Hospital Measures-Joint Commission Evidence of a surgical procedure requiring general or neuraxial anesthesia" using "Hospital Measures-Joint Commission Evidence of a surgical procedure requiring general or neuraxial anesthesia SNOMED-CT Value Set (1.3.6.1.4.1.33895.1.3.0.31)"
- Attribute: "Ordinality: Hospital Measures-Principal" using "Hospital Measures-Principal SNOMED-CT Value Set (2.16.840.1.113883.3.526.02.8001)"

Figure 3. Sample from eMeasure data criteria section. The data elements and value set identifiers (OIDs) are listed for Cardiac Surgery Patients With Controlled 6 A.M. Postoperative Blood Glucose (NQF 300) (measure developer, Oklahoma Foundation for Medical Quality)



Supplemental Data Elements

- "Patient Characteristic: Gender" using "Gender HL7 Value Set (2.16.840.1.113883.1.11.1)"
- "Patient Characteristic: Race" using "Race CDC Value Set (2.16.840.1.114222.4.11.836)"
- "Patient Characteristic: Ethnicity" using "Ethnicity CDC Value Set (2.16.840.1.114222.4.11.837)"
- "Patient Characteristic: Payer" using "Payer Source of Payment Typology Value Set (2.16.840.1.113883.3.221.5)"

Figure 4. Sample from eMeasure Supplemental Data elements section. The data elements and value set identifiers (OIDs) are listed for Cardiac Surgery Patients With Controlled 6 A.M. Postoperative Blood Glucose (NQF 300) (measure developer, Oklahoma Foundation for Medical Quality)

eMeasure value sets (example: NQF_nnnn_Value Sets _Updated_Dec_2011.xls)

Basics

All codes for eMeasures are identified in a spreadsheet for that measure. The spreadsheet also contains 8 columns; each with information about the individual value sets. Table 1, below, provides a description of the information in each column.

Groupings

Groupings are value sets (value sets) that have nested within them other value sets. Groupings are used for two reasons:

1. To combine value sets for the same concept, each in different taxonomies (e.g., ICD-9-CM, ICD-10, SNOMED-CT)
2. To combine objects that can be used independently but for the specific data element are used together (e.g., encounters may include 'encounter ambulatory,' encounters inpatient,' encounters behavioral health,' may each be used individually for some elements of a measure wile in other measures any encounters 9in any of those encounters apply). This type of grouping is a convenience grouping to avoid the need to create an additional value set (e.g., "all encounters") or to provide more lengthy logic descriptions.

Table 1. eMeasure Value Set Spreadsheet Column Titles and Descriptions

Column Name	Description
Value Set Developer	The measure steward; the organization responsible for the measure content and maintenance
Value Set OID	A unique identification number for the value set
Value Set Name	A descriptive name for standard concept, most often defined by a specific value set – the standard concept *plus* the QDM data type constitute the QDM data element *(e.g., diabetes, inhaled corticosteroids, pregnancy test)*
QDM Category	Descriptive name for the QDM data type with which the standard element is used
Code System	The medical coding system, or taxonomy, used to describe the standard concept *(e.g., ICD-9, RxNorm, LOINC).* In some cases the value set (value set) is a 'superset,' in that it is a combination of other value sets (value sets) in the spreadsheet. These 'supersets' are called *GROUPINGs*. The taxonomies used are specified with the individual value sets listed in the grouping.
Code System Version	The version of the coding system, or taxonomy used to describe the standard concept
Code	The code included within the value set (value set). If the standard taxonomy column indicates *GROUPING*, the standard OID (identifier) of each individual value set in the *GROUPING* is listed in this section rather than individual codes. *GROUPINGs* that combine value sets for the same concept in different taxonomies display a standard OID for each of the respective concepts. Some concepts could not be expressed in certain taxonomies, or the measure developer preferred to limit the taxonomies provided. Therefore, all *GROUPINGs* do not include all taxonomies expected.
Descriptor	The text description for each code. Note that descriptors are provided for all codes except those derived from Current Procedural Terminology (CPT®). CPT® contained in the Measure specifications is copyright 2004- 2011 American Medical Association.

Appendix A: Example Formatting for a Continuous Variable eMeasure

eMeasure Title			
eMeasure Identifier (Measure Authoring Tool)		**eMeasure Version number**	1
NQF Number		**GUID**	
Measurement Period	January 1, 20xx through December 31, 20xx		
Measure Steward			
Measure Developer			
Endorsed By	National Quality Forum		
Description			
Copyright			
Disclaimer			
Measure Scoring	Continuous Variable		
Measure Type	Outcome		
Stratification			
Risk Adjustment			
Rate Aggregation			
Rationale			
Clinical Recommendation Statement			
Improvement Notation			

Reference	
Definition	
Guidance	
Transmission Format	None
Initial Patient Population	N/A
Denominator	N/A
Denominator Exclusions	N/A
Numerator	N/A
Numerator Exclusions	N/A
Denominator Exceptions	N/A
Measure Population	
Measure Observations	
Supplemental Data Elements	Report "Patient Characteristic: Gender" using "Gender HL7 Value Set (2.16.840.1.113883.1.11.1)"; Report "Patient Characteristic: Race" using "Race CDC Value Set (2.16.840.1.114222.4.11.836)"; Report "Patient Characteristic: Ethnicity" using "Ethnicity CDC Value Set (2.16.840.1.114222.4.11.837)"; Report "Patient Characteristic: Payer" using "Payer Source of Payment Typology Value Set (2.16.840.1.113883.3.221.5)".

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Population criteria

- **Initial Patient Population =**
- **Measure Population =**

Measure observations

Data criteria (QDM Data Elements)

Supplemental Data Elements

Measure set	CLINICAL QUALITY MEASURE SET 2011-2012

Appendix B: Example Formatting for a Ratio eMeasure

eMeasure Title			
eMeasure Identifier (Measure Authoring Tool)		**eMeasure Version number**	1
NQF Number		**GUID**	
Measurement Period	January 1, 20xx through December 31, 20xx		
Measure Steward			
Measure Developer			
Endorsed By	National Quality Forum		
Description			
Copyright			
Disclaimer			
Measure Scoring	Ratio		
Measure Type	Outcome		
Stratification			

Risk Adjustment	
Rate Aggregation	
Rationale	
Clinical Recommendation Statement	
Improvement Notation	
Reference	
Definition	
Guidance	
Transmission Format	None
Initial Patient Population	
Denominator	
Denominator Exclusions	
Numerator	
Numerator Exclusions	
Denominator Exceptions	N/A
Measure Population	N/A
Measure Observations	N/A
Supplemental Data Elements	Report "Patient Characteristic: Gender" using "Gender HL7 Value Set (2.16.840.1.113883.1.11.1)"; Report "Patient Characteristic: Race" using "Race CDC Value Set (2.16.840.1.114222.4.11.836)"; Report "Patient Characteristic: Ethnicity" using "Ethnicity CDC Value Set (2.16.840.1.114222.4.11.837)"; Report "Patient Characteristic: Payer" using "Payer Source of Payment Typology Value Set (2.16.840.1.113883.3.221.5)".

Table of Contents

Population criteria

- **Initial Patient Population =**
- **Denominator =**
  - **Denominator Observations =**
- **Denominator Exclusions =**
  -
- **Numerator =**
  - **Numerator Observations =**
- **Numerator Exclusions =**

Stratification

- **Reporting Stratum 1 =**
- **Reporting Stratum 2 =**
- Etc.

Data criteria (QDM Data Elements)

Supplemental Data Elements

Measure set	CLINICAL QUALITY MEASURE SET 2011-2012