Quality Data Model (QDM) Style Guide

QDM (version MAT) for Meaningful Use Stage 2

Quality Data Model (QDM) Style Guide for EHR Feasibility

Introduction to the QDM Style Guide

The QDM Style Guide provides guidance as to which QDM categories, datatypes, and attributes can be found in a structured form in electronic health records (EHRs) and which may require additional effort for structured representation within EHRs. This effort includes adjustment of the electronic user interface for structured data capture, interface from non EHR systems, natural language processing or other means to translate point of care data into eMeasures[1] while preserving semantic meaning. The Style Guide is based on Meaningful Use Stage 2 quality measures and EHRs certified for the 2014 EHR Certification Program, by the Office of the National Coordinator for Health IT (ONC).

Intended Use

The QDM Style Guide is intended to help identify datatypes and attributes readily found in 2014 certified EHRs when creating eMeasures.

Structure of Style Guide

The QDM Style Guide is presented in a table format. For each QDM Category, the related standards recommended by the Federal Advisory Act (FACA) Health IT Standards Committee and those incorporated in the Final 2014 Edition EHR Certification Criteria[2] are provided. The Guide also provides guidance as to what might be expected as structured data available in EHRs that adhere to the final 2014 certification criteria and what data criteria may require additional effort within EHRs.

[1] The eMeasure is the electronic format for quality measures using the QDM and the Healthcare Quality Measure Format (HQMF), an HL7standard.

[2] Available at: http://www.gpo.gov/fdsys/pkg/FR-2012-03-07/pdf/2012-4430.pdf.

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Column Header Definitions:

1. **QDM Category** refers to a particular group of information that can be addressed in a quality measure. **Standards** list the ***Vocabulary (Code system)*** recommendations provided by the HITSC with modifications as included in the Final 2014 Edition EHR Certification Criteria and ***ONC 2014 EHR Certification Standard (final)*** section that discusses the information category.
2. **Feasible** includes those d*atatypes* (context of use) and attributes that should be present in structured form in an EHR meeting final 2014 certification requirements.
3. **Feasible but require additional effort, e.g., workflow changes** lists datatype (or contexts of use) and attributes that *cannot* be expected to be present in an EHR meeting final 2014 certification requirements. Some EHRs may be able to provide the level of detail required by these Datatype or attributes. Many will require a change to clinician workflow to document in structured format data currently captured external to the EHR or in unstructured text, or to document information that is not part of a standard workflow. Such data may be available by *post-documentation* methods such as natural language processing and/or abstraction of some data components. To limit the potential extra burden on the part of clinicians, such elements should not be used in measures designed for data captured exclusively by EHRs without testing to be certain of data availability. In summary, this second column of feasibility issues require one of the following:
   a. entry by clinicians of structured data where current practice addresses unstructured data, OR
   b. entry by the clinician that is not currently documented, or request of the clinician to evaluate the output of other post-documentation methods such as natural language processing and/or abstraction of some data components.

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QDM Category	Standards	Feasible*	Feasible but require additional effort for capture through the EHR (workflow changes)**
This version of the QDM does not have a specific allergy/ adverse event category	**Vocabulary (Code system):** SNOMED-CT to describe the allergic reaction RxNorm for Medications that are the causative agents SNOMED-CT for non-medication substances that are causative agents **ONC 2014 EHR Certification Standard (final):** 170.314(a)(2) – Drug-drug, drug-allergy interaction checks § 170.314(a)(7) – Medication allergy list	**Datatype:** Device, Adverse Event Device, Allergy Diagnostic Study, Adverse Event Diagnostic Study, Intolerance Intervention, Adverse Event Intervention, Intolerance Laboratory Test, Adverse Event Laboratory Test, Intolerance Medication, Adverse Event Medication, Allergy Medication, Intolerance Procedure, Adverse Event Procedure, Intolerance **Attributes:** *Reaction* *Start datetime* *Stop datetime*	**Datatype:** Substance, Adverse Event Substance, Allergy Substance, Intolerance **Attributes:** *Negation rationale* *Patient preference* *Provider preference*

Care Goal	**Vocabulary (Code system):** Dependent on the type of information expressed as the goal. E.g.: a) Improvement in Body Mass Index (BMI) uses the vocabulary for the physical exam element (LOINC) and numerical or SNOMED-CT for the result b) Patient understanding of education provided uses SNOMED-CT **ONC 2014 EHR Certification Standard (final):** § 170.205(a)(3) – Consolidated CDA	**Datatype:** Care Goal **Attributes:** *Related to* *Start datetime* *Stop datetime*	**Datatype:** None **Attributes:** *Negation rationale* *Patient preference* *Provider preference*

Individual Characteristic	**Vocabulary (Code system):** Varies by characteristic: • ISO 639-2 constrained to elements in ISO 639-1 for Patient's Preferred Language (Mapping maintained by Library of Congress: http://www.loc.gov/standards/iso639-2/php/code_list.php) • CDC PHIN-VADS HL7 for Administrative Gender • CDC PHIN-VADS HL7 Race and Ethnicity (use broadest range of code sets within CDC listed for Race, Ethnicity, or both combined) – Identical to OMB Race and Ethnicity values • LOINC-For assessment instruments, (including tobacco use) • SNOMED-CT-Appropriate Responses to Instruments (including patient preferences and behaviors) • Payer Typology of the Public Health Data Standards Consortium for characterizing payers **ONC 2014 EHR Certification Standard (final):** • § 170.314(a)(3) – Demographics • § 170.207(j) – ISO 639-1:2002 (preferred language) • No standard specified –Patient Sex • § 170.207(f) OMB standards for the classification of federal data on race and ethnicity • § 170.207(l) – smoking status types • § 170.314(a)(11) – smoking status • No standard specified – Patient preferences and behaviors • No standard specified – Payer	**Datatype:** Patient characteristic Patient characteristic birth date Patient characteristic expired Patient characteristic clinical trial participant Patient characteristic payer Patient characteristic sex Patient characteristic ethnicity Patient characteristic race **Attributes:** *Start datetime* *Stop datetime* *Time (for expired)* *Date (for expired)*	**Datatype:** Provider characteristic **Attributes:** *Negation rationale* *Reason* *Start datetime* *Stop datetime*

Communication	**Vocabulary (Code system):** SNOMED-CT **ONC 2014 EHR Certification Standard (final):** § 170.314(d)(1) –Authentication, access control, and authorization – Patient preferences § 170.314(a)(15) – Ambulatory setting only – patient reminders § 170.314(b)(1) – Transitions of care – receive, display, and incorporate transition of care/ referral summaries (level 2 effort) § 170.314(b)(2) – Transitions of care -Create and transmit transition of care/ referral summaries (level 3 effort) § 170.205(a)(3) – Consolidated CDA § 170.202(a)(1) – Applicability Statement for Secure Health Transport § 170.202(a)(2) –XDR and XDM for Direct Messaging § 170.202(a)(3) – SOAP Based Secure Transport RTM version 1.0	**Datatype:** None **Attributes:** None	**Datatype:** Communication: From Patient to Provider Communication: From Provider to Patient **Attributes:** *Negation rationale* *Start datetime* *Stop datetime* *Patient preference* *Provider preference*
Condition/ Diagnosis/ Problem	**Vocabulary (Code system):** SNOMED-CT **ONC 2014 EHR Certification Standard (final):** § 170.314(a)(5) – Problem List § 170.314(a)(13) – Family health history § 170.207(m) – Encounter diagnoses [ICD-10 (ICD-10-CM and ICD-10-PCS, respectively)]	**Datatype:** Diagnosis, Active Diagnosis, Family History Diagnosis, Inactive Diagnosis, Resolved **Attributes:** *laterality* *ordinality* *severity* *start datetime* *status* *stop datetime*	**Datatype:** *None* **Attributes:** *negation rationale* *patient preference* *provider preference*

Device	**Vocabulary (Code system):** SNOMED-CT **ONC 2014 EHR Certification Standard (final): Standard** § 170.210(e) – Record actions related to electronic health information, audit log status, and encryption of end user devices – for purposes of reporting safety events No standard directly related to device use	**Datatype:** Device, Adverse Event Device, Allergy Device, Applied Device, Intolerance Device, Order **Attributes:** *Anatomical structure* *Removal datetime* *Reason* *reaction* *start datetime* *stop datetime*	**Datatype:** Device, Recommended **Attributes:** *negation rationale* *patient preference* *provider preference*
Diagnostic Study (non-laboratory)	**Vocabulary (Code system):** LOINC – study name SNOMED-CT – appropriate findings UCUM – specific units of measure **ONC 2014 EHR Certification Standard (final): Standard** 170.314(a)(12) – Imaging [Level 2 Effort]	**Datatype:** Diagnostic Study, Adverse Event Diagnostic Study, Intolerance Diagnostic Study, Order Diagnostic Study, Performed Diagnostic Study, Result **Attributes:** *method* *reason* *result* *status* *start datetime* *stop datetime*	**Datatype:** Diagnostic Study, Recommended **Attributes:** *negation rationale* *patient preference* *provider preference* *radiation dosage* *radiation duration*

Intervention	**Vocabulary (Code system):** LOINC – for interactions that produce an assessment or measurable results SNOMED-CT – for appropriate results and interventions that do not produce measurable results (e.g., counseling) **ONC 2014 EHR Certification Standard (final): Standard** 170.314(a)(15) – Patient-specific education resources [At a minimum, each one of the data elements included in the patient's: problem list; medication list; and laboratory tests and values/results; and the standard specified at § 170.204(b)(1)]	**Datatype:** Intervention, Adverse Event Intervention, Intolerance Intervention, Order Intervention, Performed Intervention, Result **Attributes:** *method* *reason* *result* *reaction* *start datetime* *stop datetime*	**Datatype:** Intervention, Recommended **Attributes:** *negation rationale* *patient preference* *provider preference*
Encounter	**Vocabulary (Code system):** SNOMED-CT **ONC 2014 EHR Certification Standard (final): Standard** No specific standard to identify an encounter. Standards are identified for Encounter diagnoses (See Condition / Diagnosis / Problem section)	**Datatype:** Encounter, Active Encounter, Performed Encounter, Order **Attributes:** *admission datetime* *discharge datetime* *facility location arrival datetime* *facility location departure datetime* *length of stay* *Discharge status* *Facility location*	**Datatype:** Encounter, Recommended **Attributes:** *Negation rationale* *Reason* *Patient preference* *Provider Preference* *Frequency (for Home Care Use)*

Care Experience	**Vocabulary (Code system):** LOINC for assessment instruments SNOMED-CT for appropriate responses **ONC 2014 EHR Certification Standard (final): Standard** No specific standard to identify experience	**Datatype:** *None* **Attributes:** *None*	**Datatype:** Provider Care Experience Patient Care Experience **Attributes:** *negation rationale* *patient preference* *provider preference* *start datetime* *stop datetime*
Functional Status	**Vocabulary (Code system):** ICF (International Classification of Functioning, Disability and Health) for categories of function LOINC for assessment instruments SNOMED-CT for appropriate responses **ONC 2014 EHR Certification Standard (final): Standard** No specific standard to identify functional status	**Datatype:** Functional Status, Performed (*Note: Limited to Calculated Form and use of validated instruments registered in LOINC*) Functional Status, Result Functional Status, Order **Attributes:** *Result* *method* *reason* *start datetime* *stop datetime*	**Datatype:** Functional Status, Performed (*Note: for functional status performed other than Calculated Forms and use of validated instruments registered in LOINC*) Functional Status, Recommended **Attributes:** *negation rationale* *patient preference* *provider preference*

Laboratory Test	**Vocabulary (Code system):** LOINC for the test name and its results SNOMED-CT for applicable result values UCUM for units of measure **ONC 2014 EHR Certification Standard (final): Standard** § 170.314(b)(5) –Incorporate laboratory tests and values/results § 170.314(f)(4) – Transmission of reportable laboratory tests and values/ results	**Datatype:** Laboratory Test, Adverse Event Laboratory Test, Intolerance Laboratory Test, Order Laboratory Test, Performed Laboratory Test, Result **Attributes:** *Method* *Start datetime* *Status* Stop datetime reaction reason Result	**Datatype:** Laboratory Test, Recommended **Attributes:** *Negation rationale* *Patient preference* *Provider preference* Laterality Facility location Cardinality (1,2,3...) Alerted

Medication	**Vocabulary (Code system):** RxNorm for medications CVX for vaccinations (acknowledging that vaccinations are treated as medications in some contexts and as a separate category in others) **ONC 2014 EHR Certification Standard (final): Standard** § 170.299 – by reference includes medications § 170.207(h) – Medications for transitions of care and ambulatory clinical summaries § 170.314(a)(6) – Medication list § 170.314(a)(16) – Electronic medication administration record § 170.314(b)(3) – Electronic prescribing § 170.314(b)(4) – Clinical record reconciliation (covers Medication List, Allergy List and Problem List)	**Datatype:** Medication, Active Medication, Administered Medication, Adverse Event Medication, Allergy Medication, Dispensed Medication, Discharge Medication, Intolerance Medication, Order **Attributes:** *Cumulative medication duration* *Date* *Dose* *Frequency* *Method* *Number* *Reason* *Reaction* *Refills* *Route* *Time* Start datetime Stop datetime	**Datatype:** None **Attributes:** *Infusion duration* *Negation rationale* *Patient preference* *Provider preference*

Physical Exam	**Vocabulary (Code system):** LOINC for assessment instruments and individual examination elements SNOMED-CT for appropriate responses **ONC 2014 EHR Certification Standard (final): Standard** § 170.314(a)(4) – Vital signs, body mass index, and growth charts	**Datatype:** Physical Exam, Performed **Attributes:** *Result* *(limited to vital signs that are captured as structured data and also data that are captured in routine inpatient assessments)* *Start datetime* *Stop datetime*	**Datatype:** Physical Exam , Finding (*In addition to vital signs that are captured as structured data)* Physical Exam, Order Physical Exam, Recommended **Attributes:** *Anatomical structure* *Facility location* *Negation rationale* *Patient preference* *Provider preference* *Reason*
Procedure	**Vocabulary (Code system):** SNOMED-CT **ONC 2014 EHR Certification Standard (final): Standard** § 170.207(b)(2) – HCPCS and CPT-4 OR § 170.207(b)(3) – ICD-10 PCS	**Datatype:** Procedure, Adverse Event Procedure, Intolerance Procedure, Order Procedure, Performed Procedure, Result **Attributes:** *Incision datetime* *Reason* *Reaction* *Result* *Start datetime* *Stop datetime*	**Datatype:** Procedure, Recommended **Attributes:** *Method* *Ordinality* *negation rationale* *patient preference* *provider preference* *radiation dosage* *radiation duration* *Status*

Risk Category/ Assessment	**Vocabulary (Code system):** LOINC for assessment instruments SNOMED-CT for appropriate responses **ONC 2014 EHR Certification Standard (final):** **Standard** No specific standard to identify risk category/ assessment	**Datatype:** Risk category assessment (*Note: Requires Calculated Form Capability and use of validated instruments registered in LOINC*) **Attributes:** *start datetime* *stop datetime* *result* Result Date time	**Datatype:** None **Attributes:** *negation rationale* *patient preference* *provider preference*
Substance	**Vocabulary (Code system):** SNOMED-CT **ONC 2014 EHR Certification Standard (final):** **Standard** Non-medication substances are not referenced	**Datatype:** Substance, Administered Substance, Adverse Event Substance, Allergy Substance, Intolerance Substance, Order **Attributes** *Date* *Reaction* *Refills* *Route* *Start datetime* *Stop datetime* *Time*	**Datatype:** Substance, Recommended **Attributes** *Dose* *Frequency* *Method* *Negation rationale* *Number* *Patient preference* *Provider Preference* *Reason* *Start datetime* *Stop datetime*

Symptom	**Vocabulary (Code system):** SNOMED-CT **ONC 2014 EHR Certification Standard (final): Standard** Symptoms are not referenced	**Datatype:** *None* **Attributes:** *None*	**Datatype:** Symptom, Active Symptom, Assessed Symptom, Inactive Symptom, Resolved -**Attributes:** *Environment* *Negation rationale* *Patient preference* *Provider preference* *Ordinality (principal, secondary, ...)* *Severity* *Start datetime* *Status* *Stop datetime*
System Characteristic	**Vocabulary (Code system):** LOINC for healthcare resources (staffing) HL7 for EHR functions SNOMED-CT for equipment **ONC 2014 EHR Certification Standard (final): Standard** System characteristics are not referenced	**Datatype:** None **Attributes:** *None*	**Datatype:** System characteristic **Attributes:** *Negation rationale* *Start datetime* *Stop datetime*

Transfer of care	**Vocabulary (Code system):** SNOMED-CT **ONC 2014 EHR Certification Standard (final): Standard** § 170.205(a)(3) references information requirements for transitions of care but the process of transition is not referenced § 170.314(b)(1) – Transitions of care – receive, display, and incorporate transition of care/ referral summaries (level 2 effort) § 170.314(b)(2) – Transitions of care -Create and transmit transition of care/ referral summaries (level 3 effort)	**Datatype:** Transfer from Transfer to **Attributes:** *Start datetime* *Stop datetime*	**Datatype:** *None* **Attributes:** *Negation rationale* *Patient preference* *Provider preference*

* **Data that should be present in structured form in a Meaningful Use 2014 Certified HER**

** **Feasible but require additional effort, such as the following workflow changes**:

a. entry by clinicians of structured data where current practice addresses unstructured data, OR
b. entry by the clinician that is not currently documented, or request of the clinician to evaluate the output of other post-documentation methods such as natural language processing and/or abstraction of some data components.