



**DENTAL
QUALITY
ALLIANCE**

**Pediatric Oral Healthcare
Exploring the Feasibility for E-Measures
December 2012**

TABLE OF CONTENTS

INTRODUCTION	3
CURRENT DATA INFRASTRUCTURE AND VOCABULARY STANDARDS IN DENTISTRY	4
NEEDS TO IMPLEMENT STANDARDIZED E-MEASURES IN DENTISTRY	5
RECOMMENDATIONS	6
DQA STARTER SET OF PEDIATRIC MEASURES: ADAPTED FOR USE WITH HEALTH RECORDS	8
DQA STARTER SET OF PEDIATRIC MEASURES: NOT ADAPTED FOR USE WITH HEALTH RECORDS	9
MOVING TOWARDS OUTCOME MEASURES WITH DATA FROM HEALTH RECORDS	10
IMPLEMENTATION OF DQA PEDIATRIC ORAL HEALTH MEASURE SET IN HEALTH RECORDS	12
LEVEL OF AGGREGATION: PLAN/ PROGRAM	12
LEVEL OF AGGREGATION: PRACTICE	12
APPENDIX 1: THE QUALITY DATA MODEL	13
COMPONENTS OF THE QDM	13
QDM ELEMENTS USED IN THIS MEASURE SET	13
APPENDIX 2: PROPOSED SPECIFICATIONS	14
GENERAL NOTES ON PROPOSED SPECIFICATIONS	14
EXCLUSIONS AND EXCEPTIONS.....	14
E-MEASURE: ORAL EVALUATION.....	16
E-MEASURE: PREVENTION: FLUORIDE OR SEALANTS	17
E-MEASURE: PREVENTION: SEALANTS FOR 6-9 YEAR OLDS	19
E-MEASURE: PREVENTION: SEALANTS FOR 10-14 YEAR OLDS	21
E-MEASURE: PREVENTION: TOPICAL FLUORIDE	23
E-MEASURE: CARE CONTINUITY	25
E-MEASURE: DENTAL CARIES	26
APPENDIX 3: APPLICABLE VALUE SETS FOR MEASURE SET	27
ACKNOWLEDGEMENTS	31

Introduction

A recent report by the Institute of Medicine (IOM)¹ envisions a “Continuously learning health system” with one of its key characteristics being the ability to capture data from each patient at the initial point of care and ongoing thereafter. The report notes that “..., in a true learning system, information is developed as a natural by-product of the care process; knowledge on effectiveness, quality, and value is gained from each patient experience. Increased use of data collected and measured at the point of care, of clinical data sets, and of emerging research techniques in conjunction with traditional research methods, can help ensure that research informs the real-world settings of clinical practice.” Referenced within the IOM report are projections for 90 percent of office-based physicians to have access to fully operational electronic health records by 2019, up from 34 percent in 2011. The report does not specify whether these projections are for systems that will be specifically designed to capture data in a common format that can be used across multiple platforms.

While the penetration of EHR's within dentistry remains unclear, the Electronic Health Record (EHR) Incentive program launched by the Centers for Medicare and Medicaid Services (CMS) has helped spark great interest in implementation of the EHR. Requirements for reporting clinical quality measures to receive incentives have further promoted interest in developing measures based on standardized electronic formats using data mined from an EHR, i.e., e-Measures. CMS along with the Office of the National Coordinator for Health IT (ONC) has included two oral health clinical quality measures² within the Stage 2 requirements for the EHR Incentive program. CMS and ONC are currently specifying these measures in collaboration with the National Committee for Quality Assurance (NCQA). Many dental schools, group practices, and Federally Qualified Health Centers (FQHC) are engaged in tracking quality measures for their specific institutions, with the data being aggregated within each institution's database and reports being generated on demand. .

Recognizing this interest and the need for **standardized quality measures** based on health records, the Dental Quality Alliance (DQA) commissioned this report to explore the feasibility of adapting its Starter Set of administrative (using claims/eligibility data) measures for pediatric oral health into e-Measures. The objective of this effort was to:

¹ Best Care at Lower Cost: The Path to Continuously Learning Health Care in America, Institute of Medicine, September 2012.
<http://www.iom.edu/Reports>

² Percentage of children ages 0-20, who have had tooth decay or cavities during the measurement period and percentage of children, age 0-20 years, who received a fluoride varnish application during the measurement period.

- Develop preliminary e-specifications for the DQA Starter Set of Pediatric Oral Health Measures³
- Identify vocabulary standards and data infrastructure that exist to support these e-Measures
- Identify needs to implement standardized e-Measures in dentistry.

As the use of EHR's evolves in dentistry, the quality measurement enterprise must be able to provide input regarding its needs in order to establish a robust system for measurement in the future.

Current Data Infrastructure and Vocabulary Standards in Dentistry

The practice of dentistry occurs mostly in solo or small group practices.⁴ In general, these office settings do not support routine manual chart auditing for quality and performance measurement. While a vast majority of dental offices are using electronic patient management systems⁵, these are largely used for recording completed procedures and submission of electronic claims. As mentioned, there are some institutions, such as large corporate practices or FQHC's able to compile data from health records. The data is collated within local databases which are manually queried to compute the measures. Through the Consortium for Oral Health Research and Informatics or COHRI initiative, four dental schools have come together to address this need for populations treated at these schools.⁶ .

Infrastructure to support end-to-end quality measurement and reporting must support structured data capture, data export, data analysis, and reporting capabilities. To address some of these issues, and to cater to the unique needs of an electronic dental record, the American Dental Association Standards Committee on Dental Informatics (ADA- SCDI) is in the process of developing a national standard to define functional requirements.. Assessment of population health outcomes from EHR data poses additional challenges such as the need for interoperability between systems along with Health Information Exchanges (HIE) to gather and report outcomes..

In terms of standardized vocabularies, the Code on Dental Terminology (CDT) has been the recognized standard to capture information on dental procedures and services. This code set is also recognized as the Level II HCPCS Code and was adopted by the secretary of the Department of Health and Human Services

³ DQA Pediatric Oral Health Performance Measure Set. Accessed at www.ada.org/resources/research/dental-quality-alliance/dqa-dental-quality-measures

⁴ American Dental Association, Survey Center. 2010 survey of dental practice. Chicago: American Dental Association, 2011.

⁵ American Dental Association, Survey Center. 2006 Technology Survey. Chicago: American Dental Association, 2011.

⁶ A recent effort is the formation of the Consortium for Oral Health Related Informatics (COHRI). The purpose of COHRI is to establish an Oral Health Data Repository that can accept and integrate data from disparate dental data sources, and allow end users to explore and extract information to support their specific research or decision making needs. This repository can be a powerful tool for quality measurement. <https://sbmi.uth.edu/uth-big/projects/cohri.htm>

(HHS) for the Health Insurance Portability and Accountability Act (HIPAA), P.L. 104-191. Until recent years, standardized diagnostic terminologies had not been adopted; diagnostic terminologies still remain to be implemented by the majority of general practitioners. Dental schools use proprietary diagnostic terminologies (e.g., EZ codes 2012 Dental Diagnostic Terminology⁷) to capture diagnostic information. Some dental diagnostic terms also exist within the International Classification of Diseases (ICD) Code set. Recently, the Systematized Nomenclature of Dentistry (SNODENT) was adopted as a subset of Systematized Nomenclature of Medicine (SNOMED-CT) to expand the dental terminology within SNOMED and provide for a standard set of diagnostic codes in dentistry.⁸ Specific to the Meaningful Use EHR Incentive program, the Secretary of the Department of Health and Human Services (HHS) adopted certification criteria that establishes the technical capabilities and specifies the related standards and implementation specifications that Certified EHR Technology will need to include. These criteria recognize SNOMED CT® as the required vocabulary for calculation of clinical quality measures.⁹ ¹⁰ The Secretary also “encouraged EHR technology developers to include SNODENT in EHR technology when it would be beneficial to provider”. ¹¹

Needs to Implement Standardized E-Measures in Dentistry

As the DQA’s EHR Committee worked through the preliminary e-specifications for the DQA Starter Set of pediatric measures, the Committee identified the challenges that need to be overcome in order to implement standardized e-Measures in dentistry:

1. The National Quality Forum (NQF) has identified standards and created tools to standardize creation of e-Measures.¹² These include
 - a. Quality Data Model (QDM) - an “information model” that defines concepts used in quality measures and clinical care and is intended to enable automation of EHR use. It provides a way to describe clinical concepts in a standardized format so individuals (i.e., providers, researchers, measure developers) monitoring clinical performance and outcomes can clearly and concisely communicate necessary information. (Appendix 1)
 - b. Measure Authoring Tool (MAT) - a web-based tool that allows us to “write” the specification. Recently, NQF transitioned the day-to-day operation of the MAT to HHS. This will enable HHS

⁷ Evaluating a Dental Diagnostic Terminology in an Electronic Health Record; *J Dent Educ.* 2011 May; 75(5): 605–615. Dr. Joel M. White, Dr. Elsbeth Kalenderian, et al. <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3119719/>

⁸ International Health Terminology Standards Development Organization. Accessed at: <http://www.ihtsdo.org/>

⁹ Office of National Coordinator: Standards and Certification Criteria Accessed at <http://healthit.hhs.gov/>

¹⁰ Recommendations from ONC HITSC to the National Coordinator for Health IT. Accessed at <https://www.healthit.gov>

¹¹ Stage 2 EHR Final Rule <http://www.gpo.gov/fdsys/pkg/FR-2012-09-04/pdf/2012-20982.pdf>

¹² National Quality Forum, Health IT <http://www.qualityforum.org/HealthIT/>

to better position the MAT and e-Measures in programs utilizing EHR-based performance measurement.

In addition to the work by NQF, Health Level 7 International (HL7) has created e-Measure standards for developing, exporting, and calculating measures. These standards include the Health Quality Measures Format (HQMF) and the Quality Reporting Document Architecture (QRDA). Through standardization of a measure's structure, metadata, definitions, and logic, the HQMF provides for quality measure consistency and unambiguous interpretation. Note that a health quality measure encoded in the HQMF format is referred to as an "e-Measure"¹³. **Dentistry has not been previously involved in these efforts and must now conform to these established standards.**

2. A basic understanding of workflow is essential to measure development. **Measurement should not place an additional burden on providers. The best measures are those based on structured data captured within the workflow of the clinical care processes.** Since development of functional dental EHR's continues to evolve, measure developers must allow for workflow testing and adapt measures to clinical workflow processes as more EHR's are implemented. On the other hand, this situation also provides an opportunity for measure developers to provide input into the workflow patterns being implemented within EHR's.
3. **Data capture for a measure is best done if it is present as a structured field within an EHR.** Dentists do not generally use an entry screen with multiple pick lists and radio buttons to enter findings and diagnoses. Thus, measure developers should also look to provide the necessary input into standards for functional requirements of an EHR..
4. Some oral health procedures, such as preventive and surgical procedures, cross the medical-dental realms. **In such instances, instituting oral health measures across medical-dental systems poses additional challenges.**
5. **Implementation of standardized diagnostic terms is necessary for meaningful measurement.**

Recommendations

Based on this effort, this Committee recommends that the DQA:

1. To provide input into functional data elements that must be captured as structured data within the EHR for implementing measures.
2. Establish relationships with the National Library of Medicine (NLM) to coordinate development of accurate value sets to support oral health measures

¹³ Health Level 7, Product Briefs, e-Measures Accessed at http://wiki.hl7.org/index.php?title=Product_eMeasures, Oct 2012

3. Submit the DQA Starter set of measures and their e-specifications for consideration as clinical quality measures within the Meaningful Use program.

DQA Starter Set of Pediatric Measures: Adapted for Use with Health Records

As mentioned, the primary objective of this effort was to explore the feasibility of adapting the DQA Starter Set of Pediatric Oral Health Measures based on administrative data into e-Measures. **Along with standardization, it is also important to ensure that measures are aligned across data sources.** Of the eleven measures identified with the Starter Set, the EHR Committee adapted six measures into e-Measures. The table below provides the overview of the measures and Appendix 2 provides the measure specifications applicable to health records.

	Description	Numerator	Denominator	Domain ¹⁴	Improvement noted as
Evaluation/Treatment Planning	Percentage of children under age 21 who were seen by a practitioner who received at least one comprehensive or periodic oral evaluation.	Unduplicated number of children under age 21 years who received at least one comprehensive or periodic oral evaluation in the reporting year	Unduplicated number of children under age 21 years who were seen by a practitioner in the reporting year	Process	Higher the better
Prevention: Fluoride or sealants	Percentage of elevated risk children who were seen by a practitioner who received topical fluoride application and/or one or more sealants.	Unduplicated number of children under age 21 years at elevated risk who received topical fluoride application and/or one or more sealants in the reporting year	Unduplicated number of children under age 21 years at elevated risk who were seen by a practitioner in the reporting year	Process	Higher the better
Prevention: sealants for 6 – 9 years	Percentage of elevated risk children in the age categories of 6-9 who were seen by a practitioner who received a sealant on one or more first permanent molar tooth.	Unduplicated number of children aged 6-9 at elevated risk who received a sealant on one or more first permanent molar tooth in the reporting year	Unduplicated number of children between 6 - 9 years at elevated risk who were seen by a practitioner in the reporting year	Process	Higher the better
Prevention: sealants for 10 – 14 years	Percentage of elevated risk children in the age categories of 10-14 who were seen by a practitioner who received a sealant on one or more second permanent molar tooth within the	Unduplicated number of children aged 10-14 at elevated risk who received a sealant on one or more second permanent molar tooth in the reporting	Unduplicated number of children between 10 - 14 years at elevated risk who were seen by a practitioner in the reporting year	Process	Higher the better

¹⁴ Domain definitions based on National Quality Measures Clearinghouse

Prevention: Topical Fluoride ¹⁵	reporting year. Percentage of elevated risk children who were seen by a practitioner who received at least one topical fluoride application within the reporting year.	year Unduplicated number of children under age 21 years at elevated risk who received at least one topical fluoride application in the reporting year	Unduplicated number of children under age 21 years who were seen by a practitioner in the reporting year	Process	Higher the better
Care continuity ¹⁶ – Regular care (Also represents usual source of care)	Percentage of children under age 21 who received a comprehensive or periodic oral evaluation within the reporting year who also received a comprehensive or periodic oral evaluation in the year prior to the measurement year.	Unduplicated number of children under age 21 who received a comprehensive or periodic oral evaluation in the year prior to the measurement year.	Unduplicated number of children under age 21 who received a comprehensive or periodic oral evaluation within the reporting year.	Related healthcare delivery: Use of Services	Higher the better

DQA Starter Set of Pediatric Measures: Not Adapted for Use with Health Records

The following table lists the administrative measures within the DQA Starter Set for Pediatric Oral Health that were not adapted for use with data from health records.

Measure Concept	Reason for not specifying as e-Measure
Utilization of Services: Children who received any dental service	Within the context of a practice for a reporting period, both numerator and denominator refer to patients with encounters. This measure could be adapted to refer to a measure of utilization of services for a specific program, e.g., percentage of children who accessed care who were eligible for Medicaid. This would be a measure of the user-enrollee health state as defined by the National Quality Measures Clearinghouse (NQMC) domain framework. ¹⁷
Treatment: Children who received any treatment service	This measure is difficult to interpret. However this measure may be enhanced as a measure of treatment plan completion rates. For example, ‘Percentage of children under age 21 years who had a treatment plan established in the year prior to the measurement year who had their treatment plan completed within 12 months.’ (Exclude: Patients who had only an evaluation or treatment for a dental emergency in the year prior to the measurement year.) ¹⁸ This would fall under the “use of services” domain as defined by NQMC because evidence linking completion of treatment plans to improved health outcomes is not established.

¹⁵ This measure is similar to the e-Measure currently being developed by ONC for Stage 2 MU. However the DQA measure is specific to children at “elevated risk”, thus more closely following the evidence on topical fluoride efficacy. While the MU Stage 2 measure is largely a measure intended to be used for attestation to measurement, the DQA measure is an evidence-based process measure that may be used at all levels.

¹⁶ Although it is possible that some children who see a practitioner within a short time span (e.g. in December of Year 1 and January of Year 2) will be included in this measure of care continuity, this Committee believes that these will be outliers and will not affect the intent of this measure. Further validation testing will allow us to further understand the impact of this.

¹⁷ National Quality Measures Clearinghouse Domain Definitions. Accessed at <http://www.qualitymeasures.ahrq.gov/about/domain-definitions.aspx>

¹⁸ Adapted from HAB HIV Performance Measures: Oral Health Services Accessed at <http://hab.hrsa.gov/deliverhivaidscare/files/habpmsoralhealth.pdf>

Usual Source of Care: Children who received care from the same practice or clinical entity for two consecutive years	This measure is not applicable for measurement within the context of a practice for a reporting year. The measure on care continuity over two years provides the required information.
Per enrollee/user cost of clinical services	This measure is not applicable for measurement within the context of a practice for a reporting year. However this measure may be adapted as a measure of the cost for a full episode of care once there is a more clear definition of an “episode of care” in dentistry.
Percentage of child healthcare expenditures	This measure is not applicable for measurement within the context of a practice for a reporting year.

Moving Towards Outcome Measures with Data from Health Records

Achieving “value” (health outcomes/cost) from healthcare is a concept that is well established and yet evolving.^{19,20} While measuring and reporting outcomes of care, provides information that has utility in the calculation of value, it is the ability to link outcome measures with care delivery inputs and processes that provides information to assist providers and healthcare systems to improve performance. Thus a comprehensive understanding of the care delivery system that includes measurement that reflects the linkages between inputs, processes and outcomes is critical.²¹

Also, there is often no single “outcome” that captures the results of care, which must encompass management of multiple variables to achieve and sustain better health. For many medical conditions or patient populations, outcomes of managing multiple related factors collectively contribute to success. Further, outcomes should be measured for periods long enough to reveal the achievement as well as sustainability of health.²² Practitioners and patients frequently share common goals such as favorable clinical outcomes, but also frequently have different perspectives about what constitutes good health and desirable health outcomes.^{23, 24, 25} A balanced approach that evaluates multiple aspects of care is essential in understanding disparities and adequately planning for improved quality.²⁶

¹⁹ Jordan M. VanLare, A.B., and Patrick H. Conway, M.D. Value-Based Purchasing — National Programs to Move from Volume to Value Engl J Med 2012; 367:292-295. Accessed at <http://www.nejm.org/doi/full/10.1056/NEJMp1204939?query=health-policy-and-reform>

²⁰ Porter ME. What is value in healthcare? N Eng J Med 2010;363: 2477 – 81.

²¹ National Quality Forum: National Priorities Partnership: [NPP Report to HHS](#): Accessed November 6, 2011.

²² Porter ME. What is value in healthcare? N Eng J Med 2010;363: 2477 – 81. Supplementary Appendix 1

²³ Crall JJ [Pediatric dental treatment outcomes: the importance of multiple perspectives.](#) Pediatr Dent. 1998 May-Jun;20 (3):219-20.

²⁴ Abrams RA, Ayers CS, Vogt Petterson M., Quality assessment of dental restorations; a comparison by dentists and patients. Community Dent Oral Epidemiology 1986; 14: 317-9.

²⁵ National Quality Forum: National Priorities Partnership: [NPP Report to HHS](#): Accessed November 6, 2011.

²⁶ DQA Environmental Scan on Pediatric Quality Measures: Accessed at <http://www.ada.org/7503.aspx>

In dentistry, a slow move towards a universally accepted diagnostic code set, reporting infrastructure, and oral health related outcome measures limits the ability to assess the impact of care delivered.²⁷ The advent of EHR's pave the way for significant advancements on this front.

Although the objective of this effort was to adapt the set of pediatric measures identified by the DQA, the EHR Committee recognizes the value of data from health records that can be used to create many more meaningful measures beyond what is possible from claims data. To that end, the Committee proposes an additional measure concept towards the DQA's initial charge of developing performance measures on pediatric oral health.

Note that according to the NQMC domain definitions²⁸, an “outcome” associated with healthcare delivery is “a health state of a patient resulting from health care. Outcome measures are supported by evidence that the measure has been used to detect the impact of one or more clinical interventions. Measures in this domain are attributable to antecedent health care and should include provisions for risk-adjustment.”

	Description	Numerator	Denominator	Domain ²⁹	Improvement noted as
Dental Caries³⁰:	Percentage of children who were seen by a practitioner <u>for a comprehensive or periodic evaluation each year for 2 consecutive years</u> who have new carious lesions or untreated carious lesions (caries-active) in the reporting year	Unduplicated number of children under age 21 years who have new carious lesions or untreated carious lesions (caries-active) in the reporting year	Unduplicated number of children under age 21 years who were seen by a practitioner for a comprehensive or periodic evaluation each year for 2 consecutive years	Outcome	Lower the better

As noted in the DQA Pediatric Quality and Performance Measure Concept Set, “Health outcomes that are achievable will depend on many factors, including the patient’s initial condition and susceptibility to disease. This can be influenced by genetic, socioeconomic, and environmental factors apart from patient lifestyle and behaviors. Adjusting for the influence of these factors when measuring outcomes or results of care is crucial. Risk adjustment models should be developed in order to make the interpretation of the measurements more scientifically accurate and allow comparative studies.”³¹ **Such measures can also be used to promote**

²⁷ DQA Environmental Scan on Pediatric Quality Measures: Accessed at <http://www.ada.org/7503.aspx>

²⁸ National Quality Measures Clearinghouse Domain Definitions: Accessed at <http://www.qualitymeasures.ahrq.gov/about/domain-definitions.aspx>

²⁹ Domain definitions based on National Quality Measures Clearinghouse

³⁰ Although similar to the Stage 2 MU measure currently being developed by ONC, this outcome measure is a healthcare delivery measure (NQMC domain) attributable to antecedent healthcare. It is possible that some children who see a practitioner within a short time span (e.g. in December of Year 1 and January of Year 2) will be included in this measure of care continuity, this Committee believes that these will be outliers and will not affect the intent of this measure. Further validation testing will allow us to further understand the impact of this.

³¹ DQA Pediatric Quality and Performance Measure Concept Set: Accessed at <http://www.ada.org/7503.aspx>

improvements by having benchmarks for year over year achievements rather than a set threshold. These measures should also be closely monitored for adverse effects such as adverse patient selection.

Implementation of DQA Pediatric Oral Health Measure Set in Health Records

Results of quality measurement can be used to improve quality of care at the practice level and aggregated through exchanges to capture data at the population level

Level of aggregation: plan/ program

1. A fully functional EHR using standardized taxonomies to capture structured data along with an Health Information Exchange (HIE) is a pre-requisite for implementation. In the interim, health plans, programs, and other organizations including state and federal agencies can obtain measurement scores from practices in their networks to calculate aggregate statistics for the populations they serve. Ensuring reliability of the measures is essential before comparisons are made.

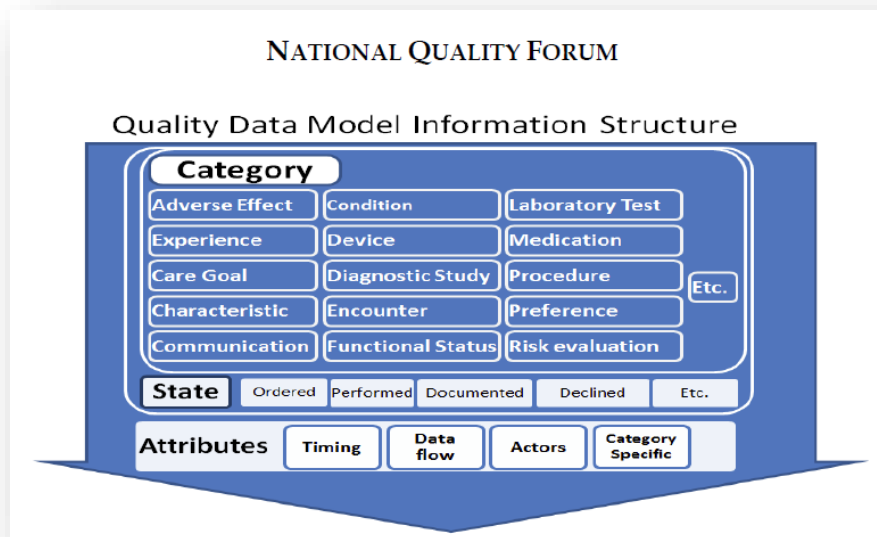
Level of aggregation: practice

1. Practices using a functional EHR can integrate these e-Measures into their systems through their vendor. Vendors developing EHR's can program these e-Measures into their systems.
2. Institutions that already have a data warehouse (e.g., large group practices and dental schools) may adapt these specifications to query their databases. Standardizing specifications across practice sites will allow comparison across sites. Traditional dental practices could use the same specifications to query their office systems for quality improvement. **Although this is not exactly the same as implementing "e-Measures," it is a start to implementing measures using data from health records.**

Appendix 1: The Quality Data Model

Components of the QDM

The QDM provides a method to describe a specific data element by clarifying the category of information, the context in which it is expected to exist (the state), and any additional information to precisely identify it (attributes). The QDM further coordinates with standards used by clinical information systems, which is important in order to ensure the information is clear, unambiguous, consistent, and accurate.³²



QDM elements used in this measure set

The table below provides examples of the QDM element combinations.

Category	State	Attribute
Patient Characteristic	Documented	
Encounter	Performed	Reason
Procedure	Performed	
Procedure	Declined	Reason
Procedure	Performed	Anatomical Structure
Diagnosis	Active	Result
Risk Evaluation	Assessed	Method

³² National Quality Forum: Quality Data Model <http://www.qualityforum.org/QualityDataModel.aspx>

Appendix 2: Proposed Specifications

General notes on proposed specifications

1. As much as possible, the specifications conform to the QDM (**June 2012 version released for public comment**) developed by NQF. Only the human readable format of the e-Measure is included.
2. When available, terms from **all standardized taxonomies** have been included in the value set.
3. Medication orders, such as prescription of fluoride supplements or home-use tooth pastes that are evidence-based caries preventive modalities, have not been captured within these specifications. Once EHR systems allow for capture of medication orders, it will be feasible to include these additional preventive elements.
4. Capturing risk level has been specified for two different scenarios including getting the data as a diagnosis from a drop down menu/ radio button list or from a risk assessment module programmed into the EHR. Irrespective of the tool used to assess risk, it is anticipated that the structured data will be captured as a standardized code.
5. The specifications detailed below are yet to be tested for feasibility, reliability and validity. **The feasibility of capturing data from structured fields including data for exceptions and exclusions should be first verified within evolving dental record systems.**

Exclusions and Exceptions

Within the realm of e-Measures, “exclusions” are patients for whom the treatment is not indicated. “Exceptions” are patients for whom the treatment is indicated but was not performed. In general, exclusions and exceptions result due to clinical, patient, and system reasons. For example, a “clinical” reason for not including a patient within the measure population for a sealant measure could be that the occlusal surface of a tooth was already restored. A patient reason could be a missed appointment or treatment refusal while a “system” reason could be lack of coverage for indicated service.

The DQA measures based on administrative data sources did not include measure exclusions or exceptions since data to support such specifications do not exist within current claims systems. However, structured data from health records can be available in evolving dental record systems, to support exclusions and exceptions.

There are both pros and cons of including specifications for exceptions to a measure due to patient and system reasons. Some believe that patients should be excluded from measurement only under some exceptional

circumstance or condition that warrants such exclusion. Reasons such as missed appointments or lack of coverage were regular occurrences in the dental delivery system and some responsibility to alleviate such instances may lie with the provider. Further, specifying measures with detailed exceptions results in increasing the complexity of EHR workflows and coding required to develop software. Very often precise reasons for excluding a patient from a measure population cannot be captured through structured data fields within an EHR.

Others believe measure scores can be more easily interpreted if patient or system reasons for not providing an indicated service are captured separately. Quality improvement efforts could be initiated for practices with relatively high exception scores even when the measure score was above any set threshold. Measure scores would be more precise once the exceptions were appropriately identified, although the accountability for appropriately categorizing patients as exceptions to the measure rests with the provider and should be supported by additional documentation within the health record.

Based on these discussions, the Committee agreed to include exceptions within the measure specification. In order to reduce the complexity of identifying workflows, developing software, and to standardize the information collected for exceptions, the Committee decided not to require granular data to identify specific reasons for exceptions. Thus software vendors could merely include a check box for use by the provider to indicate the patient as an exception to the measure rather than using concepts from SNOMED-CT to record specific reasons. The feasibility, reliability and validity of this approach should be verified during the testing phase.

E-Measure: Oral evaluation

Measure Concept: Children who received a comprehensive or periodic oral evaluation

Aligned Administrative Measure: Percentage of enrolled children who accessed [dental/ oral health] care (received at least one service) who received a comprehensive or periodic oral evaluation within the reporting year.

Description: Percentage of children who were seen by a practitioner who received a comprehensive or periodic oral evaluation within the reporting year

Numerator: Unique number of children under age 21 years who received a comprehensive or periodic oral evaluation in the reporting year

Denominator: Unique number of children under age 21 years who were seen by a practitioner in the reporting year

Exclusions/ Exceptions: None.

Stratifications:

1. Race
2. Ethnicity
3. Payer Type

E-Measure Specification: Oral Evaluation

Population and Data Criteria

Denominator Patient Population = Include all patients who meet the following criteria

Age <= 20 years (using "Patient Characteristic Documented: Birth Date") starts before start of "Measurement Period"

AND:

Patient who was seen by a practitioner (using "Encounter Performed Reason: [All In-office Visits Value Set](#)") during the "Measurement Period")

Denominator Exclusions = Remove all patients who meet the following criteria

None

Numerator = Include all patients who meet the following criteria

Patients who received comprehensive or periodic oral evaluation (using "Procedure Performed: [Oral Evaluation Value Set](#)") during the "Measurement Period"

Denominator Exceptions = Remove all patients who meet the following criteria from denominator

None

Supplemental Data Elements*

"Patient Characteristic Documented: Race" using "Race CDC Value Set"

"Patient Characteristic Documented: Ethnicity" using "Ethnicity CDC Value Set"

"Patient Characteristic Documented: Payer" using "Payer Source of Payment Typology Value Set"

*Standardized by ONC. Although the "Payer Source of Payment Typology Value Set" must be revised to include dental plan types.

E-Measure: Prevention: Fluoride or sealants

Measure Concept: Children who received topical fluoride or sealants

Aligned Administrative Measure: Percentage of enrolled children at elevated risk who accessed [dental/ oral health] care (received at least one service) who received topical fluoride or sealants within the reporting year.

Description: Percentage of **elevated risk** children who were seen by a practitioner who received topical fluoride application and/or one or more sealants within the reporting year.

Numerator: Unique number of children under age 21 years at **elevated risk** who received topical fluoride application and/or one or more sealants in the reporting year

Denominator: Unique number of children under age 21 years **at elevated risk** who were seen by a practitioner in the reporting year

Exclusions:

- Children under 6 months
- Full mouth lack of teeth (absent, extracted, unerupted)

Exceptions:

- Patient reasons (e.g., refusal of treatment, missed appointments)
- System reasons (e.g., plan coverage issues)

Stratifications:

1. Race
2. Ethnicity
3. Payer Type

E-Measure Specification: Fluoride or Sealants

Population and Data Criteria

Denominator patient population= Include all patients who meet the following criteria

Age <= 20 years using (using "Patient Characteristic Documented: Birth Date") starts before start of "Measurement Period"

AND:

Patient who was seen by a practitioner (using "Encounter, Performed Reason: [In-Office Visit applicable for prevention](#)") during the "Measurement period"

AND:

Patients at elevated risk for caries (using

Diagnosis, Active Result: "[Elevated Caries Risk](#)"

OR

Risk Evaluation Assessed Method: "[Elevated Caries Risk](#)" from Risk Assessment Module"

during "Measurement Period"

Denominator Exclusions = Remove all patients who meet the following criteria

Age <= 7 months (using "Patient Characteristic Documented: Birth Date") starts before start of "Measurement Period"

OR:

Patients for whom procedure was not recommended (using "Procedure Declined Reason: Medical Reason": ["Full-Mouth Lack of teeth"](#) exclusion value set) during the "Measurement period"

Numerator = Include all patients who meet the following criteria

Patients who received topical fluoride (using "Procedure, performed: [Topical Fluoride Value Set](#)") during "Measurement Period"

OR:

Patients who received sealants in any tooth (using "Procedure, performed: [Sealants Value set](#)") during "Measurement Period"

Denominator Exceptions = Remove all patients who meet the following criteria from denominator

Patients for whom procedure was not performed (using "Procedure Declined Reason: Patient reasons") occurs during the in-office prevention encounter (using Encounter Performed Reason: [In-Office Visit applicable for prevention](#))

OR:

Patients for whom procedure was not performed (using "Procedure Declined Reason: System reasons") occurs during in-office prevention encounter (using Encounter Performed Reason: [In-Office Visit applicable for prevention](#))

Supplemental Data Elements*

"Patient Characteristic Documented: Race" using "Race CDC Value Set"

"Patient Characteristic Documented: Ethnicity" using "Ethnicity CDC Value Set"

"Patient Characteristic Documented: Payer" using "Payer Source of Payment Typology Value Set"

*Standardized by ONC. Although the "Payer Source of Payment Typology Value Set" must be revised to include dental plan types.

E-Measure: Prevention: Sealants for 6-9 year olds

Measure Concept: Children aged 6-9 years who receive sealants in the first permanent molar

Aligned Administrative Measure: Percentage of enrolled children aged 6-9 years at elevated risk who accessed [dental/ oral health] care (received at least one service) who received a sealant in the first permanent molar within the reporting year.

Description: Percentage of **elevated risk** children in the age categories of **6-9** who were seen by a practitioner who received a sealant on a one or more **first permanent** molar tooth within the reporting year.

Numerator: Unique number of children aged **6-9** at **elevated risk** who received a sealant on one or more **first permanent** molar tooth in the reporting year

Denominator: Unique number of children between 6-9 years **at elevated risk** who were seen by a practitioner in the reporting year

Exceptions:

- Patient reasons (e.g., refusal of treatment, missed appointments)
- System reasons (e.g., plan coverage issues)

Stratifications:

1. Race
2. Ethnicity
3. Payer Type

E-Measure Specification: Sealants 6-9 year olds

Population and Data Criteria

Denominator = Include all patients who meet the following criteria

{Age >= 5 years (using "Patient Characteristic Documented Birth Date") starts before start of "Measurement Period" AND Age <= 8 years (using "Patient Characteristic Documented Birth Date") starts before start of "Measurement Period"}

AND:

Patient who was seen by a practitioner (using "Encounter Performed Reason: [In-Office Visit applicable for prevention](#)") during the "Measurement Period"

AND:

Patients at elevated risk for caries (using

Diagnosis, Active Result: "[Elevated Caries Risk](#)"

OR

Risk Evaluation Assessed Method: "[Elevated Caries Risk](#)" from Risk Assessment Module

during "Measurement Period"

Denominator Exclusions = Remove all patients who meet the following criteria

None

Numerator = Include all patients who meet the following criteria

Patients who received sealants (using "Procedure, performed: [Sealants Value set](#)") in first permanent molar (using Procedure performed Anatomical Structure: "[First Permanent Molar](#)" Value Set) during "Measurement Period"

Denominator Exceptions = Remove all patients who meet the following criteria from denominator

Patients for whom procedure was not performed (using "Procedure Declined Reason: Patient reasons") occurs during in-office prevention encounter (using Encounter Performed Reason: [In-Office Visit applicable for prevention](#))

OR:

Patients for whom procedure was not performed (using "Procedure Declined Reason: System Reasons") occurs during in-office prevention encounter (using Encounter Performed Reason: [In-Office Visit applicable for prevention](#)) during the "Measurement period"

Supplemental Data Elements*

"Patient Characteristic Documented: Race" using "Race CDC Value Set"

"Patient Characteristic Documented: Ethnicity" using "Ethnicity CDC Value Set"

"Patient Characteristic Documented: Payer" using "Payer Source of Payment Typology Value Set"

*Standardized by ONC Although the "Payer Source of Payment Typology Value Set" must be revised to include dental plan types.

E-Measure: Prevention: Sealants for 10-14 year olds

Measure Concept: Children aged 10-14 years who receive sealants in the second permanent molar

Aligned Administrative Measure: Percentage of enrolled children at elevated risk aged 10-14 years who accessed [dental/ oral] health care (received at least one service) who received a sealant in the second permanent molar within the reporting year.

Description: Percentage of **elevated risk** children in the age categories of **10-14** who were seen by a practitioner who received a sealant on one or more **second permanent** molar tooth within the reporting year.

Numerator: Unique number of children aged **10-14 at elevated risk** who received a sealant on one or more **second permanent** molar tooth in the reporting year

Denominator: Unique number of children between 10-14 years **at elevated risk** who were seen by a practitioner in the reporting year

Exceptions:

- Patient reasons (e.g., refusal of treatment, missed appointments)
- System reasons (e.g., plan coverage issues)

Stratifications:

1. Race
2. Ethnicity
3. Payer Type

E-Measure Specification: Sealants 10-14 year olds

Population and Data Criteria

Denominator = Include all patients who meet the following criteria

{Age >= 10 years (using "Patient Characteristic Documented Birth Date") starts before start of "Measurement Period" AND Age <= 14 years (using "Patient Characteristic Documented Birth Date") starts before start of "Measurement Period"}

AND:

Patient who was seen by a practitioner (using "Encounter Performed reason: [In-Office Visit applicable for prevention](#)") during the "Measurement period"

AND:

Patients at elevated risk for caries (using

Diagnosis, Active Result: "[Elevated Caries Risk](#)"

OR

Risk Evaluation Assessed Method: "[Elevated Caries Risk](#)" from Risk Assessment Module"

during "Measurement Period"

Denominator Exclusions = Remove all patients who meet the following criteria

None

Numerator = Include all patients who meet the following criteria

Patients who received sealants (using "Procedure, performed: [Sealants Value set](#)") in second permanent molar (using Procedure performed Anatomical Structure: "[Second Permanent Molar](#)" Value Set) during "Measurement Period"

Denominator Exceptions = Remove all patients who meet the following criteria from denominator

Patients for whom procedure was not performed (using "Procedure Declined Reason: Patient reasons") occurs during in-office prevention encounter (using Encounter Performed Reason: [In-Office Visit applicable for prevention](#))

OR:

Patients for whom procedure was not performed (using "Procedure Declined Reason: System reasons") occurs during in-office prevention encounter (using Encounter Performed Reason: [In-Office Visit applicable for prevention](#))

Supplemental Data Elements*

"Patient Characteristic Documented: Race" using "Race CDC Value Set"

"Patient Characteristic Documented: Ethnicity" using "Ethnicity CDC Value Set"

"Patient Characteristic Documented: Payer" using "Payer Source of Payment Typology Value Set"

*Standardized by ONC. . Although the "Payer Source of Payment Typology Value Set" must be revised to include dental plan types.

E-Measure: Prevention: Topical fluoride

Measure Concept: *Children who receive topical fluoride*

Aligned Administrative Measure: *Percentage of enrolled children at elevated risk who accessed [dental/ oral] health care (received at least one service) who received topical fluoride within the reporting year.*

Description: Percentage of **elevated risk** children who were seen by a practitioner who received at least one topical fluoride application within the reporting year

Numerator: Unique number of children under age 21 years at **elevated risk** who received at least one topical fluoride application in the reporting year

Denominator: Unique number of children under age 21 years who were seen by a practitioner in the reporting year

Exclusions:

- Children under 6 months
- Full mouth lack of teeth (absent, extracted, unerupted)

Exceptions:

- Patient reasons (e.g., refusal of treatment, missed appointments)
- System reasons (e.g., plan coverage issues)

Stratifications:

1. Race
2. Ethnicity
3. Payer Type

E-Measure Specification: Topical Fluoride

Population and Data Criteria

Denominator patient population= Include all patients who meet the following criteria

Age <= 20 years (using "Patient Characteristic Documented Birth Date") starts before start of "Measurement Period"

AND:

Patient who was seen by a practitioner (using "Encounter Performed Reason: [In-Office Visit applicable for prevention](#)") during the "Measurement Period"

AND:

Patients at elevated risk for caries (using

Diagnosis, Active Result: "[Elevated Caries Risk](#)"

OR

Risk Evaluation Assessed Method: "[Elevated Caries Risk](#)" from Risk Assessment Module"

during "Measurement Period"

Denominator Exclusions = Remove all patients who meet the following criteria

Age <= 7 months (using "Patient Characteristic Documented Birth Date") starts before start of "Measurement Period"

OR:

Patients for whom procedure was not recommended (using "Procedure Declined Reason: Medical Reason": ["Full-Mouth Lack of teeth"](#) exclusion value set) during the "Measurement period"

Numerator = Include all patients who meet the following criteria

Patients who received topical fluoride (using "Procedure, performed: [Topical Fluoride Value Set](#)") during "Measurement Period"

Denominator Exceptions = Remove all patients who meet the following criteria from denominator

Patients for whom procedure was not performed (using "Procedure Declined Reason: Patient Reason") occurs during in-office prevention encounter (using Encounter Performed Reason: [In-Office Visit applicable for prevention](#))

OR:

Patients for whom procedure was not performed (using "Procedure Declined Reason: System Reason") occurs during in-office prevention encounter (using Encounter Performed Reason: [In-Office Visit applicable for prevention](#))

Supplemental Data Elements*

"Patient Characteristic Documented: Race" using "Race CDC Value Set"

"Patient Characteristic Documented: Ethnicity" using "Ethnicity CDC Value Set"

"Patient Characteristic Documented: Payer" using "Payer Source of Payment Typology Value Set"

*Standardized by ONC. . Although the "Payer Source of Payment Typology Value Set" must be revised to include dental plan types.

E-Measure: Care continuity

Measure Concept: Children who receive a comprehensive or periodic oral evaluation in two consecutive years

Aligned Administrative Measure: Percentage of enrolled children who accessed [dental/ oral health] services (received at least one service) who received a comprehensive or periodic oral evaluation in the year prior to the measurement, who also received a comprehensive or periodic oral evaluation within the reporting year.

Description: Percentage of children who were seen by a practitioner who received a comprehensive or periodic oral evaluation within the reporting year

Numerator: Unique number of children under age 21 who received a comprehensive or periodic oral evaluation in the year prior to the measurement year.

Denominator: Unique number of children under age 21 who received a comprehensive or periodic oral evaluation within the reporting year.

Exclusions/Exceptions: None.

Stratifications:

1. Race
2. Ethnicity
3. Payer Type

E-Measure Specification: Oral Evaluation

Population and Data Criteria

Denominator Patient Population = Include all patients who meet the following criteria

{Age >= 2 years (using "Patient Characteristic Documented Birth Date") starts before start of "Measurement Period" AND Age <= 20 years (using "Patient Characteristic Documented Birth Date") starts before start of "Measurement Period"}

AND:

Patients who received comprehensive or periodic oral evaluation (using "Procedure Performed: [Oral Evaluation Value Set](#)") during the "Measurement Period"

Denominator Exclusions = Remove all patients who meet the following criteria

None

Numerator = Include all patients who meet the following criteria

Patients who received comprehensive or periodic oral evaluation (using "Procedure Performed: [Oral Evaluation Value Set](#)") in the year prior to the "Measurement Period"

Denominator Exceptions = Remove all patients who meet the following criteria from denominator

None

Supplemental Data Elements*

"Patient Characteristic Documented: Race" using "Race CDC Value Set"

"Patient Characteristic Documented: Ethnicity" using "Ethnicity CDC Value Set"

"Patient Characteristic Documented: Payer" using "Payer Source of Payment Typology Value Set"

*Standardized by ONC. . Although the "Payer Source of Payment Typology Value Set" must be revised to include dental plan types.

E-Measure: Dental caries

Measure Concept: *Children who have new caries or untreated caries*

Aligned administrative measure: *NA.*

Description: Percentage of children who were seen by a practitioner **for 2 consecutive years** who have new carious lesions or untreated carious lesions (caries-active) in the reporting year

Numerator: Unduplicated number of children under age 21 years who have new carious lesions or untreated carious lesions (caries-active) in the reporting year

Denominator: Unduplicated number of children under age 21 years who were seen by a practitioner for a comprehensive or periodic evaluation each year **for 2 consecutive years**

Exclusions/ Exceptions: None.

Stratifications:

1. Race
2. Ethnicity
3. Payer Type

E-Measure Specification: Oral Evaluation

Population and Data Criteria

Denominator Patient Population = Include all patients who meet the following criteria

{Age >= 2 years (using "Patient Characteristic Documented Birth Date") starts before start of "Measurement Period" AND Age <= 20 years (using "Patient Characteristic Documented Birth Date") starts before start of "Measurement Period"}

AND:

Patients who received comprehensive or periodic oral evaluation (using "Procedure Performed: [Oral Evaluation Value Set](#)") during the "Measurement Period"

AND:

Patients who received comprehensive or periodic oral evaluation (using "Procedure Performed: [Oral Evaluation Value Set](#)") in the year prior to the "Measurement Period"

Denominator Exclusions = Remove all patients who meet the following criteria

None

Numerator = Include all patients who meet the following criteria

Patients who had dental caries (using "Diagnosis Active: [Dental caries](#)") during the "Measurement Period"

Denominator Exceptions = Remove all patients who meet the following criteria from denominator

None

Supplemental Data Elements*

"Patient Characteristic Documented: Race" using "Race CDC Value Set"

"Patient Characteristic Documented: Ethnicity" using "Ethnicity CDC Value Set"

"Patient Characteristic Documented: Payer" using "Payer Source of Payment Typology Value Set"

*Standardized by ONC. . Although the "Payer Source of Payment Typology Value Set" must be revised to include dental plan types.

Appendix 3: Applicable Value Sets for Measure Set

Value set, (previously referred to as *code list*), is a set of values that contain specific codes derived from a particular taxonomy. With respect to value sets, a *value* is a specific code defined by a given taxonomy. Values are included in value sets ³³ The National Library of Medicine (NLM), in collaboration with the Office of the National Coordinator for Health Information Technology (ONC) and Centers for Medicare & Medicaid Services (CMS), has launched the NLM Value Set Authority Center (VSAC) and thus coordinates the data elements and vocabularies included within the value sets for clinical quality measures within the Meaningful Use program. Presented below are the value sets for the concepts used within the specifications of this measure set. For each concept, codes from vocabularies specified as standards within the Meaningful Use regulation are included within the tables.

Topical Fluoride Value Set		
CDT	D1203	
CDT	D1206	
CDT	D1208	
SNOMED	35889000	Topical application of fluoride excluding prophylaxis, child (procedure)
SNOMED	70468009	Topical application of fluoride including prophylaxis, child (procedure)
SNOMED	234723000	Topical application of fluoride - tooth (procedure)
SNOMED	313042009	Application of dental fluoride varnish (procedure)
ICD-9	V07.31	Prophy with Fluoride application
ICD-9	V07.8	Preventive fluoride/sealants
Sealants		
CDT	D1351	
Oral Evaluation Value Set		
CDT	D0120	
CDT	D0145	
CDT	D0150	
Elevated Caries Risk Value Set		
SNOMED	366238008	Finding of dental caries susceptibility
SNODENT	177855D	Finding of dental caries susceptibility
SNOMED	251333000	Susceptible to caries
SNODENT	177872D	Susceptible to caries
SNODENT	177903D	Susceptible to caries, high risk
SNODENT	177893D	Susceptible to caries, moderate risk

³³ National Quality Forum. Guide to reading eligible providers and hospital measure. Accessed at http://www.qualityforum.org/Projects/e-g/Measures/Electronic_Quality_Measures.aspx

All In-Office Visit Value Set		
CDT	D0100 – D9999	*Capture all dental services*
Well-child Pediatric visits		Face-to-Face Interaction Grouping Value Set (2.16.840.1.113883.3.464.1003.101.12.1048)" Office Visit Grouping Value Set (2.16.840.1.113883.3.464.1003.101.12.1001)" "Preventive Care - Established Office Visit, 0 to 17 Grouping Value Set (2.16.840.1.113883.3.464.1003.101.12.1024)" "Preventive Care- Initial Office Visit, 0 to 17 Grouping Value Set (2.16.840.1.113883.3.464.1003.101.12.1022)" "Preventive Care Services - Established Office Visit, 18 and Up Grouping Value Set (2.16.840.1.113883.3.464.1003.101.12.1025)" "Preventive Care Services-Initial Office Visit, 18 and Up Grouping Value Set (2.16.840.1.113883.3.464.1003.101.12.1023)"
In-Office Visit Applicable for prevention Value Set		
CDT	D0100 – D0999	Diagnostic
CDT	D1000 – D1999	Preventive
CDT	D2000 – D2999	Restorative
CDT	D9000 – D9999	Adjunctive General Services
Well Child Pediatric Visits		Face-to-Face Interaction Grouping Value Set (2.16.840.1.113883.3.464.1003.101.12.1048)" Office Visit Grouping Value Set (2.16.840.1.113883.3.464.1003.101.12.1001)" "Preventive Care - Established Office Visit, 0 to 17 Grouping Value Set (2.16.840.1.113883.3.464.1003.101.12.1024)" "Preventive Care- Initial Office Visit, 0 to 17 Grouping Value Set (2.16.840.1.113883.3.464.1003.101.12.1022)" "Preventive Care Services - Established Office Visit, 18 and Up Grouping Value Set (2.16.840.1.113883.3.464.1003.101.12.1025)" "Preventive Care Services-Initial Office Visit, 18 and Up Grouping Value Set (2.16.840.1.113883.3.464.1003.101.12.1023)"
First Permanent Molar Value Set		
SNODENT	161925D	Entire permanent first molar tooth
Second Permanent Molar Value Set		
SNODENT	162402D	Entire permanent second molar tooth
Full Mouth Lack of teeth: Exclusion Value Set		
SNODENT	115505D	Acquired absence of teeth (parent)
SNODENT	120109D	Anodontia
SNOMED	26624006	Anodontia
ICD-9	520.0	Anodontia
ICD-9	525.4	Complete edentulism
Dental Caries		
SNODENT	118065D	Dental caries (disorder)
SNODENT	177167D	Cariou lesion of interproximal origin, arising on any approximal smooth surface of the tooth contacting an adjacent tooth (disorder)
SNODENT	177179D	Cariou lesion of any cervical (gingival) or other smooth surface area of tooth (disorder)
SNODENT	177151D	Cariou lesion of pit and fissure origin in occlusal areas and buccal or lingual pits (disorder)
SNODENT	161648D	Caries involving multiple surfaces of tooth (disorder)
SNODENT	114681D	Primary dental caries, multisurface origin (disorder)
SNODENT	132634D	Secondary dental caries (disorder)
SNODENT	126852D	Dental caries associated with local or systemic factors (disorder)
SNODENT	122486D	Dental caries associated with enamel hypoplasia (disorder)
SNODENT	144012D	Dental caries associated with enamel hypomineralization (disorder)
SNODENT	146098D	Dental caries associated with salivary dysfunction (disorder)

SNODENT	114545D	Salivary dysfunction caries secondary to medication (disorder)
SNODENT	142990D	Salivary dysfunction caries secondary to radiation therapy (disorder)
SNODENT	149042D	Dental caries secondary to acquired defects of tooth structure (disorder)
SNODENT	112890D	Dental caries associated with failed or defective dental restoration (disorder)
SNODENT	126670D	Dental caries secondary to developmental defects of tooth structure (disorder)
SNODENT	106309D	Enamel caries (disorder)
SNODENT	118240D	Primary dental caries, pit and fissure origin (disorder)
SNODENT	100545D	Primary dental caries, nonproximal smooth surface origin (disorder)
SNODENT	132165D	Primary dental caries, proximal smooth surface origin (disorder)
SNODENT	121940D	Primary dental caries, cervical origin (disorder)
SNODENT	142360D	Acute enamel dental caries (disorder)
SNODENT	119490D	Primary dental caries, indeterminate origin (disorder)
SNODENT	161735D	Chronic enamel dental caries (disorder)
SNODENT	118684D	Incipient enamel caries (disorder)
SNODENT	177244D	Cariou exposure of pulp (disorder)
SNODENT	177200D	Root caries (disorder)
SNODENT	177216D	Moderate lesion limited to outer half of root dentin (disorder)
SNODENT	177228D	Extensive lesion involving root dentin (disorder)
SNODENT	135649D	Primary dental caries, root surface origin (disorder)
SNODENT	161653D	Dental caries extending into dentine (disorder)
SNODENT	161719D	Acute dentine dental caries (disorder)
SNODENT	177180D	Moderate cavitated lesion limited to outer half of dentin (disorder)
SNODENT	161761D	Chronic dentine dental caries (disorder)
SNODENT	177198D	Extensive cavitated lesion with exposed dentin (disorder)
SNODENT	177237D	Early childhood caries (disorder)
SNODENT	118716D	Caries of infancy (disorder)
SNODENT	132371D	Caries of infancy associated with bottle feeding (disorder)
SNODENT	122377D	Caries of infancy, indeterminate origin (disorder)
SNOMED	80967001	Dental caries (disorder)
SNOMED	442231009	Caries involving multiple surfaces of tooth (disorder)
SNOMED	109577004	Primary dental caries, multisurface origin (disorder)
SNOMED	95254009	Secondary dental caries (disorder)
SNOMED	95253003	Dental caries associated with local or systemic factors (disorder)
SNOMED	109566005	Dental caries associated with enamel hypoplasia (disorder)
SNOMED	109564008	Dental caries associated with enamel hypomineralization (disorder)
SNOMED	95249000	Dental caries associated with salivary dysfunction (disorder)
SNOMED	95247003	Salivary dysfunction caries secondary to medication (disorder)
SNOMED	95248008	Salivary dysfunction caries secondary to radiation therapy (disorder)
SNOMED	109569003	Dental caries secondary to acquired defects of tooth structure (disorder)
SNOMED	95252008	Dental caries associated with failed or defective dental restoration (disorder)
SNOMED	109568006	Dental caries secondary to developmental defects of tooth structure (disorder)
SNOMED	80353004	Enamel caries (disorder)
SNOMED	109575007	Primary dental caries, pit and fissure origin (disorder)
SNOMED	109574006	Primary dental caries, nonproximal smooth surface origin (disorder)
SNOMED	109573000	Primary dental caries, proximal smooth surface origin (disorder)
SNOMED	109572005	Primary dental caries, cervical origin (disorder)
SNOMED	196301001	Acute enamel dental caries (disorder)

SNOMED	109571003	Primary dental caries, indeterminate origin (disorder)
SNOMED	196302008	Chronic enamel dental caries (disorder)
SNOMED	15733007	Incipient enamel caries (disorder)
SNOMED	109576008	Primary dental caries, root surface origin (disorder)
SNOMED	442551007	Dental caries extending into dentine (disorder)
SNOMED	196298000	Acute dentine dental caries (disorder)
SNOMED	196299008	Chronic dentine dental caries (disorder)
SNOMED	109578009	Caries of infancy (disorder)
SNOMED	109581004	Caries of infancy associated with bottle feeding (disorder)
SNOMED	109579001	Caries of infancy, indeterminate origin (disorder)
ICD - 10	K02.7	Dental root caries
ICD - 10	K02.9	Dental caries, unspecified
ICD - 10	K02.51	Dental caries on pit and fissure surface limited to enamel
ICD - 10	K02.52	Dental caries on pit and fissure surface penetrating into dentin
ICD - 10	K02.53	Dental caries on pit and fissure surface penetrating into pulp
ICD - 10	K02.61	Dental caries on smooth surface limited to enamel
ICD - 10	K02.62	Dental caries on smooth surface penetrating into dentin
ICD - 10	K02.63	Dental caries on smooth surface penetrating into pulp
ICD - 9	521.00	Dental caries, unspecified
ICD - 9	521.09	Other dental caries
ICD - 9	521.08	Dental caries of root surface
ICD - 9	521.01	Dental caries limited to enamel
ICD - 9	521.02	Dental caries extending into dentine
ICD - 9	521.03	Dental caries extending into pulp
ICD - 9	521.05	Odontoclasia
ICD - 9	521.06	Dental caries pit and fissure
ICD - 9	521.07	Dental caries of smooth surface

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