MCAS Quality Measure Instructions

How to Set-up the Data Elements for the New Measures

Version 2

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Introduction

The acronym MCAS stands for "Medi-Cal Managed Care Accountability Set." There are 39 measures on the full list from the California Department of Health Care Services[1], but not all measures are applicable to or can be tracked by primary medical clinics. Some measures (like Breast Cancer Screening and Controlling High Blood Pressure) are already being tracked by other reporting agencies, like the Bureau of Primary Health Care (the UDS Report) and Partnership HealthPlan (the QIP and ECDS Reports). A document that compares the measures of common reporting agencies is available from Aliados Health[2].

Aliados Health contracted with Relevant to create a set of MCAS Quality Measures that did not already exist and were pertinent to member community health centers. These measures are defined on a federal level by the Centers for Medicare & Medicaid Services. Technical specifications are available for Adult Health Care Quality Measures[3] and Children's Health Care Quality Measures[4]. The Quality Measures have been designed based on the 2022 version of the measure specifications because these are reported in the calendar year 2023. There are plans to update this measure set annually as new specifications become available.

The list of MCAS Quality Measures designed by Relevant for this project appears in the table below[5]. Quality Measures can be downloaded from the Relevant Measures Library when they become available.

Measure Name to use in Document	Abbreviation	Alignment	Name of Quality Measure(s) in Relevant
Lead Screening in Children	LSC	HEDIS	Lead Screening in Children (Aligns with 2022 HEDIS Measure LSC)
Topical Fluoride for Children	TFL	DQA	Topical Fluoride for Children (Aligns with 2022 CMS Measure TFL-CH)
Well-Child Visits for Age 15 Months to 30 Months	W30	HEDIS	Well-Child Visits for Age 15 Months–30 Months (Aligns with 2022 HEDIS Measure W30)
Developmental Screening in the First Three Years of Life	DEV	CMS	Developmental Screening in the First Three Years of Life (Aligns with 2022 CMS Measure DEV-CH)

[1] https://www.dhcs.ca.gov/dataandstats/reports/Pages/MgdCareQualPerfEAS.aspx

[2] Named "Comparison of Measurements Between Different Projects and Funders" (v20 for the 2022 version)

[3] https://www.medicaid.gov/medicaid/quality-of-care/performance-measurement/adult-and-child-health-care-quality-measures/adult-health-care-quality-measures/index.html

[4] https://www.medicaid.gov/medicaid/quality-of-care/performance-measurement/adult-and-child-health-care-quality-measures/childrens-health-care-quality-measures/index.html

[5] One measure was dropped from this list due to technical issues with its complexity. This measure is named One measure mentioned in this presentation was extremely complex and therefore not developed this round: Use of Opioids at High Dosage in Persons Without Cancer (OHD)

Measure Name to use in Document	Abbreviation	Alignment	Name of Quality Measure(s) in Relevant
Metabolic Monitoring for Children and Adolescents on Antipsychotics	APM	HEDIS	Metabolic Monitoring for Children and Adolescents on Antipsychotics (Aligns with 2022 HEDIS Measure APM)
Diabetes Screening for People With Schizophrenia or Bipolar Disorder Who Are Using Antipsychotic Medications	SSD	HEDIS	Diabetes Screening for People With Schizophrenia or Bipolar Disorder Who Are Using Antipsychotic Medications (Aligns with 2022 HEDIS Measure SSD)
Antidepressant Medication Management	AMM	HEDIS	1. Antidepressant Medication Management - Acute Phase (Aligns with 2022 HEDIS Measure AMM) 2. Antidepressant Medication Management - Continuation Phase (Aligns with 2022 HEDIS Measure AMM)
Contraceptive Care: Most or Moderately Effective Contraception (Postpartum Women)	CCP	CMS	Contraceptive Care - Postpartum Women: Most or Moderately Effective Contraception Within 60 Days of Delivery (Aligns with 2022 CMS Measure CCP-AD)
Contraceptive Care: Most or Moderately Effective Contraception (All Women)	CCW	CMS	Contraceptive Care - All Women: Most or Moderately Effective Contraception (Aligns with 2022 CMS Measure CCW-AD)
Chlamydia Screening in Women	CHL	HEDIS	Chlamydia Screening in Women (Aligns with 2022 HEDIS Measure CHL)
Prenatal and Postpartum Care	PPC	HEDIS	1. Prenatal and Postpartum Care: Timeliness of Prenatal Care (Aligns with 2022 HEDIS Measure PPC) 2. Prenatal and Postpartum Care: Postpartum Care (Aligns with 2022 HEDIS Measure PPC)
Prenatal Immunization Status	PRS	HEDIS	Prenatal Immunization Status (Aligns with 2022 HEDIS Measure PRS)
Concurrent Use of Opioids and Benzodiazepines	COB	CMS	Concurrent Use of Opioids and Benzodiazepines (Aligns with 2022 CMS Measure COB-AD)
Pharmacotherapy for Opioid Use Disorder	POD	HEDIS	Pharmacotherapy for Opioid Use Disorder (Aligns with 2022 HEDIS Measure POD)

The Quality Measures that already exist in Relevant and overlap the MCAS measure set are:

- Breast Cancer Screening
- Cervical Cancer Screening
- Colorectal Cancer Screening
- Hemoglobin A1c Control for Patients With Diabetes – HbA1c Poor Control (> 9%)
- Controlling High Blood Pressure
- Depression Screening and Follow-Up for Adolescents and Adults
- Depression Remission or Response for Adolescents and Adults
- Childhood Immunization Status: Combination 10

- Immunizations for Adolescents: Combination 2
- Well-Child Visits in the First 15 Months of Life
- Child and Adolescent Well-Care Visits
- Asthma Medication Ratio
- Follow-Up Care for Children Prescribed ADHD Medication (Initiation Phase and Continuation Phase)

Data Elements Required for the Measures

There are 17 new Data Elements required for the 16 new MCAS Relevant Quality Measures. Some of the new Quality Measures use Data Elements that have already been established in Relevant. Some of the new Data Elements are used on more than one MCAS Quality Measure.

Beginning on the next page is a table that shows all of the new Data Elements that need to be established in Relevant. The list is organized by the data type used to define the rows of the Data Element. For example, patients with sickle cell disease are identified by a diagnosis code (ICD-10) on the Problem List. There is a standard Value Set that defines the diagnosis codes for sickle cell disease. This Value Set should be used directly in the Data Element SQL code in Relevant.

Appendix A contains a table that defines all of the Value Sets needed for the new Data Elements. Appendix B explains the structure of Value Set tables in Relevant and how to use them. This appendix also features examples of SQL code that can be used in the Data Elements to join Relevant standard data tables to the Value Sets, depending on data type (diagnosis, lab, medication, etc.)

There is a detailed discussion for each Data Element organized by MCAS Quality Measure in the main section of the document below. These sections, along with the appendices, can be used by a SQL programmer to establish the Data Elements. Health Center Data Analysts and Quality Improvement Managers who are familiar with Relevant can also use these sections to understand the measure definitions and the approach to assembling data to evaluate them.

Other Supporting Documents

The Aliados Health Data Workgroup discussed measure definitions during the November 2022 webinar and discussed required Data Elements in March 2023. More technical discussions around the establishment of the required Data Elements were conducted in the April 2023 and May 2023 Data Workgroup webinars. The slides used in these presentations and recordings of the webinar are available on the Aliados Health website[6].

[6] See Additional Resources and Companion Documents under the heading "Data Workgroup and Report Documentation" on the webpage https://aliadoshealth.org/population-health/data-analytics-and-governance/

New Data Element Connections to Value Set Codes

The column "Structured Data" depends completely on what data the health center has or plans to have in the EHR structured data

New Data Element Name	General Measure Name	Diagnosis (ICD-10)		Procedures			Medications		Labs (LOINC)	Structured Data
		Problem List	Visit Assessment	CPT	HCPCS	DPT	NDC	RxNorm and NDC		
opioid_use_or_dependence_cases	Pharmacotherapy for Opioid Use Disorder	Yes								
infertility_cases	Contraceptive Care: Most or Moderately Effective Contraception (All Women)	Yes		Yes*	Yes*					
contraceptive_observations	1. Contraceptive Care: Most or Moderately Effective Contraception (All Women) 2. Contraceptive Care: Most or Moderately Effective Contraception (Postpartum Women)		Yes	Yes	Yes		Yes			Yes
sexual_activity_observations	Chlamydia Screening in Women		Yes*	Yes*	Yes*					Yes
postpartum_treatments	Prenatal and Postpartum Care: Postpartum Care		Yes*	Yes*						Yes
childhood_development_screens	Developmental Screening in the First Three Years of Life			Yes**						Yes
topical_fluoride_applications	Topical Fluoride for Children			Yes**		Yes				
antidepressant_medications	Antidepressant Medication Management							Yes		
antipsychotic_medications	Metabolic Monitoring for Children and Adolescents on Antipsychotics							Yes		
opioid_use_disorder_medications	Pharmacotherapy for Opioid Use Disorder							Yes		
opioid_medications	Concurrent Use of Opioids and Benzodiazepines						Yes			

New Data Element Name	General Measure Name	Diagnosis (ICD-10)		Procedures			Medications		Labs (LOINC)	Structured Data
		Problem List	Visit Assessment	CPT	HCPCS	DPT	NDC	RxNorm and NDC		
benzodiazepine_medications	Concurrent Use of Opioids and Benzodiazepines						Yes			
lead_blood_tests	Lead Screening in Children			Yes*					Yes	
glucose_labs	1. Metabolic Monitoring for Children and Adolescents on Antipsychotics 2. Diabetes Screening for People With Schizophrenia or Bipolar Disorder Who Are Using Antipsychotic Medications								Yes	
total_cholesterol_labs	Metabolic Monitoring for Children and Adolescents on Antipsychotics								Yes	
chlamydia_labs	Chlamydia Screening in Women								Yes	

Table Key

Yes* -- The Value Set contains these codes, but they will not be used in the associated Data Element. For example, the Value Set for the Data Element infertility_cases contains CPT codes for surgical procedures that are rarely performed and billed at a community health center.

Yes** -- No Value Set exists on a Value Set table, but codes in this category could possibly be used in the Data Element directly. See the specific Data Element sections below for an explanation

Overview of Measure Sections

The remaining pages of this document below display a section for each new MCAS Quality Measure. These sections follow the format described below.

- Section Title (Roman numeral): The general measure name and official abbreviation
- Quality Measure Name: The name of the Quality Measure, as it appears in Relevant
- Measure Description: A general description of what the measure is evaluating
- Denominator Description: The denominator definition
- Numerator Description: The numerator definition
- Exclusion Description: The exclusion definition
- Other Notes: Additional comments about the measure approach or SQL code (may not be present in all sections)

For Quality Measures with new Data Elements, each element is then listed and discussed. The heading (after a letter) contains the Data Element general name in Relevant, as well as:

- Data Element Code Name: The name of the Data Element as it appears in the Relevant Production Database SQL code
- Data Element Fields: The fields (columns) that appear on the standard Data Element
- Description: A description of the data the element should display and other considerations for its design.

The text in the sections below refer to SQL code in the Data Element, but in reality, the SQL code to extract the data can also be constructed in a Transformer and then simply referenced in the Data Element. The name of the Data Element and the fields it contains are fixed, which makes it more appropriate to reference in this instructions document. However, health centers should construct the Data Elements following the pattern that already exists in their instance of Relevant.

I. Lead Screening in Children (LSC)

Quality Measure Name: Lead Screening in Children (Aligns with 2022 HEDIS Measure LSC)

Measure Description: The percentage of children 2 years of age who had one or more capillary or venous lead blood test for lead poisoning by their second birthday.

Denominator Description: Children who turn 2 years old and had a medical visit during the measurement year.

Numerator Description: Patients with one or more capillary or venous lead blood test for lead poisoning by their second birthday

Exclusion Description: Patients using hospice services anytime during the measurement period.

A. Data Element: Lead Blood Tests

Data Element Code Name: lead_blood_tests

Data Element Fields:

- id (integer) *autogenerated*
- patient_id (integer)
- performed_on (date)

Description: This Data Element should display unduplicated dates that lead blood tests were completed for individual patients. Follow the standard definition for a "completed" test.

The programmer should ensure that all appropriate lead blood tests are identified by the Value Set (see Appendix A), which features LOINC codes. See the section Labs in Appendix B for sample SQL.

II. Topical Fluoride for Children (TFL)

Quality Measure Name: Topical Fluoride for Children (Aligns with 2022 CMS Measure TFL-CH)

Measure Description: Percentage of patients 1 to 20 years of age who received at least two topical fluoride applications in the measurement period.

Denominator Description: Children age 1 to 20 as of the end of the measurement period, with at least one medical or dental visit in the period.

Numerator Description: Children with at least two topical fluoride applications on different dates of service in the measurement period.

Exclusion Description: (None)

A. Data Element: Topical Fluoride Applications

Data Element Code Name: topical_fluoride_applications

Data Element Fields:

- id (integer) *autogenerated*
- patient_id (integer)
- performed_on (date)

Description: This Data Element should display unduplicated dates that topical fluoride was applied for individual patients. In other words, no more than one fluoride application can be counted for the same patient on the same date of service.

The topical fluoride applications are defined by procedure codes (dental DPT and medical CPT codes) that appear on claims. These codes are defined in the CMS specifications for the measure and do not appear on a standard Value Set table in Relevant. Therefore, this Data Element is an exception because the codes will need to appear in the SQL code itself and be updated manually. If required, Aliados Health will announce the update to the health centers[7].

[7] This can occur in the Data Standards and Integrity Council meeting, through the Analytics Slack Channel, etc.

It is assumed that any of the following codes would appear on a claim when a topical fluoride application is performed: CDT D1206 or CDT D1208 or CPT 99188. If additional codes are normally used, the health center can add those to the list.

Sometimes, topical fluoride is applied in a primary care medical setting. Although not common, if the health center also has fluoride application data in a structured field (and billing is not regularly performed or there is some other reason to add it), the health center can UNION that data in the Data Element after validation that this data is accurate and displays the actual date of application.

III. Well-Child Visits for Age 15 Months to 30 Months (W30)

Quality Measure Name: Well-Child Visits for Age 15 Months–30 Months (Aligns with 2022 HEDIS Measure W30)

Measure Description: Percentage of children turning 30 months of age with 2 or more well-child visits between 15 and 30 months of age.

Denominator Description: Children who turn age 30 months in the measurement period. The 30-month birthday is calculated as the second birthday plus 180 days

Numerator Description: Children with two or more well child visits (at least 14 days apart) after they turn 15 months and on or before the day they turn 30 months

Exclusion Description: Patients using hospice services anytime during the measurement period.

Data Elements for this measure already exist. Nothing new is needed.

Other Notes: The same HEDIS Value Set for the Data Element well_child_interventions is used for all well-child measures, including Well-Child Visits in the First 15 Months of Life (QIP 2022) and Child and Adolescent Well-Care Visits (QIP 2022). Note that the Value Set contains ICD, CPT and HCPCS codes and should be joined appropriately to the standard Relevant tables containing those codes in the Data Element SQL code. See Appendix B for examples of SQL code for the joins.

Because the other well-child measures were established prior to the availability of the HEDIS Value Set table in Relevant, health centers should ensure the Data Element Well Child Interventions is linked to the most recent Value Set. This Value Set appears on the standard table in Relevant named hedis_value_set_codes with the value_set_oid = '2.16.840.1.113883.3.464.1004.1262' (Value Set name is “Well-Care”).

When the patient has three or more well-child visits between age 15 months and 30 months, only the dates of the first and last visit are displayed in the column measurement_value.

Similar to the measure for well-child visits in the first 15 months of life, the “14-day rule” is applied in the SQL code of this measure. This rule states that successive well-child visits must be at least 14 days apart to be counted by the numerator.

IV. Developmental Screening in the First Three Years of Life (DEV)

Quality Measure Name: Developmental Screening in the First Three Years of Life (Aligns with 2022 CMS Measure DEV-CH)

Measure Description: Percentage of children screened for risk of developmental, behavioral, and social delays using a standardized screening tool in the 12 months preceding or on their first, second, or third birthday.

Denominator Description: Patients turning 1, 2 or 3 years of age in the measurement period, who have a medical visit during the period.

Numerator Description: Patients screened for risk of developmental, behavioral, and social delays using a standardized screening tool on or in the 12 months prior to their birthday in the period

Exclusion Description: (None)

Other Notes: although the CMS measure breaks down the denominator into the individual age categories, the Quality Measure combines all patients turning 1, 2 and 3 years of age together in the measure universe.

A. Data Element: Childhood Development Screens

Data Element Code Name: childhood_development_screens

Data Element Fields:

- id (integer) *autogenerated*
- patient_id (integer)
- performed_on (date)

Description: The data in this Data Element should consist of unduplicated screens (one screen date for one patient in rows). Validation should be performed to ensure that only screens "for risk of developmental, behavioral, and social delays using a standardized screening tool" are being picked up by the Data Element. More information about recommended screens appears at the end of this section below.

This measure is defined by the CMS specifications (not HEDIS or eCQM) and does not have an official Value Set to define childhood development screens. If the health center is already screening patients using a standardized tool and is entering the results into structured data, then this data should be extracted by the Data Element. Health centers not already screening patients and entering data into structured data (for example, HPI or Preventive sections) should consider establishing a clinical workflow and associating structured data items in their EHR.

Global developmental screening tools recommended for this measure identify risk for developmental, behavioral, and social delays[8]. Examples of developmental screening tools that meet criteria for the measure are:

- Ages and Stages Questionnaire - 3rd Edition (ASQ-3)
- Parents' Evaluation of Developmental Status (PEDS) - Birth to age 8
- Parent's Evaluation of Developmental Status - Developmental Milestones (PEDS-DM)
- Survey of Well-Being in Young Children (SWYC)

The specifications also list tools that do NOT meet the criteria for global developmental screening tools. The specifications state "It is important to note that standardized tools specifically focused on one domain of development (e.g., child's socio-emotional development [ASQ-SE] or autism [M-CHAT]) are not included in the list above as this measure is anchored to recommendations related to global developmental screening using tools that identify risk for developmental, behavioral, and social delays." Do not map these tools or similar kinds of domain-specific tools to the Data Element.

According to the specifications, documentation of developmental screening in structured data of the medical record must include all of the following[9]:

- The name of the standardized tool used
- A note indicating the date on which the test was performed
- Evidence of a screening result or screening score

[8] The specifications reference the Bright Futures Recommendations for Preventive Care (https://downloads.aap.org/AAP/PDF/periodicity_schedule.pdf),

[9] Note that this is the typical data structure for other screening tools used in most health centers affiliated with Aliados Health, such as depression screens.

Example code for pulling data from Structured Data appears in Appendix B in the section Structured Data. This code can be modified and used in the Data Element (or related Transformer).

As mentioned previously, there is not an official Value Set associated with developmental screens associated with this measure. Nonetheless, the specifications mention a CPT and an ICD code[10] generally associated with these screens. However, these codes are not necessarily specific for global screens and may also be used for domain-specific screenings. Therefore, the validity of using these codes is uncertain. The CMS specifications state "The code 96110 has been shown to have questionable validity in states that do not have policies clarifying the standardized tools meeting the criterion stated in the specification." It is unknown at this time how this applies to health centers in California service areas.

There is a new row on Table 6A of the 2023 UDS Report for Childhood Development Screenings and Evaluations. There is no implication that all of these codes represent screens that meet the definition for the numerator of the Developmental Screening in the First Three Years of Life measure. Nonetheless, the codes on Table 6A are:

- CPT 96110
- CPT 96112
- CPT 96113
- ICD Z13.4* (where * is a wild-card)

Similar to tobacco screening or alcohol screening, there may be a result entered into structed data and a charge for the service on the claim. The correlation between screens that appear on claims and acceptable screens done in the clinic may differ among health centers. Nonetheless, health centers may choose to pursue a validation of their billing codes if considering adding any of these codes to the Data Element. This is a possibility and not a recommendation[11]. Using billing codes would require a solid validation effort.

[10] CPT = 96110 and ICD-10 = Z13.42

[11] From a preliminary data analysis, it seems unlikely CPT codes can be used

If the health center decides to investigate the possibility of using billing codes (for example, in cases where no developmental screens appear in Structured Data and a decision was made to not add them), consider the following:

- It is a good idea to also look at the text description of the code selected by the provider. This may distinguish between a more general screen (acceptable) or a more specific screen (not acceptable).
- For example, CPT 96110 can have a description at some health centers like “DEVELOPMENTAL TEST ASQ” (acceptable) or “DEVELOPMENTAL TEST MCHAT” (not acceptable).
- In another example, Z13.4 can have a description for “Screening for early childhood developmental handicap” (acceptable) or “ADHD (attention deficit hyperactivity disorder) evaluation” (not acceptable).
- Also, Z13.41 is most often used for autism screening (not acceptable).

V. Metabolic Monitoring for Children and Adolescents on Antipsychotics (APM)

Quality Measure Name: Metabolic Monitoring for Children and Adolescents on Antipsychotics (Aligns with 2022 HEDIS Measure APM)

Measure Description: Percentage of children 1 to 17 years of age who had two or more antipsychotic prescriptions and had metabolic testing.

Denominator Description: Children 1 to 17 years of age who had two or more antipsychotic prescriptions dispensed during the measurement period

Numerator Description: Children who received blood glucose testing and cholesterol testing during the measurement period

Exclusion Description: Patients using hospice services any time during the measurement period

A. Data Element: Antipsychotic Medications

Data Element Code Name: antipsychotic_medications

Data Element Fields:

- id (integer) *autogenerated*
- patient_id (integer)
- started_on (date)
- ended_on (date)

Description: This Data Element should display one medication date (started_on) for one patient (patient_id) without duplication. The started_on date is the date that the patient was known to be using the medication (it is an observation date). The duration that the patient is using the medication is not evaluated by the measure.

See the Medications (sub-heading Medication Observations Approach) section in Appendix B for an example of SQL code.

Note that in Appendix A there are three medication Value Sets associated with this Data Element.

The Quality Measure Diabetes Screening for People With Schizophrenia or Bipolar Disorder Who Are Using Antipsychotic Medications (SSD) has “antipsychotic medications” in its name but does not use this Data Element. The Value Sets for “antipsychotic medications” are different between the two measures.

B. Data Element: Glucose Labs

Data Element Code Name: glucose_labs

Data Element Fields:

- id (integer) *autogenerated*
- patient_id (integer)
- performed_on (date)
- result_date (date)
- result (numeric)

Description: This Data Element should display one completed glucose lab date (performed_on) for one patient (patient_id) per row. The result date and lab result are optional and not evaluated by the measure. See the Labs section in Appendix B for an example of SQL code.

C. Data Element: Total Cholesterol Labs

Data Element Code Name: total_cholesterol_labs

Data Element Fields:

- id (integer) *autogenerated*
- patient_id (integer)
- performed_on (date)
- result_date (date)
- result (numeric)

Description: This Data Element should display one completed total cholesterol lab date (performed_on) for one patient (patient_id) per row. The result date and lab result are optional and not evaluated by the measure. See the Labs section in Appendix B for an example of SQL code.

VI. Diabetes Screening for People With Schizophrenia or Bipolar Disorder Who Are Using Antipsychotic Medications (SSD)

Quality Measure Name: Diabetes Screening for People With Schizophrenia or Bipolar Disorder Who Are Using Antipsychotic Medications (Aligns with 2022 HEDIS Measure SSD)

Measure Description: Percentage of patients ages 18 to 64 with schizophrenia, schizoaffective disorder, or bipolar disorder, who were dispensed an antipsychotic medication and had a diabetes screening test during the measurement year.

Denominator Description: Patients between 18 and 64 years of age with a diagnosis of schizophrenia, schizoaffective disorder or bipolar disorder who are using an antipsychotic medication in the measurement period. Patients should have a medical encounter in the measurement period and should not have already been diagnosed with diabetes.

Numerator Description: At least one glucose lab test or HbA1c lab test in the measurement period

Exclusion Description: Patients using hospice services any time during the measurement period

Other notes: This measure relies on identifying a set of antipsychotic medications that are different than those identified by the Data Element Antipsychotic Medications for the measure "Metabolic Monitoring for Children and Adolescents on Antipsychotics (APM)." Therefore, instead of creating a second Data Element, the HEDIS medication Value Set is used directly in the SQL code[12]. No medications Data Element is needed for this measure.

In the SQL code of the Quality Measure, the JOIN to the HEDIS Value Set is based on the medication NDC code. Therefore, a field for the NDC code must exist on the Data Element Medications. See Section D (Medications, then then sub-heading Medication Value Sets) under the heading "Coding Examples, By Data Type" in Appendix B for more detail on adding this field.

[12] This Value Set is named "SSD Antipsychotic Medications" (OID = 2.16.840.1.113883.3.464.1004.2173).

A. Data Element: Glucose Labs

Data Element Code Name: glucose_labs

Description: See the description for this Data Element in the section above "V. Metabolic Monitoring for Children and Adolescents on Antipsychotics (APM)."

VII. Antidepressant Medication Management (AMM)

Quality Measure Names (there are separate Quality Measures for the two numerators):

Antidepressant Medication Management - Acute Phase (Aligns with 2022 HEDIS Measure AMM)

Measure Description: Percentage of adult patients with major depression and started an antidepressant medication who remained on the medication for at least 84 days (12 weeks).

Denominator Description: Patients age 18 and older with a diagnosis of major depression and started an antidepressant medication in the intake period.

Numerator Description: Patients who remained on an antidepressant medication for at least 84 days (12 weeks) during the period of 114 days after the medication start date.

Exclusion Description: Patients using hospice services any time during the measurement period.

Antidepressant Medication Management - Continuation Phase (Aligns with 2022 HEDIS Measure AMM)

Measure Description: Percentage of adult patients with major depression and started an antidepressant medication who remained on the medication for at least 180 days (6 months).

Denominator Description: Patients age 18 and older with a diagnosis of major depression and started an antidepressant medication in the intake period.

Numerator Description: Patients who remained on an antidepressant medication for at least 180 days (6 months) during the period of 231 days after the medication start date.

Exclusion Description: Patients using hospice services any time during the measurement period.

Both Quality Measures use the same Data Element and have the same denominator.

A. Data Element: Antidepressant Prescriptions

Data Element Code Name: antidepressant_prescriptions

Data Element Fields:

- id (integer) *autogenerated*
- patient_id (integer)
- medication_name (varchar)
- prescribed_on (date)
- duration_days (integer)
- rxnorm_code (varchar)
- ndc_code (varchar)
- prescribed_by (integer)

Description: This Data Element should display one prescription date (prescribed_on) for one medication (medication_name) for one patient (patient_id) without duplication. The prescribed_on date is the date that the patient had a prescription with a known quantity of medication. The quantity is expressed as the number of days (the "duration") that the patient is expected to be using the medication when it is prescribed.

The HEDIS measure specifications define Treatment Days as "The actual number of calendar days covered with prescriptions within the specified measurement interval." The SQL code of the Quality Measure summarizes the total unduplicated dates (which are the treatment days) that the patient is taking the medication to calculate the numerator.

Relevant has developed a new approach for obtaining data from prescriptions using the new Transformer relevant_prescriptions. This Transformer is used rather than the Transformer containing medication observations (relevant_medications) because medication list entries can reflect instances where the patient confirmed continuing medication use from previous prescriptions (or other actions on the medications by the provider) where medication was not actually dispensed. See the Medications section in Appendix B (sub-heading Medication Duration Approach) for an example of SQL code that can be used for the antidepressant Transformer[13].

[13] This is a place-holder: the SQL code will be developed once the relevant_prescriptions is finalized

VIII. Contraceptive Care: Most or Moderately Effective Contraception (Postpartum Women) (CCP)

Quality Measure Name: Contraceptive Care – Postpartum Women: Most or Moderately Effective Contraception Within 60 Days of Delivery (Aligns with 2022 CMS Measure CCP-AD)

Measure Description: Percentage of women age 21 to 44 years with a live birth who were provided a most effective or moderately effective method of contraception within 60 days of delivery

Denominator Description: Patients between 21 and 44 years of age at the end of the measurement period with a live birth between the measurement period start date and 60 days prior to the end of the measurement period end date. Patients with multiple deliveries in the period count twice; patients with multiple births at a single delivery count once.

Numerator Description: Patients provided a most effective method (sterilization, IUD/IUS, or implant) or moderately effective method (injectables, oral pills, patch, or ring) of contraception within 60 days of delivery

Exclusion Description: Patients with a live birth during the last two months of the measurement period.

A. Data Element: Contraceptive Observations

Data Element Code Name: contraceptive_observations

Data Element Fields:

- id (integer) *autogenerated*
- patient_id (integer)
- observed_on (date)
- moderately_effective (boolean)
- most_effective (boolean)
- long_acting_reversible_method (boolean)
- method (varchar)

Description: The data on this Data Element is composed of "observations" which means the records are tied to a particular date when the patient was asked a question about contraceptive use or received a contraceptive service. The sources of contraception data in a typical EHR can include:

- Assessment diagnosis codes
- Procedure codes on a claim
- Medications from the medication list
- Structured data

The Value Set for contraceptives contains diagnosis codes, procedure codes and medication (NDC) codes. Furthermore, some health centers have questions in structured data to capture contraceptive use in patients who might not have gotten the contraceptive directly from the health center. This may be more common for longer-lasting contraception methods. Thus, the Data Element should take into consideration all of these sources of data.

Importantly, the method of contraception needs to be classified by the Data Element. There are three major classifications of contraceptives identified in the CMS specifications, but only two (Most Effective and Moderately Effective) are used for the two MCAS measures of this set. Nonetheless, the third classification (Long Acting Reversible Contraception, or LARC) should still be coded at this time because it has clinical or informational uses outside of the measures, and because new contraception measures in the future might be adopted that require it.

The classifications of contraceptives defined within the Value Set is listed in the table below.

	Value Set Contains This Type of Code				Classification of contraception method		
	Procedure/ device		Diagnosis	Medication			
Contraception Method	CPT	HCPCS	ICD10	NDC	Moderately effective	Most effective	Long acting reversible method
Injectable (1-month/3-months)		Yes	Yes	Yes	TRUE		
Oral Contraceptive Pills		Yes	Yes	Yes	TRUE		
Patch		Yes	Yes	Yes	TRUE		
Vaginal Ring		Yes	Yes	Yes	TRUE		
Female Sterilization	Yes*	Yes	Yes			TRUE	
Hormonal Implant	Yes	Yes	Yes	Yes		TRUE	TRUE
IUD/IUS	Yes	Yes	Yes	Yes		TRUE	TRUE

*CPT codes for Female Sterilization involve surgical codes very uncommon at community health centers

The Value Set table in Relevant is named cms_non_hedis_contraceptive_value_set_codes. The field on this table named contraceptive_type contains the text displayed in the column Contraception Method of the table above. Therefore, in the SQL code, the field contraceptive_type can be used to populate the BOOLEAN classification columns moderately_effective, most_effective and long_acting_reversible_method using a CASE WHEN statement. The field on the Data Element named "method" is not used by the measures, but should contain text describing the contraceptive method (i.e., text from the field cms_non_hedis_contraceptive_value_set_codes.contraceptive_type). This might be useful to Relevant users outside of the measure.

If the health center is using Structured Data for the Data Element, the questions and answers must have the ability to be interpreted and placed into the required contraception method categories. In other words, patient responses must be coded into the BOOLEAN classification columns moderately_effective, most_effective and long_acting_reversible_method (most likely using a CASE WHEN statement). Also, the field cms_non_hedis_contraceptive_value_set_codes.contraceptive_type should display similar text as when the Value Sets are used (i.e., text from the Contraceptive Method column of the table above). Therefore, a question such as "Do you currently use contraceptives?" with possible answers "Yes" and "No" would not be acceptable for use on the Data Element because it is not specific enough. In an ideal situation, the Structured Data values would cover all of the possible methods covered by the Data Element. However, if historically only some of the methods exist in structured data (for example, "Patch" was not an option), it is okay to code what data you have.

Beginning on the next page is an example of the SQL code for contraceptive observations using multiple data approaches (diagnosis codes, procedure codes and NDC medication codes). Note that if you use structured data in the Data Element, you will need to manually code the contraception classification (the three BOOLEAN columns) and the method (the VARCHAR column "method") depending on the questions and values that appear in your data (the code below does not contain this portion of code because it is highly specific to the health center).

```
-- DROP TABLE IF EXISTS relevant_contraceptive_observations;
-- CREATE TABLE relevant_contraceptive_observations AS
SELECT
  patient_id,
  observed_on,
  CASE WHEN contraceptive_type IN('Injectable (1-month/3-months)','Oral Contraceptive Pills',
    'Patch','Vaginal Ring') THEN TRUE ELSE FALSE END AS moderately_effective,
  CASE WHEN contraceptive_type IN('Female Sterilization','Hormonal Implant',
    'IUD/IUS') THEN TRUE ELSE FALSE END AS most_effective,
  CASE WHEN contraceptive_type IN('Hormonal Implant','IUD/IUS') THEN TRUE ELSE FALSE END AS
long_acting_reversible_method,
  contraceptive_type AS method
FROM(
    SELECT
      relevant_visits.patient_id,
      relevant_visits.visit_date :: DATE AS observed_on,
      cms_non_hedis_contraceptive_value_set_codes.contraceptive_type
    FROM relevant_visits
      INNER JOIN relevant_visit_diagnosis_codes ON relevant_visit_diagnosis_codes.visit_id = relevant_visits.id
      INNER JOIN relevant_diagnosis_codes ON relevant_diagnosis_codes.id =
relevant_visit_diagnosis_codes.diagnosis_code_id
      INNER JOIN cms_non_hedis_contraceptive_value_set_codes ON
        cms_non_hedis_contraceptive_value_set_codes.code_value = relevant_diagnosis_codes.code
    WHERE value_set_id = 'CCP-C'
      AND code_system_name = 'ICD10CM'
      AND latest = TRUE
  UNION
    SELECT
      relevant_visits.patient_id,
      relevant_visits.visit_date :: DATE AS observed_on,
      cms_non_hedis_contraceptive_value_set_codes.contraceptive_type
    FROM relevant_visits
      INNER JOIN relevant_visit_billing_codes ON relevant_visit_billing_codes.visit_id = relevant_visits.id
      INNER JOIN relevant_billing_codes ON relevant_billing_codes.id =
relevant_visit_billing_codes.billing_code_id
      INNER JOIN cms_non_hedis_contraceptive_value_set_codes ON
        cms_non_hedis_contraceptive_value_set_codes.code_value = relevant_billing_codes.code
    WHERE value_set_id = 'CCP-C'
      AND code_system_name IN('CPT','HCPCS')
      AND latest = TRUE
  UNION
    SELECT
      relevant_visits.patient_id,
      relevant_visits.visit_date :: DATE AS observed_on,
      cms_non_hedis_contraceptive_value_set_codes.contraceptive_type
    FROM relevant_visits
      INNER JOIN relevant_medications ON relevant_medications.encounterid = relevant_visits.id
      INNER JOIN cms_non_hedis_contraceptive_value_set_codes ON
        cms_non_hedis_contraceptive_value_set_codes.code_value = relevant_medications.ndc_11
    WHERE value_set_id = 'CCP-C'
      AND code_system_name = 'NDC'
      AND latest = TRUE
) AS all_contraceptives
```

-- CREATE INDEX index_relevant_contraceptive_observations_on_patient_id ON relevant_contraceptive_observations (patient_id);

Note that the final UNION query in the SQL code above extracts contraceptive medications and these are identified by a Value Set (CCP-C) on the CMS Value Set table (cms_non_hedis_contraceptive_value_set_codes) that is composed of NDC codes. The join is from the table containing the Value Set to a new field featuring the standardized NDC on the table relevant_medications (highlighted in yellow above). See Section D, Medications, and the subsection Medication Value Sets in Appendix B for more detail on adding this field. Since relevant_medications is a Transformer, the actual name of the field containing the normalized NDC (not the raw NDC) may not actually be "ndc_11" as shown in the example above.

IX. Contraceptive Care: Most or Moderately Effective Contraception (All Women) (CCW)

Quality Measure Name: Contraceptive Care – All Women: Most or Moderately Effective Contraception (Aligns with 2022 CMS Measure CCW-AD)

Measure Description: Percentage of women age 21 to 44 years who were provided a most effective or moderately effective method of contraception

Denominator Description: Patients assigned female at birth, age between 21 and 44 years at the end of the measurement period, and with a medical visit in the measurement period.

Numerator Description: Patients provided a most effective method (sterilization, IUD/IUS, or implant) or moderately effective method (injectables, oral pills, patch, or ring) of contraception within the measurement period

Exclusion Description: Patients infecund due to non-contraceptive reasons; patients with a live birth during the last two months of the measurement period; patients who were pregnant at the end of the measurement period

A. Data Element: Contraceptive Observations

Data Element Code Name: contraceptive_observations

This Quality Measure uses the same Data Element as described in the last section, VIII. Contraceptive Care: Most or Moderately Effective Contraception (Postpartum Women) (CCP)

B. Data Element: Infertility Cases

Data Element Code Name: infertility_cases

Data Element Fields:

- id (integer) *autogenerated*
- patient_id (integer)

- started_on (date)
- ended_on (date)

Description: Data for this Data Element comes from the Problem List. This Data Element should display the started_on date (in other words, the onset date of the condition, or if that is not available, the date the diagnosis was entered into the Problem List) and the ended_on date if the condition was resolved (otherwise leave null) for patients (by patient_id). These do not have to be unduplicated and can be one diagnosis code per record (even though the diagnosis code is not displayed on the Data Element). See the section Diagnosis (sub-heading Problem List) in Appendix B for sample SQL.

X. Chlamydia Screening in Women (CHL)

Quality Measure Name: Chlamydia Screening in Women (Aligns with 2022 HEDIS Measure CHL)

Measure Description: Percentage of women ages 16 to 24 who were identified as sexually active and who had at least one test for chlamydia during the measurement year

Denominator Description: Patients assigned female at birth, identified as sexually active during the measurement year, who were age 16 to 24 as of the end of the measurement year

Numerator Description: Patients with at least one test for chlamydia during the measurement year

Exclusion Description: Patients using hospice services any time during the measurement period

Other notes: there may also be a Quality Measure released for screening all female patients in the 16 to 24 year age-range regardless of sexual activity. This is not the HEDIS measure definition, but it may be useful to health centers that choose to not ask patients about sexual activity or that want to measure screening members of this high-risk group more broadly.

A. Data Element: Sexual Activity Observations

Data Element Code Name: sexual_activity_observations

Data Element Fields:

- id (integer) *autogenerated*
- patient_id (integer)
- observed_on (date)

Description: This Data Element is only applicable to health centers that ask patients about sexual activity and record answers in Structured Data. If your health

center does not ask this question and decides not to establish this question as part of the clinical workflow, the Data Element will not be mapped. Although encouraged from a data perspective (it will contribute to a more accurate denominator), this decision is up to the health center considering the sensitive nature of the information (note that the age range for the measure is 16 to 24 years of age).

The HEDIS specifications feature Value Sets for proxies to sexual activity, such as pregnancy testing, STD testing and diagnosis, and pregnancy-related items. These Value Sets are used directly in the SQL of the Quality Measure and are not used in the Data Element.

The Data Element therefore contains records that represent "observations" from Structured Data which are tied to a particular date when the patient indicated that she was sexually active. Therefore, the data should show unduplicated observed_on dates for each patient_id.

B. Data Element: Chlamydia Labs

Data Element Code Name: chlamydia_labs

Data Element Fields:

- id (integer) *autogenerated*
- patient_id (integer)
- performed_on (date)
- result_date (date)
- positive (boolean)

Description: This Data Element should display unduplicated dates of completed chlamydia labs for individual patients. Follow the standard definition for a "completed" test. The Data Element also contains fields for the result date and positive result, even though these are not evaluated by the measure.

The programmer should ensure that all appropriate chlamydia tests are identified by the Value Set (see Appendix A), which features LOINC codes. See the section Labs in Appendix B for sample SQL.

XI. Prenatal and Postpartum Care (PPC)

Quality Measure Names (there are separate Quality Measures for the two numerators):

Prenatal and Postpartum Care: Timeliness of Prenatal Care (Aligns with 2022 HEDIS Measure PPC)

Measure Description: Percentage of deliveries of live births on or between 85 days prior to the start of the measurement year and 85 days prior to the end of the measurement year that received a prenatal care visit in the first trimester.

Denominator Description: Deliveries on or between 85 days prior to the start of the measurement year and 85 days prior to the end of the measurement year. Patients with multiple deliveries in the period count twice; patients with multiple births at a single delivery count once.

Numerator Description: Deliveries to patients who received prenatal care in the first trimester.

Exclusion Description: Deliveries without a live birth; patients in hospice care overlapping 85 days prior to the start of the measurement year and 85 days prior to the end of the measurement year.

Data Elements for this measure already exist. Nothing new is needed.

Prenatal and Postpartum Care: Postpartum Care (Aligns with 2022 HEDIS Measure PPC)

Measure Description: Percentage of deliveries of live births on or between 85 days prior to the start of the measurement year and 85 days prior to the end of the measurement year that had a postpartum visit on or between 7 and 84 days after delivery.

Denominator Description: Deliveries on or between 85 days prior to the start of the measurement year and 85 days prior to the end of the measurement year.

Patients with multiple deliveries in the period count twice; patients with multiple births at a single delivery count once.

Numerator Description: Deliveries to patients who had a postpartum visit on or between 7 and 84 days after delivery.

Exclusion Description: Deliveries without a live birth; patients in hospice care overlapping 85 days prior to the start of the measurement year and 85 days prior to the end of the measurement year.

A. Data Element: Postpartum Treatments

Data Element Code Name: postpartum_treatments

Data Element Fields:

- id (integer) *autogenerated*
- visit_id (integer)
- pregnancy_id (integer)

Description: This Data Element should rely on Postpartum Visits from the OB Flowsheet. Note that it has similar fields as the Data Element named prenatal_care_treatments. The idea is to link the postpartum visit to a distinct pregnancy (pregnancy_id) and visit (visit_id). These records should be unduplicated.

The measure features Value Set codes for "bundled" postpartum services. These are services often associated with postpartum visits but are not exclusive to postpartum visits. Therefore, the Value Sets are used directly in the SQL code of the Relevant Quality Measure. **Do not** join the Value Sets to the Postpartum Treatments Data Element, but rather identify the visits only through the OB Flowsheet.

In this way, postpartum visits will be "clean" (or in other words, will mirror what a typical user sees in the EHR) and also available for other purposes outside of the measure.

XII. Prenatal Immunization Status (PRS)

Quality Measure Name: Prenatal Immunization Status (Aligns with 2022 HEDIS Measure PRS)

Measure Description: Percentage of deliveries in which women had received influenza and tetanus, diphtheria toxoids and acellular pertussis (Tdap) vaccinations

Denominator Description: Deliveries during the measurement period. Patients with multiple deliveries in the period count twice; patients with multiple births at a single delivery count once

Numerator Description: Deliveries with patients who:

- Had a flu vaccine between six months prior to the start of the measurement period and the delivery date; or had an influenza virus vaccine adverse reaction any time during or before the measurement period
- AND had a Tdap vaccine between the start of the pregnancy and the delivery date; or had an anaphylactic reaction or encephalopathy due to Tdap or Td vaccine any time during or before the measurement period

Exclusion Description: Deliveries that occurred at less than 37 weeks gestation; patients using hospice services anytime during the measurement period

Data Elements for this measure already exist. Nothing new is needed.

Because the Tdap Data Element was established prior to the availability of the HEDIS Value Set table in Relevant, health centers should ensure that this Data Element is linked to the most recent Value Set. This Value Set appears on the standard table in Relevant named hedis_value_set_codes with the value_set_oid = ' 2.16.840.1.113883.3.464.1004.1791' (Value Set name is “Tdap Immunization”).

XIII. Concurrent Use of Opioids and Benzodiazepines (COB)

Quality Measure Name: Concurrent Use of Opioids and Benzodiazepines (Aligns with 2022 CMS Measure COB-AD)

Measure Description: Percentage of adult patients using prescription opioids who concurrently use prescription benzodiazepine medications. Note: A lower rate indicates better performance.

Denominator Description: Patients 18 years of age and older with two or more prescriptions for opioid medications exceeding a 15 day supply on different dates of service between the start of the measurement period and 30 days prior to the end of the measurement period

Numerator Description: Patients with two or more prescriptions for benzodiazepine medications on different dates of service during the measurement period and the concurrent use of prescription opioids and prescription benzodiazepine medications equals or exceeds 30 cumulative days

Exclusion Description: Patients in hospice or palliative care during the measurement period; patients with cancer or sickle cell disease

Note on medication Date Elements for this measure: The measure specifications read, "Concurrent use is identified using the dates of service and days' supply of a beneficiary's prescription claims." The Data Elements will not rely on claims, but rather on prescriptions, which contain the duration (i.e., the number of days) that the patient is expected to be using the medication.

Relevant has developed a new approach for obtaining data from prescriptions using the new Transformer relevant_prescriptions. This Transformer is used rather than the Transformer containing medication observations (relevant_medications) because medication list entries can reflect instances where the patient confirmed continuing medication use from previous prescriptions (or other actions on the medications by the provider) where medication was not actually dispensed. See the Medications section in Appendix B (sub-heading Medication Duration Approach) for an example of SQL code that can be used for the two Data Elements below.

A. Data Element: Benzodiazepine Prescriptions

Data Element Code Name: benzodiazepine_prescriptions

Data Element Fields:

- id (integer) *autogenerated*
- patient_id (integer)
- medication_name (varchar)
- prescribed_on (date)
- duration_days (integer)
- rxnorm_code (varchar)
- ndc_code (varchar)
- prescribed_by (integer)

Description: This Data Element should display one prescription date (prescribed_on) for one medication (medication_name) for one patient (patient_id) without duplication. The prescribed_on date is the date that the patient had a prescription with a known quantity of medication. The quantity is expressed as the number of days (the "duration") that the patient is expected to be using the medication when it is prescribed.

The SQL code of the Quality Measure determines the calendar dates that the patient is taking the medication during the measurement period and overlaps these dates with the dates from the Opioid Prescriptions Data Element.

B. Data Element: Opioid Prescriptions

Data Element Code Name: opioid_prescriptions

Data Element Fields:

- id (integer) *autogenerated*
- patient_id (integer)
- medication_name (varchar)
- prescribed_on (date)
- duration_days (integer)
- rxnorm_code (varchar)
- ndc_code (varchar)

- prescribed_by (integer)

Description: This Data Element should display one prescription date (prescribed_on) for one medication (medication_name) for one patient (patient_id) without duplication. The prescribed_on date is the date that the patient had a prescription with a known quantity of medication. The quantity is expressed as the number of days (the “duration”) that the patient is expected to be using the medication when it is prescribed.

The SQL code of the Quality Measure determines the calendar dates that the patient is taking the medication during the measurement period and overlaps these dates with the dates from the Benzodiazepine Prescriptions Data Element.

XIV. Pharmacotherapy for Opioid Use Disorder (POD)

Quality Measure Name: Pharmacotherapy for Opioid Use Disorder (Aligns with 2022 HEDIS Measure POD)

Measure Description: Percentage of opioid use disorder (OUD) pharmacotherapy treatment events among patients age 16 and older that continue for at least 180 days (6 months).

Denominator Description: New opioid use disorder (OUD) pharmacotherapy treatment events in the Intake Period among patients 16 years of age and older with a diagnosis of opioid use disorder. The Intake period is between six months prior to the measurement period start date and six months prior to the measurement period end date. A "new" treatment event means the patient was not taking any OUD medication in the 31 days prior to the event.

Numerator Description: New opioid use disorder (OUD) pharmacotherapy treatment events with at least 180 days of continuous pharmacotherapy without a gap in treatment of 8 or more consecutive days.

Exclusion Description: Patients using hospice services any time during the measurement period

A. Data Element: Opioid Use Or Dependence Cases

Data Element Code Name: opioid_use_or_dependence_cases

Data Element Fields:

- id (integer) *autogenerated*
- patient_id (integer)
- started_on (date)
- ended_on (date)

Description: Diagnosis codes used by this Data Element comes from the Problem List. This Data Element should display the started_on date (in other words, the onset date of the condition, or if that is not available, the date the diagnosis was entered into the Problem List) and the ended_on date if the condition was resolved

(otherwise leave null) for patients (by patient_id). These do not have to be unduplicated and can be one diagnosis code per record (even though the diagnosis code is not displayed on the Data Element). See the section Diagnosis (sub-heading Problem List) in Appendix B for sample SQL.

B. Data Element: Opioid Use Disorder Prescriptions

Data Element Code Name: opioid_use_disorder_prescriptions

Data Element Fields:

- id (integer) *autogenerated*
- patient_id (integer)
- medication_name (varchar)
- prescribed_on (date)
- duration_days (integer)
- rxnorm_code (varchar)
- ndc_code (varchar)
- prescribed_by (integer)

Description: This Data Element should display one prescription date (prescribed_on) for one medication (medication_name) for one patient (patient_id) without duplication. The prescribed_on date is the date that the patient had a prescription with a known quantity of medication. The quantity is expressed as the number of days (the "duration") that the patient is expected to be using the medication when it is prescribed.

The HEDIS specifications for this measure state, "For OUD dispensing events identified using a medication list, use days supply in the pharmacy data." The SQL code of the Quality Measure summarizes the total unduplicated dates (which are the treatment days) that the patient is taking any OUD medication to calculate the numerator. The SQL code also evaluates gaps in treatment based on one prescription date to the next and the stated duration of the medication on the prescription.

Relevant has developed a new approach for obtaining data from prescriptions using the new Transformer relevant_prescriptions. This Transformer is used rather than the Transformer containing medication observations (relevant_medications)

because medication list entries can reflect instances where the patient confirmed continuing medication use from previous prescriptions (or other actions on the medications by the provider) where medication was not actually dispensed. See the Medications section in Appendix B (sub-heading Medication Duration Approach) for an example of SQL code that can be used for the OUD medication Transformer.

Appendix A: Value Set References

The following table shows the Value Set references needed to properly code the Data Elements for the new Quality Measures.

General Measure Name	Data Element Name	Source Table in Relevant	Value Set Name	OID or Unique Name	Code System Name
Lead Screening in Children	lead_blood_tests	hedis_value_set_codes	Lead Tests	2.16.840.1.113883.3.464.1004.1147	LOINC
1. Metabolic Monitoring for Children and Adolescents on Antipsychotics 2. Diabetes Screening for People With Schizophrenia or Bipolar Disorder Who Are Using Antipsychotic Medications	glucose_labs	hedis_value_set_codes	Glucose Lab Test	2.16.840.1.113883.3.464.1004.1751	LOINC
Metabolic Monitoring for Children and Adolescents on Antipsychotics	total_cholesterol_labs	hedis_value_set_codes	Cholesterol Lab Test	2.16.840.1.113883.3.464.1004.1742	LOINC
Metabolic Monitoring for Children and Adolescents on Antipsychotics	antipsychotic_medications	hedis_medication_lists	Antipsychotic Medications Antipsychotic Combination Medications Prochlorperazine Medications	2.16.840.1.113883.3.464.1004.1737 2.16.840.1.113883.3.464.1004.1738 2.16.840.1.113883.3.464.1004.2195	NDC and RxNorm
Antidepressant Medication Management	antidepressant_medications	hedis_medication_lists	Antidepressant Medications	2.16.840.1.113883.3.464.1004.1503	NDC and RxNorm
1. Contraceptive Care: Most or Moderately Effective Contraception (All Women) 2. Contraceptive Care: Most or Moderately Effective Contraception (Postpartum Women)	contraceptive_observations	cms_non_hedis_contraceptive_value_set_codes	Provision of a Most or Moderately Effective Contraceptive Method	CCP-C	ICD10CM, CPT, HCPCS and NDC
Contraceptive Care: Most or Moderately Effective Contraception (All Women)	infertility_cases	cms_non_hedis_contraceptive_value_set_codes	Sterilization for Non-Contraceptive Reasons (e.g. hysterectomy, oophorectomy)	CCW-A	ICD10CM
Chlamydia Screening in Women	chlamydia_labs	hedis_value_set_codes	Chlamydia Tests	2.16.840.1.113883.3.464.1004.1060	LOINC

General Measure Name	Data Element Name	Source Table in Relevant	Value Set Name	OID or Unique Name	Code System Name
Concurrent Use of Opioids and Benzodiazepines	benzodiazepine_medications	cms_cob_ohd_medication_lists	BENZODIAZEPINES	BENZODIAZEPINES	NDC
Concurrent Use of Opioids and Benzodiazepines	opioid_medications	cms_cob_ohd_medication_lists	OPIOIDS	OPIOIDS_COB	NDC
Concurrent Use of Opioids and Benzodiazepines	sickle_cell_disease_cases	cms_cob_ohd_value_set_codes	SICKLE_CELL_DISEASE	SICKLE_CELL_DISEASE	ICD_10
Pharmacotherapy for Opioid Use Disorder	opioid_use_or_dependence_cases	hedis_value_set_codes	Opioid Abuse and Dependence	2.16.840.1.113883.3.464.1004.1425	ICD10CM
Pharmacotherapy for Opioid Use Disorder	opioid_use_disorder_medications	hedis_medication_lists	Buprenorphine Implant Medications Buprenorphine Injection Medications Buprenorphine Naloxone Medications Buprenorphine Oral Medications Methadone Medications Naltrexone Injection Medications Naltrexone Oral Medications	2.16.840.1.113883.3.464.1004.2187 2.16.840.1.113883.3.464.1004.2186 2.16.840.1.113883.3.464.1004.2188 2.16.840.1.113883.3.464.1004.2185 2.16.840.1.113883.3.464.1004.1536 2.16.840.1.113883.3.464.1004.2140 2.16.840.1.113883.3.464.1004.2141	NDC and RxNorm

Data Elements that depend on Structured Data and not Value Sets:

- childhood_development_screens
- postpartum_treatments
- sexual_activity_observations

Data Element that features codes not displayed on a Value Set table in Relevant:

- topical_fluoride_applications

Data Elements that have already been established for QIP Quality Measures and should use the new HEDIS Value Set table and recommended approach shown in Appendix B below

- well_child_interventions (Value Set Name “Well-Care” and OID = '2.16.840.1.113883.3.464.1004.1262') used for the measure Well-Child Visits for Age 15 Months to 30 Months
- tdap_immunizations (Value Set Name “Tdap Immunization” and OID = '2.16.840.1.113883.3.464.1004.1791') used for the measure Prenatal Immunization Status

Appendix B: Examples of SQL Code

Health centers will need to establish a set of new Data Elements that provide the required data for the new MCAS Quality Measures. Like other standard Data Elements, these contain defined fields and have an expected data structure. A description of the individual Data Elements appears in the body of this document, above.

This appendix gives examples of SQL code that a programmer can use to design the Data Elements, or the associated Transformers, depending on the approach that the health center already uses. To keep things universal and predictable within the health center instance of Relevant, it is recommended that the programmer use the same or similar routine to gather the data (depending on data type) as other existing Data Elements of the same type[14].

Therefore, the SQL code in the examples below reflect one approach to designing the Data Elements, but not the only approach. Programmers familiar with existing Transformers and Data Elements can use portions of the example SQL code or the principles behind the examples.

References in Appendix B and in this instruction manual in general refer to Data Elements, but the SQL code that defines the data can actually be programmed into a Transformer (with a similar but not exact name) or a Data Element, depending on the typical approach in the health center instance. The SQL code in the examples below is based on the Staging Database, which can be used in the design of Transformers or Data Elements.

Most health centers have certain "derived" Transformers that prepare and stage data of particular types. For example, the Transformer relevant_labs displays a list of all completed labs performed and the Transformer relevant_cases displays all diagnosis codes from the Problem List. These Transformers save processing time and should be used if they have been thoroughly validated. In the typical design, these Transformers display a code (like a LOINC code for a lab or an ICD code for a diagnosis) that can be joined directly to a standard Value Set. Some health centers have Transformers that display the Value Set identification number (i.e., the OID). In

[14] As an aside, consideration for the transition to Epic might also influence the design the new Data Elements, if applicable.

either case, there is a method to join the code to the Value Set so that it can be appropriately identified.

If they exist, programmers should base the Data Elements on the standard "derived" Relevant Transformers. This will also help during the transition to Epic[15]. The derived Transformers are displayed in the table beginning on the next page. They will be featured in the example SQL code for each data type later on in this section.

Value Set Code Type	Data Source	Transformer (Staging)
Diagnosis	Problem List	relevant_cases
Diagnosis	Assessments	relevant_visit_diagnosis_codes
Procedure	Claim	relevant_visit_billing_codes
Labs	Labs	relevant_lab_results
Medications	Medications (med list)	relevant_medications
Medications	Prescriptions (using best data available)	relevant_prescriptions
Structured data	Structured data (HPI, Social History, Preventive Medicine, etc.)	relevant_structured_data

Different health centers have different approaches to designing the Transformers and Data Elements that stage the data for the Quality Measures. The example code gives a general idea of one recommended approach, but it does not suggest that health centers change their standard approach, especially if that approach has been thoroughly validated. The programmer should be familiar (or be able to investigate) how the health center is currently pulling items for similar Transformers. For example, how are Hemoglobin A1c labs identified? How are patients with diabetes or essential hypertension identified? Try to use a similar approach with similar concepts among the MCAS measures, if possible. Also, recognize that the Value Set codes for the MCAS measures are defined on different tables within Relevant, depending on the measure.

[15] This helps with the transition because (theoretically) only the derived Transformers will need to be changed while the Data Elements that rely on them can remain the same.

Explanation of Value Set Tables in Relevant

Value Sets are published by the national organizations (called stewards) that author the measures themselves. For our purposes, Value Sets allow health centers to have common definitions for particular items (like labs or vaccines) or populations. Value Sets are composed of codes that correspond to particular data types. The same codes are present in the EHR (and Relevant) and therefore can be joined to the Value Set using SQL code.

Relevant has a good article on their help pages that explains the Value Set tables present in the software[16]. The tables needed for new MCAS Data Elements are listed below and they should be present in both the Staging and Production Databases. The table in Appendix A specifies which table and Value Set identifier should to be used for each Data Element.

Since most of these measures are defined by HEDIS specifications, many of the Value Sets come from the HEDIS tables. There are two HEDIS tables listed below. Because the HEDIS medications table is extremely large, it was placed in its own table. Note that these tables contain Value Sets for all published HEDIS measures, not just the ones that are in the MCAS measure set.

- hedis_value_set_codes (diagnosis, procedure, and lab codes)
- hedis_medication_lists (RXNorm and NDC codes)

Note that the old (and limited) HEDIS table, relevant_qip_2019_value_set, has not been updated since 2019 and has been depreciated by Relevant. Health centers should check to see if they have any JOINS to this table and consider switching the JOIN to a new HEDIS table.

Three of the CMS measures also have their own Value Set tables. These are:

- cms_cob_ohd_value_set_codes (diagnosis codes for the measure Concurrent Use of Opioids and Benzodiazepines)
- cms_cob_ohd_medication_lists (medication codes for the measure Concurrent Use of Opioids and Benzodiazepines)
- cms_non_hedis_contraceptive_value_set_codes (diagnosis, procedure and medication codes for the Contraceptive Care measures measures).

[16] Use this link to the article in the Relevant Help pages (https://relevantsupport.zendesk.com/hc/en-us/articles/12440836827927-Reference-tables) or follow this path: Relevant Healthcare → Data Warehouse and SQL → Data warehouse contents

Note that the old CMS table, cms_value_set_codes, has not been updated since 2020 and has been depreciated by Relevant. Health centers should check to see if they have any JOINS to this table and consider switching the JOIN to the HEDIS or CQM Value Set table, depending on the definition required.

Up to now, the most common Value Set table was the CQM Value Set table (used for the UDS measures) named cqm_value_set_codes. Programmers may see this table used in existing Data Elements (including depression_cases), but no new MCAS Data Elements will use the CQM Value Set table.

Since Value Sets are updated annually by the measure stewards, Relevant will update the Value Set tables during the year as well. If the Data Element is coded properly, it will always pull the most recent Value Set and not need to be updated itself. The most recent Value Set is identified in the SQL code with the statement WHERE latest = TRUE. This statement is used in the examples in the next section.

Some programmers like to specify the code system identifier in addition to the Value Set identifier[17]. The two HEDIS Value Set tables have a code system ID column (code_system_oid) that can be used for this purpose. The table below shows the most common HEDIS code system identifiers for the MCAS measures. The CMS tables only have a column for the code system name. The code examples in the section below identify the code system in the WHERE statement.

code_system_oid	code_system_name
2.16.840.1.113883.6.90	ICD10CM
2.16.840.1.113883.6.103	ICD9CM
2.16.840.1.113883.6.12	CPT
2.16.840.1.113883.6.285	HCPCS
2.16.840.1.113883.6.1	LOINC
2.16.840.1.113883.12.292	CVX
2.16.840.1.113883.6.88	RxNorm
2.16.840.1.113883.6.69	NDC

The sections below give examples of SQL code for different data types using the derived Transformers. Generally speaking, the design of the SQL code takes the following form:

[17] This may be theoretically necessary for cases where the same text code belongs to different code systems. However, the author has not seen any specific cases of this happening.

```
SELECT
        <required fields>
FROM <derived transformer>
WHERE <code field> IN
        (SELECT <code field>
         FROM <value set table>
         WHERE <value set ID> = 'value set identifier'
                AND latest = TRUE)
```

Coding Examples, By Data Type

A. Diagnosis

Diagnosis Data Elements generally contain these fields:

- Id (autogenerated)
- patient_id
- started_on
- ended_on

Diagnosis codes can come from two places: the Problem List or assessments. Normally, the Problem List is used to identify patients with a chronic disease or condition. However, assessments are used to identify patients with non-permanent characteristics that are observed at a visit, or a service that was given at the visit (where the service is coded with a diagnosis code). The SQL code is different for each source.

Problem List

The example code below pulls patients with Sickle Cell Disease, which is defined by a HEDIS Value Set of diagnosis codes (see Appendix A). The code below assumes that there is a diagnosis code field on the Transformer relevant_cases (containing a single code). This diagnosis must be present on the Problem List to be counted.

```
SELECT
   patient_id,
   started_on,
   ended_on
FROM relevant_cases
WHERE relevant_cases.code IN
```

```
    (SELECT DISTINCT code_value
    FROM cms_cob_ohd_value_set_codes
    WHERE value_set_id = 'SICKLE_CELL_DISEASE'
      AND code_system = 'ICD_10'
      AND latest = TRUE)
```

The example above takes codes from the CMS table, but this can be swapped out for another CMS Value Set table, the HEDIS Value Set table, or the CQM Value Set table depending on what Value Set is needed.

Assessments

There is only one Data Element for the MCAS measures that uses diagnosis codes from assessments. Example code for the Data Element Contraceptive Observations is shown below, but note that the actual Data Elements needs to extract data from other sources as well (see the section above, "Contraceptive Care: Most or Moderately Effective Contraception (Postpartum Women"). The example code below is only for the diagnosis-assessment component.

```
SELECT
  patient_id,
  visit_date AS observed_on
FROM relevant_visit_diagnosis_codes
WHERE code IN
    (SELECT DISTINCT code_value
    FROM cms_non_hedis_contraceptive_value_set_codes
    WHERE value_set_id = 'CCP-C'
      AND code_system_name = 'ICD10CM'
      AND latest = TRUE)
```

The example above takes codes from one of the CMS tables, but this can be swapped out for another CMS Value Set table, the HEDIS Value Set table, or the CQM Value Set table.

B. Procedures

The general design of procedure Data Elements contains the following fields:

- id (autogenerated)
- patient_id
- observed_on

The Contraceptive Observations Data Element uses procedure (and device) codes from claims. An example of SQL code for procedures billed on claims in shown below. Note: similar to the above example for diagnosis codes on Assessments, there are additional considerations on the Data Element Contraceptive Observations. Therefore, only the procedures portion is shown here.

```
SELECT DISTINCT
   patient_id,
   visit_date AS observed_on
FROM relevant_visit_billing_codes
WHERE code IN
      (SELECT DISTINCT code_value
      FROM cms_non_hedis_contraceptive_value_set_codes
      WHERE value_set_id = 'CCP-C'
         AND code_system_name IN('CPT','HCPCS')
         AND latest = TRUE)
```

C. Labs

The general design of lab Data Elements have these fields:

- id (autogenerated)
- patient_id
- performed_on
- result_date
- result

The result_date and result are optional and may not appear on every lab-related Data Element.

The example code below relies on the derived Transformer relevant_lab_results, which should display completed labs along with a LOINC code.

```
SELECT DISTINCT
     patient_id AS patient_id,
     performed_on AS performed_on
FROM relevant_lab_results
WHERE relevant_lab_results.loinc_code IN
       (SELECT code_value
      FROM hedis_value_set_codes
      WHERE value_set_oid = '2.16.840.1.113883.3.464.1004.1147'
         AND code_system_oid = '2.16.840.1.113883.6.1')
```

D. Medications

Medication Value Sets

Two different standard Value Set code systems exist for medications:

- National Drug Codes (**NDC**). A numeric code composed of a labeler code (the drug manufacturer, repackager, or distributer), a product code (specific strength or dosage) and a package code (package size or type).
- **RxNorm**. Produced by the National Library of Medicine, this is a normalized naming system for generic and branded drugs. The goal of RxNorm is to allow computer systems to communicate drug-related information efficiently and unambiguously.

The eCW and NextGen EHRs feature fields containing NDCs[18] to identify specific medications. Relevant uses a "crosswalk" to obtain an RxNorm code from the existing NDC.

Different sets of Quality Measures contain different standard code systems, as displayed in the table below.

Measure Steward	Medication Value Set Codes
CQM (UDS)	RxNorm
HEDIS (QIP and MCAS)	NDC and RxNorm
CMS (MCAS)	NDC

Because the UDS Quality Measure set was established a number of years ago, RxNorm codes have traditionally been used and displayed in Relevant. However, now that NDCs are being featured in Value Sets needed by the MCAS measures, it is important that these codes are displayed on the medication Transformer and Data Element.

At most health centers, the Transformer relevant_medications and the Data Element Medications already display the RxNorm code. Health centers should ensure that the field rxnorm_code is populated on the Data Element Medications.

[18] At the time of writing this manual, the availability of NDC and/or RxNorm codes in EPIC is unknown

Importantly, the NDC should also be added to the Transformer relevant_medications and the Data Element Medications. There are two fields on the Data Element for the NDC code: ndc_raw (displays the code, as it appears in the EHR table) and ndc_normalized (the code transformed into a format that can be joined to the RxNorm crosswalk or a Value Set).

Since relevant_medications is a Transformer designed by Relevant, the health center should consult with their Relevant programmer contact before making any changes. Because this is a Transformer and not part of the standard Relevant Data Model, different instances of Relevant may have different fields or different field names in the results query. Nonetheless, in many instances, the raw and the standardized NDC appear on the TEMPORARY TABLE rx_items (in the relevant_medications query SQL) that is joined in the results query. The raw NDC can appear on this table as the field named ndc_code and the standardized NDC can appear as the field named ndc_11. Therefore, it is just a matter of displaying these fields in the results query (possibly with better alias names, if the health center chooses). These fields would then be mapped to the fields ndc_raw and ndc_normalized on the Data Element Medications.

It is important that all health centers add these NDC fields to the Transformer and Data Element because the NDC will be used to join to Value Sets that feature NDC codes. For example, the MCAS measure Diabetes Screening for People With Schizophrenia or Bipolar Disorder Who Are Using Antipsychotic Medications (SSD) has SQL code to directly join the NDC code on the Medications Data Element to the Value Set and the measure will not work unless the appropriate codes are displayed.

The new Transformer relevant_prescriptions and Data Element Prescriptions will feature the RxNorm and NDC codes when it becomes available.

Two Approaches to Using Medications in Quality Measures

There are two different approaches to using medications employed by the MCAS Quality Measures, depending on the nature of the measurement. Each approach obtains data from a different derived Transformer.

1. The observations approach, which is commonly used in UDS and QIP Quality Measures. In this case, all that is needed is evidence that the patient was taking the medication on a particular date. The derived Transformer

relevant_medications shows medication observations, by date. For example, the numerator for the UDS measure Statin Therapy for the Prevention and Treatment of Cardiovascular Disease reads: "Patients who are actively using or who received an order (prescription) for statin therapy at any time during the measurement period."

2. The duration approach, which requires a calculation for how long the patient was using the medication. A new Transformer relevant_prescriptions is being designed by Relevant to show data from actual prescriptions where it is known how many days-worth of medication (the duration) the patient received. For example, the numerator for Antidepressant Medication Management reads: "[Patients] who remained on an antidepressant medication for at least 84 days."

The approach used by MCAS measures that rely on medications is shown in the table below.

Quality Measure	Medication Approach	Codes in Value Set
Metabolic Monitoring for Children and Adolescents on Antipsychotics (APM)	Observation	NDC
Diabetes Screening for People With Schizophrenia or Bipolar Disorder Who Are Using Antipsychotic Medications (SSD)	Observation[19]	NDC
Contraceptive Care: Most or Moderately Effective Contraception (All) (CCW)	Observation	NDC
Contraceptive Care: Most or Moderately Effective Contraception (Postpartum) (CCP)	Observation	NDC
Antidepressant Medication Management (AMM)	Duration	NDC
Concurrent Use of Opioids and Benzodiazepines (COB)	Duration	NDC
Pharmacotherapy for Opioid Use Disorder (POD)	Duration	NDC

Medication Observations Approach

The general design of medication Data Elements contain these fields:

- id (autogenerated)
- patient_id
- started_on
- ended_on
- medication_name

[19] Note that there is no separate medications Data Element for this measure. See the measure section for an explanation.

The example code below is for antipsychotic medications for the measure "Metabolic Monitoring for Children and Adolescents on Antipsychotics (APM)."

```
SELECT DISTINCT
   patient_id,
   started_on,
   ended_on,
   medication AS medication_name,
   rxnorm_code
FROM relevant_medications
WHERE rxnorm_code IN
    (SELECT DISTINCT code_value
     FROM hedis_medication_lists
     WHERE medication_list_oid IN('2.16.840.1.113883.3.464.1004.1737',
                  '2.16.840.1.113883.3.464.1004.1738',
                  '2.16.840.1.113883.3.464.1004.2195')
       AND code_system_oid = '2.16.840.1.113883.6.88'
       AND latest = TRUE)
```

Medication Duration Approach

The Transformer relevant_prescriptions is currently being finalized. Example SQL code will be developed for the next version of these instructions.

E. Structured Data

There is more variation among health centers in the Data Elements that are based on structured data. However, the basic design has a patient ID field and the date that the structured data item was observed (or entered into the EHR). The fields typically present on these Data Elements are:

- patient_id
- observed_on

Structured data items are not identified by Value Sets in the same way as other Data Elements. Programmers will therefore need to recognize the appropriate items in the EHR[20] and then construct code to pull them from the derived

[20] For example, health centers using eCW can use the validation report that displays structured data items called "RCHC List All Structured Data Items"

Transformer relevant_structured_data. Typically, this Transformer has a Category name, an Item or Symptom name, and a Question name along with ID numbers for each. Since text names for these items can change in the EHR, it is recommended that ID numbers be used in the Data Element.

Even if the health center instance of Relevant does not have the derived Transformer relevant_structured_data, the Data Element can be built in the same manner as other Data Elements that use structured data. For example, the programmer might be able to reference the SQL code from Tobacco Use Screens.

In either case, a unique combination of ID numbers will identify the structured data item that should be pulled by the query. This can be a combination of the catid, itemid, and detailid. In the example below, the itemid, and detailid were sufficient to identify the question needed. For some items like screens, the detailid indicating the actual score is used to ensure that a completed screen was performed.

Note that there may be values (i.e., answers to the structured data question or prompt) that indicate the item was actually not done and these should be ignored by the Data Element. The SQL code below provides an example of this, but its use depends on the unique data in the EHR. In other cases, it may preferable to select only particular values (by ID number or by text search) that provide results for the Data Element. For example, the Contraceptive Observations Data Element is particular to the data it needs to process.

Lastly, if using ID numbers, it is a good idea to add the name text in SQL notes so that other programmers know what is being identified.

The sample below is for pulling a childhood developmental screen. The ID number combination will be unique for the item at the health center.

```
SELECT DISTINCT
   patient_id,
   visit_date
FROM relevant_structured_data
WHERE itemid = 19108 -- "ASQ"
   AND detailid = 4195 -- "ASQ score"
   AND NOT valueid = 10692  -- "Patient refused"
```