

Conventions for Populating OMOP CDM v5.0 to Support PCORnet v3 Requirements

Version	Date	Author	Summary
1.0	3/3/2016	Don Torok	Initial document for OMOP v5 to PCORnet v3
2.0	3/31/2016	Don Torok	Move items previously stored in the observation table:
2.1	4/7/2016	Don Torok	Move DRG to Cost Table
2.1.1	7/21/2016	Don Torok	Include changes/comments from Rimma and Lisa's review.
	8/24/2016	Rimma	<p>Change:</p> <p>Visit_Occurrence:</p> <ul style="list-style-type: none"> visit_concept_id, added new visit type Emergency/Inpatient; also added to the Outstanding Issues admitting_source_value, admitting_source_concept_id, discharge_to_source_value, discharge_to_concept_id - changed from "non-standard" to bonafide OMOP CDM fields <p>Cost:</p> <ul style="list-style-type: none"> DRG_source_value, DRG_concept_id - changed from "non-standard" to bonafide OMOP CDM fields <p>Condition_Occurrence:</p> <ul style="list-style-type: none"> condition_status_source_value, condition_status_concept_id - changed from "non-standard" to bonafide OMOP CDM fields Removed "Discharge" from possible values for condition_status_concept_id
2.2	8/25/2016	Don Torok	Update tobacco section
3.0	14 Sept 2016	Don Torok	Reorganized to ONLY include additions and conventions necessary to capture data needed to populate PCORnet.
3.1	01 Nov 2016	Don Torok	Responded to group review
3.2	19 Dec 2016	Don Torok	Added order date and frequency to drug exposure

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Purpose

This document defines a set of conventions for storing information within the OMOP CDM, with the intent that information needed to populate the PCORnet CDM can be obtained from the OMOP CDM using a common set of procedures. Populating OMOP CDMv5 is addressed in the OMOP Common Data Model Specification, Version 5. This document only addresses areas where the standards spelled out in the OMOP Common Data Model Specification, Version 5 will not support data elements, referential integrity, cardinality or other structural requirements necessary for the PCORnet CDM or where there is ambiguity in how medical data or observations needed for PCORnet might be recorded in the OMOP CDM.

This is an evolving specification, based in structure on the OMOP Common Data Model with focus on PCORnet requirements.

General Conventions

1. Concept IDs are taken from OMOP vocabularies v5 or later using the complete (“restricted”) version that includes licensed terminologies such as CPT and others.
2. PCORnet CDM V3.0 requires some concepts that are not currently part of the OMOP standard vocabulary. To represent PCORnet concepts that are not represented in the standard OMOP vocabulary, we will be using non-standard concepts from vocabulary_id = ‘PCORnet’ (former vocabulary_id = 60). While this violates the OMOP conventions to use only concept_ids from OMOP standard vocabularies, this CDRN-specific convention enables a uniform ETL from OMOP CDM to PCORnet CDM.
3. Representation of PCORNet “Unknown” flavors.
To support PCORnet conventions for representation of “Unknown” flavors, we will follow these conventions:

Null Name	Definition of each field
A data field is not present in the source system	A corresponding field in the OMOP CDM will be populated with concept_ID=0. Not Present in Source
A data field is present in the source system, but the source value is null or blank	A corresponding field in the OMOP CDM will be populated with “No Information” (44814650) from vocabulary_id = ‘PCORNet’
A data field is present in the source system, but the source value explicitly denotes an unknown value	A corresponding field in the OMOP CDM will be populated with “Unknown”(44814653) from vocabulary_id = ‘PCORNet’
A data field is present in the source system, but the source value cannot be mapped to the CDM	A corresponding field in the OMOP CDM will be populated with “Other” (44814649) from vocabulary_id = ‘PCORNet’

This set of concept ids will be referred to as ‘Unknown flavors’ throughout the rest of this document.

1. Person

The allowable concepts ids for the following attributes are expanded as shown below:

Field	Type	Required	Description	PCORnet Convention
gender concept id	Integer	Yes	Foreign key to a standard concept identifier in the Vocabulary for the gender of the person.	Valid OMOP concept_ids are: Female: 8532 Male: 8507 Allowable concepts have been extended to include the following from vocabulary_id = 'PCORnet': Ambiguous: 44814664 and PCORnet 'Unknown flavors'
Race concept id	Integer	Yes	Foreign key to a standard concept identifier in the Vocabulary for the race of the person.	All standard concepts from vocabulary_id = 'Race' plus the following concepts from vocabulary_id = 'PCORnet': Multiple Race: 44814659 Refuse to answer: 44814660 and PCORnet 'Unknown flavors'
Ethnicity concept id	Integer	Yes	Foreign key to a standard concept identifier for the ethnicity	In addition to the standard OMOP values vocabulary_id = 'PCORnet': Refuse to answer: 44814660 and PCORnet 'Unknown flavors'

2. Observation Period

The OBSERVATION_PERIOD table is designed to capture the time intervals in which data are being recorded for the person. The allowable concepts are limited to the following standard concepts from vocabulary_id = 'Obs Period Type':

- Insurance: 44814722
- Geography: 44814723
- Algorithmic: 44814725
- Encounter-based: 44814724

Conventions

According to PCORnet requirements, "Enrollment" is an insurance-based concept that defines a period during which all medically-attended events are expected to be observed. For partners that do not have enrollment information for some of their patients, other approaches for identifying periods during which complete medical capture is expected can be used.

The Enrollment data can be loaded from OMOP Payer_Plan_period table; which in turn is built based on patients' encounters ('E' – encounter based). For Claims based source data this ENR_BASIS is 'I' – Insurance based.

In the absence of claims data, Encounter-based (44814724) method will be used: where observation period start and end date correspond to the start date of the earliest and end date of the latest available patient visit occurrence respectively.

3. Visit Occurrence

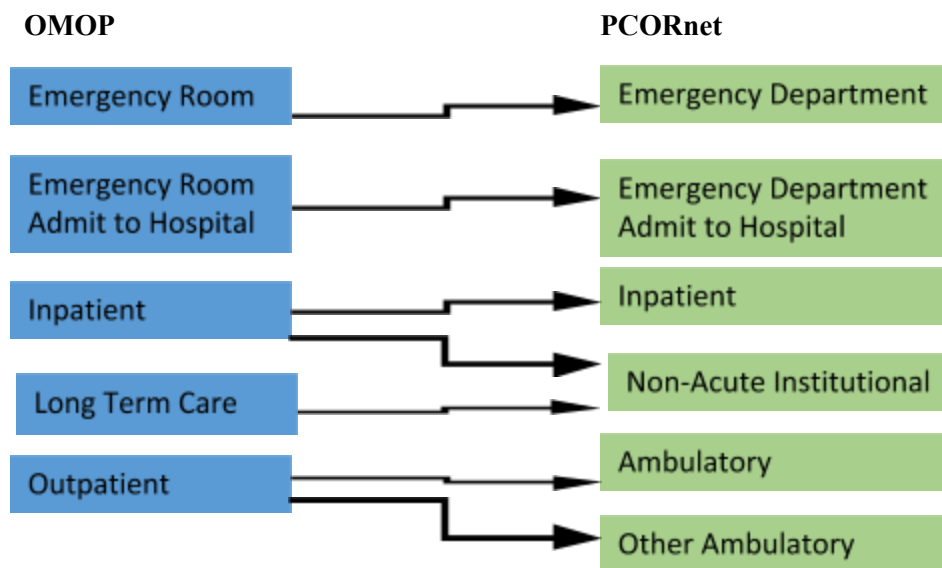
The VISIT_OCCURRENCE table contains the spans of time a person continuously receives medical services from one or more providers at a facility in a given setting within the healthcare system. The OMOP Visit Occurrence corresponds with the PCORnet Encounter table. The allowed values for the visit_concept_id is expanded to accommodate values requested by PCORnet. There are also a number of columns added to support the PCORnet Encounter table hospital admission admission, discharge disposition and discharge status.

Expanded Values for Visit Concept Id

Field	Type	Required	Description	PCORnet Convention
Visit concept id	Integer	Yes	Foreign key to standard concept identifier for a visit.	In addition to the standard OMOP values add the follow concepts from PCORnet vocabulary. Non-Acute Institutional Stay: 44814710 Other Ambulatory Visit: 44814711 and PCORnet 'Unknown flavors'

Discussion

There is NOT a one to one relationship between the OMOP visit properties and PCORnet for all the possible types of visits. The ETL designer will need to make judgements as to how some visits will be classified and which types of visits will be included. The ETL designer will need to determine how the different values assigned to the *visit concept id* may affect analysis. The following points out the potential problems.



Emergency room and Inpatient

The OMOP and PCORnet definitions for emergency room, inpatient and emergency room visits that result in a hospital admission are similar and no special consideration is necessary when determining the visit concept id for these visits.

However, it is not so obvious how to classify Non-Acute Institutional stays. The PCORnet definition for a Non-Acute Institutional Stay includes hospice, skilled nursing facility, rehab center, nursing home, residential, overnight non-hospital dialysis, and other non-hospital stays. OMOP lacks this classification. These types of encounters would either be classified as Inpatient or Long Term care visits.

Outpatient visit

The OMOP Outpatient visit definition overlaps two PCORnet encounter types, Ambulatory and Other Ambulatory. PCORnet defines an Ambulatory Visit as visits at outpatient clinics, physician offices, same day/ambulatory surgery centers, urgent care facilities, and other same-day ambulatory hospital encounters, but excludes emergency department encounters. And Other Ambulatory Visit as other non-overnight encounters such as hospice visits, home health visits, skilled nursing visits, other non-hospital visits, as well as telemedicine, telephone and email consultations. May also include "lab only" visits (when a lab is ordered outside of a patient visit), "pharmacy only" (e.g., when a patient has a refill ordered without a face-to-face visit), "imaging only", etc.

Here the ETL into OMOP needs to make a few decisions. Is it important to distinguish between the PCORnet Ambulatory and Other Ambulatory visits? If not, then it should be sufficient to classify all

these visits as Outpatient. If the distinction is important enough to maintain both Ambulatory and Other Ambulatory, then use the OMOP concept for Outpatient to correspond to the Ambulatory visits and the OMOP concept for 44814711(Other Ambulatory) for those visits that meet the Other Ambulatory definition.

Also to be decided is if the OMOP CDM should include visit information for PCORnet that otherwise might not be included. For example, an ETL into the OMOP CDM may not be expected to include a telephone or email consultation, but PCORnet does make allowances for these encounters. These decisions will be site specific, but if these types of visits are included, the visit concept id should be Other Ambulatory visit.

Visit Occurrence Table

The following columns have been accepted by the OHDSI community as additions to the version 5 Visit Occurrence table. They are listed here as “added” because the OMOP CDM v5 documentation does not include them.

Field	Type	Required	Description	PCORnet Convention
Admitting_source_value	Text(50)	No	Code or identifier as it appears in the source data	Define, when available in the source data, for ER, Inpatient and Long term care visits
Admitting_source_concept_id	Integer	Yes	Concept from the Place of Service vocabulary and Unknown flavors Set to zero when not applicable.	Same rule as above.
Discharge_to_source_value	Text(50)	No	Place of service values, unless it is known that the person died in which case enter ‘Patient Died’ or Patient absent without leave, enter ‘AWOL’ or Patient self discharged against medical advice, enter ‘Self discharge’	Define, when available in the source data, for ER, Inpatient and Long term care visits
Discharge_to_concept_id	Integer	Yes	Concept from the Place of Service vocabulary. In addition to the “Place of Service” vocabulary, the following SNOMED concepts for discharge disposition can be used: Patient died: 4216643 Absent without leave: 44814693 Patient self-discharge against medical advice: 4021968 and Unknown flavors	Same rule as above.

			Set to zero when not applicable.	
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4. Condition Occurrence

The CONDITION_OCCURRENCE table captures records of a disease or a medical condition based on evaluation by a provider or reported by a patient. The corresponding table in PCORnet is the Diagnosis table.

Conventions

The *condition_status_source_value* and *condition_status_concept_id* columns have been adopted by OHDSI after CDMv5 was released. They are included here because they may not exist in your schema. The *condition_origin* column is added to record the condition origin for a column with the same name added in PCORnet CDMv3.1.

Field	Type	Required	Description	PCORnet Convention
condition_type_concept_id	integer	Yes	Concept reflecting the source data from which the condition was recorded. For example, conditions may be defined as primary or secondary diagnoses, problem lists and person statuses.	Only the following two types are relevant to PCORnet Principal discharge diagnosis flag: <ul style="list-style-type: none"> Primary Condition: 44786627 Secondary Condition: 44786629 PCORnet 'Unknown' flavors
Condition_status_concept_id	Integer	Yes	Possible standard value_as_concept_id: Admitting diagnosis: 4203942 Final diagnosis: 4230359 Preliminary diagnosis: 4033240 Interim: 45880831 Set to zero when not applicable.	Also allowed are the PCORnet 'Unknown' flavors
Condition_status_source_value	Text(50)	No	Classification of diagnosis status. Potential values are 'Admitting', 'Final' (interchangeable with 'Discharge'), or 'Interim'. Outpatient Visits would generally be expected to have a source of "Final."	The context is to capture available diagnoses recorded during a specific encounter. It is not necessary to populate interim diagnoses unless readily available. Ambulatory encounters would generally be expected to have a source of "Final."
Condition_Origin (V3.1)	Text(2)	Yes	Billing pertains to internal healthcare processes and data sources. Claim pertains to data from the bill fulfillment, generally data	BI=Billing CL=Claim PCORnet 'Unknown' flavors Use OT=Other is the origin is electronic health records

			sources held by insurers and other health plans.	
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5. Drug Exposure

When drug exposure are the result of an order there they may be an order date as well as drug start date. Add the following two columns to the Drug Exposure table

Field	Type	Required	Description	PCORnet Convention
order_date	date	No	Order date of the prescription by the provider.	NON OMOP COLUMN
frequency	char(20)	No	Specified frequency of medication.	<p>This column is used to populate PCORnet where the possible values are:</p> <p>01=Every day 02=Two times a day (BID) 03=Three times a day (TID) 04=Four times a day (QID) 05=Every morning 06=Every afternoon 07=Before meals 08=After meals 09=As needed (PRN) NI=No information UN=Unknown OT=Other</p> <p>Do not simply use the PCORnet two character code as it will have no meaning in OMOP</p>

6. Measurement

Values from the Measurement table are used to populate both the Vital and the Lab Result CM tables in PCORnet. No additional columns are added to the Measurement table, but there are a number of conventions that need to be followed to enable the OMOP to PCORnet ETL to find the correct values.

Measurement Type Concept id

The PCORnet 'Unknown' flavors added as possible values for *measurement_type_concept_id*.

Field	Type	Required	Description	PCORnet Convention
measurement_type_concept_id	Integer	Yes	A foreign key to the concept	Concept_ids where vocabulary_id = 'Meas Type'

			identifier in the Standardized Vocabularies reflecting the type of data on which the measurement record is based.	Also allowed are the PCORnet 'Unknown' flavors
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Vitals

The Measure records that hold information used to fill in the attributes of the Vital table are identified by setting the *measurement concept_id* to the LOINC codes given in the following table.

Vital Measurement	Concept Name	Code	Concept Id
Height	Body height	8302-2	3036277
Weight	Body weight	29463-7	3025315
Body Mass Index (BMI)	Body mass index	39156-5	3038553
Diastolic Blood Pressure	Diastolic Blood Pressure - Sitting	8453-3	3034703
	Diastolic Blood Pressure - Standing	8454-1	3019962
	Diastolic Blood Pressure - Supine	8455-8	3013940
	Diastolic BP	8462-4	3012888
Systolic Blood Pressure	Systolic Blood Pressure - Sitting	8459-0	3018586
	Systolic Blood Pressure - Standing	8460-8	3035856
	Systolic Blood Pressure - Supine	8461-6	3009395
	Systolic BP	8480-6	3004249

To synchronize Diastolic and Systolic BP in case of multiple measurements, *measurement_date* and *measurement_time* of the same measurement should be the same. Additionally, records for the same measurement are linked together via *FACT_RELATIONSHIP* table. For each pair of BP measurements, there will be two records in the *FACT_RELATIONSHIP* table. The first record will contain: *domain_concept_id_1* and *domain_concept_id_2* equal to 21 ('Measurement'), *Fact_id_1* and *Fact_id_2* equal to the respective *measurement_id* of diastolic and systolic BP records in the Measurement table coming from the same measurement, and *relationship_concept_id* equal to 46233682 ('Diastolic to systolic blood pressure measurement'). The second record will contain: *domain_concept_id_1* and *domain_concept_id_2* equal to 21 ('Measurement'), *Fact_id_1* and *Fact_id_2* equal to the respective *measurement_id* of systolic and diastolic BP records in the Measurement table coming from the same measurement, and *relationship_concept_id* equal to 46233683 ('Systolic to diastolic blood pressure measurement').

PCORnet Lab Values

The PCORnet Lab Result CM table has columns for the *order date*, *specimen date and time*, and a *result date and time*. Whereas the OMOP Measurement table only has a measurement date. The most meaningful date for a lab test is when the sample was drawn. Therefore the convention will be to fill the *measurement date and time* with the source values that best represents the when the sample was drawn.

Field	Type	Required	Description	PCORnet Convention
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measurement_date	date	yes	Date the sample being tested was taken	
measurement_time	time	no	Time the sample being tested was taken	

Add the following columns to the Observation table to accommodate the other two date fields and priority requested by PCORnet. Note these columns are optional. It is not necessary to add these columns if your source data does not have these dates and times or priority.

Field	Type	Required	Description	PCORnet Convention
result_date	date	no	Date the results received	Optional
result_time	time	no	Time the results received	Optional
order_date	date	no	Date the lab was ordered	Optional
priority	char 2	no	Immediacy of test. The intent of this variable is to determine whether the test was obtained as part of routine care or as an emergent/urgent diagnostic test (designated as Stat or Expedite).	E=Expedite R=Routine S=Stat NI=No information UN=Unknown OT=Other

Note: depending on the database there might not be a separated data type for time, use the date/time data type that is capable of representing time. It will be the responsibility of the ETL to parse out the date and times for PCORnet.

PCORnet Laboratory Results of Interest

PCORnet is currently limiting the laboratory results to a finite set of Labs. However, all laboratory results should be loaded into the OMOP Measurement table. The OMOP to PCORnet ETL is responsible for selecting the labs of interest for PCORnet.

Laboratory results will be copied into the PCORnet Lab Result CM table when the *measurement_concept_id* is equal any of the OMOP Concept Id listed in the table below. This table is included here, as a potential aid in prioritizing if your site is in the process of mapping internal lab identifiers into LOINC codes. This table should NOT be used to limit what labs are loading into the OMOP Observation table.

PCORnet Lab Name	LOINC Code	OMOP Concept ID	LOINC long common name	Component	Specimen	Units	Unit OMOP Concept ID
Creatinine	12190-5	3016662	Creatinine [Mass/volume] in Body fluid	Creatinine	Body fld	mg/d L	8840
Creatinine	2160-0	3016723	Creatinine [Mass/volume] in Serum or Plasma	Creatinine	Ser/Plas	mg/d L	8840

Creatinine	38483-4	3051825	Creatinine [Mass/volume] in Blood	Creatinine	Bld	mg/d L	8840
Creatinine kinase MB	13969-1	3005785	Creatine kinase.MB [Mass/volume] in Serum or Plasma	Creatine kinase.MB	Ser/Plas	ng/m L	8842
Creatinine kinase MB	32673-6	3029790	Creatine kinase.MB [Enzymatic activity/volume] in Serum or Plasma	Creatine kinase.MB	Ser/Plas	U/L	8923
Creatinine kinase MB	5912-1	3017761	Creatine kinase isoenzymes [interpretation] in Serum or Plasma	Creatine kinase isoenzymes	Ser/Plas		
Creatinine kinase MB/creatinine kinase total	12187-1	3007150	Creatine kinase.MB/Creatine kinase.total in Serum or Plasma by Electrophoresis	Creatine kinase.MB/Creatine kinase.total	Ser/Plas	%	8554
Creatinine kinase MB/creatinine kinase total	20569-0	3016311	Creatine kinase.MB/Creatine kinase.total in Serum or Plasma	Creatine kinase.MB/Creatine kinase.total	Ser/Plas	%	8554
Creatinine kinase MB/creatinine kinase total	49136-5	3048863	Creatine kinase.MB/Creatine kinase.total [Ratio] in Serum or Plasma	Creatine kinase.MB/Creatine kinase.total	Ser/Plas		
Creatinine kinase total	2157-6	3007220	Creatine kinase [Enzymatic activity/volume] in Serum or Plasma	Creatine kinase	Ser/Plas	U/L	8923
Hemoglobin	718-7	3000963	Hemoglobin [Mass/volume] in Blood	Hemoglobin	Bld	g/dL	8713
Hemoglobin A1c	4548-4	3004410	Hemoglobin A1c/Hemoglobin.total in Blood	Hemoglobin A1c/Hemoglobin.total	Bld	%	8554
International normalized ratio	6301-6	3022217	INR in Platelet poor plasma by Coagulation assay	Coagulation tissue factor induced.INR	PPP		
Low-density lipoprotein	13457-7	3028288	Cholesterol in LDL [Mass/volume] in Serum or Plasma by calculation	Cholesterol.in LDL	Ser/Plas		
Low-density lipoprotein	18262-6	3009966	Cholesterol in LDL [Mass/volume] in Serum or Plasma by Direct assay	Cholesterol.in LDL	Ser/Plas	mg/d L	8840
Low-density lipoprotein	2089-1	3028437	Cholesterol in LDL [Mass/volume] in Serum or Plasma	Cholesterol.in LDL	Ser/Plas	mg/d L	8840
Low-density lipoprotein	22748-8	3001308	Cholesterol in LDL [Moles/volume] in Serum or Plasma	Cholesterol.in LDL	Ser/Plas		
Low-density lipoprotein	43727-7	3046549	Lipoprotein.beta.subparticle.small [Moles/volume] in Serum or Plasma	Lipoprotein.beta.subparticle	Ser/Plas	nmol/ L	8736
Low-density lipoprotein	47213-4	3053190	Cholesterol in LDL real size pattern [Identifier] in Serum or Plasma	Cholesterol.in LDL real size pattern	Ser/Plas		
Low-density lipoprotein	54434-6	40757565	Lipoprotein.beta.subparticle [Moles/volume] in Serum or Plasma	Lipoprotein.beta.subparticle	Ser/Plas	nmol/ L	8736
Low-density lipoprotein	55440-2	40758569	Cholesterol.in LDL (real) [Mass/volume] in Serum or Plasma by VAP	Cholesterol.in LDL	Ser/Plas	mg/d L	8840
Troponin I cardiac	10839-9	3021337	Troponin I.cardiac [Mass/volume] in Serum or Plasma	Troponin I.cardiac	Ser/Plas	ng/m L	8842
Troponin I cardiac	42757-5	3033745	Troponin I.cardiac [Mass/volume] in Blood	Troponin I.cardiac	Bld	ng/m L	8842

Troponin T cardiac (qualitative)	33204-9	3042837	Troponin T cardiac [Presence] in Serum or Plasma	Troponin T cardiac	Ser/Plas		
Troponin T cardiac (qualitative)	48426-1	3052931	Troponin T cardiac [Presence] in Blood	Troponin T cardiac	Bld		
Troponin T cardiac (quantitative)	48425-3	3048529	Troponin T cardiac [Mass/volume] in Blood	Troponin T cardiac	Bld	ug/L	8748
Troponin T cardiac (quantitative)	6597-9	3019572	Troponin T cardiac [Mass/volume] in Venous blood	Troponin T cardiac	BldV	ug/L	8748
Troponin T cardiac (quantitative)	6598-7	3019800	Troponin T cardiac [Mass/volume] in Serum or Plasma	Troponin T cardiac	Ser/Plas	ug/L	8748

7. PCORnet Values Stored in the Observation Table

Information to populate the PCORnet the *biobank_flag* in the Demographic table, the *chart* in the Enrollment table and the *smoking*, *tobacco*, and *tobacco_type* values in the Vital table is stored in the OMOP Observation table.

Biobank Flag

The *biobank_flag* is in the PCORnet Demographic table and indicates that one or more biobanked specimens are stored and available for research use. If a biobanked specimen is available for a person, then add a record to the Observation table with the *observation_concept_id* set to 4001345 (Specimen from patient). Set the *value_as_concept_id* to 4188539 (Yes). If a biobanked specimen is not available, either do not add a record to the Observation table or add a record and set the *value_as_concept_id* to 4188540 (No). Set the *observation_date* to the same date as the *observation_period_start_date* in the Observation Period table for that person.

Chart

The *chart* is in the PCORnet Enrollment table, the Yes/No values are intended to answer the question, "Are you able to request (or review) charts for this person?" If the answer is 'Yes' then create a record in the Observation table with the *observation_concept_id* set to 4030450 (Patient chart) and the *value_as_concept_id* set to 4188539 (Yes). If the *chart* is NOT available, either do not add a record or add a record and set the *value_as_concept_id* to 4188540 (No). Since the PCORnet Enrollment table corresponds to the OMOP Observation Period table set the *observation_date* to the *observation_period_start_date*.

Smoking and Tobacco Vital Values

All tobacco related patient observations should have the *Observation.observation_concept_id* set to 4041306 (Tobacco use and exposure). The concept describing the observations will be in the *value_as_concept_id* column. The existence of a record, assumes that the answer to the question is Yes. Do not add a record when the answer to the question is any value other than Yes.

Observations regarding a person's smoking behavior are time dependent, for an example at one point in time a person may report that they have never smoked, but later on they start smoking. As a result, it is important that the observation date be defined.

Description	SNOMED Code	Concept Id
Chews tobacco	81703003	4218741
Cigar smoker	59978006	4246415
Cigarette smoker	65568007	4276526
Current nonsmoker but past smoking history unknown	405746006	4233486
Current non-smoker	160618006	4052464
Ex-cigar smoker	160621008	4052949
Ex-cigarette smoker	281018007	4092281
Ex-cigarette smoker amount unknown	266928006	4148416
Ex-heavy cigarette smoker (20-39/day)	266924008	4141783
Ex-light cigarette smoker (1-9/day)	266922007	4145798
Ex-moderate cigarette smoker (10-19/day)	266923002	4141782
Ex-pipe smoker	160620009	4052465

Ex-smoker	8517006	4310250
Ex-trivial cigarette smoker (<1/day))	266921000	4148415
Ex-user of moist powdered tobacco	228503001	4038733
Ex-very heavy cigarette smoker (40+/day)	266925009	4141784
Heavy cigarette smoker (20-39 cigs/day)	160605003	4052947
Light cigarette smoker (1-9 cigs/day)	160603005	4052029
Moderate cigarette smoker (10-19 cigs/day)	160604004	4052030
Never chewed tobacco	228512004	4036090
Never smoked tobacco	266919005	4144272
Never used moist powdered tobacco	228502006	4036557
Non-smoker	8392000	4222303
Patient not asked	1631000175102	46273465
Pipe smoker	82302008	4218917
Second hand cigarette smoke	102409004	4009853
Smoker	77176002	4298794
Smokes tobacco daily	449868002	42709996
Snuff user	228494002	4043053
Tobacco smoking consumption unknown	266927001	4141786
Trivial cigarette smoker (less than one cigarette/day)	266920004	4144273
User of moist powdered tobacco	228504007	4043056

The following SNOMED codes may be seen in the source data, but they are NOT in the current vocabulary. They should be mapped to the closest equivalent concept from the table above.

Description	SNOMED Code	Mapped to Concept	Description
Current some day smoker	428041000124106	4298794	Smoker
Heavy tobacco smoker	428071000124103	4052947	Heavy cigarette smoker (20-39 cigs/day)
Light cigarette smoker (1-9 cigs/day)	428061000124105	4052029	Light cigarette smoker (1-9 cigs/day)
Occasional tobacco smoker	428041000124106	4144273	Trivial cigarette smoker (less than one cigarette/day)

Other smoking or tobacco use concept may exist in the source data. However only the above values are currently included in the scheme to translate the OMOP smoking values to the PCORnet vital values. A separate document explains how this mapping is accomplished.

Outstanding Items

Immediate

1. Check with Chris if concept 44814723 has been corrected: 'Period while enrolled in study' should be changed to 'Geography based'.
2. Ask Chris to add new concept for Emergency-Inhospital Visit

Parking lot

1. Lab handling
 - a. RESULT_LOC
 - b. LAB_PX
 - c. LAB_PX_TYPE
 - d. LAB_ORDER_DATE– add to OMOP CDM and also add TIME
 - e. RESULT_DATE – add to OMOP CDM
 - f. RESULT_TIME - add to OMOP CDM
 - g. NORM_MODIFIER_LOW
 - h. NORM_MODIFIER_HIGH
 - i. Abnormal indicator
 - j. Lab order – add concept
2. When observation period and chart availability determination is clear, address how Chart Availability in the Observation table connects with Observation_period table.
3. Handling of Providers with multiple NPIs in PCORnet???
4. Discuss distributions of records across the CDM tables based on the concept domain and how this affects interoperability with PCORnet.
5. Test of edits that must be accepted.