PCORnet CDM Forum

Tuesday, April 19, 2016, 1–2 PM Eastern

Hosted by Abel Kho, MD

Facilitated by Shelley Rusincovitch and Michelle Smerek

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The National Patient-Centered Clinical Research Network

Agenda

- Welcome and announcements
- Review of the GitHub CDM issue tracker and errata
- Recent work with the lab result reference table
- Discussion of the CONDITION table and “PCORnet-defined cohort algorithm” category
- Wrap up

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Announcements

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Upcoming data characterization office hours

Why it may be of interest to this group:

- Offers an opportunity for in-depth discussion with the team about your questions

April 20, 2-3 ET

1-650-479-3207 Call-in toll number (US/Canada)

Access code: 738 585 443

April 26, 2-3 ET

1-650-479-3207 Call-in toll number (US/Canada)

Access code: 734 755 577

May 6, 12-1 ET

1-650-479-3207 Call-in toll number (US/Canada)

Access code: 736 965 276

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Research Using a DRN Forum on April 25

Why it may be of interest to this group:

- This is a new forum with focus on Distributed Research Network (DRN) research methods
- Topic for April 25: Flexible Analytic Tool Development: A SAS based perspective, presented by Jennifer Popovic

Research Using a DRN Forum
Monday April 25th, 11am-12pm ET
Online:
https://dukemed.webex.com/dukemed/j.php?MTID=mca9d81877417a4558450558d80cc5e22
Phone: 1-855-244-8681 / Access code: 736 510 205

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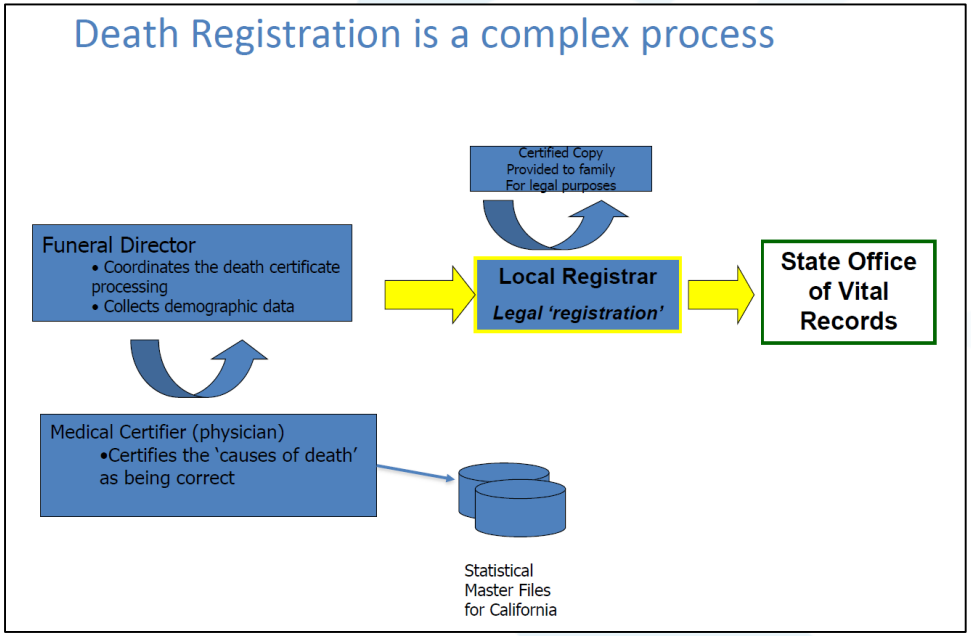
Recap: CDM Forum from March 14

Why it may be of interest to this group:

- Mike Hogarth presented on dearth event registration and mortality data
- Session prompted considerable interest and attention, even a request to rebroadcast recording with internal team

Recording, slides, and summary: https://pcornet.imeetcentral.com/p/ZgAAAAAcTEB



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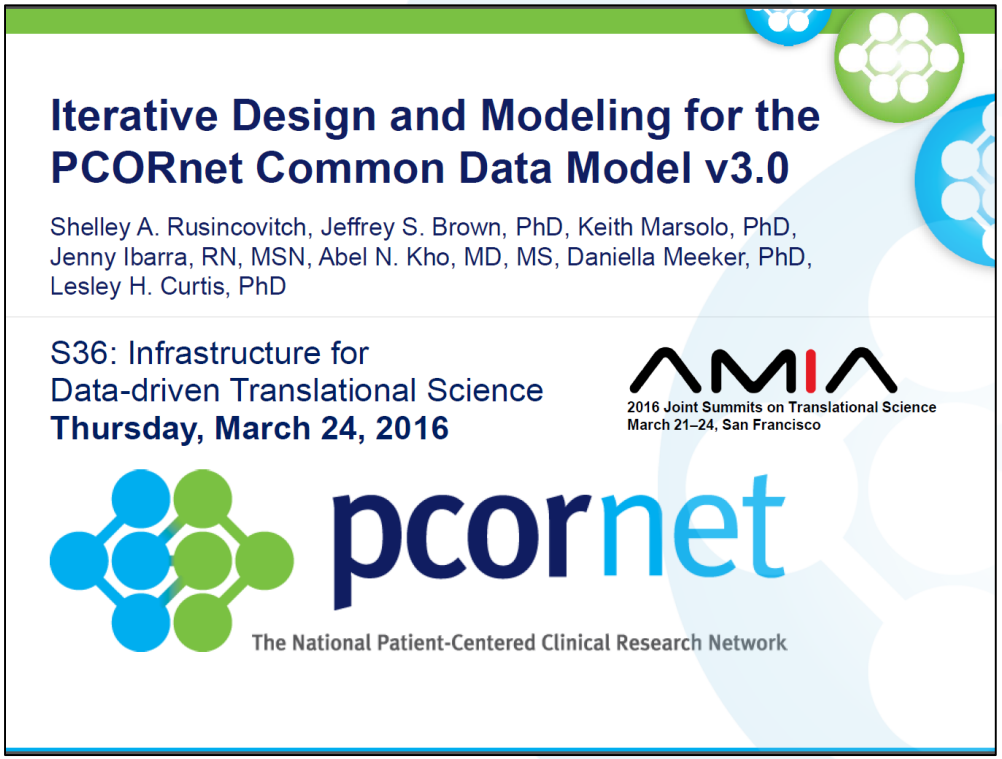
Recap: AMIA presentation on CDM v3.0

Why it may be of interest to this group:

- Shelley Rusincovitch presented on the Common Data Model v3.0 design at the AMIA Joint Summits in March

Slides and abstract:
https://github.com/CDMFORUM/CDM-GUIDANCE/wiki/CDM-related-Abstracts



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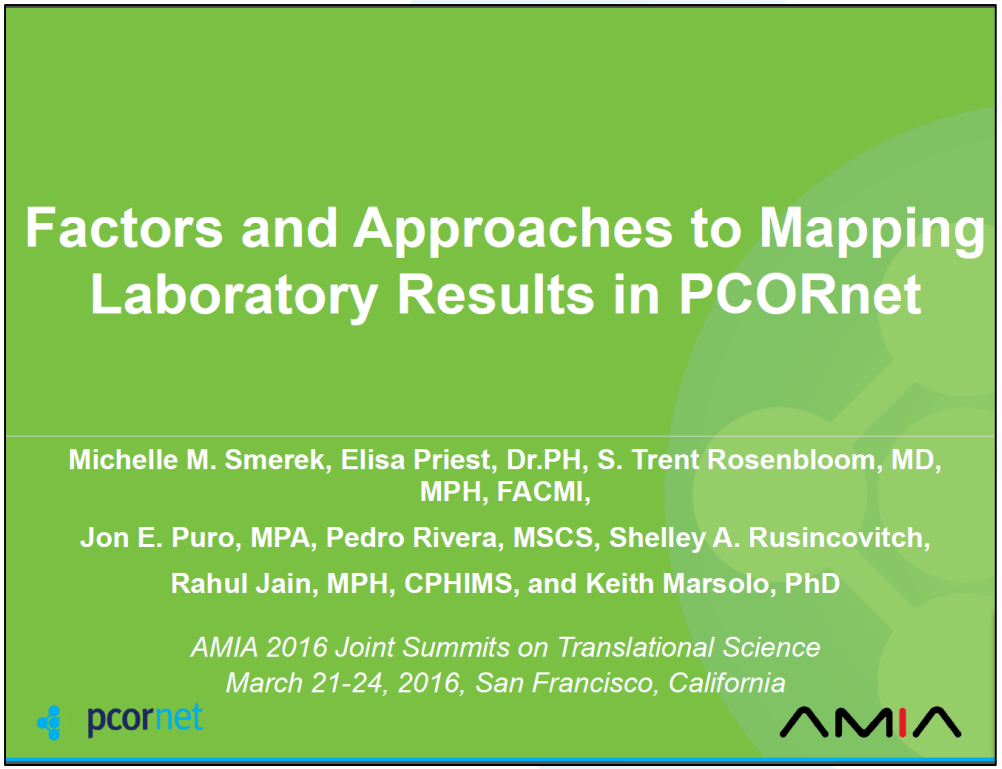
Recap: AMIA presentation on lab mapping strategies

Why it may be of interest to this group:

- Michelle Smerek presented at the AMIA Joint Summits in March; a product of the Lab Mappings Interest Group; includes survey results

Slides and abstract: https://github.com/CDMFORUM/CDM-GUIDANCE/wiki/CDM-related-Abstracts



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GitHub and Issue Tracker Review

Some content repeated from DRN OC Forum on March 7, 2016

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What is GitHub?

- Web-based repositories for storing software program code
- Largest platform of its kind with >12 million people, >31 million projects (https://github.com/about)
- Often used for open-source projects
- Used by initiatives such as:
  - openFDA: https://github.com/FDA/openfda
  - precisionFDA: https://github.com/FDA/precisionFDA
  - OHDSI: https://github.com/OHDSI
- Used by several PCORnet-related groups, including:
  - LHSNet: https://github.com/LHSNet
  - SCILHS: https://github.com/SCILHS
  - PEDSnet: https://github.com/PEDSnet

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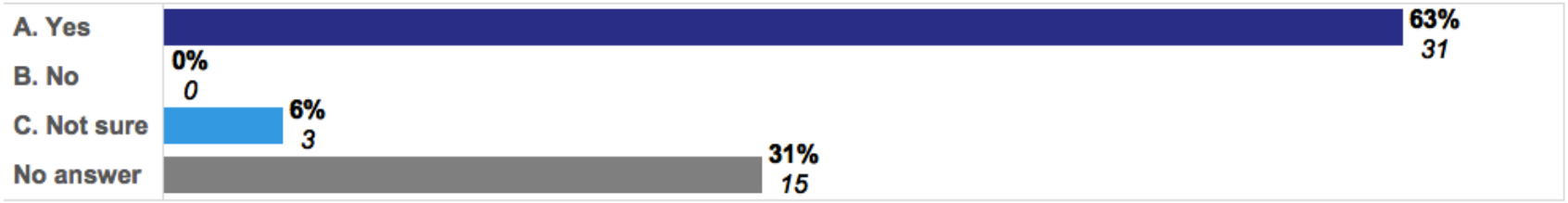
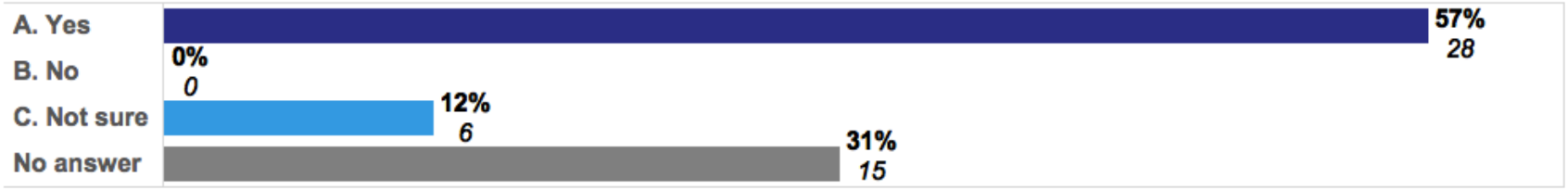
Poll results from CDM Forum on November 11, 2015

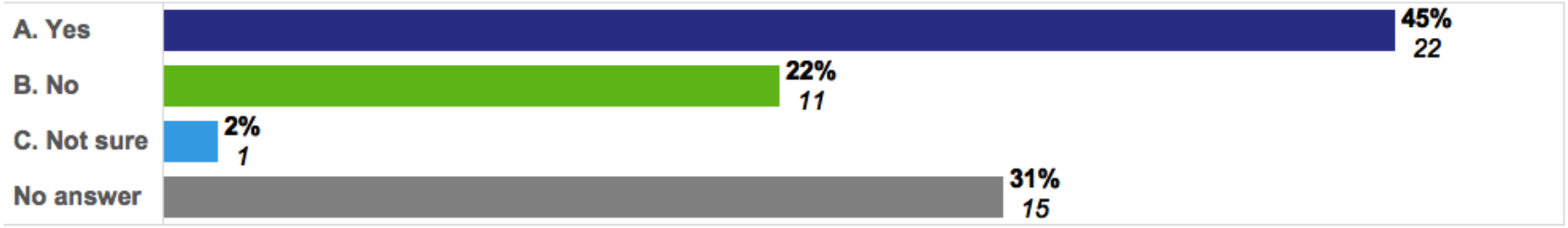
1. Would you (or your team) potentially have interest in USING or IMPROVING UPON PCORnet-related code shared by others? ("Code" might include, but is not limited to, database scripts, processing scripts, client-based utilities, etc.)



2. Would you (or your team) potentially have interest in SHARING PCORnet-related code from your team with others? ("Code" might include, but is not limited to, database scripts, processing scripts, client-based utilities, etc.)



3. Do you (or your team) have experience with a code repository tool (like GitHub or BitBucket)?



Summary of GitHub progression

3 phases of development and soft launches of GitHub repositories by the DRN OC:

(Planning stage: Discussion and assessment, primarily through the CDM Forum in fall 2015)

1. ADAPTABLE base phenotype (December 2015)
2. CDM Errata (January 2016)
3. Diagnostic Query and Data Characterization packages (March 2016)

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Using the GitHub issue tracker functionality

- These areas are often brought to our attention by data partners, with many thanks
  - Multiple mechanisms include the CDM forum, CDM forum interest groups, data characterization office hours, and site liaison activity
- For the Common Data Model, a separation between errata (errors and typos in the current specification) and non-errata (guidance and potential enhancements)

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Issue Tracker review (live)

CDM errata issue tracker:
https://github.com/CDMFORUM/CDM-ERRATA/issues

CDM guidance issue tracker:
https://github.com/CDMFORUM/CDM-GUIDANCE/issues

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Future thoughts

- Many different PCORnet-related resources exist
  - Already a number of repositories, and expected to grow
  - Different organizations represented, and many desire to brand and manage their own resources
  - A challenge will be connecting and indexing this “web of resources”
- We look forward to the Data Committee’s strategic assessment and recommendations
- Your suggestions and thoughts are appreciated!

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Lab Result Reference Table

Michelle Smerek

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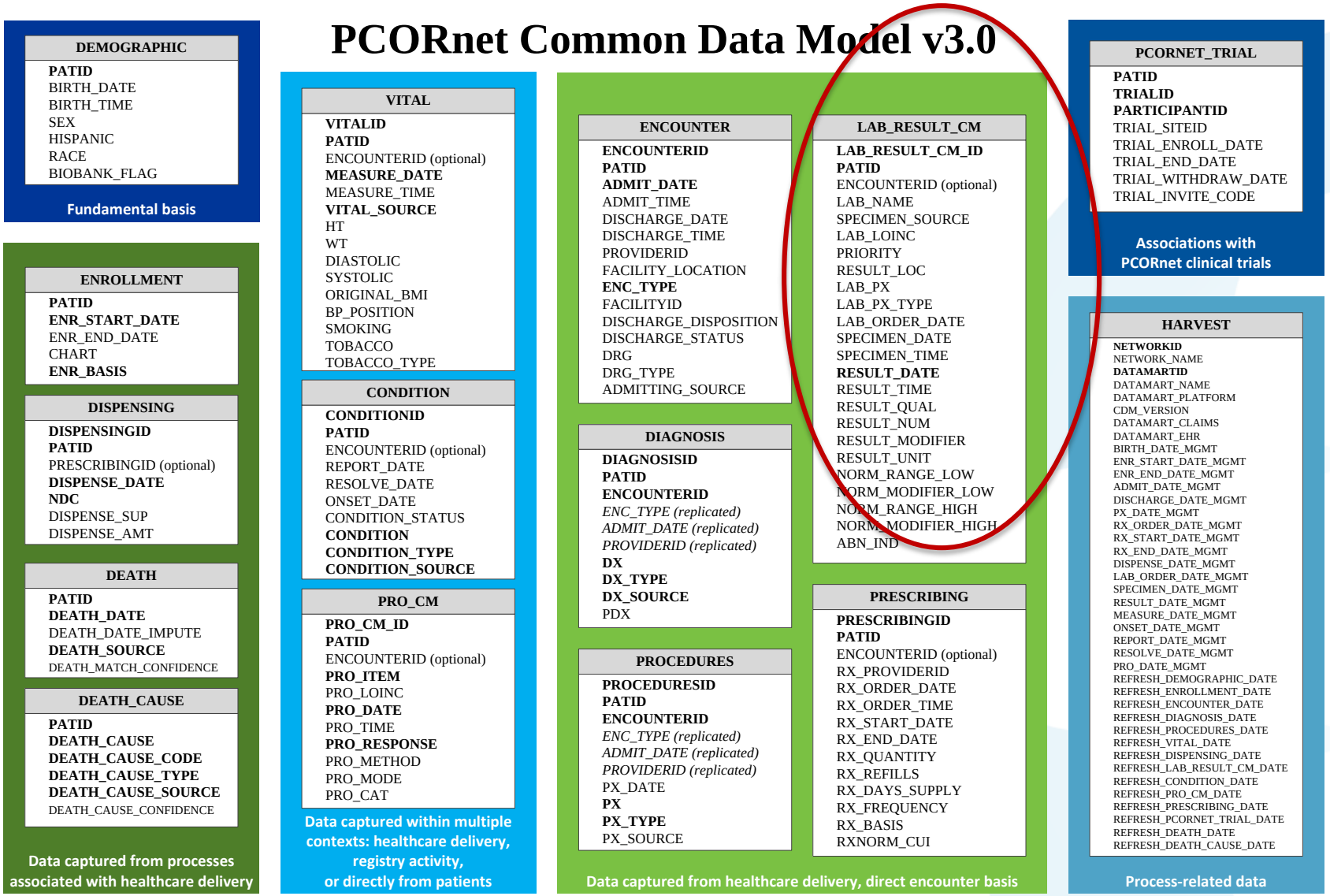
From presentation at AMIA TBI/CRI Summit: March 2016

PCORnet Common Data Model v3.0



http://www.pcornet.org/pcornet-common-data-model/

Bold font indicates fields that cannot be null due to primary key definitions or record-level constraints.

LAB_RESULT_CM: contents

LAB_RESULT_CM
LAB_RESULT_CM_ID
PATID
ENCOUNTERID (optional)
LAB_NAME
SPECIMEN_SOURCE
LAB_LOINC
PRIORITY
RESULT_LOC
LAB_PX
LAB_PX_TYPE
LAB_ORDER_DATE
SPECIMEN_DATE
SPECIMEN_TIME
RESULT_DATE
RESULT_TIME
RESULT_QUAL
RESULT_NUM
RESULT_MODIFIER
RESULT_UNIT
NORM_RANGE_LOW
NORM_MODIFIER_LOW
NORM_RANGE_HIGH
NORM_MODIFIER_HIGH
ABN_IND

The “PCORnet 11”

Hemoglobin A1c
Creatine kinase total
Creatine kinase MB
Creatine kinase MB/creatine kinase total
Creatinine
Hemoglobin
Low-density lipoprotein
International normalized ratio
Troponin I cardiac
Troponin T cardiac (qualitative)
Troponin T cardiac (quantitative)

Lab result reference table 1, v1

Reference Table 1: Laboratory Results and LOINC Codes

This table is intended to be a guide and does not represent a complete list of codes for each laboratory test. Regenstrief Institute, the organization that has developed and maintains the LOINC system, has completed a partial mapping of LOINC to CPT codes. The mapping is publicly available on the US National Library of Medicine's webpage at the following link (valid as of October 15, 2014):
http://www.nlm.nih.gov/research/umls/mapping_projects/loinc_to_cpt_map.html

LAB_NAME	*SPECIMEN_SOURCE*	*LOINC*	*Comments*
CK_MB	SERUM, PLASMA, or SR_PLS	2154-3	
CK_MB	SERUM, PLASMA, or SR_PLS	32673-6	
CK_MB	BLOOD	49551-5	
CK_MBI	SERUM, PLASMA, or SR_PLS	12187-1	
CK_MBI	SERUM, PLASMA, or SR_PLS	12189-7	
CK_MBI	SERUM, PLASMA, or SR_PLS	20569-0	
CK_MBI	SERUM, PLASMA, or SR_PLS	49136-5	Rarely used
CK_MBI			Do not use LOINC code 15049-0, as this is a ratio for CK-MM instead of CK-MB.
CREATININE	SERUM, PLASMA, or SR_PLS	14682-9	
CREATININE	BLOOD	21232-4	
CREATININE	SERUM, PLASMA, or SR_PLS	2160-0	
CREATININE	SERUM, PLASMA, or SR_PLS	35203-9	This code is "discouraged" (guidance added in v3.0)
CREATININE	BLOOD	38483-4	
CREATININE	SERUM, PLASMA, or SR_PLS	44784-7	
CREATININE	SERUM	54052-6	HEDIS 2009 code.
CREATININE	BLOOD	59826-8	
HGB	BLOOD	14775-1	
HGB	BLOOD	20509-6	
HGB	BLOOD	24360-0	HGB and HCT panel - keep only the HGB results, e.g., those with units "g/dl" instead of "%".
HGB	BLOOD	30313-1	
HGB	BLOOD	30350-3	
HGB	BLOOD	30351-1	
HGB	BLOOD	30352-9	
HGB	BLOOD	55782-7	
HGB	BLOOD	59260-0	
HGB	BLOOD	718-7	
LDL	SERUM, PLASMA, or SR_PLS	47213-4	
INR	BLOOD	34714-6	
INR	BLOOD	46418-0	

"This table is intended to be a guide and does not represent a complete list of codes for each laboratory test."

http://www.pcornet.org/pcornet-common-data-model/

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From Lab mapping Interest Group: Lab mapping survey

- *Survey launched November 11, 2015*
- *34 responses received*

How many unique lab result names does your site have?

24%: 1,001 - 5,000

32%: 5,001 - 10,000

36%: > 10,000 unique lab result names

From lab mapping survey

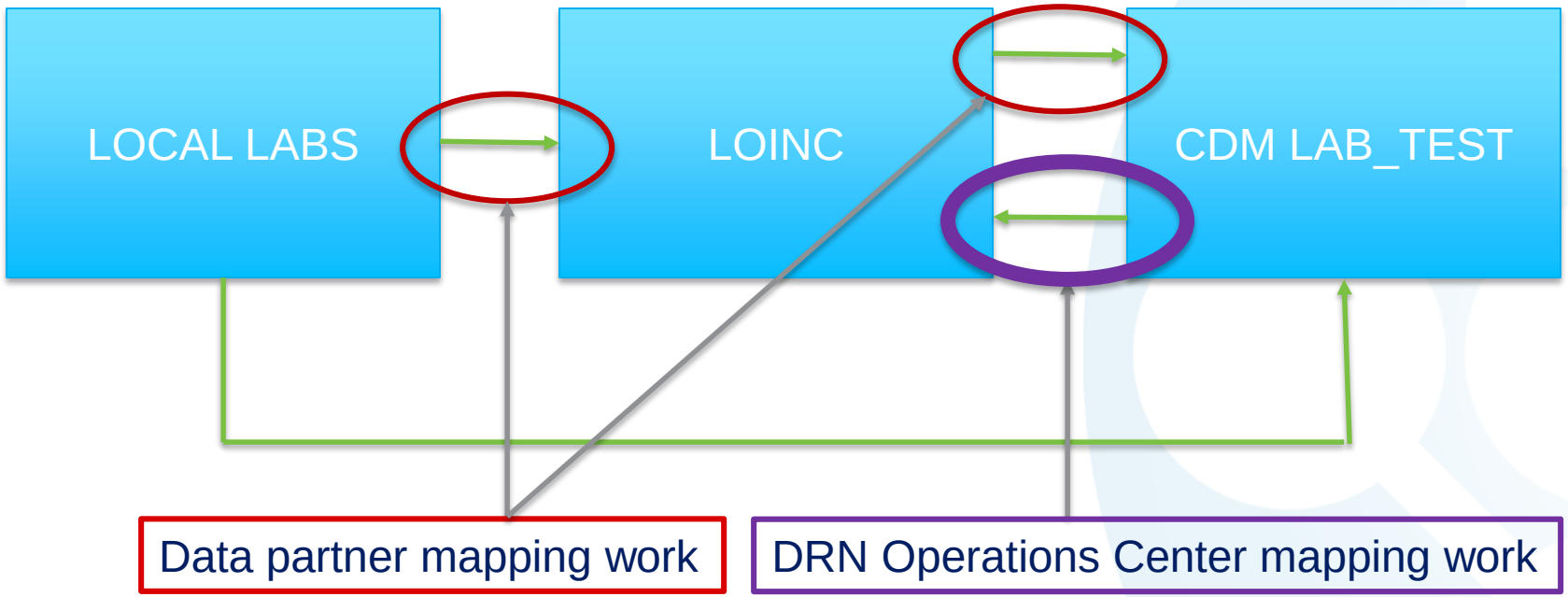
How many different synonyms does your site have for “hemoglobin?”

64%: > 7 synonyms for “hemoglobin”

48% ≥ 10 synonyms

Multiple Mapping Steps

Mapping from Local Labs to CDM “common measure” labs



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AMIA

Lab result reference table 1, v2

This table is intended to be a dynamic resource containing LOINC codes that may map to PCORnet laboratory result name common measures.
The information contained in this table can be used to search for laboratory results in local data sources that may map to PCORnet laboratory result name common measures.
This table is a living document that will be updated when/if necessary. We welcome feedback from PCORnet data partners regarding questions or suggestions for additional codes that should be considered for inclusion.
Rows highlighted in yellow indicate LOINC codes that may not correspond to the PCORnet lab result name common measure listed. They are included for data partners to determine whether or not they are a good fit.

Field	Description
PCORnet LAB_NAME	Categorical value for PCORnet LAB_NAME variable
LOINC code	LOINC unique identifier for the measure
Category or Name	LOINC long name
Component/analyte	(1) the principal name (e.g., the name of the analyte or the measurement); (2) the challenge or provocation, if relevant, including the time delay, substance of challenge, amount administered, and route of administration; and (3) any standardization or adjustment
Property	Attribute that distinguishes between different kinds of quantities relating to the same substance
Timing	Attribute that describes whether the measurement was for a point-in-time or time interval
System	Type of sample the measurement was made on. This attribute consists of two subparts; the first part names the system, the optional second part, delimited with a "^", indicates the super system source of the sample if it is not the patient
Scale	Scale of the measure
Method	Method by which the test was performed. Methods need only be expressed as part of the name when they provide a distinction between tests that measure the same component (analyte) but which have different clinical significance or have a different clinical reference ranges.
ExUnits	Example units

PCORnet LAB_NAME	LOINC code	Category or Name	Component/analyte	Property	Timing	System	Scale	Method	ExUnits
Troponin T cardiac (quantitative)	48425-3	Troponin T.cardiac [Mass/volume] in Blood	Troponin T.cardiac	MCnc	Pt	Bld	Qn		ug/L
	6597-9	Troponin T.cardiac [Mass/volume] in Venous blood	Troponin T.cardiac	MCnc	Pt	BldV	Qn		ug/L
	6598-7	Troponin T.cardiac [Mass/volume] in Serum or Plasma	Troponin T.cardiac	MCnc	Pt	Ser/Plas	Qn		ug/L
	67151-1	Troponin T.cardiac [Mass/volume] in Serum or Plasma by Detection limit <= 5 ng/L	Troponin T.cardiac	MCnc	Pt	Ser/Plas	Qn	Detection limit <= 5 ng/L	ng/L
Hemoglobin A1c	41995-2	Hemoglobin A1c [Mass/volume] in Blood	Hemoglobin A1c	MCnc	Pt	Bld	Qn		g/dL
	4548-4	Hemoglobin A1c/Hemoglobin.total in Blood	Hemoglobin A1c/Hemoglobin.total	MFr	Pt	Bld	Qn		%
	17855-8	Hemoglobin A1c/Hemoglobin.total in Blood by calculation	Hemoglobin A1c/Hemoglobin.total	MFr	Pt	Bld	Qn	Calculated	%
	4549-2	Hemoglobin A1c/Hemoglobin.total in Blood by Electrophoresis	Hemoglobin A1c/Hemoglobin.total	MFr	Pt	Bld	Qn	Electrophoresis	%
	17856-6	Hemoglobin A1c/Hemoglobin.total in Blood by HPLC	Hemoglobin A1c/Hemoglobin.total	MFr	Pt	Bld	Qn	HPLC	%
	62388-4	Hemoglobin A1c/Hemoglobin.total in Blood by JDS/JSCC protocol	Hemoglobin A1c/Hemoglobin.total	MFr	Pt	Bld	Qn	JDS/JSCC	%
	71875-9	Hemoglobin A1c/Hemoglobin.total [Pure mass fraction] in Blood	Hemoglobin A1c/Hemoglobin.total	MFr.DF	Pt	Bld	Qn		
	59261-8	Hemoglobin A1c/Hemoglobin.total in Blood by IFCC protocol	Hemoglobin A1c/Hemoglobin.total	SFr	Pt	Bld	Qn	IFCC	mmol/mol
Creatine kinase MB	49551-5	Creatine kinase.MB [Mass/volume] in Blood	Creatine kinase.MB	MCnc	Pt	Bld	Qn		ng/mL
	51506-4	Creatine kinase.MB [Enzymatic activity/volume] in Cerebral spinal fluid by Electrophoresis	Creatine kinase.MB	CCnc	Pt	CSF	Qn	Electrophoresis	U/L
	38482-6	Creatine kinase.MB [Presence] in Serum or Plasma	Creatine kinase.MB	ACnc	Pt	Ser/Plas	Ord		
	32673-6	Creatine kinase.MB [Enzymatic activity/volume] in Serum or Plasma	Creatine kinase.MB	CCnc	Pt	Ser/Plas	Qn		U/L
	2154-3	Creatine kinase.MB [Enzymatic activity/volume] in Serum or Plasma by Electrophoresis	Creatine kinase.MB	CCnc	Pt	Ser/Plas	Qn	Electrophoresis	U/L
	13969-1	Creatine kinase.MB [Mass/volume] in Serum or Plasma	Creatine kinase.MB	MCnc	Pt	Ser/Plas	Qn		ng/mL; ug/L
Creatine kinase total	2156-8	Creatine kinase [Enzymatic activity/volume] in Amniotic fluid	Creatine kinase	CCnc	Pt	Amnio fld	Qn		U/L
	50756-6	Creatine kinase [Mass/volume] in Blood	Creatine kinase	MCnc	Pt	Bld	Qn		ng/mL
	34160-2	Creatine kinase [Presence] in Body fluid	Creatine kinase	ACnc	Pt	Body fld	Ord		
	16688-4	Creatine kinase [Enzymatic activity/volume] in Body fluid	Creatine kinase	CCnc	Pt	Body fld	Qn		U/L
	2151-9	Creatine kinase [Enzymatic activity/volume] in Cerebral spinal fluid	Creatine kinase	CCnc	Pt	CSF	Qn		U/L
	53433-9	Creatine kinase [Enzymatic activity/volume] in Dialysis fluid	Creatine kinase	CCnc	Pt	Dial fld	Qn		U/L
	2157-6	Creatine kinase [Enzymatic activity/volume] in Serum or Plasma	Creatine kinase	CCnc	Pt	Ser/Plas	Qn		U/L
Creatine kinase MB/creatine kinase total	20569-0	Creatine kinase.MB/Creatine kinase.total in Serum or Plasma	Creatine kinase.MB/Creatine kinase.total	CFr	Pt	Ser/Plas	Qn		%
	12189-7	Creatine kinase.MB/Creatine kinase.total in Serum or Plasma by calculation	Creatine kinase.MB/Creatine kinase.total	CFr	Pt	Ser/Plas	Qn	Calculated	%
	12187-1	Creatine kinase.MB/Creatine kinase.total in Serum or Plasma by Electrophoresis	Creatine kinase.MB/Creatine kinase.total	CFr	Pt	Ser/Plas	Qn	Electrophoresis	%
	72564-8	Creatine kinase.MB/Creatine kinase.total [Pure catalytic fraction] in Serum or Plasma by calculation	Creatine kinase.MB/Creatine kinase.total	CFr.DF	Pt	Ser/Plas	Qn	Calculated	
	72563-0	Creatine kinase.MB/Creatine kinase.total [Pure catalytic fraction] in Serum or Plasma by Electrophoresis	Creatine kinase.MB/Creatine kinase.total	CFr.DF	Pt	Ser/Plas	Qn	Electrophoresis	
	49136-5	Creatine kinase.MB/Creatine kinase.total [Ratio] in Serum or Plasma	Creatine kinase.MB/Creatine kinase.total	Ratio	Pt	Ser/Plas	Qn		%

https://github.com/CDMFORUM/CDM-GUIDANCE/wiki/Lab-Mapping-Resources

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WHAT IT IS

- A dynamic resource containing LOINC codes that may map to PCORnet laboratory result name common measures.
- Information can be used to search for laboratory results in local data sources that may map to PCORnet laboratory result name common measures.
- Rows highlighted in yellow indicate LOINC codes that may not correspond to the PCORnet lab result name common measure listed. They are included for data partners to determine whether or not they are a good fit.

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WE NEED YOU!

- We welcome (NEED) feedback from PCORnet data partners about additional codes that should be considered for inclusion
- Also need feedback about codes that don't seem to match the lab result name common measure listed
  - Provide feedback via email: michelle.smerek@duke.edu
- Anyone interested can join the Lab Mapping Interest Group call in May.
  - Please send email to michelle.smerek@duke.edu if interested!

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WHAT IT IS NOT

- An exhaustive list of all the LOINC codes that have ever, or could ever correspond to the PCORnet lab result common measures
  - New lab names will be created in source systems
  - New LOINC codes will be created by Regenstrief
- A static resource that will make all lab data in PCORnet usable for all potential analytic purposes

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Next Steps

- Lab mapping interest group to meet and discuss in May
- Once initial round of feedback has been received/reviewed, “draft” designation will be removed, and it will be available to data partners in GitHub as a living document

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CONDITION table and “PCORnet-defined cohort algorithm” category

Some content repeated from CDM v3.0 development phase in 2015 for context

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PCORnet Common Data Model (CDM) v3.0: Stakeholder Input (Session 2 of 2)

Wednesday, April 29, 2015

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The National Patient-Centered Clinical Research Network

CDM v3.0 Development Processes

- Feedback cycle: April 7-20, 2015
- 236 discreet comments received
  - With many thanks!
- Each comment assessed and tagged into 23 thematic categories
- Comments spreadsheet with response to every comment will be finalized and posted after second stakeholder meeting

v3.0 CDM draft on Central Desktop:
https://pcornet.centraldesktop.com/taskforces/file/39183449/

v3.0 comments spreadsheet on Central Desktop:
https://pcornet.centraldesktop.com/taskforces/file/39897440/

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12 Themes Distilled from Tagging System

- Death
- Expectation
- Dates
- PCORNET_TRIAL
- Harvest
- SAS
- Global
- Phenotypes
- Other
- Medications
- DISPENSING
- PRESCRIBING

Tag
CONDITION
DATETIME
DEATH
DEMOGRAPHIC
DIAGNOSIS
DISPENSING
ENCOUNTER
ENROLLMENT
EXPECTATION
GLOBAL
HARVEST
HIT
LAB_RESULT_CM
MEDICATIONS
NULLS
OVERVIEW
PCORNET_TRIAL
PHENOTYPE
PRESCRIBING
PRO_CM
PROCEDURES
RELATIONAL
SAS
VITAL

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Theme: Phenotypes

- Process of developing computable algorithms to recognize/define disease states and conditions

Study-created code (eg, "BAR_OBESITY_1_0")

New value item: AG = Algorithmic

New value item: PC = PCORnet-defined cohort algorithm

CONDITION Table Specification

Field Name	*Data Type*	*Predefined Value Sets and Descriptive Text for Categorical Fields*	*Definition / Comments*
CONDITION	TEXT(18)	.	Condition code. Leading zeroes and different levels of decimal precision are permissible in this field. Please populate the exact textual value of this diagnosis code, but remove source-specific suffixes and prefixes. Other codes should be listed as recorded in the source data.
CONDITION_TYPE	TEXT(2)	09=ICD-9-CM 10=ICD-10-CM 11=ICD-11-CM SM=SNOMED CT HP=Human Phenotype Ontology NI=No information UN=Unknown OT=Other	Condition code type. Please note: The "Other" category is meant to identify internal use ontologies and codes.
CONDITION_SOURCE	TEXT(2)	PR=Patient-reported medical history HC=Healthcare problem list RG=Registry cohort NI=No information UN=Unknown OT=Other	Please note: The "Patient-reported" category can include reporting by a proxy, such as patient's family or guardian. Guidance: "Registry cohort" generally refers to cohorts of patients flagged with a certain set of characteristics for management within a health system. "Patient-reported" can include self-reported medical history and/or current medical conditions, not captured via healthcare problem lists or registry cohorts.

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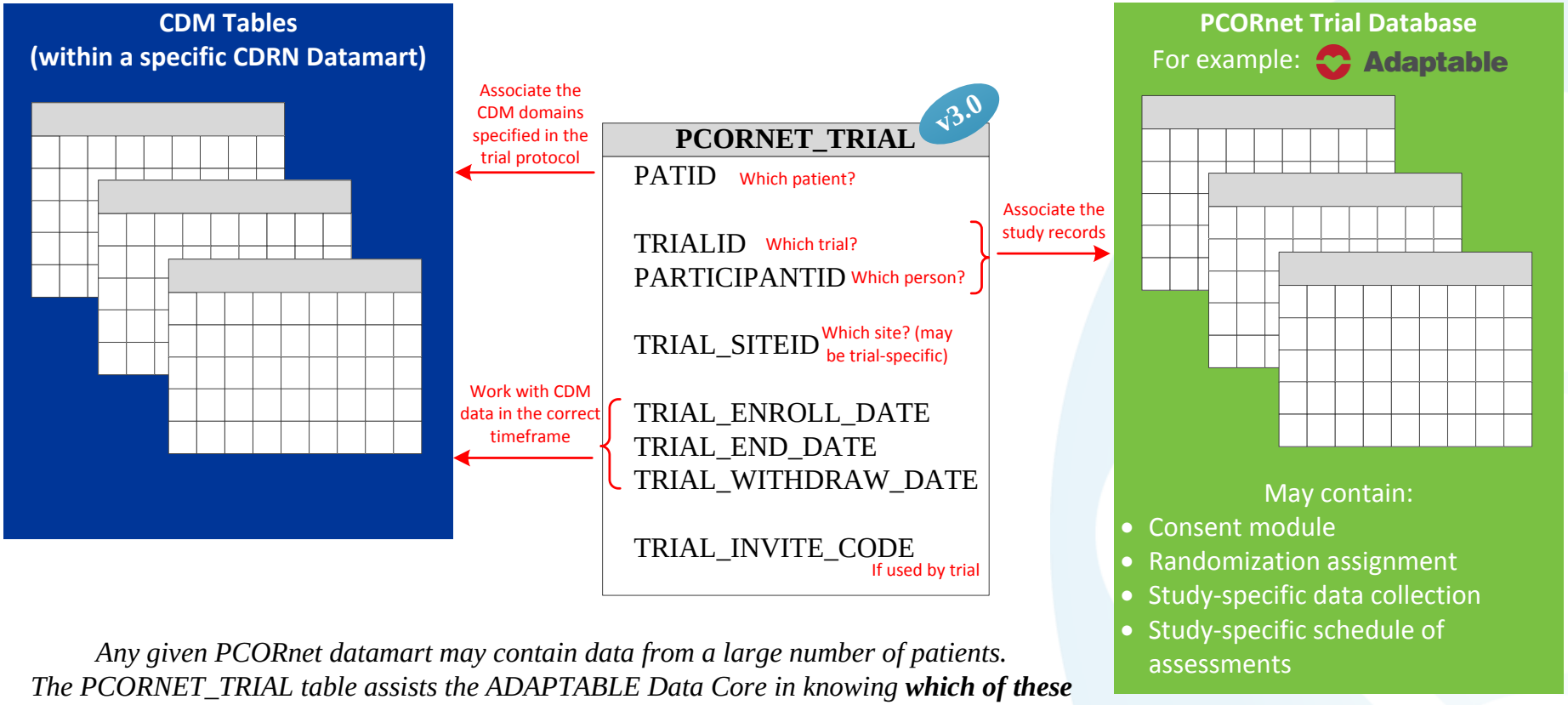
The PCORNET_TRIAL table serves as a connector and filter for CDM data within the parameters of a given trial protocol:



Any given PCORnet datamart may contain data from a large number of patients. The PCORNET_TRIAL table assists the ADAPTABLE Data Core in knowing ***which of these patients have consented and been enrolled*** *in the ADAPTABLE trial for querying purposes.*

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Wrap up

Next CDM Forum: May 11, 2016

PCORnet Common Data Model (CDM) Implementation Forum

Wednesday, May 11, 2016, 1:00 - 2:00 PM Eastern time

Hosted by Michael Matheny, MD; facilitated by Shelley Rusincovitch and Michelle Smerek

ONLINE: https://dukemed.webex.com/dukemed/j.php?MTID=m501d523454c97d76bb86dec256c4853a

PHONE: 1-650-479-3207 / Access code: 739 305 302

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These slides will also be posted on GitHub:

https://github.com/CDMFORUM/CDM-GUIDANCE/wiki

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Summary of links

iMeetCentral resources:

- PCORnet main blog (includes weekly announcements): https://pcornet.imeetcentral.com/pcornetmain/blog/
- DRN OC home: https://pcornet.imeetcentral.com/p/aQAAAAAB6T9b
  - Data Characterization home: https://pcornet.imeetcentral.com/p/aQAAAAACjjsH
  - Query Fulfillment home: https://pcornet.imeetcentral.com/p/aQAAAAAClFkW
  - DRN OC blog: https://pcornet.imeetcentral.com/drnoc-workgroups/blog/
- Collaborative threads on iMeetCentral: https://pcornet.imeetcentral.com/p/ZgAAAAAAPgOl

GitHub:

- ADAPTABLE base phenotype : https://github.com/ADAPTABLETRIAL/PHENOTYPE
- CDM errata issue tracker: https://github.com/CDMFORUM/CDM-ERRATA/issues
- CDM guidance issue tracker: https://github.com/CDMFORUM/CDM-GUIDANCE/issues
- PCORnet diagnostic query package: https://github.com/PCORnet-DRN-OC/PCORnet-Diagnostic-Query
- PCORnet data characterization query package: https://github.com/PCORnet-DRN-OC/PCORnet-Data-Characterization
- PCORnet Data Committee on GitHub: https://github.com/PCORnet/DataCommittee

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