

Ontology Approaches for PCORI

Shawn Murphy MD, Ph.D.

Lori Phillips MS


i2b2/SHRINE AUG

July 11, 2014

Approach – Expressing Data

- I2b2 does not require any specific ontology
 - Queries can be created using any system of local codes
 - Allows i2b2 to attach data of nearly any kind to patients, visits, and providers

Represents Hierarchies

 BioPortal


Browse

Search

Projects

Annotate

SNOMED Clinical Terms

SNOMED Clinical Terms  [Subscribe to updates](#)

Metadata Views (8) Projects (1) Reviews (1) Notes (0) Metrics Ontology Widgets

[Create New View](#)

[Expand All](#) | [Collapse All](#)

► **CORE Subset of SNOMED CT**

► **SNOMED Anatomy**

► **SNOMED Clinical Findings**

- **Description:** The Clinical Finding subtree of SNOMED CT
- **Definition:** Class subtree of ClinicalFinding
- **Ontology ID:** 2018
- **Definition Language:** Manual

VERSION	BASE VERSION	CREATED	CREATED BY
1.2	2009_07_31	07/16/2010	Tania Tudorache, tudorache@stanford.edu
1.1	2009_07_31	03/23/2010	Tania Tudorache, tudorache@stanford.edu
1.0	2009_01_31	09/09/2009	Tania Tudorache, tudorache@stanford.edu

► **SNOMED Ethnic Group**

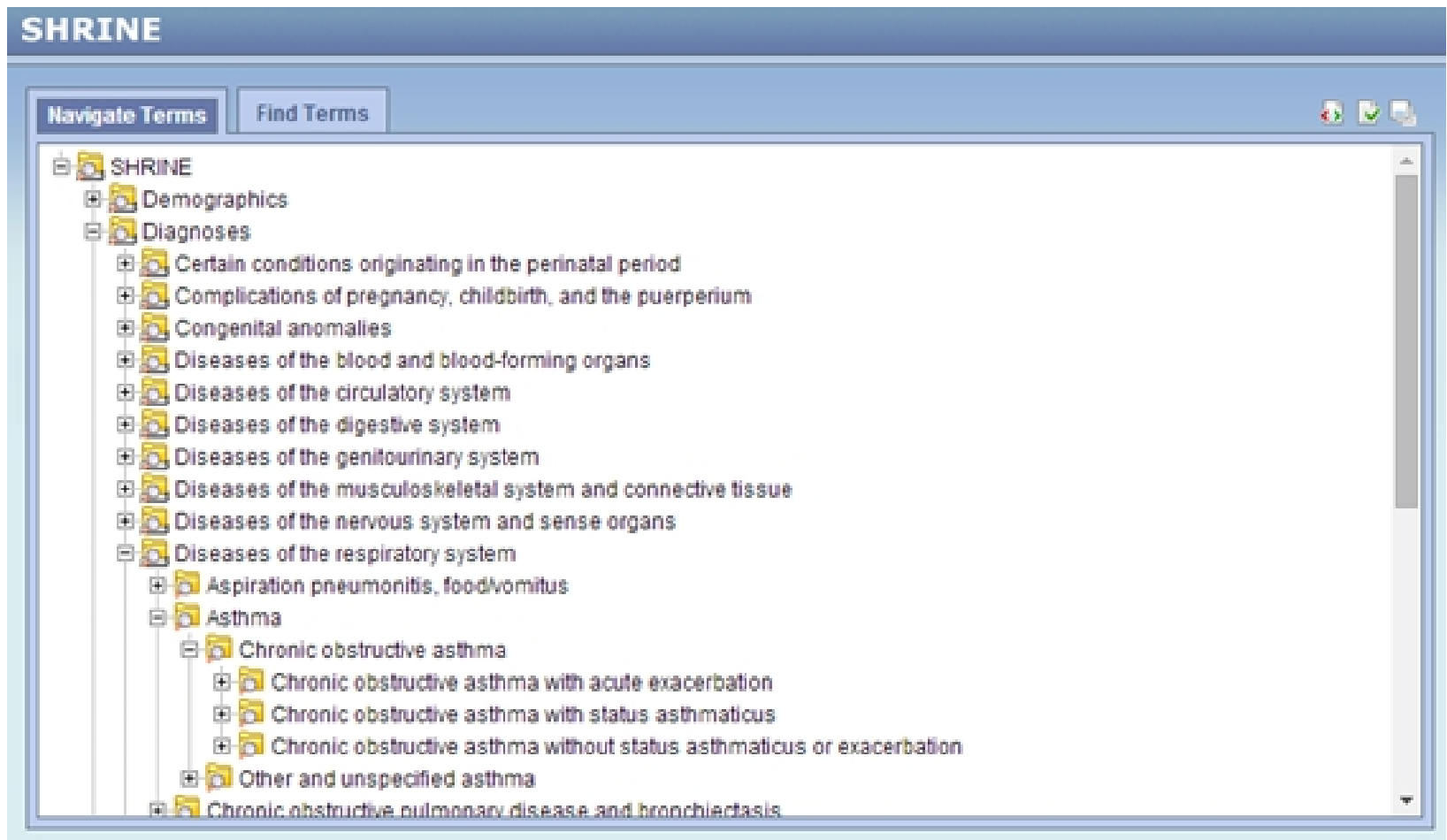
Navigate Terms

- Clinical finding
 - Administrative statuses
 - Adverse incident outcome categories
 - Calculus finding
 - Clinical history and observation findings
 - Clinical stage finding
 - Cyanosis
 - Deformity
 - Disease
 - Drug action
 - Edema
 - Effect of exposure to physical force
 - Enzyme activity finding
 - Evaluation finding
 - Fetal finding
 - Finding by method
 - Finding by site
 - Finding of grade
 - Finding related to physiologic substance
 - Finding reported by subject or history provider
 - General clinical state finding
 - Jaundice
 - Neurological finding
 - Prognosis/outlook finding
 - Sequelae of external causes and disorders
 - Swelling
 - Wound finding

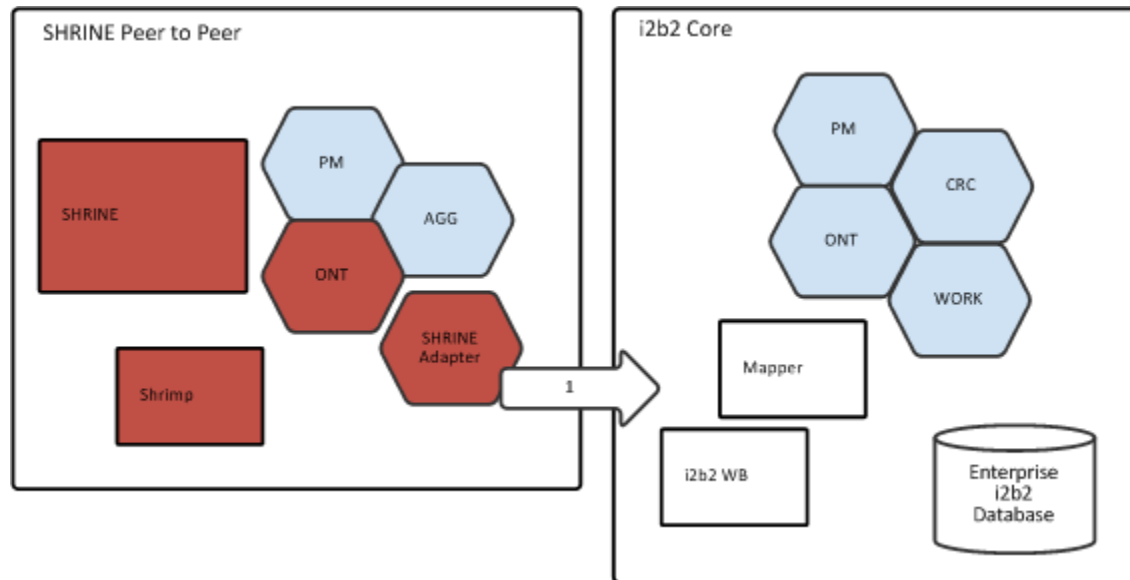
Approach - Networks

- The flexibility of i2b2 becomes a weakness when constructing data networks
 - There is no guarantee that people will choose the same ontologies at every site.
 - These can be roughly approximated using mappings

SHRINE Mappings



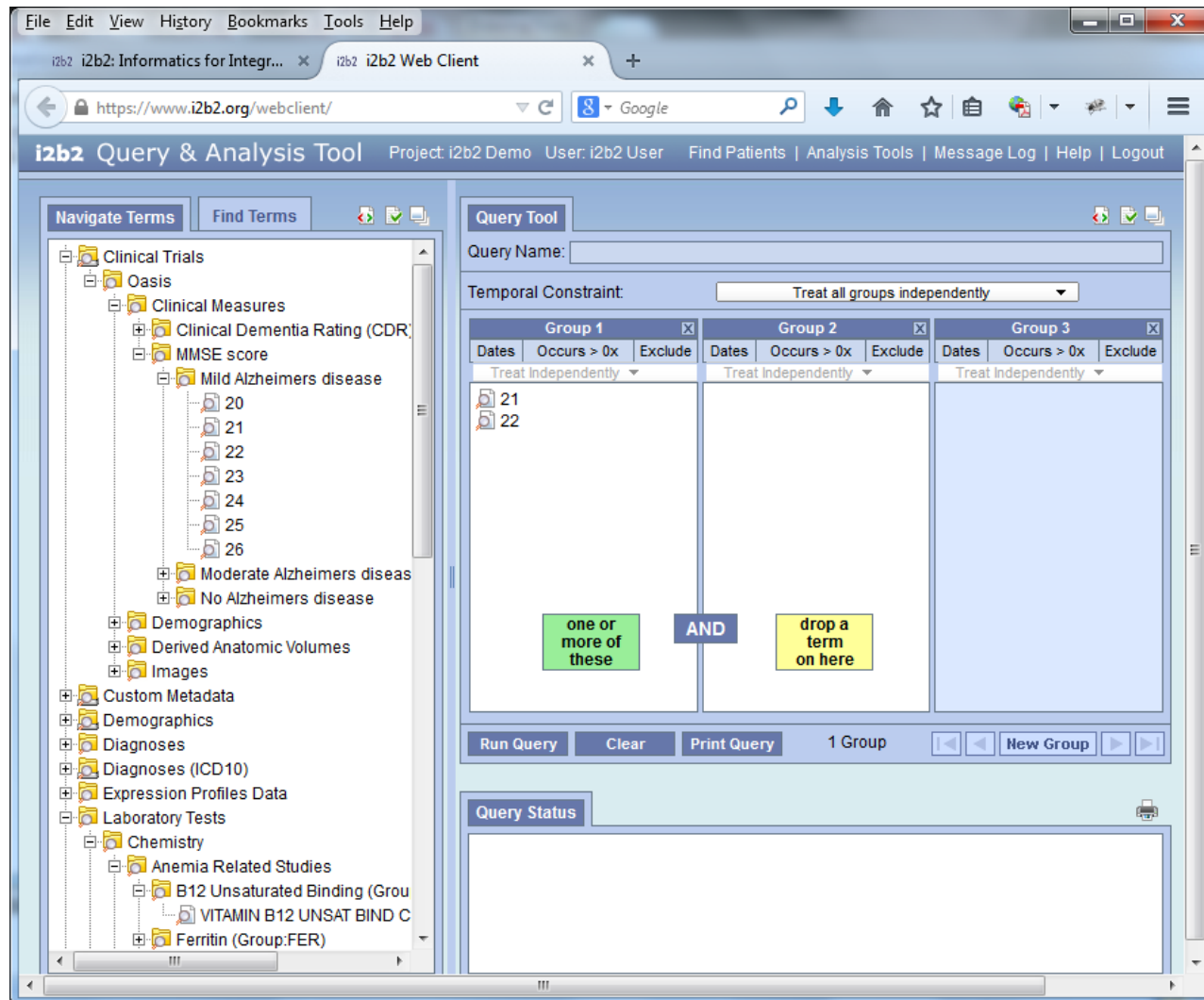
Scope of SHRINE Mappings



Approach – Modifiers and Values

- Full data representations in i2b2, often needing modifiers and values, are labeled “Information Models”
- These can be managed in i2b2 with relatively minor impact on the local observation codes
- However, the modifiers and values of the basic concepts need to be represented in similar ways to allow simple mappings to be effective.
- Also, for performance, it is useful to represent concept hierarchies in similar ways in the mappings

Represent scores as concepts



Represent scores as values

The screenshot displays the i2b2 Web Client interface. The main window shows a tree view on the left with categories like Clinical Trials, Oasis, Clinical Measures, and Demographics. The central area is the Query Tool, which includes a Query Name field, a Temporal Constraint dropdown set to 'Treat all groups independently', and three groups (Group 1, Group 2, Group 3) for defining search criteria. A dialog box titled 'Choose value of B12 Unsaturated Binding (Test:B12USAT)' is open in the foreground. It contains instructions: 'Searches by Lab values can be constrained by the high/low flag set by the performing laboratory, or by the values themselves.' Below this, there are three radio buttons: 'No Value', 'By FFlag', and 'By Value' (which is selected). To the right of the radio buttons is a 'Please select operator:' dropdown menu showing 'GREATER THAN OR EQUAL (>=)'. Below that is a 'Please enter a value:' text box containing '1252'. At the bottom of the dialog, there is a color-coded scale bar with values 568, 1000, 1252, and 2000. The units are specified as 'ng/l'. The dialog has 'OK' and 'Cancel' buttons at the bottom right.

File Edit View History Bookmarks Tools Help

i2b2 i2b2: Informatics for Integr... i2b2 i2b2 Web Client

https://www.i2b2.org/webclient/#lblOfH

i2b2 Query & Analysis Tool Project: i2b2 Demo User: i2b2 User Find Patients | Analysis Tools | Message Log | Help | Logout

Navigate Terms Find Terms

Clinical Trials

Oasis

Clinical Measures

Clinical Dementia Rating (CDR)

MMSE score

Mild Alzheimers disease

20

Query Tool

Query Name:

Temporal Constraint: Treat all groups independently

Group 1 Group 2 Group 3

Dates Occurs > 0x Exclude Dates Occurs > 0x Exclude Dates Occurs > 0x Exclude

Treat Independently Treat Independently Treat Independently

VITAMIN B12 UNSAT BIND

Choose value of B12 Unsaturated Binding (Test:B12USAT)

Searches by Lab values can be constrained by the high/low flag set by the performing laboratory, or by the values themselves.

☐ No Value

☐ By FFlag

☒ By Value

Please select operator: GREATER THAN OR EQUAL (>=)

Please enter a value: 1252

Click on a bar segment to help specify a value or range:

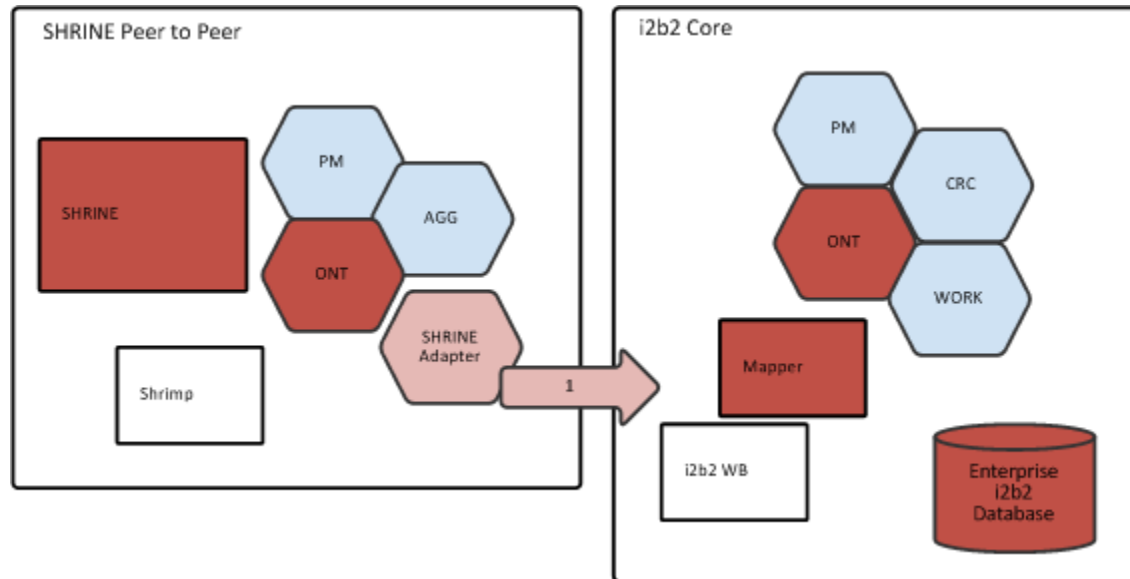
Range in ng/l

568 1000 1252 2000

Units = ng/l

OK Cancel

Scope of solution to allow information model equivalencies



Arrive at consensus through distributed ontologies

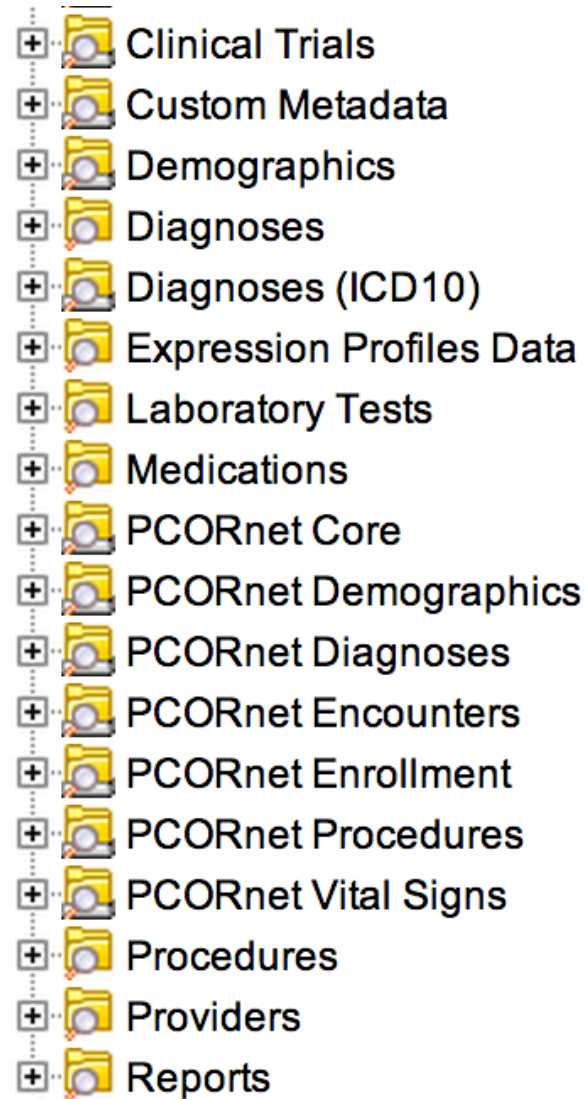
■ Approach

- Bring together existing ontologies of the group to understand the best ontology representation of a new information model
- Develop a consensus ontology and attach to local instance
- Raw codes in observation-fact table are mapped to “Consensus” ontology
- SHRINE mapping capabilities used for “finishing touches”

New Information Model Ontology

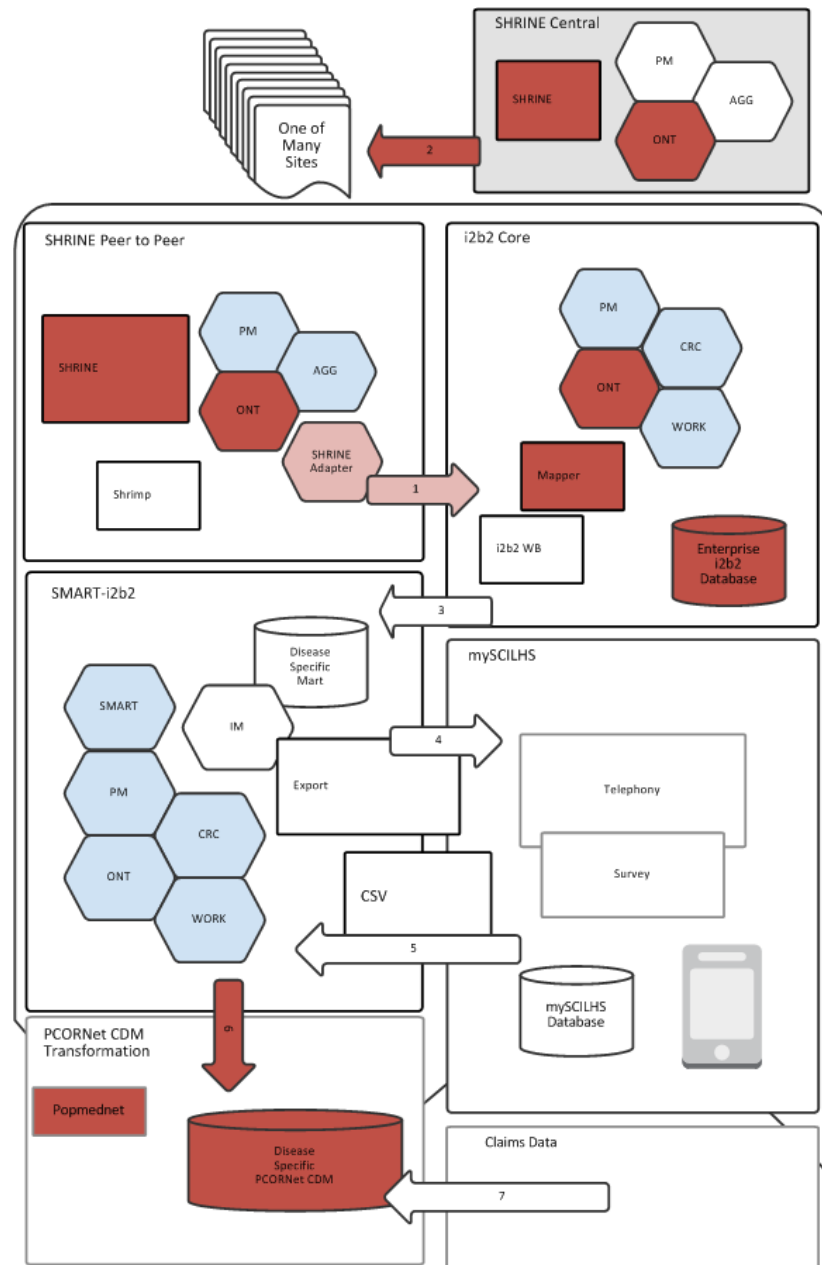
Consensus Ontology
can live alongside
other ontologies

(For example:
PCORNet CDM
ontology and the i2b2
demo ontology in this
case)



Supporting Full PCORI SCILHS workflow in i2b2

- To support the PCORNet CDM Information Model, we are distributing full SCILHS ontologies that are to be attached to the local SCILHS instance of i2b2.
- The SCILHS ontologies can accommodate the information model with simple mappings
- The SCILHS ontologies will support data transformations to the PCORNet CDM



Contributors

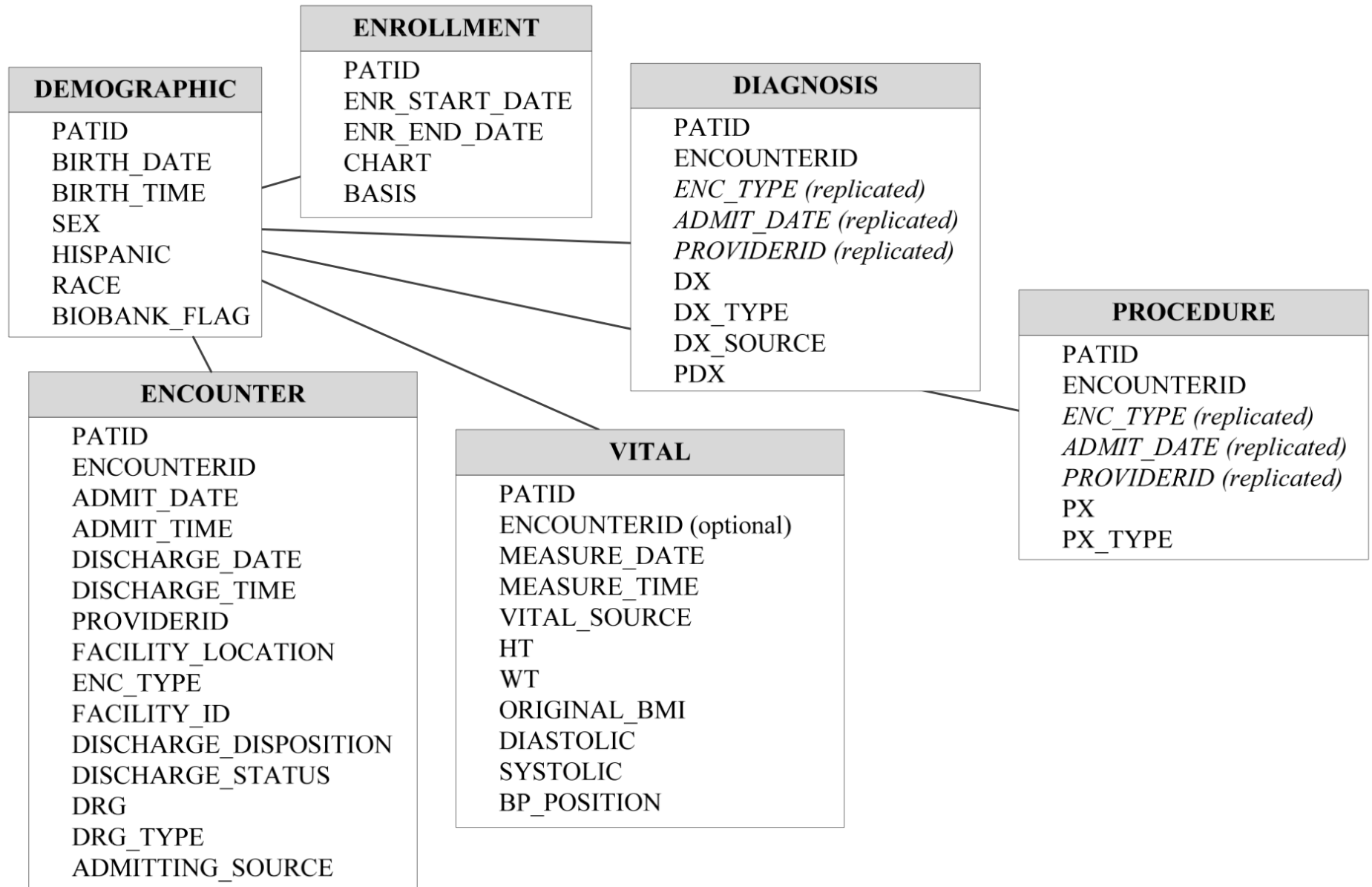
■ Ontology Contributors

- Jeff Klann
- Dan Connolly
- Lori Phillips
- Nathan Wilson

■ Release

- <https://www.i2b2.org/webclient/>
- Change the username to pcori
- Public release early fall

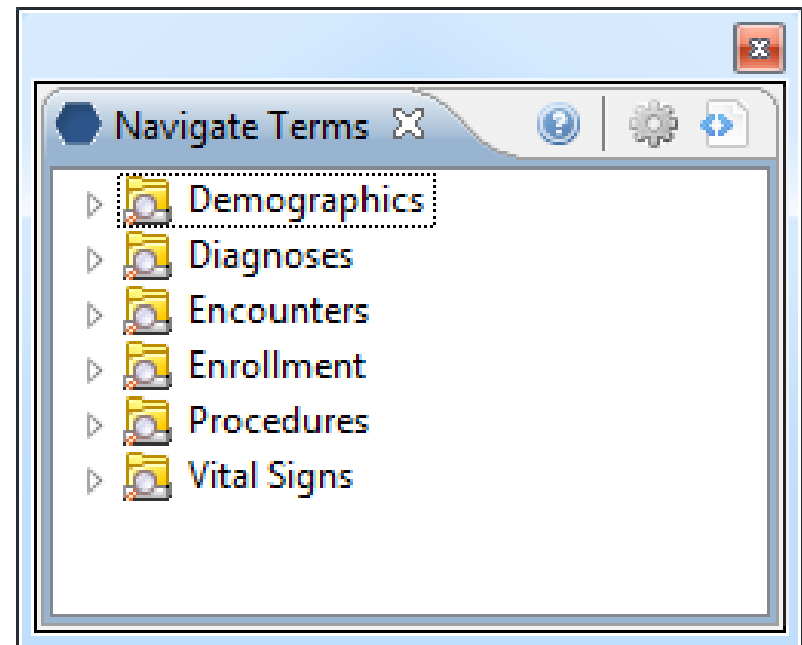
PCORnet CDM



PCORI-centric Use Case

A requirement in PCORI is that all i2b2 instances have to map their ontologies to a central PCORI ontology.

- Local codes need to be integrated into the PCORI hierarchy
- Tools and strategies to assist with this effort



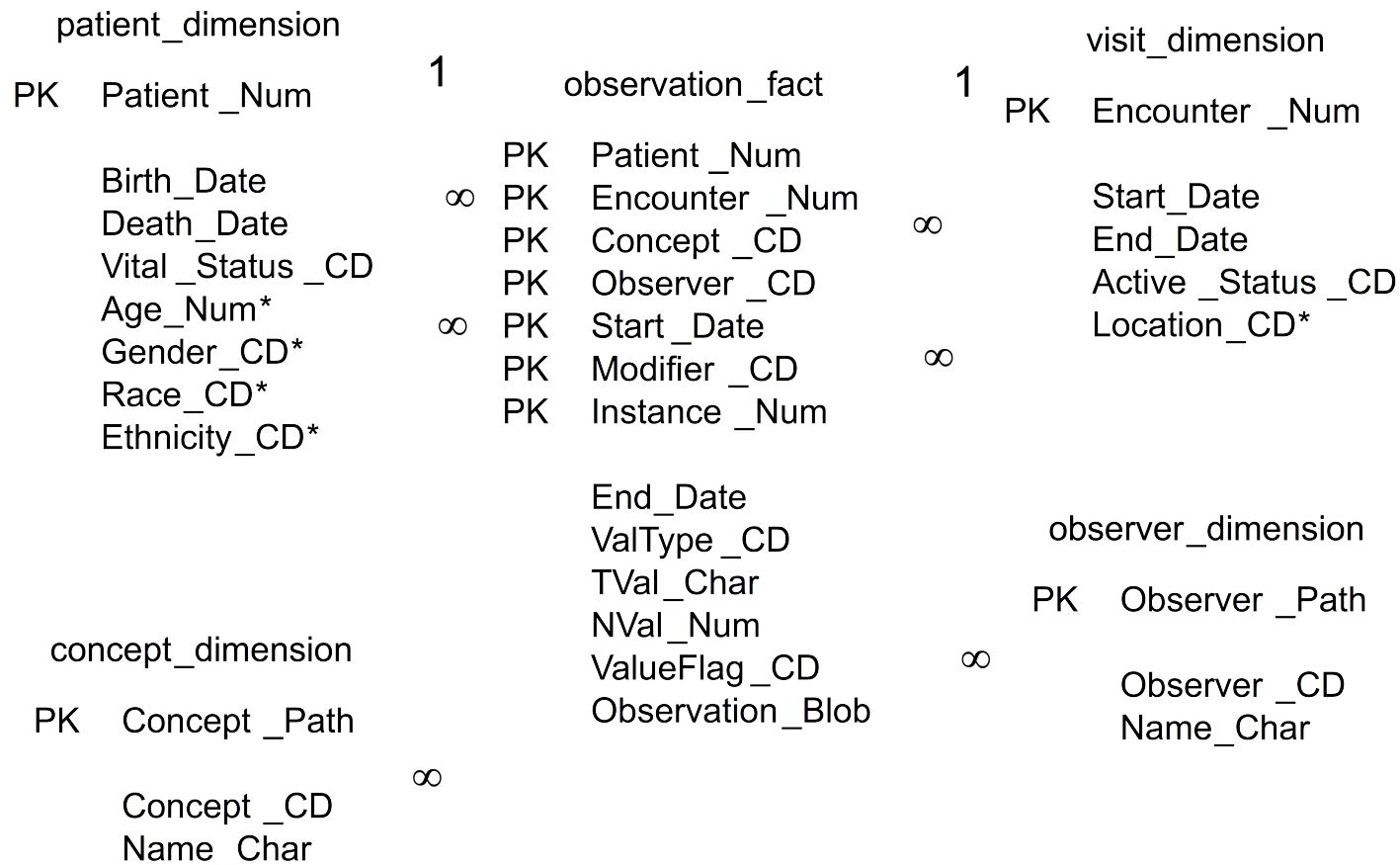
Constructing queries from metadata

METADATA

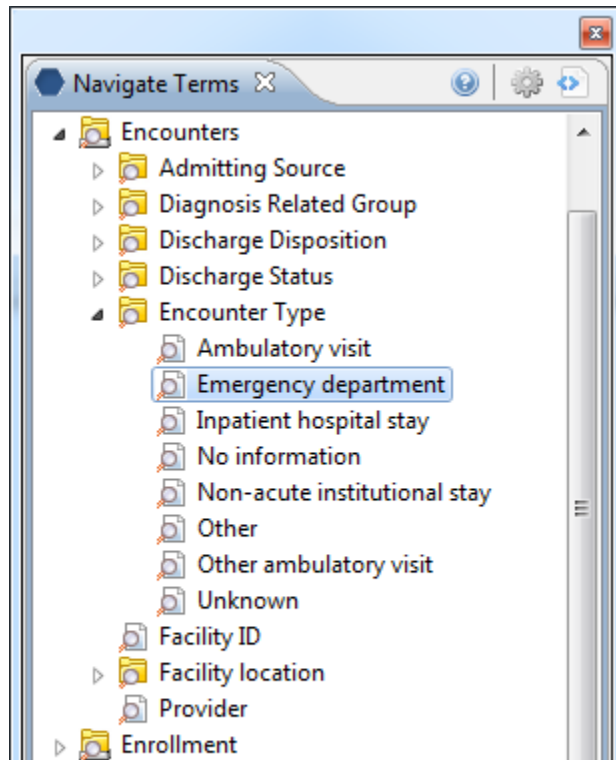
C_HLEVEL	INT NULL
C_FULLNAME	VARCHAR(900) NULL
C_NAME	VARCHAR(2000) NULL
C_SYNONYM_CD	CHAR(1) NULL
C_VISUALATTRIBUTES	CHAR(3) NULL
C_TOTALNUM	INT NULL
C_BASECODE	VARCHAR(450) NULL
C_METADATAXML	TEXT NULL
C_FACTTABLECOLUMN	VARCHAR(50) NULL
C_TABLENAME	VARCHAR(50) NULL
C_COLUMNNAME	VARCHAR(50) NULL
C_COLUMNDATATYPE	VARCHAR(50) NULL
C_OPERATOR	VARCHAR(10) NULL
C_DIMCODE	VARCHAR(900) NULL
C_COMMENT	TEXT NULL
C_TOOLTIP	VARCHAR(900) NULL
UPDATE_DATE	DATETIME NULL
DOWNLOAD_DATE	DATETIME NULL
IMPORT_DATE	DATETIME NULL
SOURCESYSTEM_CD	VARCHAR(50) NULL
VALUETYPE_CD	VARCHAR(50) NULL

```
select patient_num from
  observation_fact where
    [c_facttablecolumnname]
  IN
  (select
    [c_facttablecolumnname]
  from [c_tablename]
  where [c_columnname]
    [c_operator] [c_dimcode])
```

i2b2 Star Schema



Visit_dimension types of queries: Encounter types



```
select patient_num
from visit_dimension
where inout_cd IN
('ED','E')
```

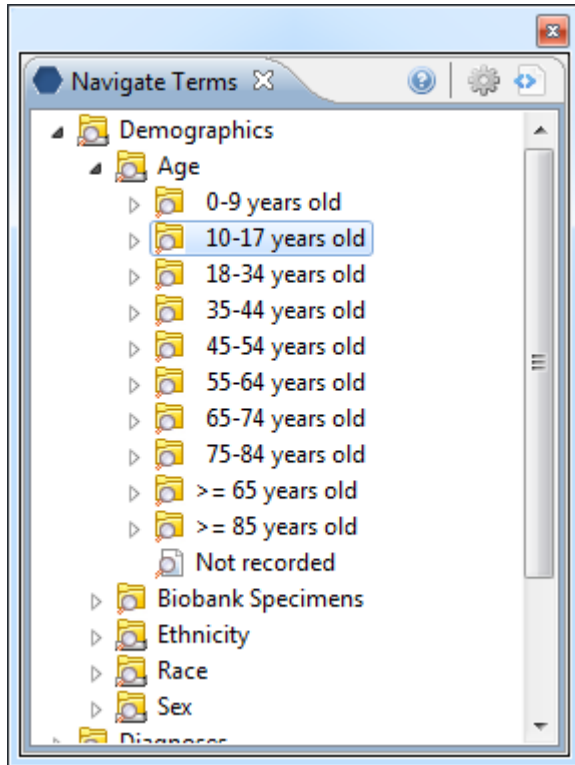
C_NAME	C_FULLNAME	C_BASECODE	C_FACTTABLECOLUMN	C_TABLENAME	C_COLUMNNAME	C_OPERATOR	C_DIMCODE
Ambulatory visit	\PCORI\ENCOUNTER\ENC_TYPE\AV\	ENCTYPE:AV	patient_num	VISIT_DIMENSION	inout_cd	in	'AV','O'
Emergency department	\PCORI\ENCOUNTER\ENC_TYPE\ED\	ENCTYPE:ED	patient_num	VISIT_DIMENSION	inout_cd	in	'ED','E'
Inpatient hospital stay	\PCORI\ENCOUNTER\ENC_TYPE\IP\	ENCTYPE:IP	patient_num	VISIT_DIMENSION	inout_cd	in	'IP','I'
No information	\PCORI\ENCOUNTER\ENC_TYPE\NI\	ENCTYPE:NI	patient_num	VISIT_DIMENSION	inout_cd	is	NULL
Non-acute institutional stay	\PCORI\ENCOUNTER\ENC_TYPE\IS\	ENCTYPE:IS	patient_num	VISIT_DIMENSION	inout_cd	in	'IS'
Other	\PCORI\ENCOUNTER\ENC_TYPE\OT\	ENCTYPE:OT	patient_num	VISIT_DIMENSION	inout_cd	in	'OT'
Other ambulatory visit	\PCORI\ENCOUNTER\ENC_TYPE\OA\	ENCTYPE:OA	patient_num	VISIT_DIMENSION	inout_cd	in	'OA'
Unknown	\PCORI\ENCOUNTER\ENC_TYPE\UN\	ENCTYPE:UN	patient_num	VISIT_DIMENSION	inout_cd	in	'UN','@'

Edit c_dimcode to match your inout_cds.

A word about missing/unknown values

- The PCORnet CDM uses the HL7 conventions of “Null Flavors” (<http://hl7.org/implement/standards/fhir/v3/NullFlavor/>) as a basis for representing missing or unknown values. Specifically, we will populate these values as follows:
 - ‘No Information’ means that the data field is present in the source system, but the source value is null or blank.
 - ‘Unknown’ means that the data field is present in the source system, but the source value explicitly denotes an unknown value.
 - ‘Other’ means that the data field is present in the source system, but the source value cannot be mapped to the choices presented in the PCORI CDM ontology.

Patient_dimension types of queries: Age calculations

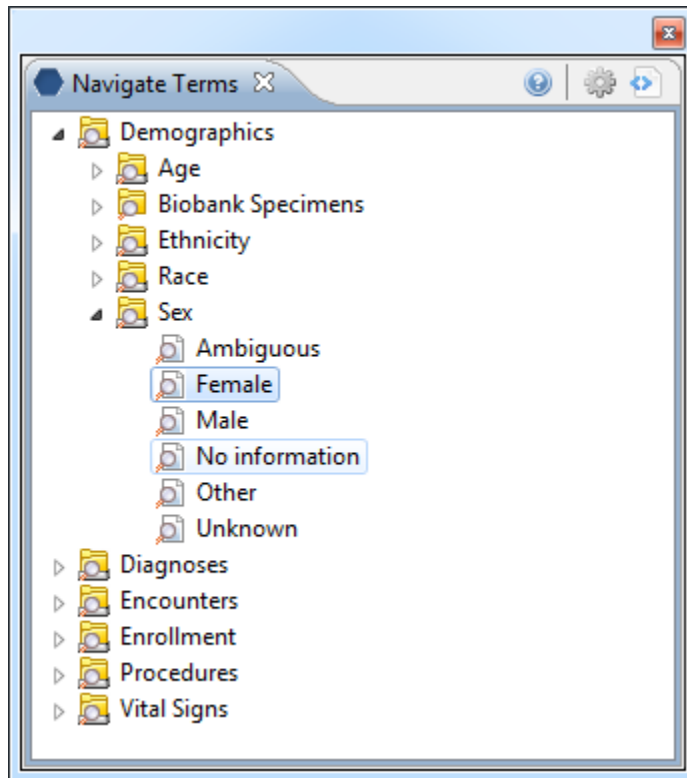


select patient_num from
patient_dimension
where birth_date
BETWEEN
sysdate – (365.25*18)
AND sysdate –
(365.25*10)

	c_name	c_facttablecolumn	c_tablename	c_columnname	c_operator	c_dimcode
1	0-9 years old	patient_num	patient_dimension	birth_date	>	getdate() - (365.25*10)
2	10-17 years old	patient_num	patient_dimension	birth_date	BETWEEN	getdate() - (365.25*18) AND getdate() - (365.25*10)

No modifications necessary.

Patient_dimension types of queries:Sex

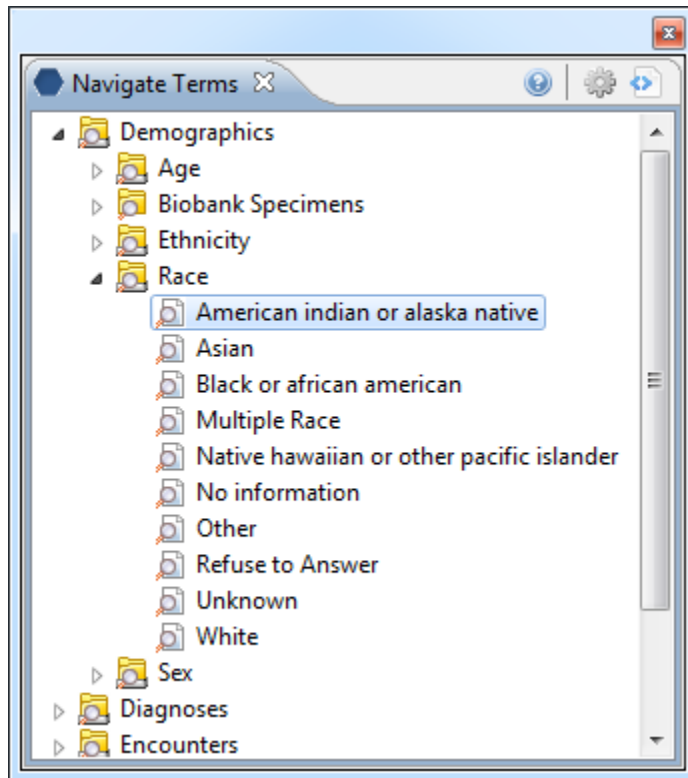


```
select patient_num
from
patient_dimension
where sex_cd IN ('F')
```

C_NAME	C_FULLNAME	C_FACTTABLECOLUMN	C_TABLENAME	C_COLUMNNAME	C_OPERATOR	C_DIMCODE
Ambiguous	\PCORI\DEMOGRAPHIC\SEX\A\	PATIENT_NUM	PATIENT_DIMENSION	SEX_CD	IN	'A'
Female	\PCORI\DEMOGRAPHIC\SEX\F\	PATIENT_NUM	PATIENT_DIMENSION	SEX_CD	IN	'F'
Male	\PCORI\DEMOGRAPHIC\SEX\M\	PATIENT_NUM	PATIENT_DIMENSION	SEX_CD	IN	'M'
No information	\PCORI\DEMOGRAPHIC\SEX\NI\	PATIENT_NUM	PATIENT_DIMENSION	SEX_CD	IN	'NI'
Other	\PCORI\DEMOGRAPHIC\SEX\OT\	PATIENT_NUM	PATIENT_DIMENSION	SEX_CD	IN	'OT'
Unknown	\PCORI\DEMOGRAPHIC\SEX\UN\	PATIENT_NUM	PATIENT_DIMENSION	SEX_CD	IN	'UN'

Edit c_dimcode to match your sex_cds.

Patient_dimension types of queries:Race

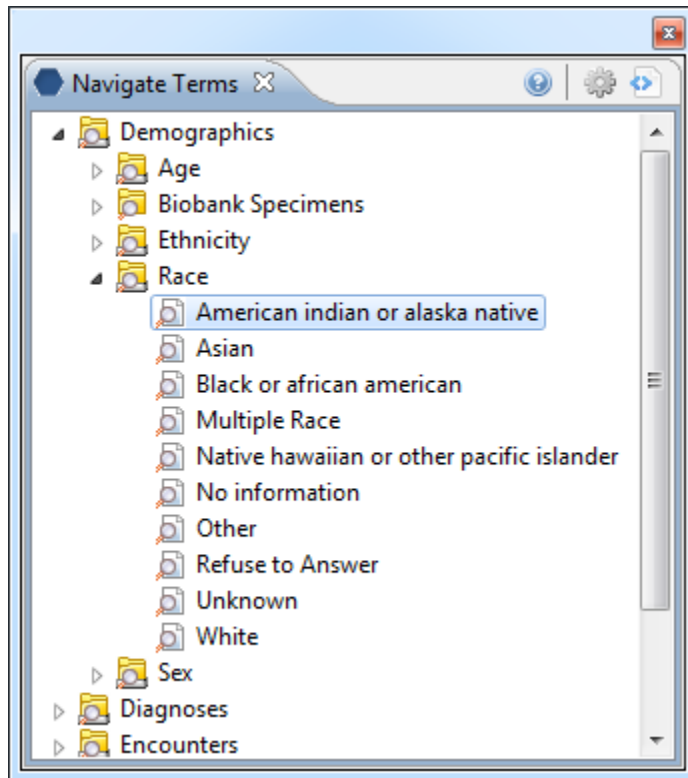


```
select patient_num
from
patient_dimension
where race_cd IN
('01','amer. Indian','i',
'na','nat. am')
```

c_name	c_fullname	c_facttablecolumn	c_tablename	c_columnname	c_operator	c_dimcode
American indian or alaska native	\PCORI\DEMOGRAPHIC\RACE\1\	PATIENT_NUM	PATIENT_DIMENSION	RACE_CD	IN	'01','amer. Indian','i','na','nat. am'
Asian	\PCORI\DEMOGRAPHIC\RACE\2\	PATIENT_NUM	PATIENT_DIMENSION	RACE_CD	IN	'02','a','asian','or','oriental','in','indian'
Black or african american	\PCORI\DEMOGRAPHIC\RACE\3\	PATIENT_NUM	PATIENT_DIMENSION	RACE_CD	IN	'03','b','black','hib','his/black'
Native hawaiian or other pacific islander	\PCORI\DEMOGRAPHIC\RACE\4\	PATIENT_NUM	PATIENT_DIMENSION	RACE_CD	IN	'04','native hawaiian','pac. isl'
White	\PCORI\DEMOGRAPHIC\RACE\5\	PATIENT_NUM	PATIENT_DIMENSION	RACE_CD	IN	'05','his/white','hiw','c','w','white','m','mid.eastern'
Multiple Race	\PCORI\DEMOGRAPHIC\RACE\6\	PATIENT_NUM	PATIENT_DIMENSION	RACE_CD	IN	'06'
Refuse to Answer	\PCORI\DEMOGRAPHIC\RACE\7\	PATIENT_NUM	PATIENT_DIMENSION	RACE_CD	IN	'07','r','refused'
No information	\PCORI\DEMOGRAPHIC\RACE\NI\	PATIENT_NUM	PATIENT_DIMENSION	RACE_CD	IN	'NI','ni'
Other	\PCORI\DEMOGRAPHIC\RACE\OT\	PATIENT_NUM	PATIENT_DIMENSION	RACE_CD	IN	'OT','o','d','@','deferred'
Unknown	\PCORI\DEMOGRAPHIC\RACE\UN\	PATIENT_NUM	PATIENT_DIMENSION	RACE_CD	IN	'UN','u','unk'

Edit c_dimcode to match your race_cds.

Patient_dimension types of queries: Ethnicity

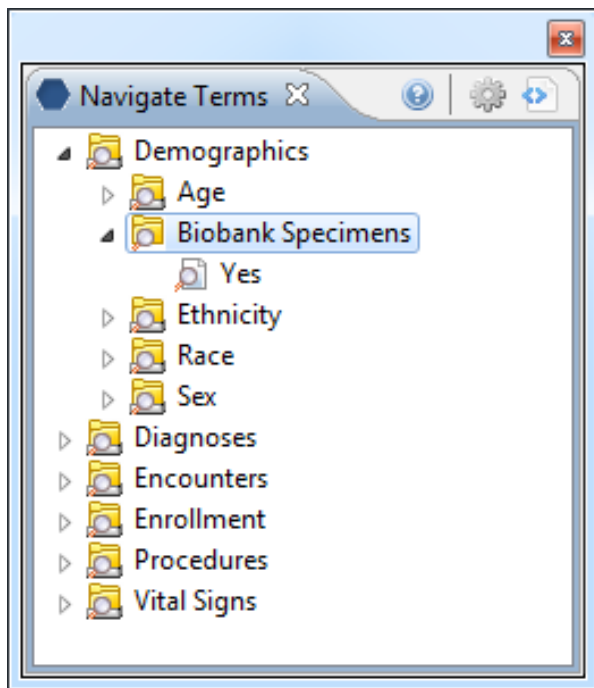


```
select patient_num
from
patient_dimension
where ethnicity_cd IN
('HISPANIC')
```

c_name	c_fullname	c_facttablecolumn	c_tablename	c_columnname	c_operator	c_dimcode
Hispanic	\PCORI\DEMOGRAPHIC\HISPANIC\Hispanic\	patient_num	PATIENT_DIMENSION	ethnicity_cd	IN	'HISPANIC'
Non-Hispanic	\PCORI\DEMOGRAPHIC\HISPANIC\NonHispanic\	patient_num	PATIENT_DIMENSION	ethnicity_cd	IN	'NON-HISPANIC'

Edit c_dimcode to match your ethnicity_cds.

Concept_dimension types of queries:Biobank

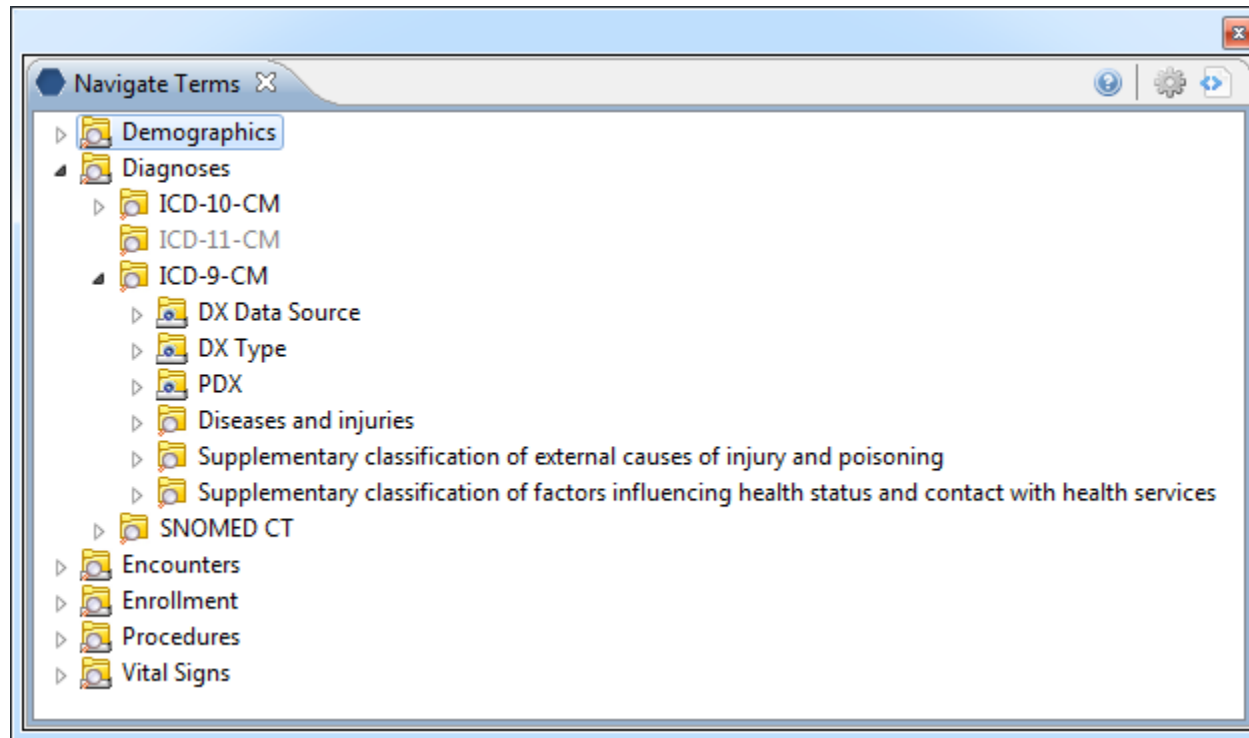


select concept_cd from
concept_dimension
where concept_path like
'\PCORI\DEMOGRAPHIC
\BIOBANK_FLAG\Y\%'

C_NAME	C_FULLNAME	C_BASECODE	C_FACTTABLECOLUMN	C_TABLENAME	C_COLUMNNAME	C_OPERATOR	C_DIMCODE
Biobank Specimens	\PCORI\DEMOGRAPHIC\BIOBANK_FLAG\	(null)	concept_cd	CONCEPT_DIMENSION	concept_path	like	\PCORI\DEMOGRAPHIC\BIOBANK_FLAG\
Yes	\PCORI\DEMOGRAPHIC\BIOBANK_FLAG\Y\	BIOBANK_FLAG:Y	concept_cd	CONCEPT_DIMENSION	concept_path	like	\PCORI\DEMOGRAPHIC\BIOBANK_FLAG\Y\

Edit c_basecode to match your code for biobank specimens.

Broader concept_dimension based queries



Diagnoses, Procedures typically require a merge of local terms within the tree.

ICD-9 Example

- If your institution uses ICD-9 ...
 - Change the c_basecode to match your code format.

PCORI_BASECODE	C_BASECODE
ICD9:250.1	MY_ICD9:250.1

```
update pcornet
set c_basecode = replace(pcori_basecode, 'ICD9:', 'MY_ICD9:')
where c_basecode is not null
and pcori_basecode like 'ICD9:%'
and c_fullname like '\PCORI\DIAGNOSIS\09\%';
```

ICD-9 plain_code example

- If your institution uses ICD-9 but in a plain_code format...
 - Change the c_basecode to match your code format.

PCORI_BASECODE	C_BASECODE
ICD9:250.1	2501

```
update pcornet
set c_basecode = substring(pcori_basecode, 6, 25)
where pcori_basecode like 'ICD9:%'
and c_fullname like '\PCORI\DIAGNOSIS\09\%';
```

```
update pcornet
set c_basecode = replace(c_basecode, '.', '')
where pcori_basecode like 'ICD9:%'
and c_fullname like '\PCORI\DIAGNOSIS\09\%';
```

Local diagnoses codes (non-ICD9)

- Local codes need to be mapped/merged.
- Mapper cell / mapping tool plugins exist for workbench.

The screenshot displays the 'Mapping Tool' application window. The top menu bar includes 'Mapping Tool Summary', '1. Mapping Tool', '2. Integration Tool', '3. Export Tool', and '4. Import Tool'. The left pane shows a tree view of ICD9CM categories, with 'Diseases and injuries (ICD9:001-999.99)' expanded. The right pane, titled 'Unmapped terms list', contains a table with columns 'Name', 'Source ...', and 'Tooltip'. The table lists various medical terms and their corresponding source codes and tooltips.

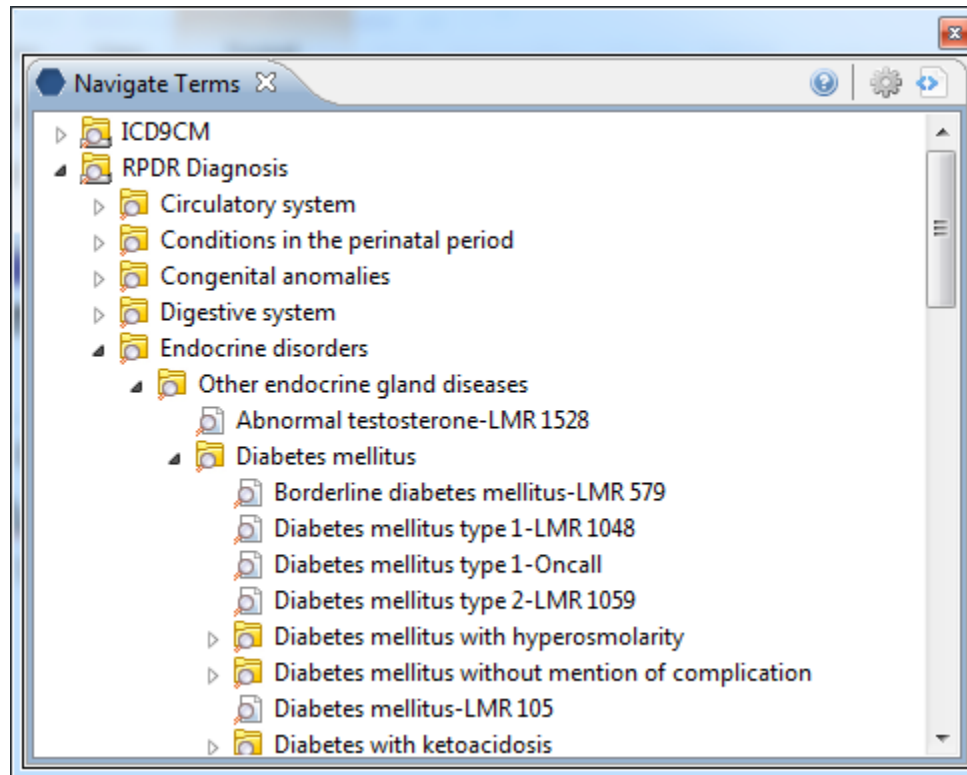
Name	Source ...	Tooltip
Psychological factors aff...	31600	Diagnoses \ ... \ Psychic factors associated with diseases classifie...
zz E-codes	E000-E...	Diagnoses \ E-codes
Missed abortion (obsolet...	63243	Diagnoses \ Events of pregnancy \ Ectopic and molar pregnancy...
zz Negatives		Diagnoses \ Negatives
HIV negative-LMR 189	LPA189	Diagnoses \ Negatives \ HIV negative-LMR 189
TB risk assessment, low-...	ODA:D...	Diagnoses \ Negatives \ TB risk assessment, low-Oncall
74.99-LMR 610	LPA610	Diagnoses \ Unclassified \ 74.99-LMR 610
74.99-LMR 610	LPB610	Diagnoses \ Unclassified \ 74.99-LMR 610
Free text diagnosis-LMR ...	LPA2968	Diagnoses \ Unclassified \ Free text diagnosis-LMR 2968
Free text diagnosis-LMR ...	LPB2968	Diagnoses \ Unclassified \ Free text diagnosis-LMR 2968
Free text diagnosis-Oncall	ODA:B...	Diagnoses \ Unclassified \ Free text diagnosis-Oncall
Living will-LMR 224	LPA224	Diagnoses \ Unclassified \ Living will-LMR 224
N-LMR 274	LPA274	Diagnoses \ Unclassified \ N-LMR 274
None-LMR 526	LPA526	Diagnoses \ Unclassified \ None-LMR 526
Not a problem-LMR 290	LPA290	Diagnoses \ Unclassified \ Not a problem-LMR 290
Positive B27 antigen-LM...	LPA341	Diagnoses \ Unclassified \ Positive B27 antigen-LMR 341
Free text-LMR -1	LPA-1	Diagnoses \ Undefined codes \ Free text-LMR -1
Free text-LMR -1	LPB-1	Diagnoses \ Undefined codes \ Free text-LMR -1
Undefined code-157.00	15700	Diagnoses \ Undefined codes \ Undefined code-157.00
Undefined code-239.20	23920	Diagnoses \ Undefined codes \ Undefined code-239.20
Undefined code-427.10	42710	Diagnoses \ Undefined codes \ Undefined code-427.10
Undefined code-827.00	82700	Diagnoses \ Undefined codes \ Undefined code-827.00
Undefined code-999.97	99997	Diagnoses \ Undefined codes \ Undefined code-999.97
Undefined code-999.98	99998	Diagnoses \ Undefined codes \ Undefined code-999.98
Undefined code-999.99	99999	Diagnoses \ Undefined codes \ Undefined code-999.99
Undefined code-LPA	LPA0	Diagnoses \ Undefined codes \ Undefined code-LPA
Undefined code-LPA1138	LPA1138	Diagnoses \ Undefined codes \ Undefined code-LPA1138

PROJECT ONT MAPPING	
SOURCE_CODING_SYSTEM	VARCHAR(50)
SOURCE_BASECODE	VARCHAR(50)
SOURCE_NAME	VARCHAR(2000)
SOURCE_FULLNAME	VARCHAR(700)
SOURCE_TOOLTIP	VARCHAR(700)
SOURCE_TABLE_CD	VARCHAR(25)
SOURCE_KEY	VARCHAR(725)
DESTINATION_CODING_SYSTEM	VARCHAR(50)
DESTINATION_BASECODE	VARCHAR(50)
DESTINATION_NAME	VARCHAR(2000)
DESTINATION_FULLNAME	VARCHAR(700)
DESTINATION_TABLE_CD	VARCHAR(25)
DESTINATION_KEY	VARCHAR(725)
MAPPING_SOURCE	VARCHAR(50)
VARFLAG	VARCHAR(25)
FLAG	INT
STATUS_CD	VARCHAR(25)
UPDATE_DATE	DATETIME
C_TOTALNUM	INT

Source fields are local terms.
Destination fields are PCORI terms.

Automated mappings

- If your local codes already exist within an ICD9 hierarchy..
- Find the c_fullname, c_basecode and c_name of parent of the term and use that as your mapping's destination.

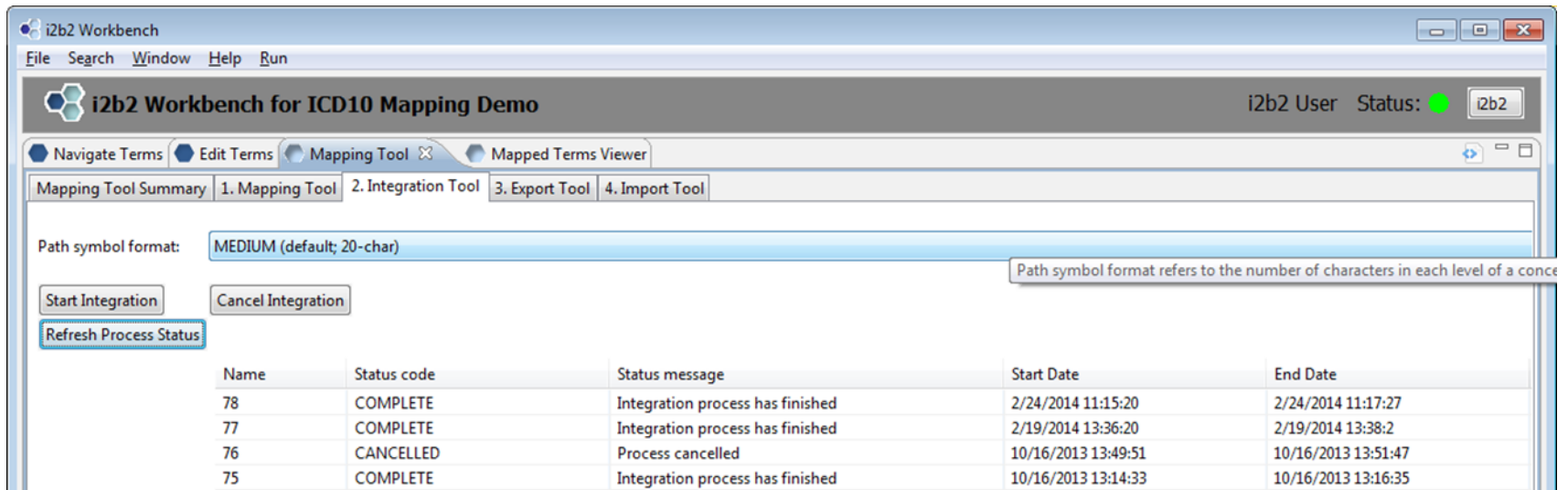


Automated mappings, cont.

```
WITH joined as(
select r2.c_basecode as sourceCode, r1.c_fullname as
destination, r1.c_basecode as destCode, r1.c_name as
destName from local_ont r1 inner join local_ont r2 on
r1.c_fullname=r2.c_path where r2.c_basecode in (select
source_basecode from project_ont_mapping where
destination_fullname is null))
```

```
update project_ont_mapping
set destination_fullname = joined.destination,
    destination_basecode = joined.destCode,
    destination_name = joined.destName
from joined
where joined.sourceCode = source_basecode
```

Integration tool



Select path symbol format (S,M,L)

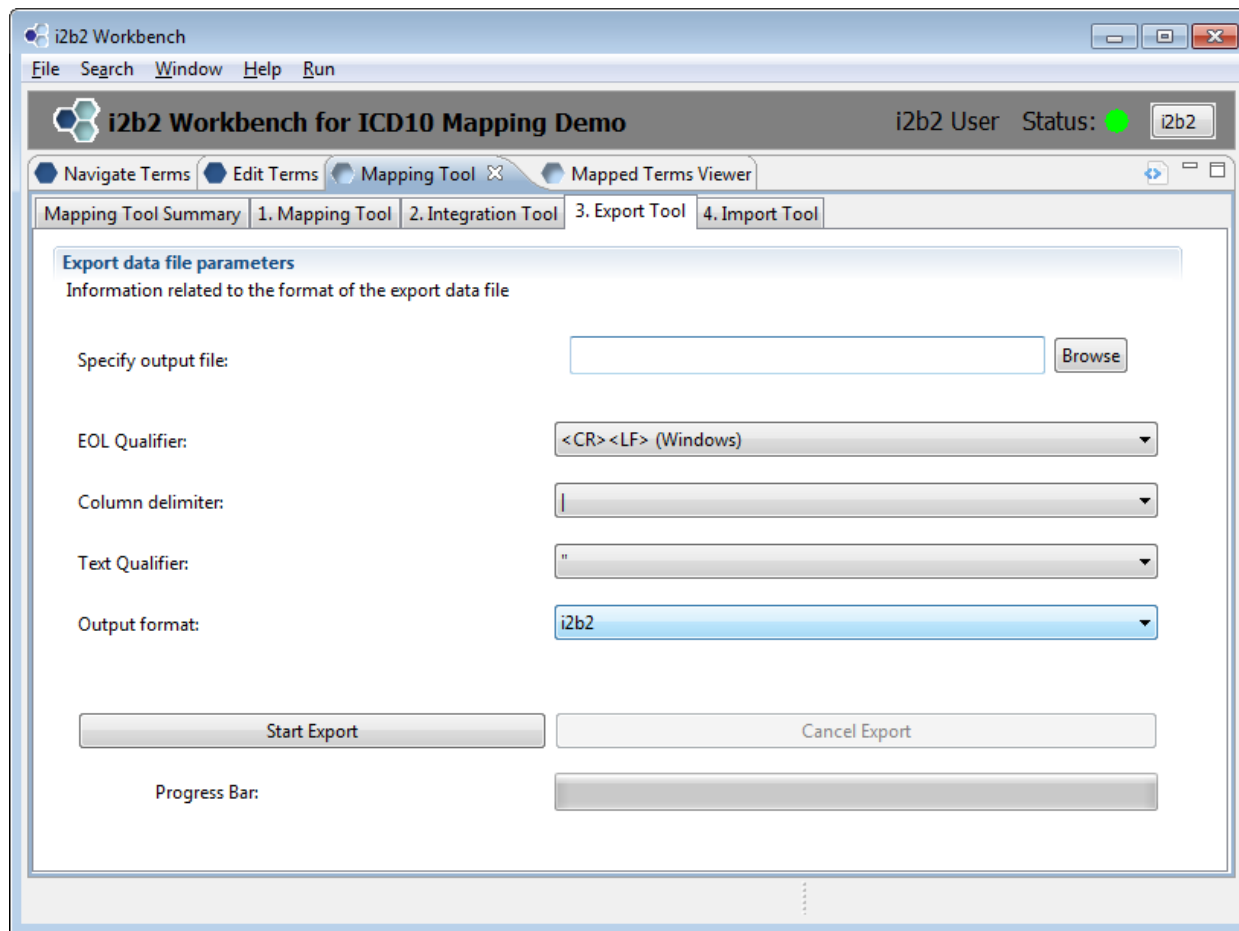
i2b2\Diagnoses\Metabolic and immunity disorders (270-279)\
(277) Other and unspecified disor~\ (277-0) Cystic fibrosis\

Start integration

Refresh process status until integration is complete.

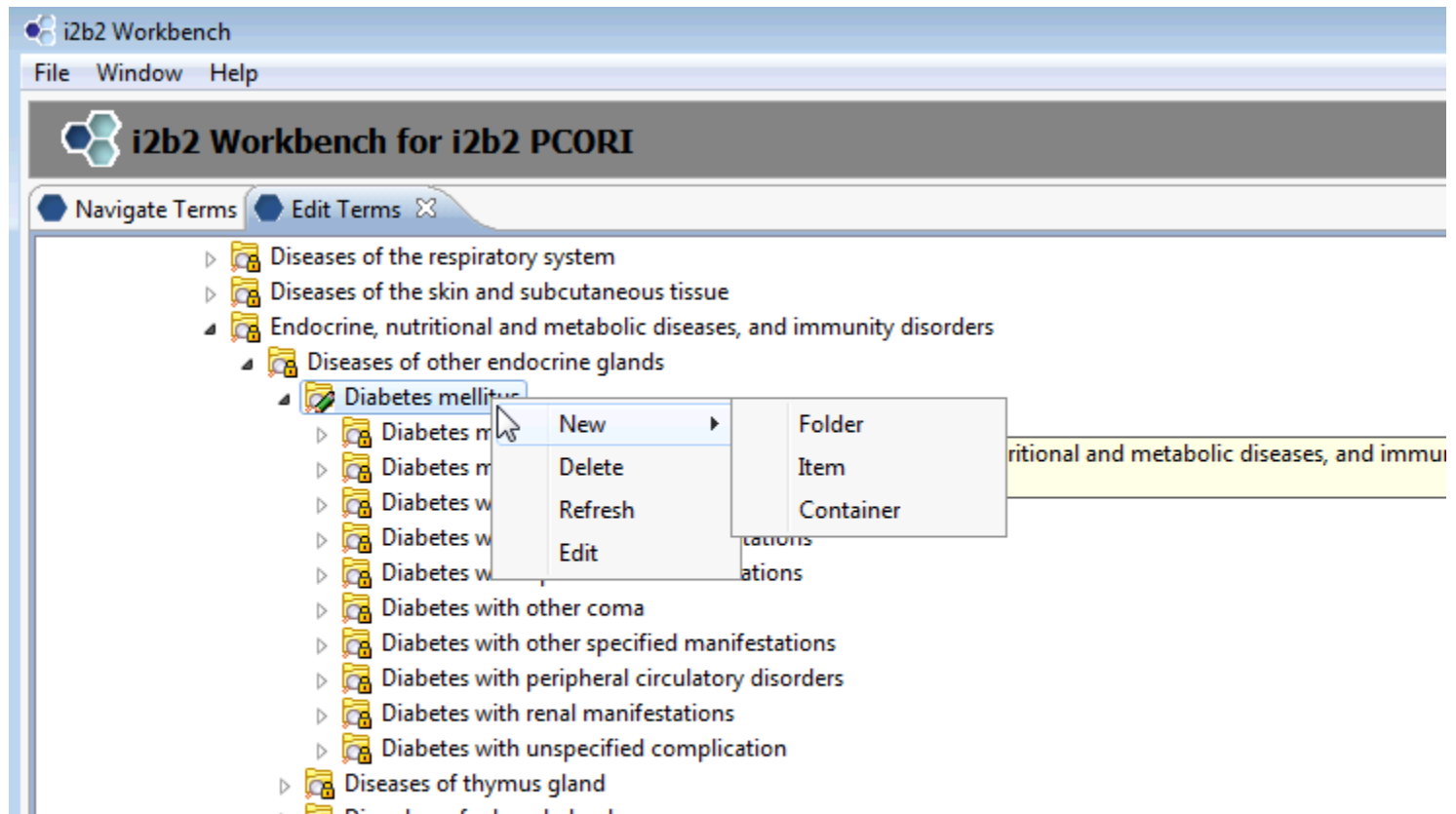
Export tool

- Exports result of integration process as a single, delimited i2b2 metadata file.

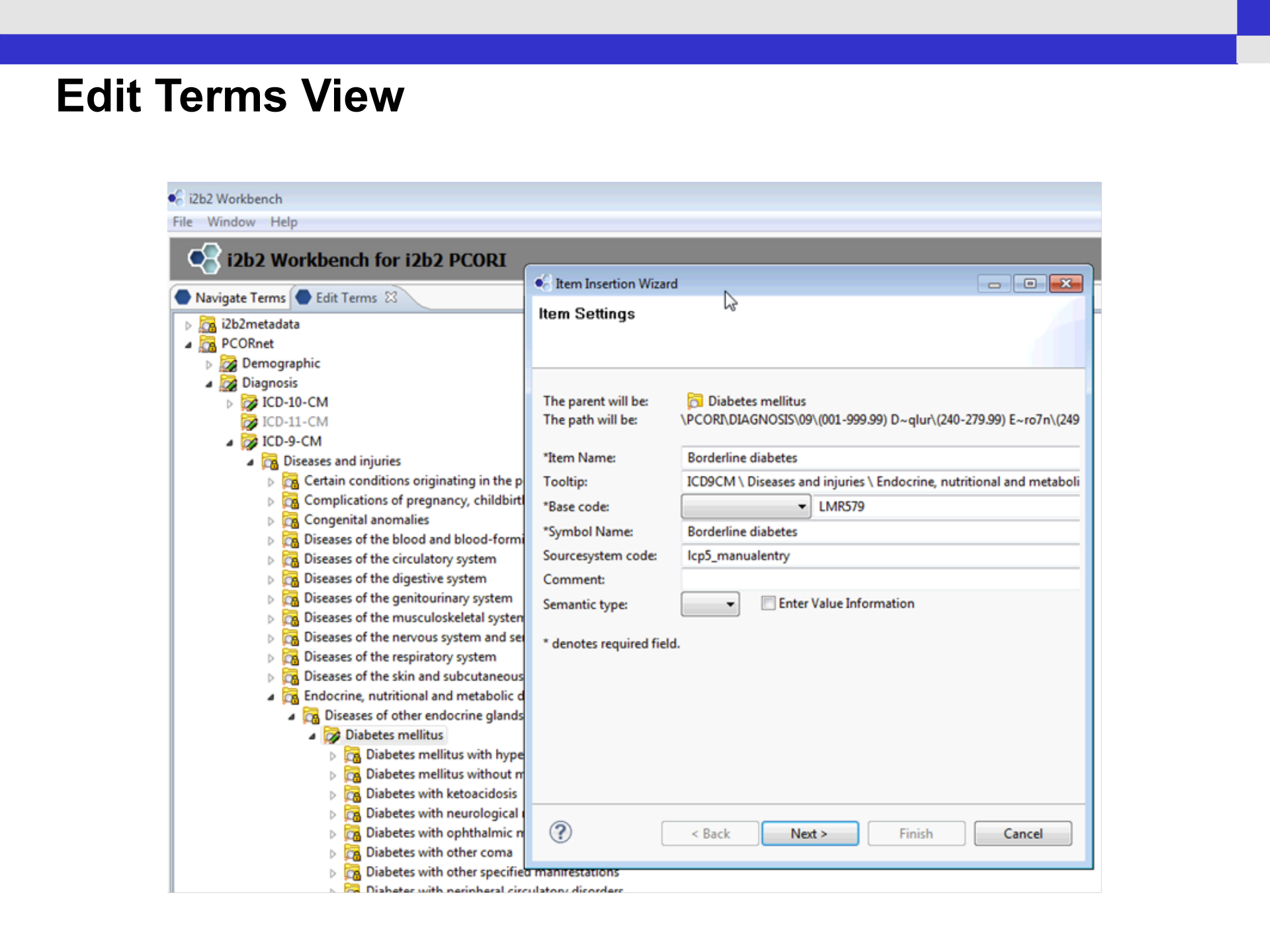


Alternate map/merge method

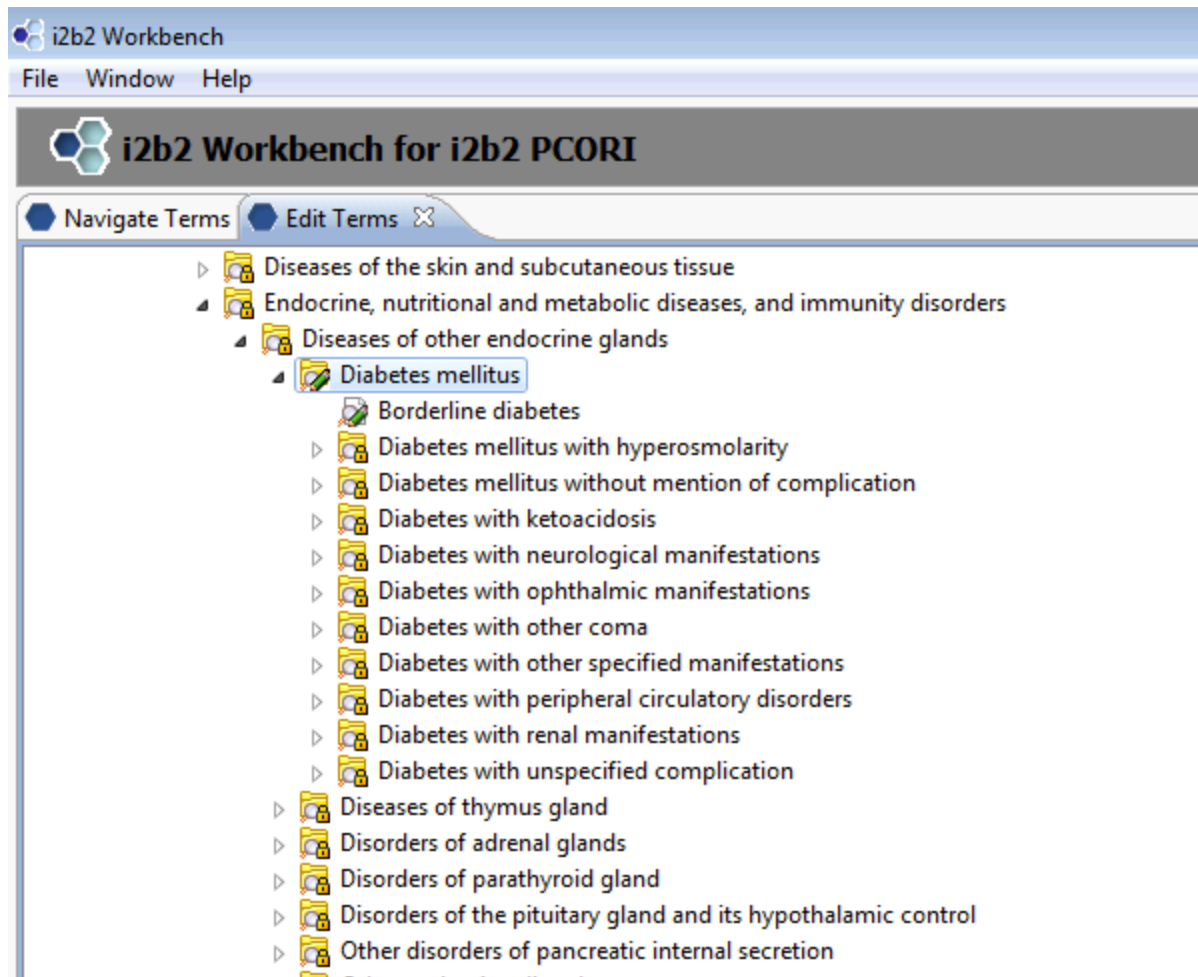
- If you have small number of local codes to merge, use the Edit Terms view.
 - User must be set up with EDITOR role



© 2011 Pearson Education, Inc. All rights reserved. Printed in the United States of America. This publication is protected by copyright. Any unauthorized reproduction or distribution, in any form or by any means, without written permission from Pearson Education, Inc., is prohibited.



New term added



No need to export file, term is added to table automatically.

SHRINE Adapter Mapping File

<entry>

 <key>\\SHRINE\SHRINE\Diagnoses\Endocrine, nutritional, and
metabolic diseases and immunity disorders\Cystic fibrosis\</key>

 <value>

 <local_key>\\i2b2\i2b2\Diagnoses\Metabolic and immunity disorders
(270-279)\(277) Other and unspecified disor~\ (277-0) Cystic
fibrosis\</local_key>

</entry>

<entry>

<entry>

 <key>\\SHRINE\SHRINE\Demographics\Gender\Female\</key>

 <value>

 <local_key>\\i2b2\i2b2\Demographics\Gender\Female</local_key>

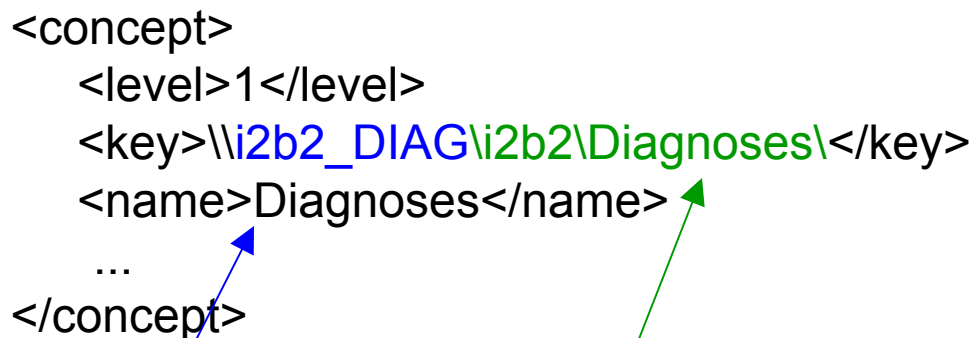
 </value>

</entry>

Meaning behind <key>

- Concept key == \\c_table_cd\c_fullname\

```
<concept>
  <level>1</level>
  <key>\\i2b2_DIAG\i2b2\Diagnoses\</key>
  <name>Diagnoses</name>
  ...
</concept>
```

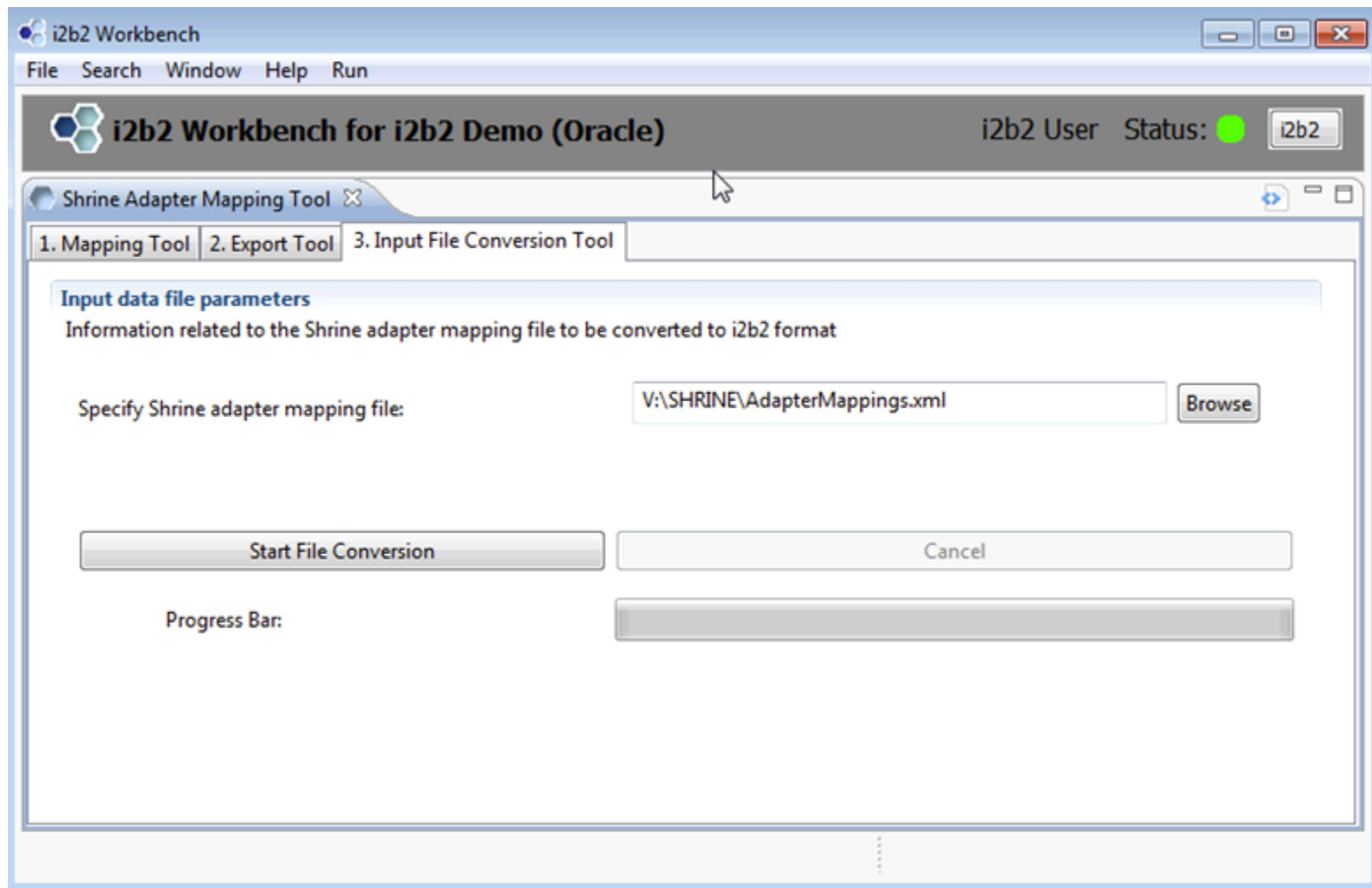


TABLE_ACCESS

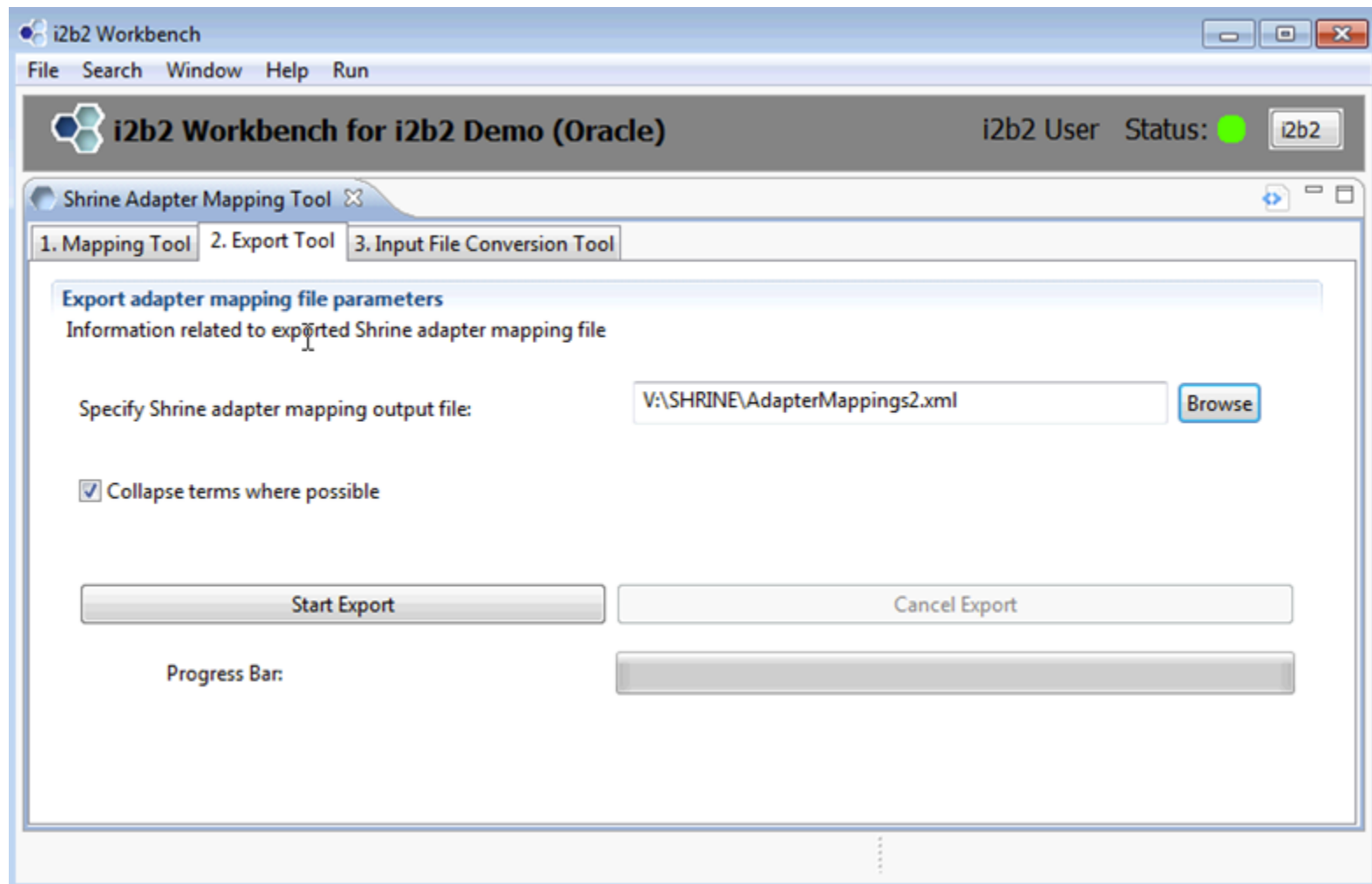
	C_TABLE_CD	C_TABLE_NAME	C_FULLNAME	C_NAME
1	BIRN	BIRN	\BIRN\	Clinical Trials
2	CUST	CUSTOM_META	\Custom Metadata\	Custom Metadata
3	i2b2_DEMO	I2B2_DEMO	\i2b2\Demographics\	Demographics
4	i2b2_DIAG	I2B2_DIAG	\i2b2\Diagnoses\	Diagnoses
5	i2b2_EXPR	I2B2_EXPR	\i2b2\Expression Profiles Data\	Expression Profiles Data
6	i2b2_LABS	I2B2_LABS	\i2b2\Labtests\	Laboratory Tests
7	i2b2_MEDS	I2B2_MEDS	\i2b2\Medications\	Medications
8	i2b2_PROC	I2B2_PROC	\i2b2\Procedures\	Procedures
9	i2b2_PROV	I2B2_PROV	\i2b2\Providers\	Providers
10	i2b2_REP	I2B2_REP	\i2b2\Reports\	Reports
11	i2b2_VISIT	I2B2_VISIT	\i2b2\Visit Details\	Visit Details
12	ICD10_ICD9	ICD10_ICD9	\Diagnoses\	Diagnoses (ICD10)

SHRINE Adapter Mapping Tool

- Version of Mapping Tool for editing Adapter Mapping File.



Export new file



Final output

entry>

<key>\\SHRINE\\SHRINE\\Diagnoses\\Endocrine, nutritional, and
metabolic diseases and immunity disorders\\Cystic fibrosis</key>

<value>

<local_key>\\i2b2\\i2b2_DIAG\\Diagnoses\\Metabolic and immunity
disorders (270-279)\\(277) Other and unspecified disor~\\(277-0) Cystic
fibrosis</local_key>

</entry>

<entry>

<entry>

<key>\\SHRINE\\SHRINE\\Demographics\\Gender\\Female</key>

<value>

<local_key>\\i2b2\\i2b2_DEMO\\Demographics\\Gender\\ Female</local_key>

</value>

</entry>

Where can I find these tools?

- Edit terms view is distributed in standard release of i2b2.
- Mapping tools will be available soon on wiki:

<https://community.i2b2.org/wiki/display/NCBO/Mapping+tools+version+1.0>

The screenshot shows a web browser window displaying the i2b2 Mapping tools version 1.0 wiki page. The browser's address bar shows the URL: <https://community.i2b2.org/wiki/display/NCBO/Mapping+tools+version+1.0>. The page has a dark blue header with navigation links: Dashboard, i2b2 Sponsored Project - NCBO Ontology Tools, and NCBO Ontology Tools. There are also links for Browse, Log In, and a Search Confluence box. On the left side, there is a search bar and a list of tools with checkboxes: NCBO Extraction Tool version 2.0, NCBO Extraction tool version 1.1, NCBO Extraction tool version 1.0, Mapping tools version 1.0 (selected), Mapping tools version 1.0RC1, and Integration tool version 1.0. The main content area features the i2b2 WIKI logo, the title 'Mapping tools version 1.0', and a note that it was added by Lori Phillips and last edited by Lori Phillips on May 27, 2014. Below this is a section titled 'i2b2 Sponsored Project - Mapping tools' with a paragraph describing the tools' purpose. A 'Features' section follows, listing several capabilities: a graphical UI for ontology mapping, an import tool for terms, an integration tool for merging terms, an export tool for metadata, and a requirement for MANAGER or EDITOR roles.

Mapping tools version 1.0 - i2b2

<https://community.i2b2.org/wiki/display/NCBO/Mapping+tools+version+1.0>

Dashboard > i2b2 Sponsored Project - NCBO Ontology Tools > NCBO Ontology Tools

Browse Log In Search Confluence

Mapping tools version 1.0

Search

- ☐ NCBO Extraction Tool version 2.0
- ☐ NCBO Extraction tool version 1.1
- ☐ NCBO Extraction tool version 1.0
- ☒ Mapping tools version 1.0
- ☐ Mapping tools version 1.0RC1
- ☐ Integration tool version 1.0

i2b2 WIKI Mapping tools version 1.0

Added by [Lori Phillips](#), last edited by [Lori Phillips](#) on May 27, 2014 ([view change](#))

i2b2 Sponsored Project - Mapping tools

A set of mapping tools have been created to assist with the assignment, verification, integration, export and import of mappings between two ontologies. In the Software section we provide a sample workbench client / vm image that have been pre-configured with a small subset of ICD-9 to ICD-10 mappings. The mappings presented here were derived from the UMLS GEM (general equivalent mappings).

Features

- A graphical UI to assist with mapping one ontology to another
- An import tool for importing a small set of terms to be mapped
- An integration tool for merging the mapped terms into the target ontology.
 - This feature replaces the 1.0 Integration command line tool.
- An export tool to export the final merged ontology into a delimited i2b2 metadata file.
 - This tool requires the user to have MANAGER or EDITOR role.



Fields used to construct queries

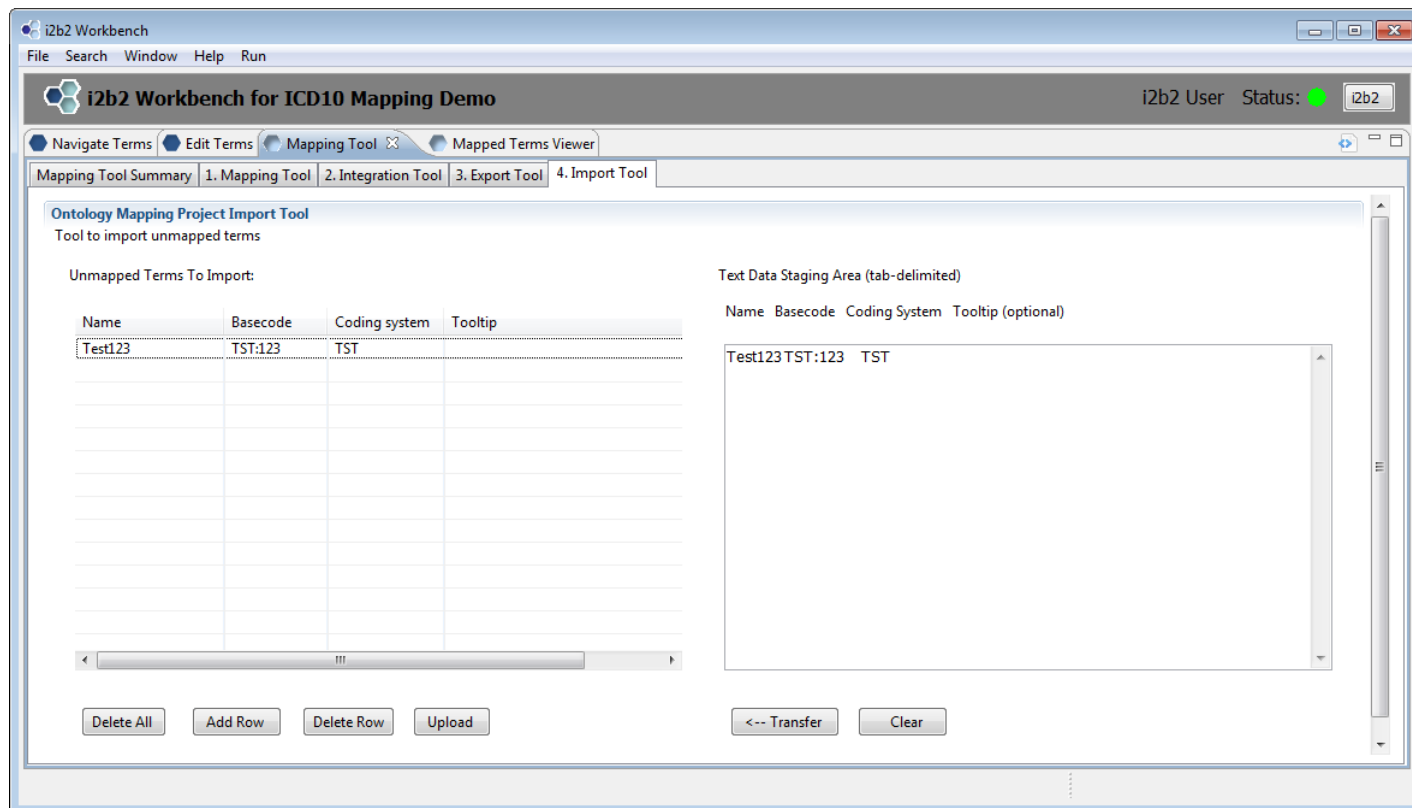
c_facttablecolumn	c_tablename	c_columnname	c_columndatatype	c_operator	c_dimcode
concept_cd	concept_dimension	concept_path	T	LIKE	\RPDR\Demographics\Gender
concept_cd	concept_dimension	concept_path	T	LIKE	\RPDR\Demographics\Gender\Female
concept_cd	concept_dimension	concept_path	T	LIKE	\RPDR\Demographics\Gender\Male
concept_cd	concept_dimension	concept_path	T	LIKE	\RPDR\Demographics\Gender\Unknown
concept_cd	concept_dimension	concept_path	T	LIKE	\RPDR\Demographics\Gender\Unknown\Unknown-@
concept_cd	concept_dimension	concept_path	T	LIKE	\RPDR\Demographics\Gender\Unknown\Unknown-U

Select * from observation_fact where c_facttablecolumn in
(select c_facttablecolumn from c_tablename where c_columnname c_operator 'c_dimcode
%')

Select * from observation_fact where concept_cd in
(select concept_cd from concept_dimension where concept_path like
'\RPDR\Demographics\Gender\Female\%')

Import tool

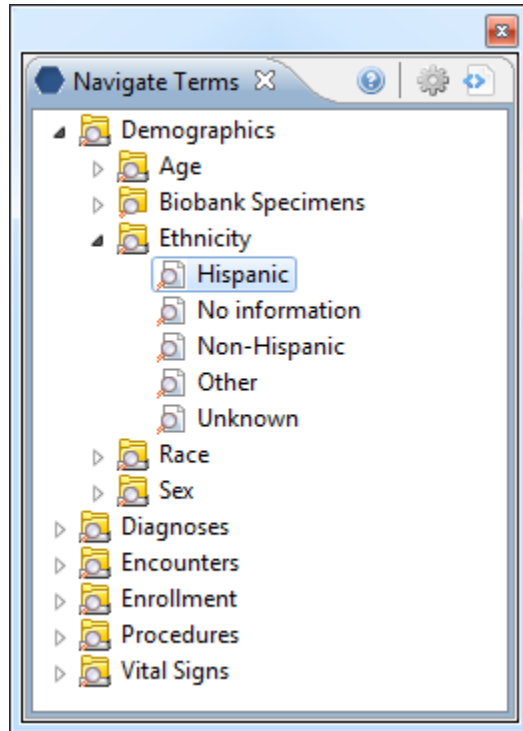
- Intended for small sets of local data
- Enter data into staging area or into table directly.
- Upload to mapping table when complete.
- Entries will appear in unmapped terms table.



patient_dim v concept_dim approaches

- HISTORY: early versions of i2b2 did not support the patient_dimension approach.
 - Demographic data was inserted as entry in observation_fact table and as a result appeared as a tick mark on the timeline.
- Patient_dimension approach does not require an entry in the observation_fact table for that concept.
- Patient_dimension approach will not result in a tick mark in the timeline for that concept.
- Patient_dimension approach is easier to maintain.

Ethnicity, two choices: concept_dimension query



```
select concept_cd from  
concept_dimension  
where concept_path like  
'\PCORI\DEMOGRAPHIC  
\HISPANIC\Y\%'
```

C_NAME	C_FULLNAME	C_BASECODE	C_FACTTABLECOLUMN	C_TABLENAME	C_COLUMNNAME	C_OPERATOR	C_DIMCODE
Hispanic	\PCORI\DEMOGRAPHIC\HISPANIC\Y\	ETHNICITY:HISPANIC	concept_cd	CONCEPT_DIMENSION	concept_path	like	\PCORI\DEMOGRAPHIC\HISPANIC\Y\
No information	\PCORI\DEMOGRAPHIC\HISPANIC\NI\	ETHNICITY:NI	concept_cd	CONCEPT_DIMENSION	concept_path	like	\PCORI\DEMOGRAPHIC\HISPANIC\NI\
Non-Hispanic	\PCORI\DEMOGRAPHIC\HISPANIC\N\	ETHNICITY:NOTHISPANIC	concept_cd	CONCEPT_DIMENSION	concept_path	like	\PCORI\DEMOGRAPHIC\HISPANIC\N\
Other	\PCORI\DEMOGRAPHIC\HISPANIC\OT\	ETHNICITY:OT	concept_cd	CONCEPT_DIMENSION	concept_path	like	\PCORI\DEMOGRAPHIC\HISPANIC\OT\
Unknown	\PCORI\DEMOGRAPHIC\HISPANIC\UN\	ETHNICITY:UN	concept_cd	CONCEPT_DIMENSION	concept_path	like	\PCORI\DEMOGRAPHIC\HISPANIC\UN\

Edit c_basecode to match your ethnicity codes.

Ethnicity, second choice: patient_dimension query

1. Add Ethnicity_cd column to patient_dimension table
2. Edit entry to a patient_dimension query; modify c_dimcode to match your ethnicity codes.

```
select patient_num from patient_dimension  
where ethnicity_cd IN ('HISPANIC')
```

```
(select [c_facttablecolumnname] from [c_tablename]  
where [c_columnname] [c_operator] [c_dimcode])
```