i2B2 Web Client Help Documentation

Version 1.8.3

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1. Quick Start

1.1 Basic Query

Basic queries are constructed by dragging and dropping terms from the 'Terms' panel into a 'Find Patients' group panel.

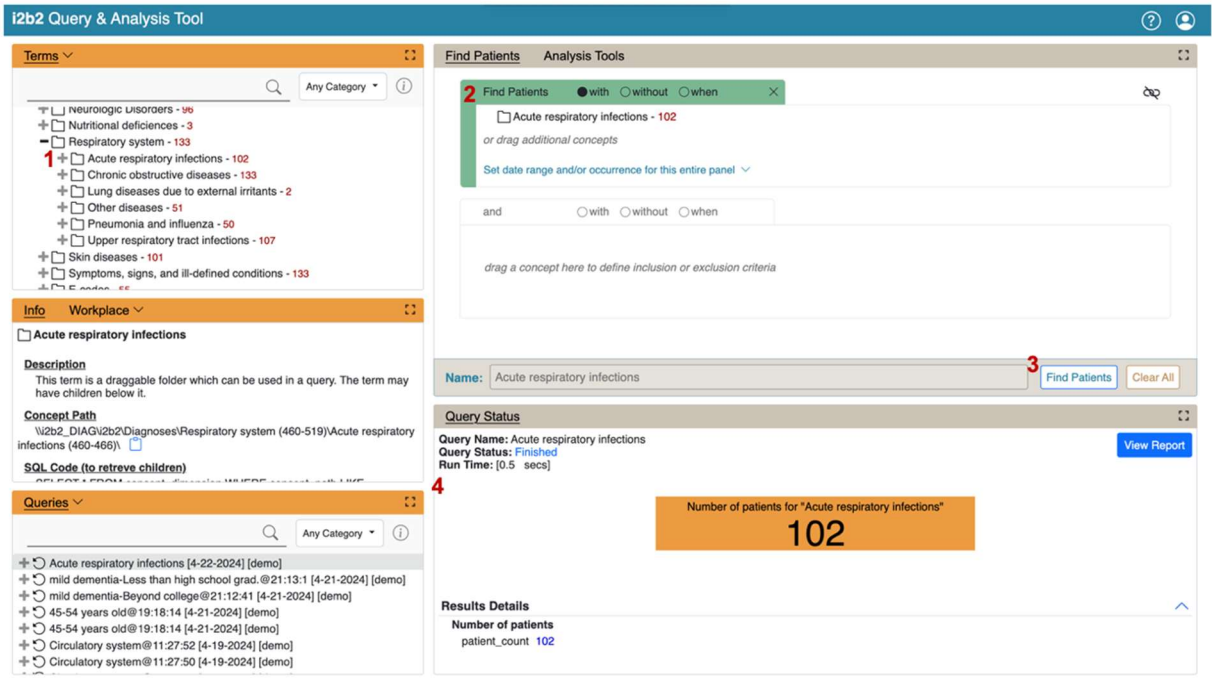
[How to]

1. Find a term
    a. Go to 'Terms' tab
    b. Click folders to expand the lists of terms
    c. Select a term
2. Drag and drop to ‘Find Patients’ group panel
    a. Drag the selected term into 'Find Patients > Find Patients' group panel
3. Run Query
    a. Click 'Find Patients > Run Query Options' → 'Run Query'
4. Get Result
    a. Query running status will be displayed in 'Query Status' section, which is located below 'Find Patients'.
    b. Query result will be displayed in 'Query Status'
        i. Number of patient
        ii. Query name
5. The query and its result will be stored and displayed in 'Queries' tab

[Example]

> **Find all patients who have**
>
> **at least one diagnosis of *Acute respiratory infections*.**

1. Find *Acute respiratory infections*
    a. Go to 'Terms' tab
    b. Click on *Diagnosis* folder to expand → Click on *Respiratory system* folder to expand → Find *Acute respiratory infections*
2. Drag and drop
    a. Drag the *Acute respiratory infections* term into 'Find Patients > Find Patients' group panel
3. Run Query
    a. Click 'Find Patients button > Run Query Options' > 'Run Query'
4. Get Results
    a. See the 'Query Status' section for the query result.
    b. The query is now stored in the 'Queries' tab



1.2 Adding an AND term

Terms in different groups have a logical AND relationship. When terms are combined with the AND operator, retrieved records must contain all the terms.

[How to]

1. Find a Term
    a. Go to 'Terms' tab
    b. Click term folders to narrow down the concept
2. Drag and drop to ‘Find Patients’ group panel
    a. Drag the selected term into 'Find Patients > Find Patients' group panel
3. Find another Term
4. Drag and drop to ‘and’ group panel
    a. Drag the selected term into ‘Find Patients > and' group panel’
5. Run Query
    a. Click 'Find Patients > Run Query Options' > 'Run Query'
6. Get Result
    a. See the 'Query Status' tab for the query result
    b. The query is now stored in the 'Queries' tab

[Example]

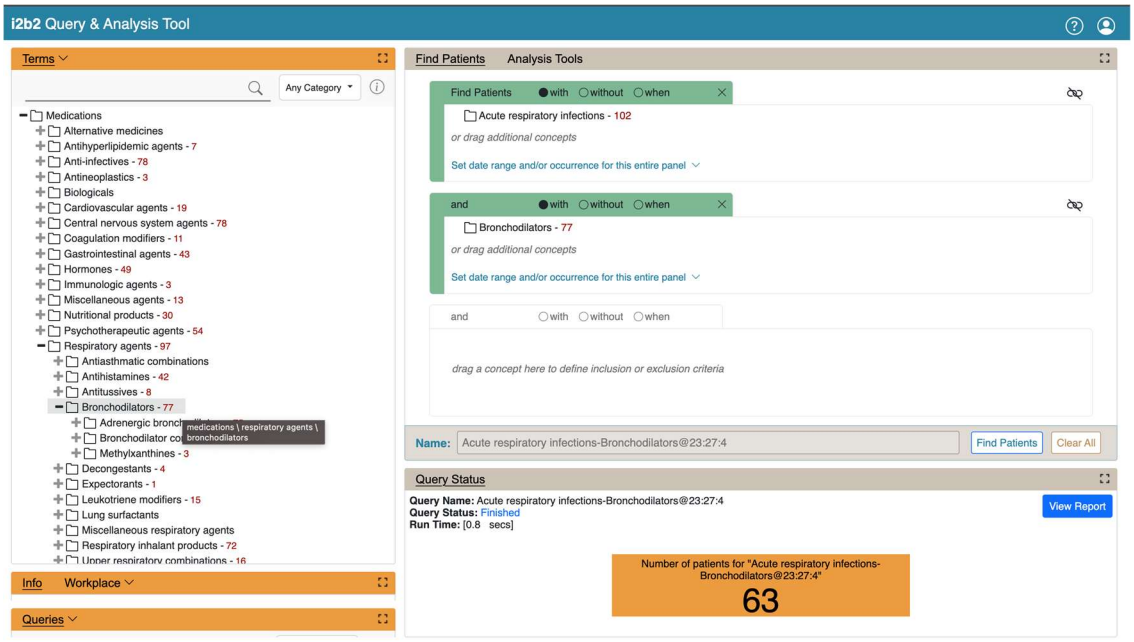
Find all patients who have

at least one diagnosis of *Acute respiratory infections*

AND

at least one prescription of *Bronchodilators*.

1. Find *Acute respiratory infections*
    a. Go to 'Navigate Terms' tab
    b. Select *Diagnosis* → *Respiratory system* → *Acute respiratory infections*
2. Drag and drop
    a. Drag the *Acute respiratory infections* term into 'Find Patients > Find Patients' group panel
3. Find *Bronchodilators*
    a. Go to 'Navigate Terms' panel
    b. Select *Medications* → *Respiratory agents* → *Bronchodilators*
4. Drag and drop
    a. Drag the *Acute respiratory infections* term into 'Find Patients> and' group panel'
5. Run Query
    a. Click 'Find Patients> Run Query Options' → 'Run Query'
6. Get Results
    a. See the 'Query Status' tab for the query result
    b. The query is now stored in the 'Queries' tab



1.3 Adding an OR term

Terms in the same group have a logical **OR** relationship. When terms are combined with the **OR** operator, retrieved records will contain either or both terms.

[How to]

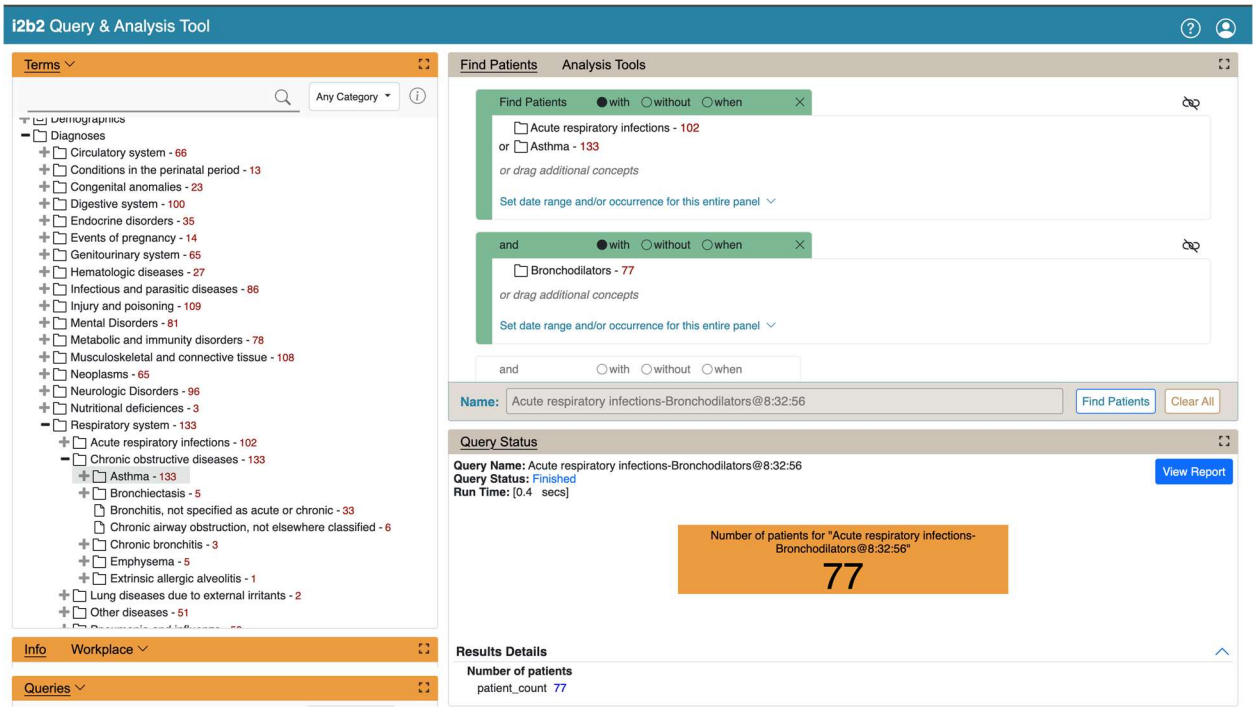
1. Find a Term
    a. Go to 'Terms' tab
    b. Click term folders to narrow down the concept
    c. Select a term
2. Drag and drop to ‘Find Patients’ group panel
    a. Drag the selected term into 'Find Patients> Find Patients' group panel
3. Find another Term
4. Drag and drop to ‘Find Patients’ group panel
    a. Drag the selected term into 'Find Patients> Find Patients' group panel, again.
5. Run Query
    a. Click 'Find Patients> Run Query Options' → 'Run Query'
6. Get Result
    a. See the 'Query Status' tab for the query result
    b. The query is now stored in the 'Queries' tab

[Example]

> **Find all patients who have**
>
> **at least one diagnosis of *Acute respiratory infections* OR at least one diagnosis of *Asthma***
>
> **AND**
>
> **at least one prescription of *Bronchodilators*.**

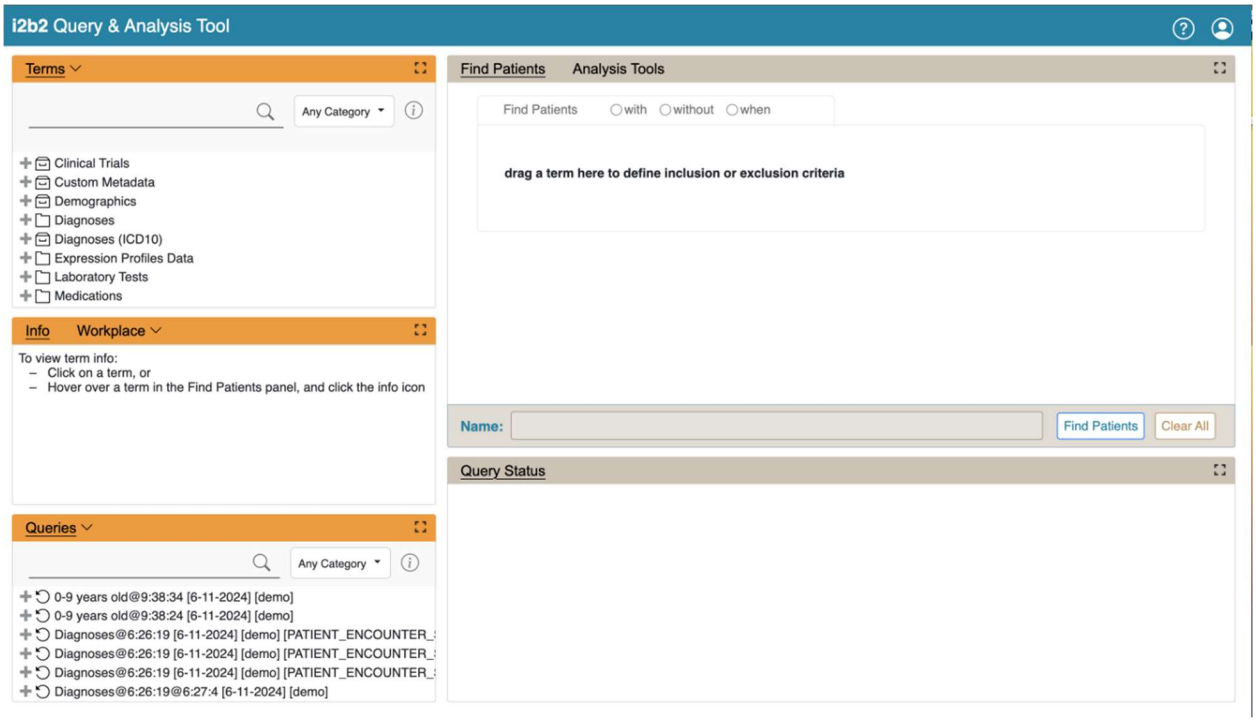
1. Find *Acute respiratory infections*
    a. Go to 'Terms' tab
    b. Select *Diagnosis → Respiratory system → Acute respiratory infections*
2. Drag and drop
    a. Drag the *Acute respiratory infections* term into 'Find Patients> Find Patients' group panel
3. Find *Asthma*
    a. Go to 'Terms' tab
    b. Select *Diagnosis → Respiratory system → Chronic obstructive diseases → Asthma*

4. Drag and drop
    a. Drag the *Acute respiratory infections* term into 'Find Patients> Find Patients' group panel, again
5. Find *Bronchodilators*
    a. Go to 'Terms' tab
    b. Select *Medications* → *Respiratory agents* → *Bronchodilators*
6. Drag and drop
    a. Drag the *Acute respiratory infections* term into 'Find Patients> and' group panel'
7. Run Query
    a. Click 'Find Patients> Run Query Options' → 'Run Query'
8. Get Results
    a. See the 'Query Status' tab for the query result
    b. The query is now stored in the 'Queries' tab



2. Webclient Layout

The i2b2 Webclient has five main panels, laid out in the following manner.



1. Query Tool/Find Patients (Top Right)

The **Find Patients** panel is where queries are constructed and run. Users can specify query criteria in the group panels. Query criteria can be any terms contained in the vocabularies (also called ontologies) in the **Terms** section, as well as past queries or query results.

2. Navigate Terms (Top Left)

The **Terms** panel contains hierarchical vocabularies of terms for constructing queries. Users can navigate through the vocabularies using the default Terms view, or can search by text or codes using the search input field.

3. Query Status (Bottom Right)

The **Query Status** panel shows information about the state of a query, such as if it is currently running, or, when it completes, the results. It can also display various graphical representations of the results. The **Query Report** button provides a textual representation of the query

4. Queries (Bottom Left)

Previously-run queries and their results are stored in the **Queries** panel. Users may re-use them by dragging them into the Query Name section or groups in the **Find Patients panel** or save them by dragging them into the **Workplace** panel. The most recently run queries are displayed at the top. Users can use the **search input field** to search for a prior query they created.

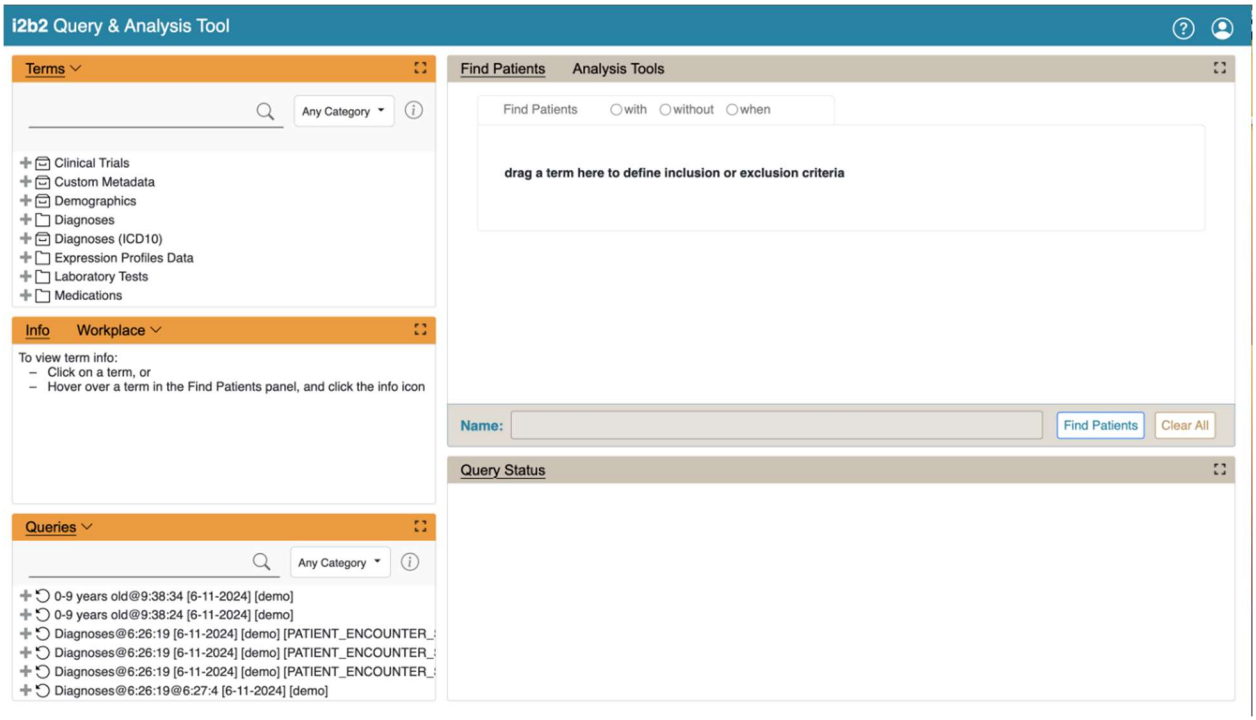
5. Workplace (Middle Panel)

The **Workplace** panel stores information, such as prior queries, that can be referred to or used later. Users may store previously-run queries, patient sets, individual patients, and terms in this panel. Users can create folders to organize the workplace. The workplace is private by default, but there is a SHARED folder that everyone has access to. Users can use the SHARED folder to share terms and queries with other colleagues.

3. Query Tool

The **Query Tool** panel is where queries are constructed and run.

3.1 Layout



Query Run Options allow users to set options for the panel. It can be accessed from the application menu.

Query Name shows the name of the current query. Users can also drop a previous query here to load it.

Query Timing Selector enables users to select the appropriate timings for their query, including temporal queries.

Query Groups are where users can drag and drop terms to build queries. There are initially one Group, but more are automatically added.

Tool Bar contains buttons to run queries, clear all the panels, and name the query.

3.2 Creating a Query

3.2.1 i2b2 Items for Querying

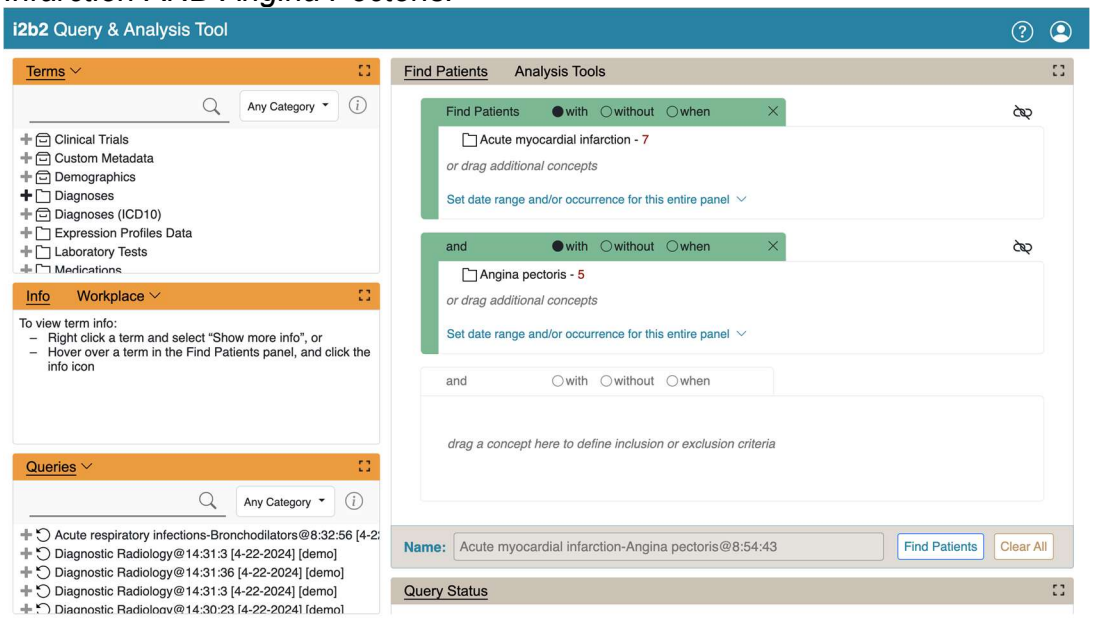
These items may be dragged into Query Groups to construct queries.

Icons	Name	Description
	Terms /Concepts	Terms (also called concepts) are the words or phrases that make up vocabularies. Terms are the basic query items.
	Term Groups	Related terms are grouped into hierarchies. When a term group is used in a query, all terms in the group are searched for.
	Modifiers	Modifiers are descriptors that can be attached to terms to make small changes to them. For example, a Diagnosis concept may be additionally described by Modifiers "Principal Diagnosis" or "Secondary diagnosis."
	Modifier Groups	Groups of Modifiers, similar to Term Groups.
	Previous Queries	Previous Queries are queries that have been run before and are stored in the 'Previous Queries' panel
	Individual Patient	If selected when running a query, a query can return a Patient Set, which is a set of patient numbers that satisfy the query criteria . The Patient Set is stored with the query in the Previous Queries panel. The Patient Set can be expanded, and individual subjects dragged into query groups to be used in a new query.
	Patient Sets	If selected when running a query, a query can return a Patient Set, which is a set of patient numbers that satisfy the query criteria. The Patient Set is stored with the query in the Previous Queries panel and can be dragged into query groups to be used in a new query.
	Encounter Sets	If selected when running a query, a query can return an Encounter Set, which is a set of encounter numbers that satisfy the query criteria. The Encounter Set is stored with the query in the Previous Queries panel and can be dragged into query groups to be used in a new query.

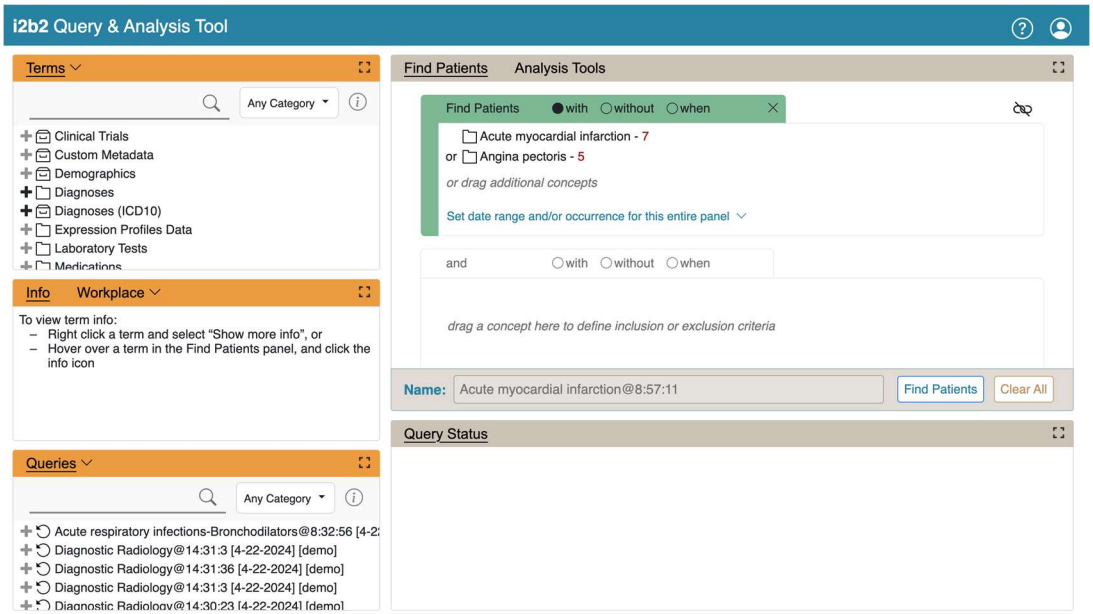
3.2.1 Operators and Order of Precedence

i2b2 items are combined using Boolean operators **AND** and **OR.** Items within each Group are first **OR** ed together. The Groups are then **AND** ed together.

Example 1 (AND): This query finds patients with *Acute Myocardial Infarction* AND *Angina Pectoris.*

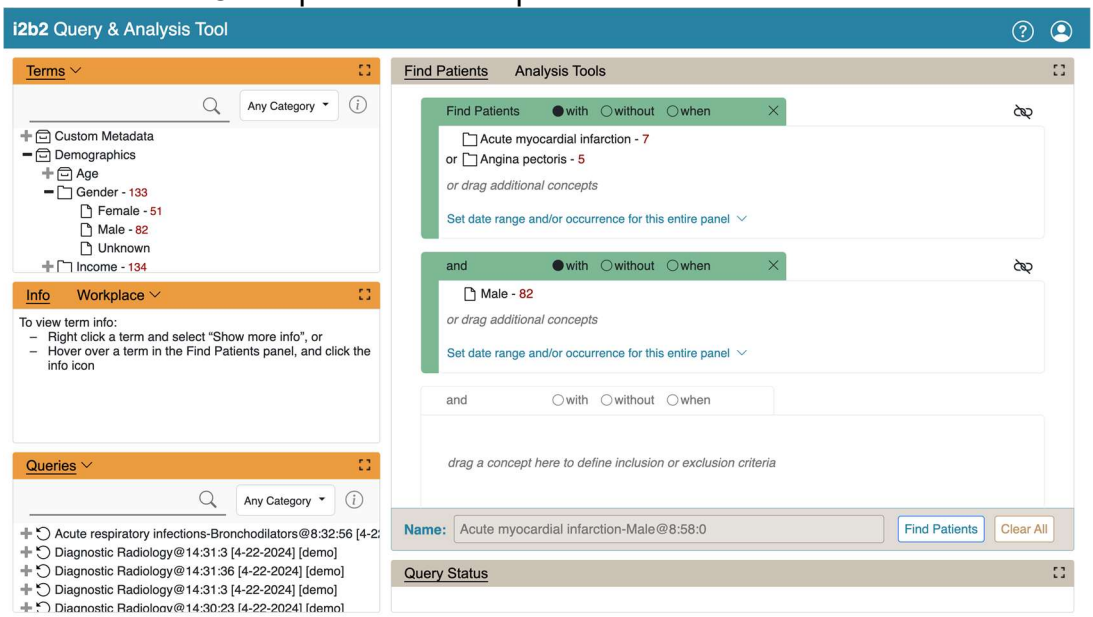


Example 2 (OR): *This query finds patients with Acute Myocardial Infarction OR Angina Pectoris.*



Example 3 (AND of ORs): *This query finds patients with (*Acute Myocardial Infarction OR Angina Pectoris) AND *who are* male.

*Note that the OR expression in the parentheses is evaluated first.



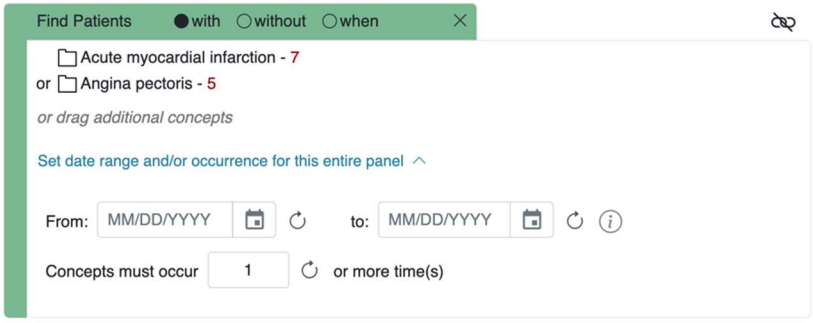
3.2.2 Constraints

Constraints are used to narrow down the search criteria to a particular time frame, number of occurrences or a specific value or range of values. In i2b2, there are several types of constraints that can be defined in the Find Patients view.

Group Constraints

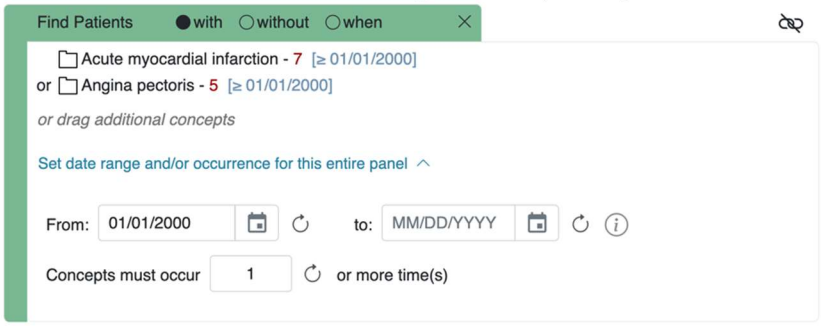
Date Constraint

Setting Date Constraint for the entire Group



Click 'Set date range and/or occurrence for this entire panel' to view controls to set a date range that can be selected to restrict the date occurrences of the items in the Group to within that range. Check one or both of the check boxes to

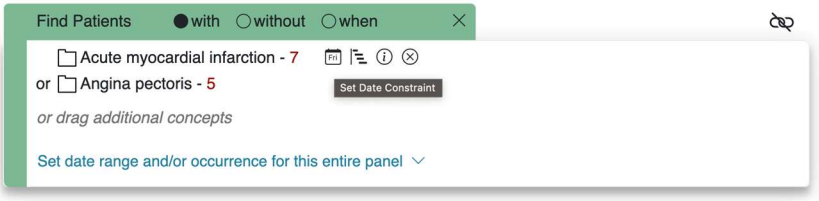
indicate whether there is a begin date (From) or an end date (To) or both.

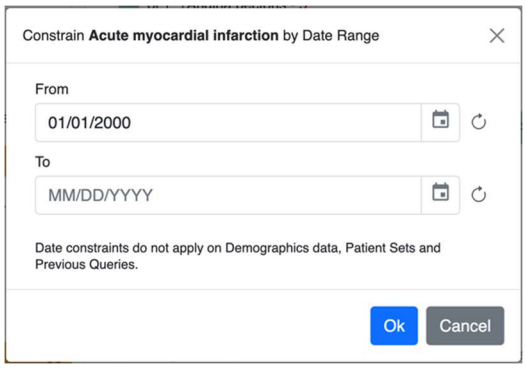


Then type the date directly in the text box or click on the drop-down arrow to open the calendar below to select a date. This will set the date range for all items in this Group.

Setting Date Constraint on individual items

Sometimes only some items in the Group need date constraints or different items in one group require different date constraints. In this case, hover over the item and select **Set Date Constraint calendar icon** to set the date constraint for that item specifically.

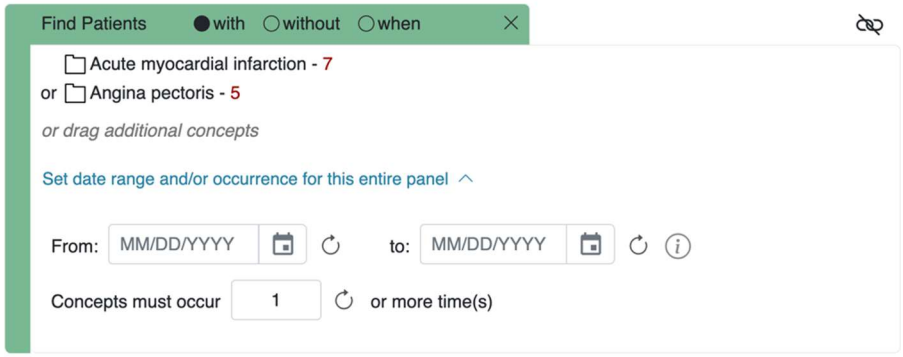




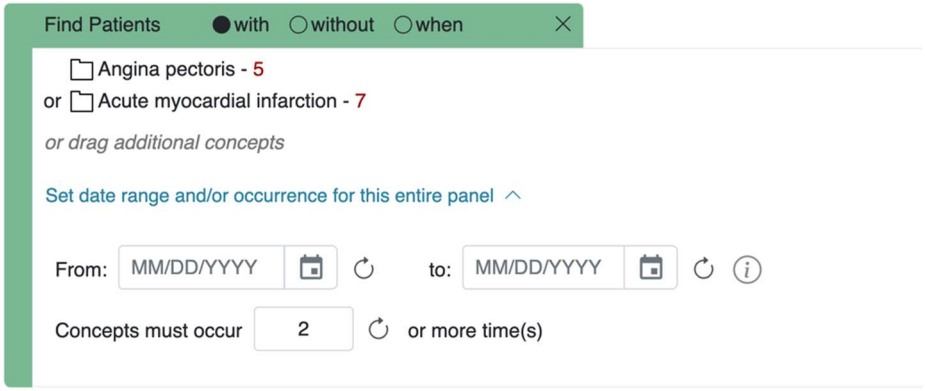
Once a date constraint is applied, **Dates** will now be underlined to indicate a date constraint has been set.

Occurrence Constraint

Users can define the number of times an item must occur for each subject. Clicking on 'Set date range and/or occurrence for this entire panel' will expand and display controls to select to restrict the occurrences of the items in the Group to within that range. Enter a value in the field.



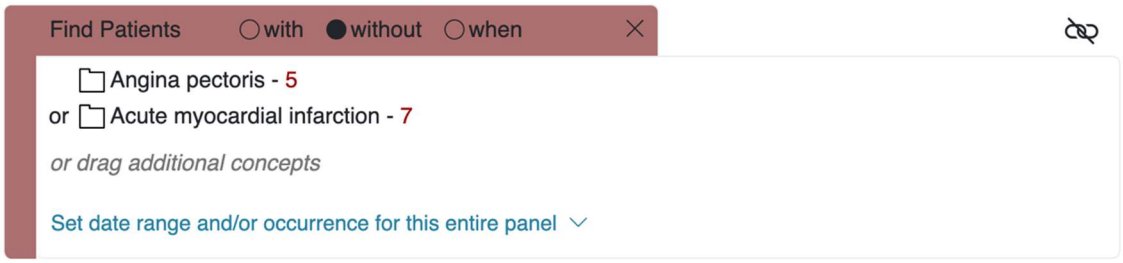
Occurs has been set and the 1 will be replaced with the selected number.



Exclusion Constraints

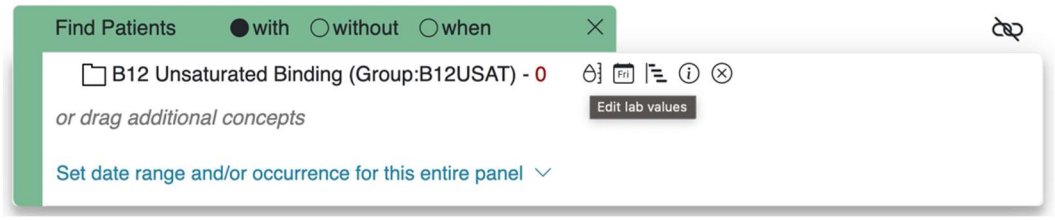
Constraint will not include patients with the concepts listed in the panel.

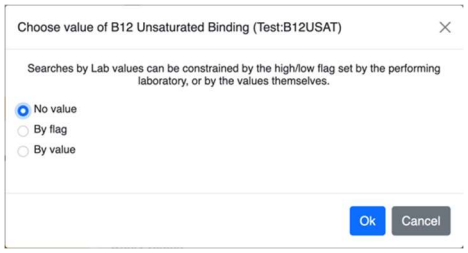
Click on the “without” radio button located in the selection criteria section of the panel. The background color will change to a red hue.



Value Constraints (eg. labs)

Constraint is by the value associated to a concept or modifier. Not all items have values. The value constraint window will open automatically when you drop a concept into a panel in the Find Patients view. To set the constraint at a later time, hove over the term and select the corresponding icon to select Set Value.

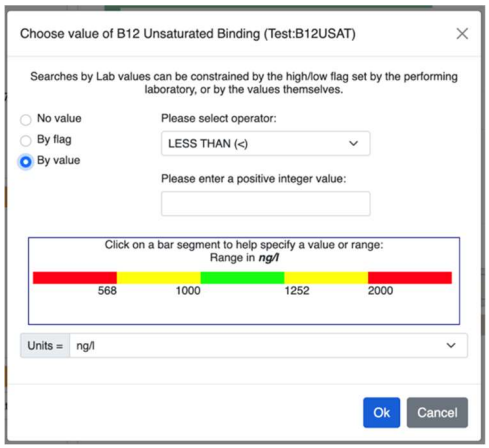




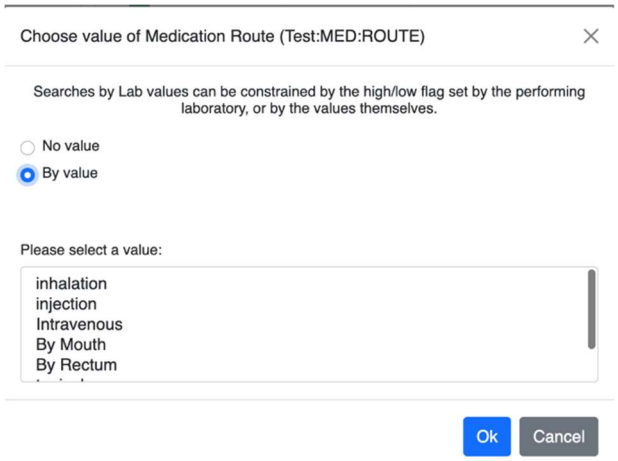
Numeric

The numeric value is defined in the source system when the result is entered. Enter a numerical value at the Please enter a value field. Unlike flag and text values, numeric values use operators, such as greater than or less than when setting the constraints. The Units will default to the normal units defined for the item. Click on the drop-down arrow to change the units.

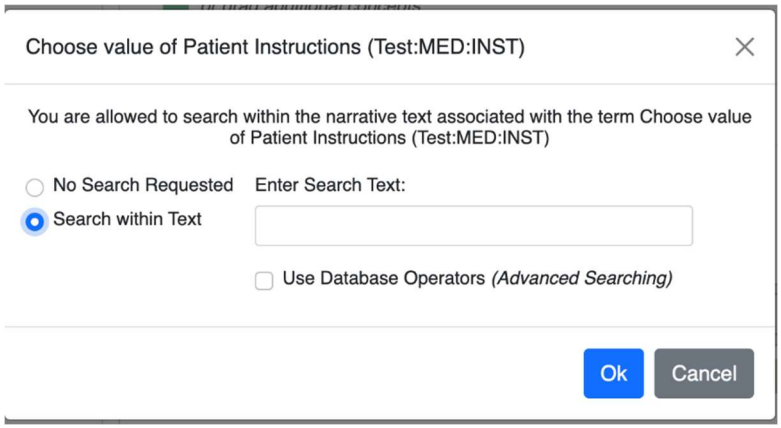
Note: In order for unit conversion to work a parameter called CRC_ENABLE_UNITCD_CONVERSION must be defined for the project. If this is not defined you need to contact your system administrator.



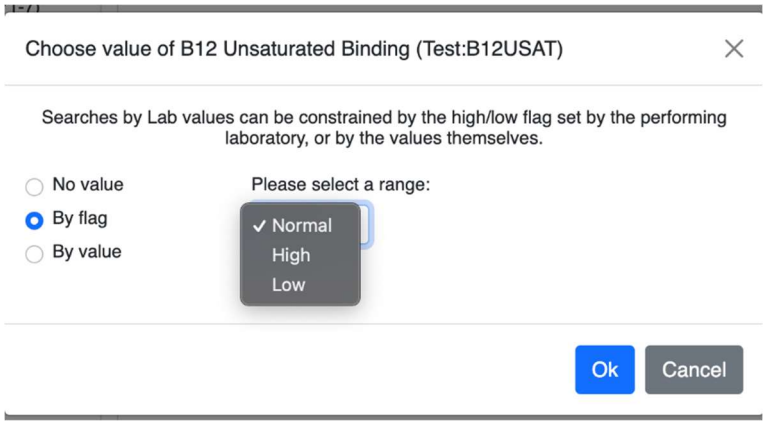
Categorical



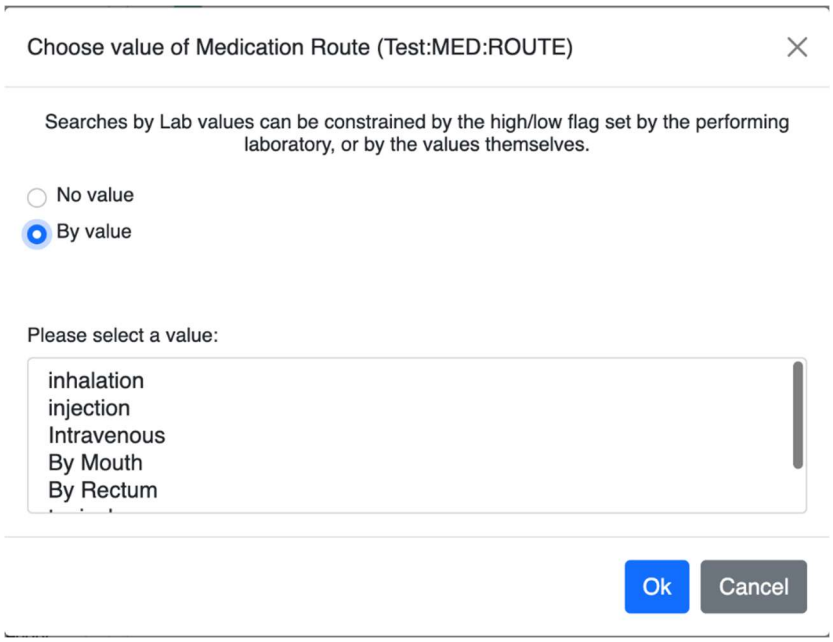
Text



Flags (high, low, etc.)



Modifier Value Constraints

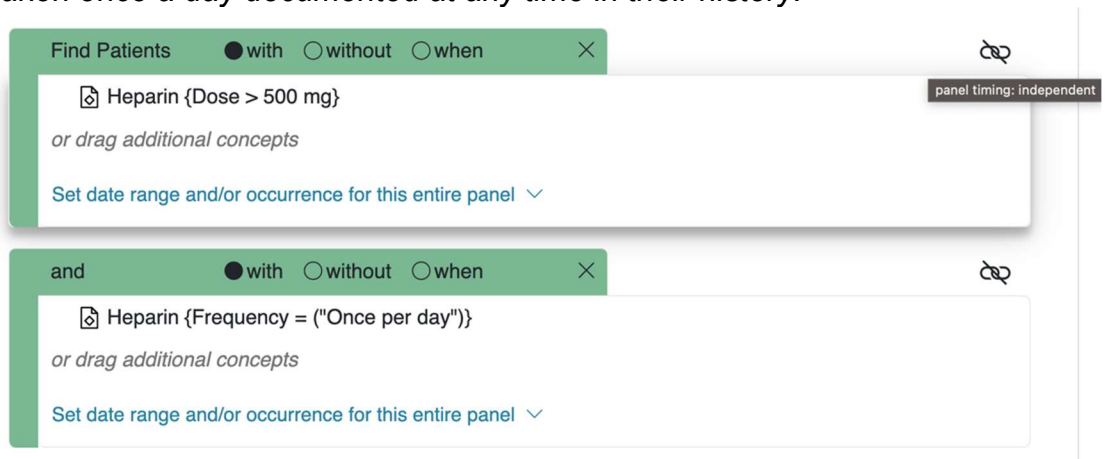


3.2.3 Query Timing

Choose the relationship between the query panels. The default timing is independent.

Independent
The items (facts) can occur at any time in the patient's history.

[Example]
Patient has a medication with a dose greater than 500 mg and a medication that is taken once a day documented at any time in their history.

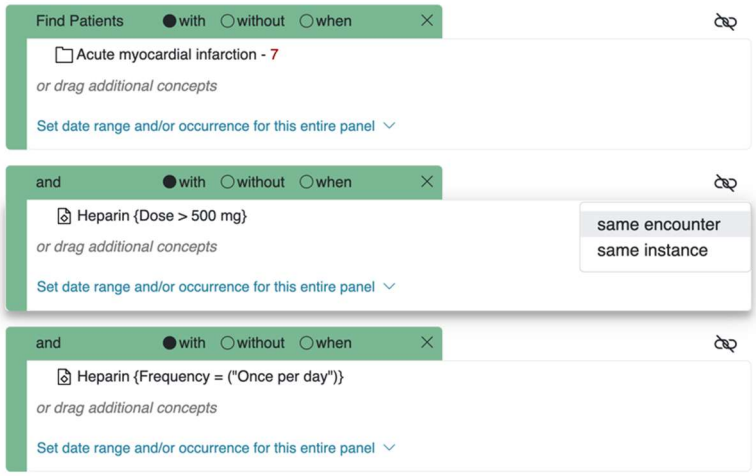


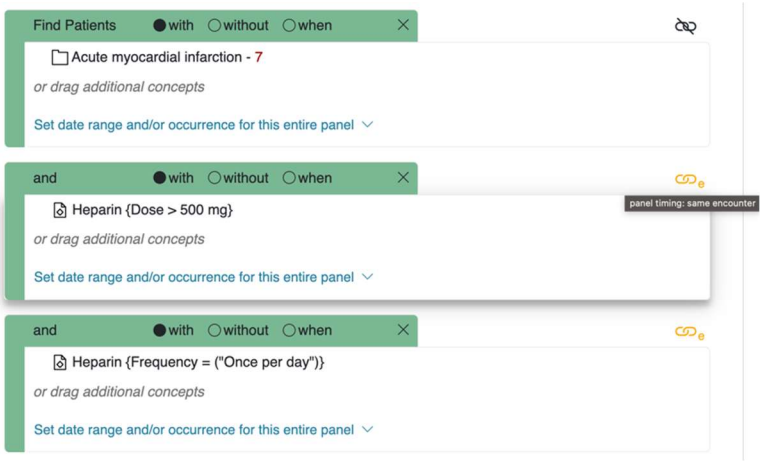
Same Financial Encounter

The items (facts) occur during the same visit (financial encounter).

When this is selected, individual panels can be included in the "same encounter" query, or they can be treated independently

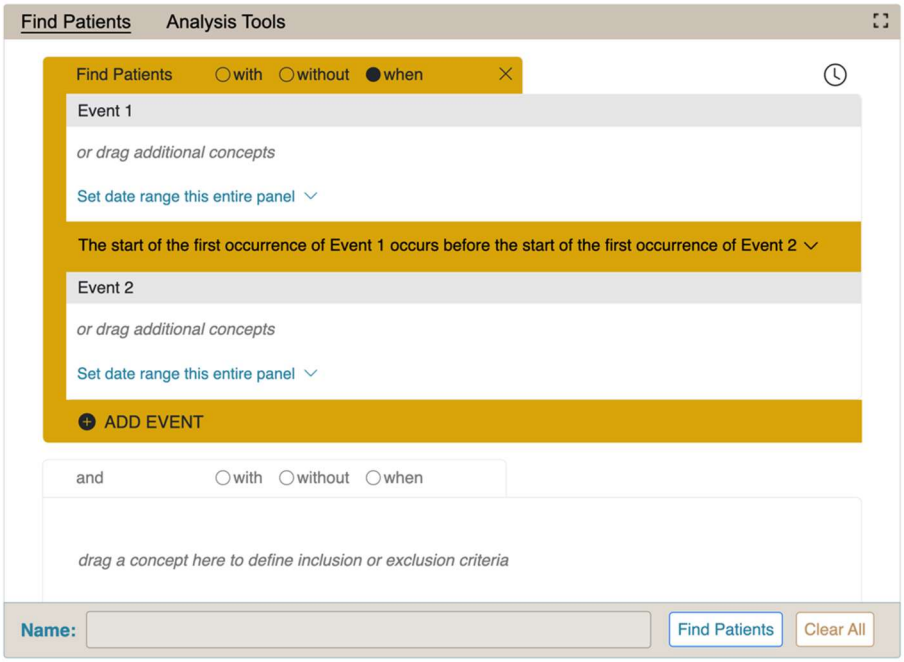
[Example]
Patient has a diagnosis of Acute MI documented at any time in their history and they have a medication with a dose greater than 500 mg and a medication that is taken once a day documented during the same visit.



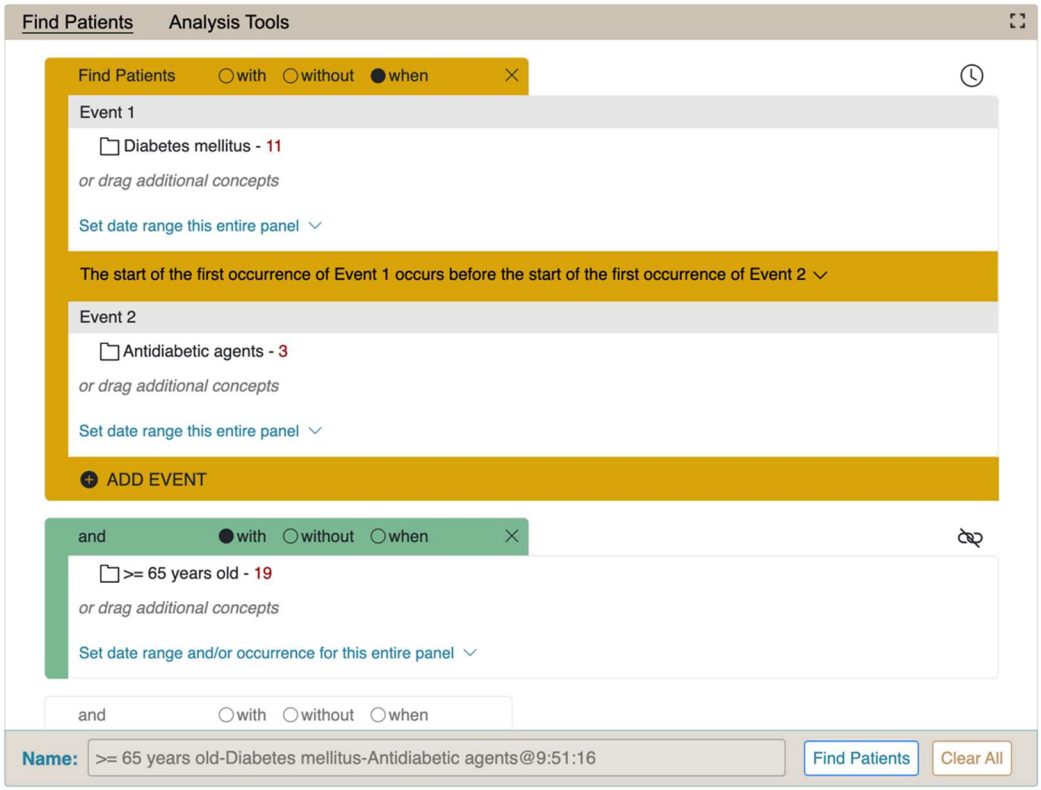


Temporal Query

In this mode, a sequence of events are defined that are anchored by a constraining population. The constraining population is defined exactly like other query types. To build a sequence of events, select the “when” radio button located in the selection criteria section of the panel. The background color will change to a yellow hue.



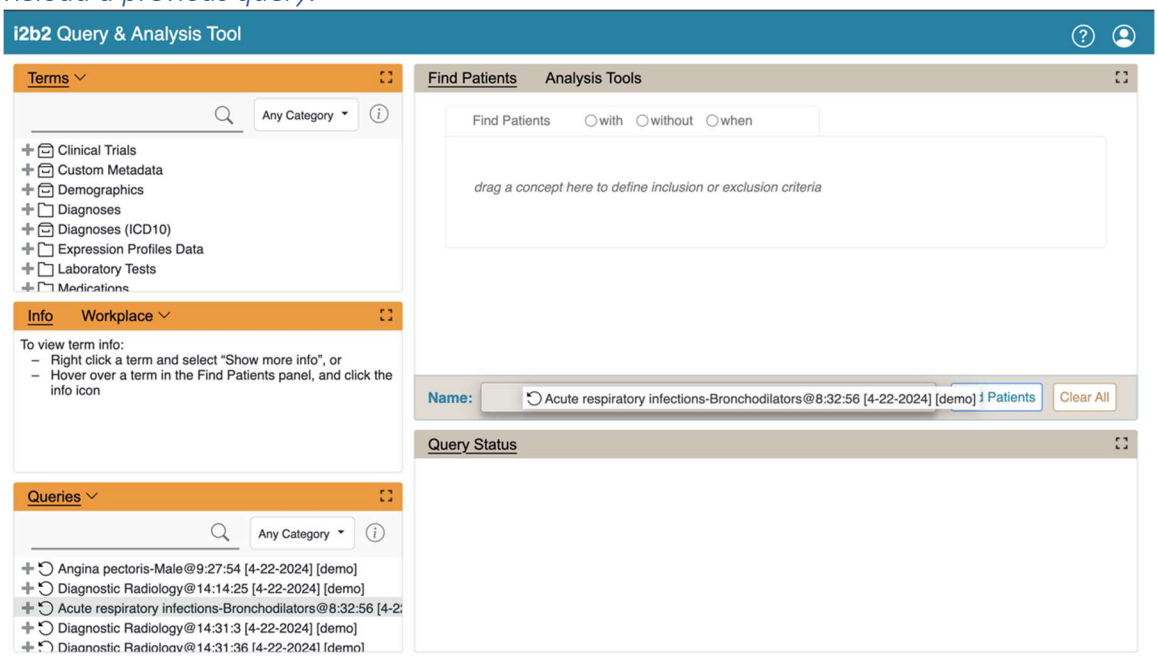
[Example]
Finds patients who were diagnosed with diabetes (*Event 1*) prior to the first observation of an antidiabetic medication *(Event 2)*. The population is constrained to patients over 64 years of age *(bottom panel).*



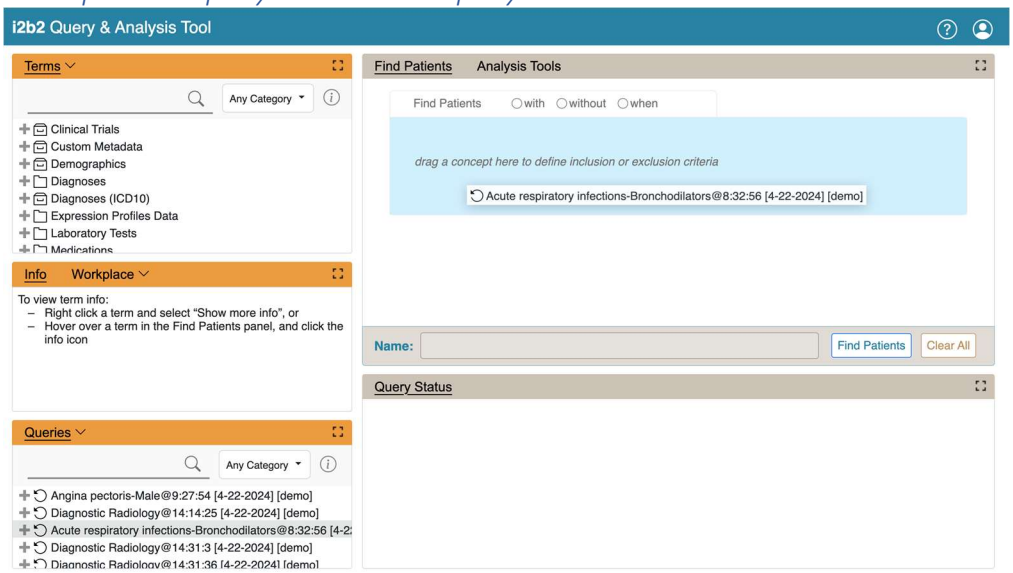
3.2.4 Reloading a Previous Query

Saved queries (either from Queries panel or the Workplace) can be reloaded by dragging them to the Name bar at the bottom of the Find Patients panel. They can be used within a query by dragging them into a query panel. See the Query section .

Reload a previous query.



Use a previous query within a new query.



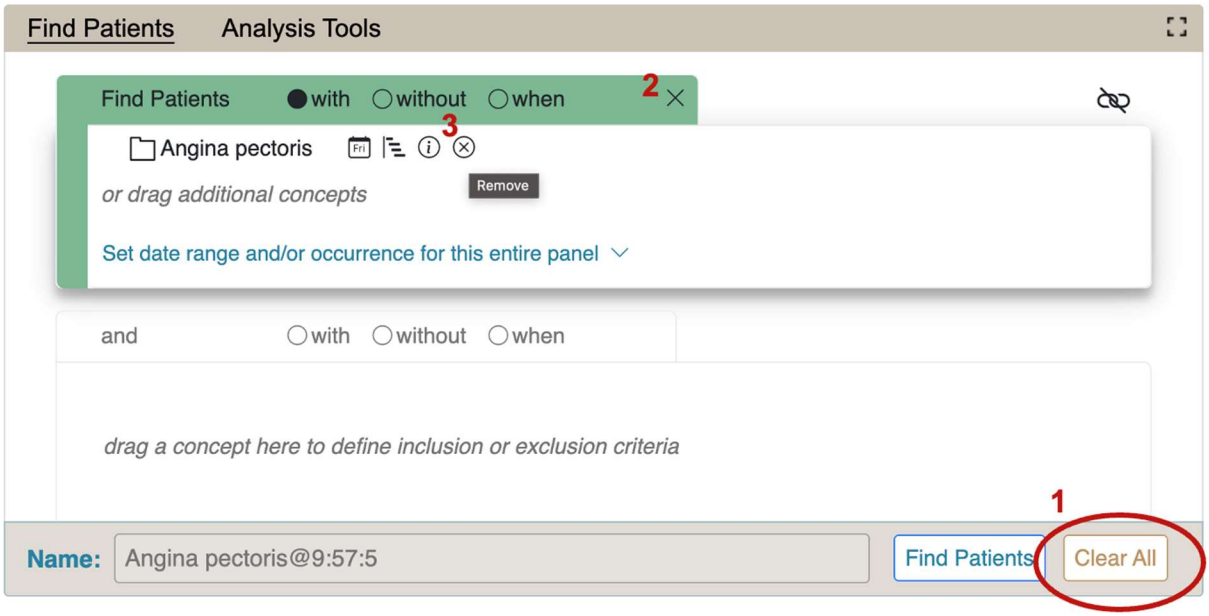
3.2.5 Resetting the Query Tool

There are three options for resetting the **Find Patient panel**. Users can (1) reset all the groups, (2) clear all items in a panel, or (3) delete an individual item from the group.

1. Reset All Groups: Click on the **Clear All button** located on the toolbar at the bottom of the *Find Patients panel.*

2. Clear Items in a Panel / Group : Click on the **Delete "X" button** located in the top right corner of the panel (next to the panel controls).

3. **Delete Single Item:** Hover over a concept, and click on the X icon to remove from the panel



3.3 Running a Query

3.3.1 Run Query

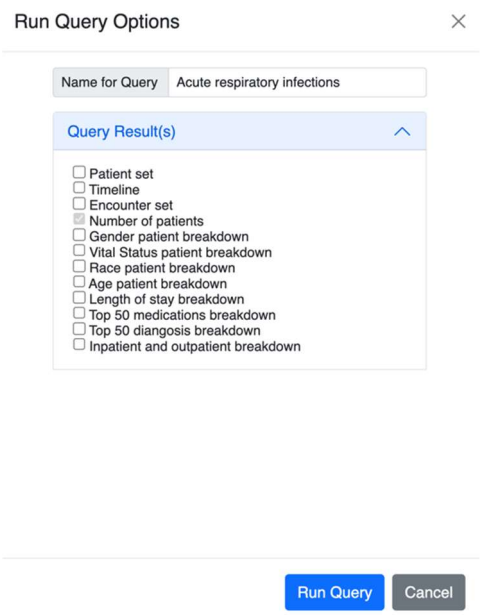
Once the query criterion has been defined, the final steps are to click on the **Find Patient button**, select the result type(s), and click on the 'Run Query' button to run the query.

Note: Number of patients is always selected.

Once you have defined the search criteria, click on the **'Find Patients'** button located on the toolbar at the bottom of the Find Patients panel. A new 'Run Query Options' window will open.

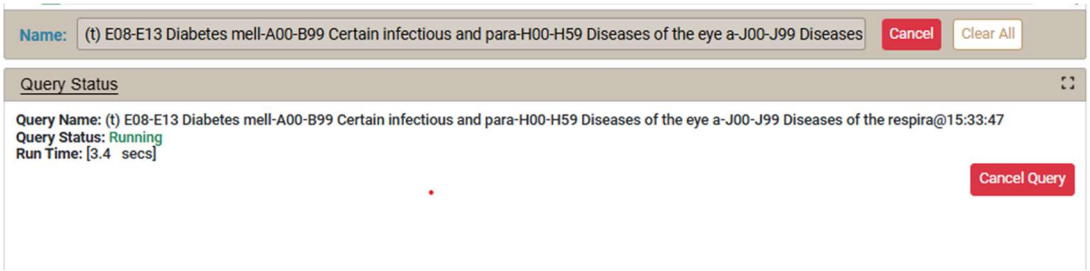
- A name for the query will default at the 'Name for query' field. Either change the name of the query or accept the default.
- In the query result type section, click on the checkboxes for those result types you want to include when the query is run.
  Note: Number of patients is always selected.
- Click on the 'Run Query' button.
- The Run Query Options window will close and the querying process will begin.

Once you begin the process of running the query the Query Status view will display "Running Query", the name of the query, and the time that has elapsed.



You can also **cancel a query** after selecting run Query:

- You will see a **Cancel** button where the "**Find Patients**" button was previously available, and in the query status window:



- If you cancel a query, you will no longer receive results for that query, and it will be deleted from your previous queries list.

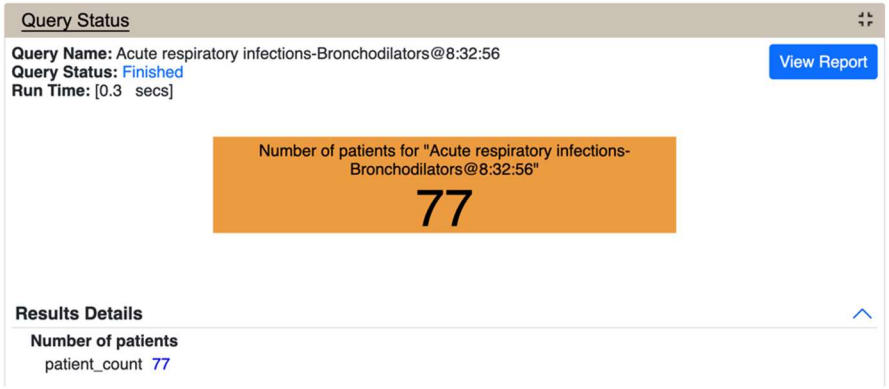
- To reset the **Cancel** button, you can select the "**Clear All**" button, or just continue editing your query and the **Find Patients** button with appear

3.3.2 Query Result Options

There are three categories of query type: counts, sets, and breakdowns.
Note: The Timeline type is not used in the Web Client. If selected it will work the same as patient set.

1) Number of Patients

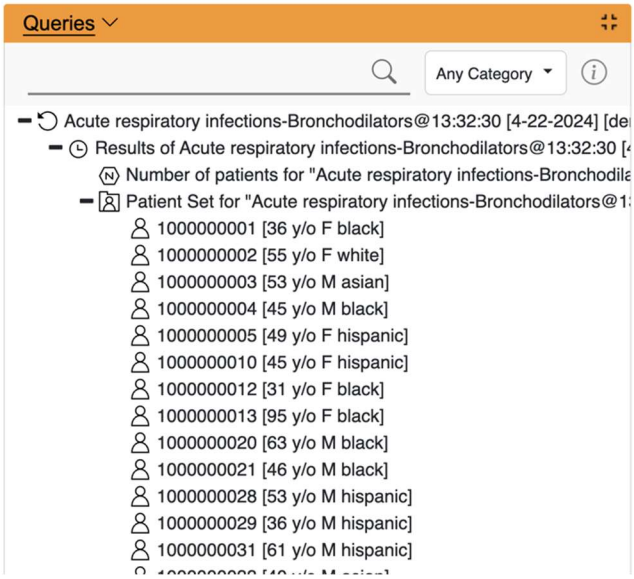
This option will return a total count for those patients who meet the defined criteria. This is the most common and fastest query type. It is always selected.



2) Patient/Encounter Set

These options return a set of patients or encounters that meet the defined criteria. The set is visible in the Queries panel and can be used in future queries, the workspace, and by plugins.

Only information on the query's completion is shown in the Query Status panel.



3) Patient Breakdowns

The following query types will return patient counts stratified by the selected breakdown category (e.g., Gender or Age).

Breakdown type

- Gender patient breakdown
- Vital Status patient breakdown
- Race patient breakdown
- Age patient breakdown
- Length of stay breakdown
- Top 20 medications breakdown
- Top 20 diagnoses breakdown
- Inpatient and Outpatient breakdown
- Enrollment table breakdown

Additional breakdown options may also be available based on your local i2b2 node.

3.3.3. Query Status

When a query is running, the query status panel will show its status.

Running	The query is currently running on the server and the client is waiting for results.
Finished	The query has completed. Results will be shown below this message.

Queued	The query took longer than the configured timeout. (Defaults to 180 seconds.) It is still running in the background and the results will appear in Previous Queries when it completes.
Error	An error occurred running the query. More information might be available in the XML Message Log. NOTE: When an error occurs in i2b2, a brief pop-up will display, with a link to view more information via the XML message log. This information may be useful to your administrator if you need troubleshooting support.

4. Navigate Terms

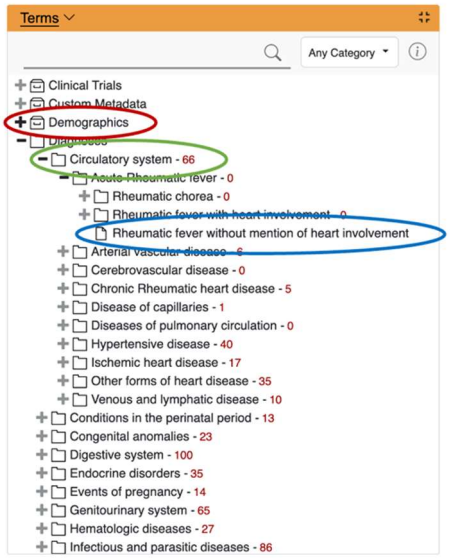
Terms, (also called concepts), make up vocabularies (or ontologies) in i2b2 and are the building blocks of i2b2 queries. The Terms Panel is used to find terms for constructing queries. It has two modes, **Term view** and the **Search**.

The **Terms** tab is used to drill into a hierarchy of terms and find terms of interest to query.
The **Search input** is used to search for terms or codes to be used in queries.

4.1 Navigate Terms Tab

The **Navigate Terms** tab is used to find ontology items to be used in a query. This panel displays the i2b2 query terms or concepts. Terms are grouped with similar items and displayed in a hierarchical tree structure that can be expanded to view all items in the category.

Folders are expanded by clicking on the '+' sign. The '+' changes to a '-' and the next level of detail is displayed. The hierarchical structure consists of containers, folders and leaves.



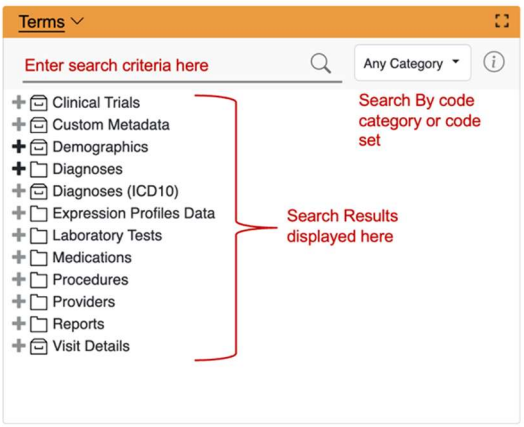
Containers are the highest level of the hierarchy. They can be expanded by clicking on the *plus sign* (+) or collapsed by clicking on the *minus sign* (-). Containers cannot be dragged to other panels.

Folders Like containers, folders can be expanded using the + and collapsed using the -. Unlike containers, folders can be dragged to other panels. When a folder is dragged into a query group, the resulting query will return results for everything in the folder.

Leaves are the lowest level of the hierarchy. They cannot be expanded or collapsed. They can be dragged into query groups as query criteria.

4.2 Find Mode

The **Find** mode provides a way to search for a query items. Query terms can be located using the Find input field.



4.2.1 Search by Name

Search by Name mode is used to find all query items containing particular text.

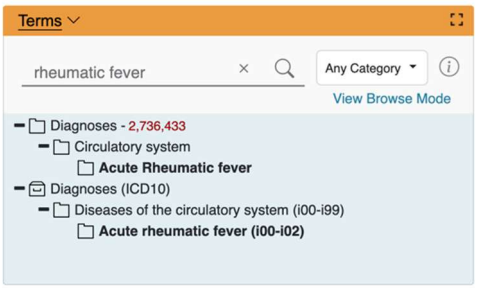
Enter search string. All results returned will be those terms whose name or code CONTAINS the text entered in the search input field.

Choose a category from the drop-down menu or leave it as the default of 'Any Category', which will search all categories.

Click Enter on the keyboard or click the search icon to run the search.

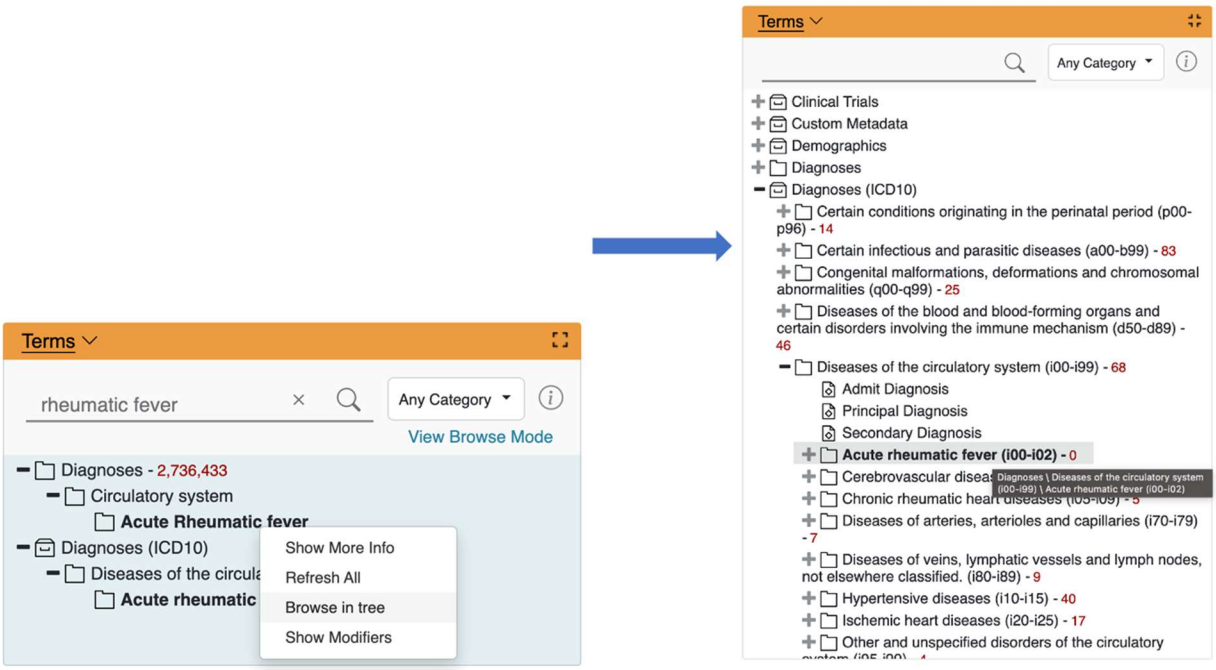
Select any terms returned by the search and drag them into a query group to use as query criteria.

[Example] Find all terms containing the text 'rheumatic fever'.



Note: New in v1.7.12

The Find Terms view has changed. The same query now shows many fewer results and it shows their placement in the hierarchy. Search results are highlighted in bold emphasis, and parent results can also be dragged into other panels. Results which are hierarchically within another result are omitted to save space (e.g., many of the results in the graphic above are within the Acute Rheumatic fever folder).
Right click on a term to view a menu. Click “Browse in tree” to restore the navigate mode. Click “View Browse Mode” to return to the tree and maintain the search results.



4.2.2 The Search by Codes

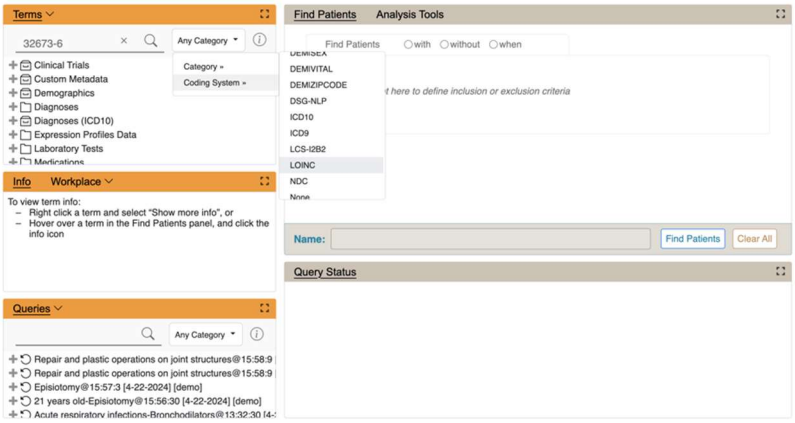
Search by code tab is used to find coded variables.

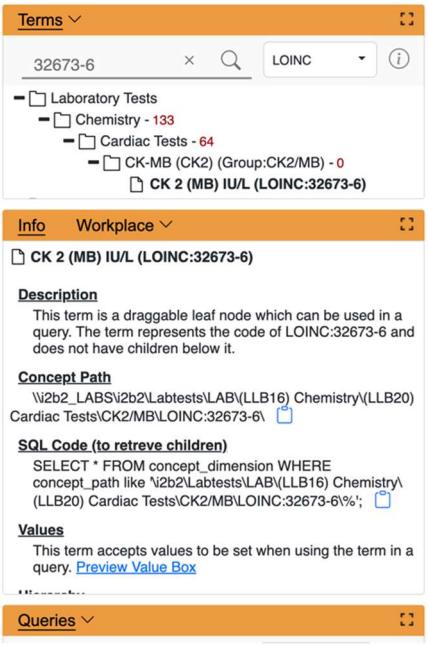
To use this option, a code must be entered and a coding system selected.

[Example] Find LOINC code 32673-6

- Enter the code in the search input field

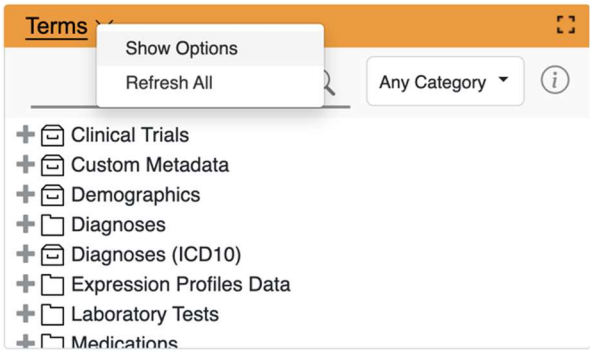
- 2. Click on the **drop-down arrow,** select **Coding System,** and select **LOINC** from the drop down list.
- Click Enter on the keyboard or click the search icon to run the search
- The results will be displayed in the results section.

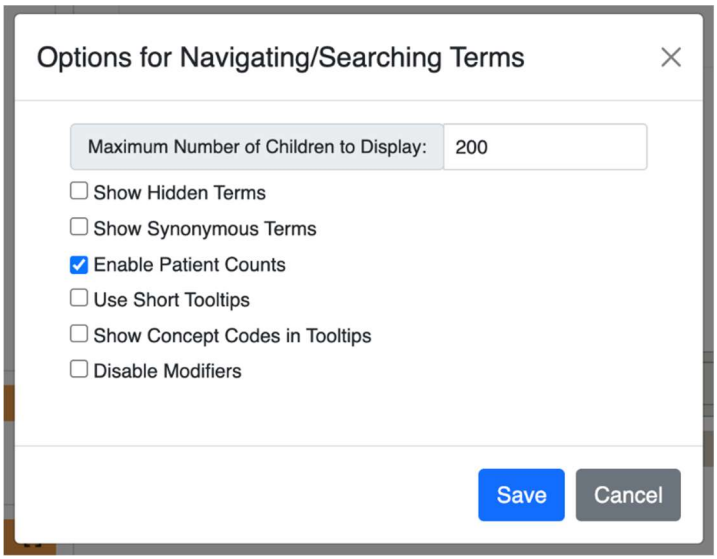




4.2.3 Options for Finding Terms

Right clicking on Terms opens an the Options for Navigating/Searching Terms that provides additional options for finding terms.





Maximum Number of Children to Display
The default value for **Maximum number of children to display** for a search of terms or codes is usually 200. However, this number can be changed to retrieve either more or fewer results. When a search is run, once the maximum number of terms is reached a message will appear to say that the query has reached the maximum number of terms and suggest searching again with a more specific query. Running a search with a more specific query will narrow results as the selection criteria will not be as broadly defined.

Show Hidden Terms
In the metadata table, an attribute is set to determine whether a term is active, inactive or hidden. If an item is marked as hidden it will not appear in the list of terms.
Selecting **Show Hidden Terms** will display those items marked to be hidden. For easy identification, hidden terms will be **red** when displayed in the results list.

Show Synonymous Terms
Some terms may be flagged in the metadata table as a synonym of another term.
Selecting **Show Synonymous Terms** will display both the original term and the synonym in the *Terms view*. For easy identification, synonymous terms will be **blue** when displayed in the results list.

Enable Patient Counts
The **Enable patient counts** option will display the total number of patients that have a fact entered for that item.

Use Short Tooltips
In the i2b2 webclient, a tooltip displays when the cursor hovers over an item. By default, the tooltip that displays contains the entire path name and the tooltip that is specific to that item. Enabling the **Use short tooltips** option will only display the tooltip information; the path will not be included.
Show Concept Codes in Tooltips
In addition to showing the tooltip, this option will also display the concept code associated with the item.

Disable Modifiers
The ability to search for modifiers will not be available if the **Disable modifiers** option is checked off.

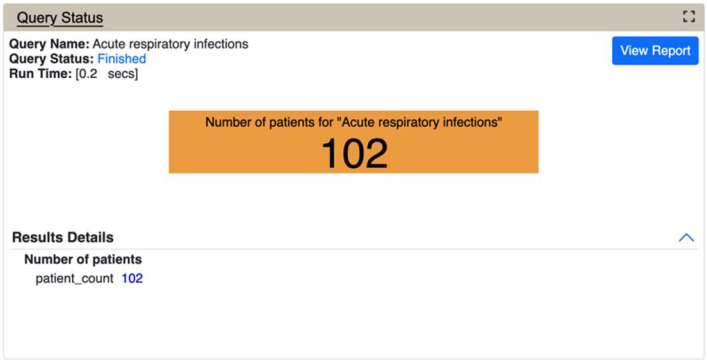
5. Query Status

The **Query Status** panel contains information regarding the state of a query.

While a query is running, the name of the query and how long it has been running will appear.

Additional information that shows up in this tab depends on which options are selected in the 'Run Query Options' popup box when the query is run.

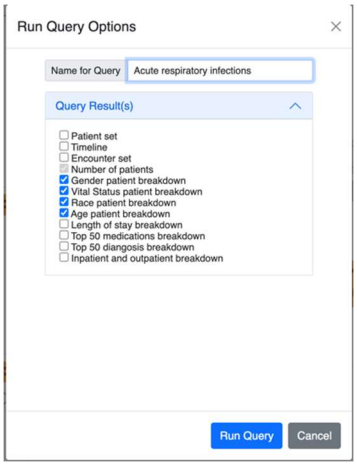
Once the query has finished, the number of patients meeting the search criteria, and the time it took to run the query, will appear.



5.1 Graph Results

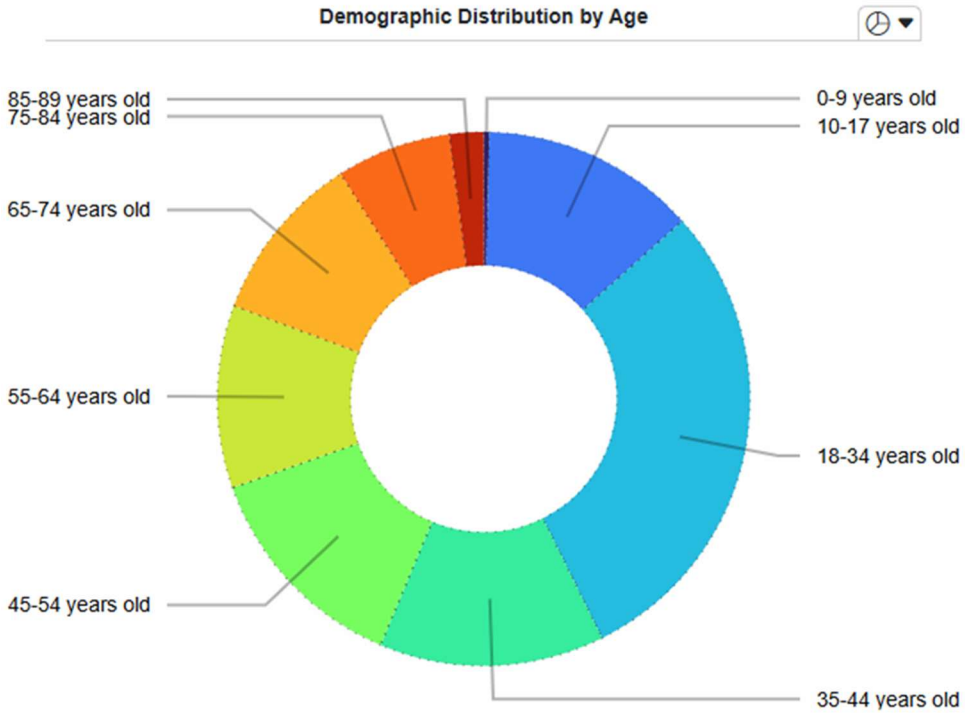
If any of the breakdown categories (Age, Race, Gender, Vital Status, Length of Stay, Top 20 diagnoses, Top 20 medications, Inpatient and Outpatient) are selected in 'Run Query Options', a bar graph will display for each category selected. Additional breakdown options may also be available to select, depending on local administrator decisions. These include Enrollment table, Diagnosis Summary, Pathogen Timeline, and a Zip code map.

This is the Run Query Options showing default breakdown types:



In addition to the default bar charts, each breakdown also includes options to view results in table format, or to down load results as a CSV file by clicking this icon 

The Age breakdown also includes the option to view patient distribution as a pie chart.



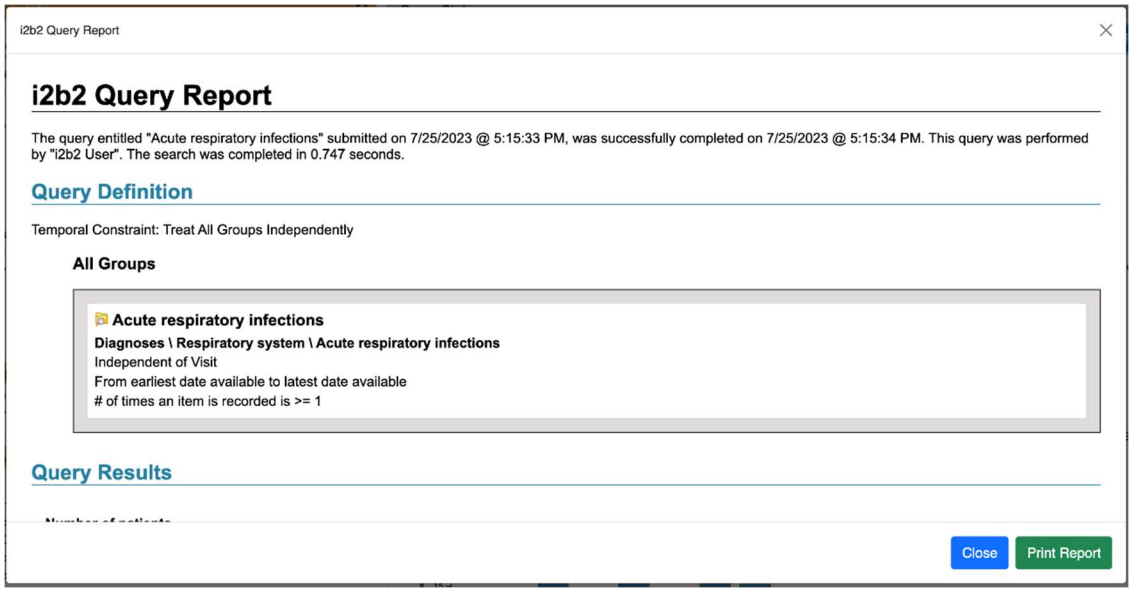
The Enrollment table breakdown returns a formatted table showing demographics details:

NIH Enrollment Table

Racial Categories	Ethnic Categories									Total
	Not Hispanic or Latino			Hispanic or Latino			Unknown / Not Reported Ethnicity			
	Female	Male	Unknown / Not Reported	Female	Male	Unknown / Not Reported	Female	Male	Unknown / Not Reported	
American Indian/Alaska Native	0	0	0	0	0	0	0	0	0	0
Asian	2,440	2,575	0	270	280	0	145	165	0	5,875
Native Hawaiian or Other Pacific Islander	0	0	0	0	0	0	0	0	0	0
Black or African American	2,915	3,170	0	370	380	0	195	185	0	7,215
White	32,010	33,475	0	3,830	3,830	0	1,865	1,920	0	76,930
More than One Race	0	0	0	0	0	0	0	0	0	0
Unknown or Not Reported	0	0	0	0	0	0	0	0	0	0
Total	37,365	39,220	0	4,470	4,490	0	2,205	2,270	0	90,020

5.2 Query Report

The 'Query Report' button displays a textual representation of the query. It can be printed by clicking on the 'View Report' button in the upper right hand corner.



6. Previous Queries

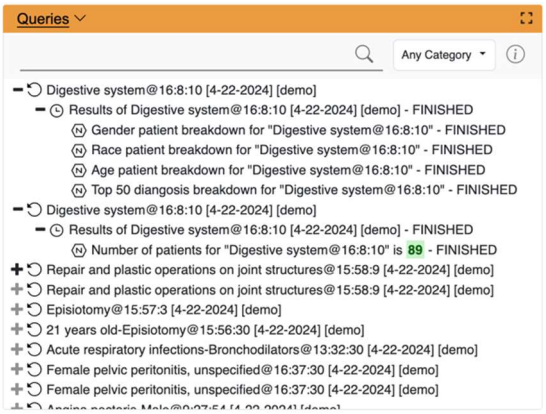
View and search queries run by the user.

The 'Queries' panel has 2 views. The default mode lists all queries run by the user, and the search mode allows users to search for their previously run queries.

6.1 Queries Tab

The 'Previous Queries' tab displays queries run by a user, with the most recent ones listed first. Results associated with the query can also be viewed in this tab. Both a *standard i2b2 query* (↻) and a *Temporal query (↻)* will appear in the 'Queries.'

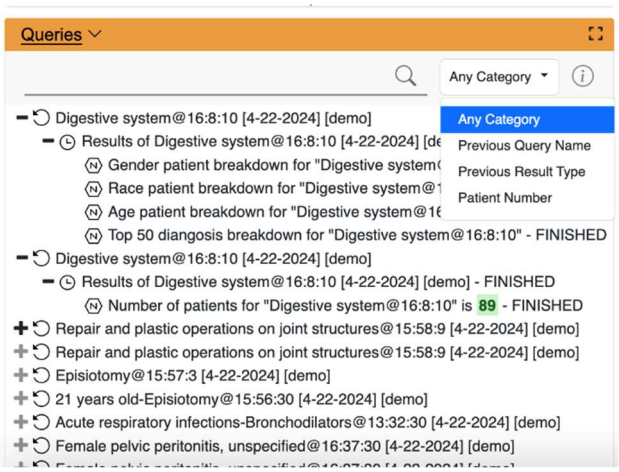
Please see 3. 'Query Tool' for query types.



6.2 Query Search Mode

The **Find** mode provides a way to search for a query or query result type. Query terms can be located using the Find input field and will find all query items containing particular text.

- Enter search string. All results returned will be those terms whose name or code CONTAINS the text entered in the search input field.
- Choose a result type from the drop-down menu or leave it as the default of ‘Any Category’, which will search all categories. Other categories are: 'Previous Query Name', 'Previous Result Type', 'Patient Number'.
- Click Enter on the keyboard or click the search icon to run the search
- Select any terms returned by the search and drag them into a query group to use as query criteria.



6.3 Layout of a Previous Query Display

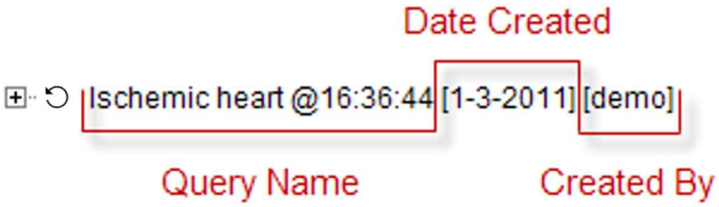
A **previous query** ( ) is created when a query is run from the 'Query Tool'. These previous queries can be used to run new queries or to easily populate other panels.

The query in the 'Previous Queries' panel is comprised of multiple hierarchical levels that can be seen by expanding each level of the tree. These levels are outlined below.

6.3.1 Previous Query Name

The name of the previous query is the top level of the hierarchal tree and is comprised of these three components.

1. **Query Name** - the name given at the time the query was created. The default name contains an abbreviated description and the time the query was run.
2. **Date** - the date the query was created.
3. **User Id** - the user who created (ran) the query.



6.3.2 Results Folder

The **Results folder** ( ) contains the results of the query. To see the query results click on the *plus sign* ( ) located next to the result name.

Results

The results associated with a **previous query** are determined by the **query result type(s)** that are selected when the query is run in the 'Query Tool'.

Patient Set

The **Patient set** ( ) appears if *Patient set* or *Timeline* was checked at the time the query was run. The set contains all the patients who met the defined search criteria.

Encounter Set

The **Encounter Set** ( ) appears if *Encounter set* was checked at the time the query was run. The set contains all the patients whose encounters met the defined search criteria.

Number of Patients

The **Number of Patients** ( ) appears if *Number of Patients* was checked at the time the query was run. The results are a total count for those patients who met the defined criteria.

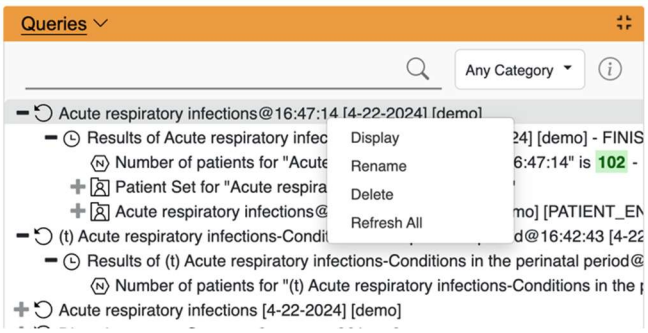
Breakdown

The **breakdown** ( ) appears if *Gender / Vital Status / Race / Age patient breakdown* was checked at the time the query was run. The results are a breakdown by gender / vital status / race /age for those patients who met the defined criteria.

6.4 Navigation

6.4.1 Menu

Using the **mouse right click** on the 'Queries' panel, users can open the **Queries Menu** . 'Display,' 'Rename,' 'Delete' options act on the selected, or mouse hovered previous query. When the menu is called from a blank space, those menu options are applied to the previous target query.



Display

Users can see a previous query information by selecting **Display** from the *popup menu*. It loads its query name, the query design, and the results in the 'Find Patients' panel.

Rename a Previous Query

Users can rename a previous query from the list by selecting **Rename** from the *popup menu.*

Note: When dragging a previous query to another view the new name will appear when it is dropped

Delete / Remove a Previous Query

Users can rename a previous query from the list by selecting **Delete** from the *pop-up menu.*

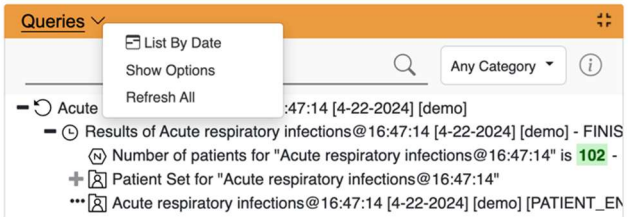
WARNING: Once you click on Delete, the previous query will be removed from the view and there is no way to restore it. Therefore, you need to make sure you want to remove it from the list.

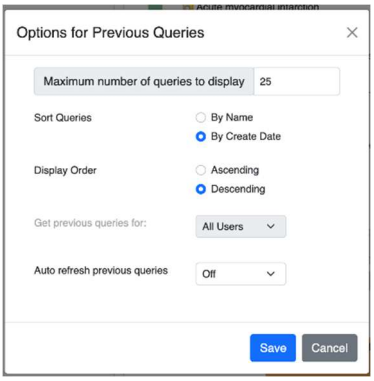
Refresh the List

Users can refresh the list of previous queries from the list by selecting **Refresh All** from the *pop-up menu.*

6.4.2 Options

Right click on the 'Queries' label to open an **Options** window. Users can define how many previous queries to display, the order in which they will appear in the list, and auto refresh setting.





Maximum to Display

The **Maximum number of queries to display** defines how many previous queries will be visible in the **'Queries' panel.** Once the maximum number is reached the oldest query will no longer appear in the view.

TIP: Recommendation: Use the 'Workplace' panel to save those previous queries that will be used often. In addition to being more convenient it will also prevent you from loosing a common query if the maximum number to display has been reached.

Sort Queries by Name

Selecting to sort **By Query Name** will sort the queries in the **'Queries'** alphabetically by the name of the query. Once you select to sort by name, you need to define whether it will be in ascending or descending order.

Ascending: queries are displayed in alphabetical order with the *beginning* of the *alphabet* at the *beginning* of the list. (A to Z)

Descending: queries are displayed in alphabetical order with the *beginning* of the *alphabet* at the *end* of the list. (Z to A)

Sort by Create Date

Selecting to sort **By Create Date** will sort the queries in the **'Queries'** by the date and time the query was created. Once you select to sort by the creation date, you need to define whether it will be in ascending or descending order.

Ascending: displays the *oldest* query *first*.

Descending: displays the *newest* query *first*.

NOTE: Renaming a query will not affect the sort order as the date and time is stored with the previous query.

Auto Refresh

Users can turn off the auto refresh, or select the auto refresh frequency from the combo box.
NOTE: If the auto refresh option is turned off, users need to use the refresh button ( ) to see the updated previous queries list.

6.5 Using a Previous Query

6.5.1 Draggable Items

Different parts of the previous query can be dragged and dropped (copied) from the **'Queries' panel** to other views in the i2b2 Web Client.

Previous Query

Associated with each **previous query** ( ) are the items used to run the query, any constraints that were defined, and the results. A previous query can be added to other views by dragging the previous query name from **'Queries' panel** to one of the following views.

- **'Find Patients' panel by** drop in the *panel (as a concept)* or *Name section (to reload the query)*.
- **'Workplace' panel by** drop in a *user* or *shared folder.*

Patient Set

A specific set of patients can be added to other views by dragging the **Patient set** ( ) from **'Queries'** to one of the following views.

- **'Find Patients' panel by** drop in the panel.
- **'Workplace' panel by** drop in a *user* or *shared folder.*

Encounter Set

A specific set of encounters (visit list) can be added to other views by dragging the **Encounter Set** ( ) from **'Queries'** to one of the following views.

- **'Find Patients' panel by** drop in the panel.
- **'Workplace' panel** by drop in a *user* or *shared folder.*

Add to 'Find Patients'

The 'Find Patients' is designed to simplify the process of retrieving information from the database associated to the i2b2 Web Client.

Within the **'Queries' panel** are several items that can be used in the 'Find Patients' to run a query. The following sections explain how to add the previous query, patient set and encounter set to the 'Find Patients'.

Add Previous Query to 'Find Patients'

Within the 'Find Patients', a previous query can be added to one of the following two locations.

Name field	The items and constraints from the original query will be used to create a new query. This information can be edited to make a new query or can be used as is to run the query again.
Panel (Group)	Used within a new query (query-in-query). The information associated with the previous query can not be edited. Add additional search criteria (items) to be used in the new query.

Add Previous Query to the Name field (New Query)

1. Highlight the **previous query** ( ) by clicking on the name of the query. While holding the *left mouse button* down, drag the item to the 'Query Tool'.
2. Drop the item into the **Name field**.
3. The item(s) associated with the previous query will display in the appropriate group(s), the name of the query will appear at **Query Name**, and any constraints that were defined when the original query was run will now default with the new query.

NOTE: When you run the query it will receive a new name. This is to distinguish the first previous query from the second.

Add Previous Query to the Panel (Query-in-Query)

1. Highlight the **previous query** ( ) by clicking on the name of the query.
2. While holding the *left mouse button* down, drag the item to the 'Query Tool'.
3. Drop the item into the **Find Patients panel**.

Add Patient Set to the 'Query Tool'

Click on the plus sign ( ) next to the name of the previous query that contains the patient set.

Click on the plus sign ( ) next to the results folder.

Highlight the **Patient set** ( ) by clicking on its name.
While holding the *left mouse button* down, drag the item over to the 'Query Tool'

Drop the item into the **Find Patients panel**.

Add Encounter Set to the 'Query Tool'

1. Click on the plus sign ( ) next to the name of the previous query that contains the encounter set.
2. Click on the plus sign ( ) next to the results folder.
3. Highlight the **Encounter set** ( ) by clicking on its name.
While holding the *left mouse button* down, drag the item over to the 'Query Tool'
4. Drop the item into the **Find Patients panel**.

Add to 'Workplace' panel

Information in the workplace is related to the most common concepts and queries that an individual uses and in essence becomes their personal workplace.

Add Previous Query to 'Workplace' Panel

1. Highlight the **previous query** ( ) by clicking on the name of the query.
2. While holding the *left mouse button* down, drag the previous query name to the **'Workplace' panel** .
3. Drop the previous query into either your workplace folder or the shared folder.
4. The previous query will now appear in the workplace with the same name.

Add Patient Set to 'Workplace' panel

1. Click on the plus sign ( ) next to the name of the previous query that contains the patient set.
2. Click on the plus sign ( ) next to the results folder.
3. Highlight the **Patient set** ( ) by clicking on its name.
4. While holding the *left mouse button* down, drag the **Patient set** to the **'Workplace' panel** .
5. Drop the Patient set into either your workplace folder or the shared folder.
6. The Patient set will now appear in the workplace.

Add Encounter Set to 'Workplace' panel

1. Click on the plus sign ( ) next to the name of the previous query that contains the encounter set.
2. Click on the plus sign ( ) next to the results folder.
3. Highlight the **Encounter Set** ( ) by clicking on its name.

4. While holding the *left mouse button* down, drag the **Encounter set** to the **'Workplace' panel.**
5. Drop the encounter set into either your workplace folder or the shared folder.
6. The encounter set will now appear in the workplace.

7. Workplace

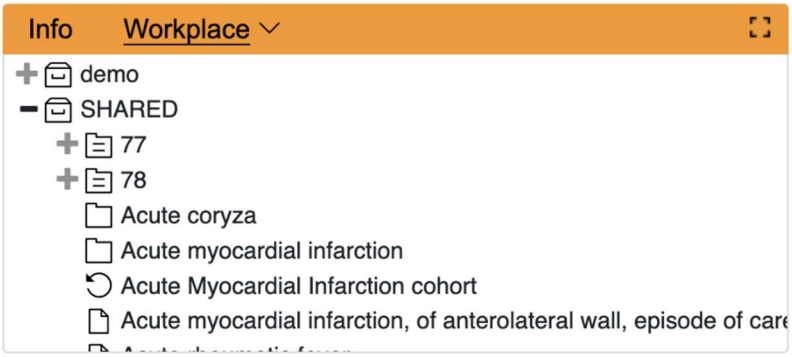
A users' personal workspace, for storing favorite concepts and queries.
The main objectives of the 'Workplace' are:

- Save and organize user specific items.
- Share information with other project users.
- Project managers can view the workplace for individual team members.

The items stored in the 'Workplace' panel can be used in many of the i2b2 panels and plug-ins, such as the 'Find Patients' panel.

7.1 Layout of the 'Workplace' panel

The 'Workplace' panel is hierarchical display of items (concepts, queries) added by the user. There are three main branches or components of the tree that displays.



7.1.1 Containers

Containers are the highest level folders () that are created automatically.
The **User container** is created with the user's name and is used to store items added by the user. The **SHARED container** is a place to share concepts and queries with other users. Containers cannot be dragged into 'Find Patients' groups as query criteria.

7.1.2 Folders

A **folder** () contains other folders and / or items added by the user. It can be expanded and collapsed by clicking on the *plus sign* () or *negative sign* () next to it.

7.1.3 Leaves (Items)

Leaves (items) are the lowest level of the hierarchy. They cannot be expanded further. Some examples of items are listed below.

- Concepts ( )
- Group of concepts (ontology folder) ( )
- Modifiers ( )
- Group of modifiers (modifier folder) ( )
- Patient set ( )
- Encounter set ( )
- Previous query ( )

7.2 Adding a folder and items

7.2.1 Folders and Items Draggable to Workplace

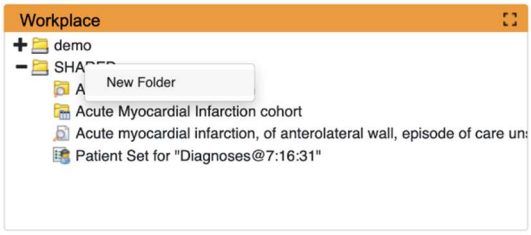
Folders and Items can be dragged and dropped (copied) into the 'Workplace' panel from other panels in the i2b2 Web Client.

A Concept Folder( ) and all its concepts (children), a Modifier Folder ( ), a concept ( ), a modifier ( ) can be dragged to the 'Workplace' from the 'Navigate/Find Terms' panel.

A Patient set ( ) , An Encounter set ( ) ,A previous query ( ) can be added to the 'Workplace' by dragging from the 'Previous Queries' panel.

7.2.2 Adding a Folder

1. Using the *right mouse button*, click on your user folder in the 'Workplace'.
2. Select **New Folder and enter a name. Click Ok**
3. The new folder will appear in the 'Workplace' panel.



7.2.3 Adding Items

7.2.3.1 Adding Concept, Concept Folder, Modifier, and Modifier Folder

Adding from ' Terms' tab
1. In the Find Terms in 'Navigate/Find Terms' component, search for the item(s) to add.
2. Highlight the concept folder() or other type (concept, modifier, modifier folder) of item by clicking on its name.
3. While holding the *left mouse button* down, drag the item over to the 'Workplace' component.
4. Drop the item into either your workplace folder or the shared folder.
5. The item will now display in the 'Workplace' panel with the same name.

7.2.3.2 Adding Previous Query, Patient Set, and Encounter Set

'Queries' Panel
The **'Queries' panel** displays the queries that were run by the user. Each previous query contains a set of results; within these results are the result options that were selected when the query was originally run. The result options include Patient set, Encounter set, Number of patients as well as various other patient breakdowns

Adding Previous Query from 'Queries' Panel

1. Highlight the **previous query** () by clicking on the name of the query.
2. While holding the *left mouse button* down, drag the item to the **'Workplace' panel.**
3. Drop the previous query into either your workplace folder or the shared folder.
4. The previous query will now appear in the workplace with the same name.

Adding Patient Set or Encounter Set from 'Queries' Panel
1. Click on the plus sign ( ) next to the name of the previous query that contains the patient set.
2. Click on the plus sign ( ) next to the results folder.
3. Highlight the **Patient set** () or the **Encounter set** () by clicking on its name.
4. While holding the *left mouse button* down, drag the **Patient Set** or the **Encounter set** to the **'Workplace' panel** .
5. Drop the patient or encounter set into either your workplace folder or the shared folder.
6. The patient set will now appear in the workplace.

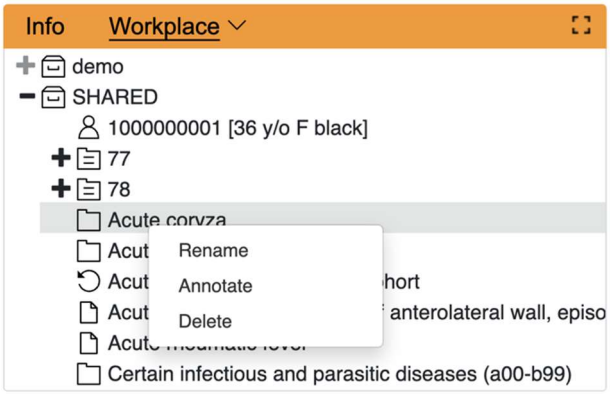
7.3 Navigation

7.3.1. Expand / Collapse a Folder

Users can expand or collapse a folder by clicking on the plus sign (⊞) or negative sign (⊟) next to the folder icon.

Expand (Open) a Folder
1. Click on the **plus sign** (⊞) next to the folder in the *'Workplace' panel.*
2. The folder will open and all the items in the folder will display.

Collapse (Close) a Folder
1. Click on the **negative sign** (⊟) next to the folder in the *'Workplace' panel.*
2. The folder will close and all the items in the folder will display.



7.3.2 Rename a Folder or an Item

Users can easily **rename** an existing folder or an item.
1. Using the *right mouse button*, click on the folder or item you want to rename. Select Rename.
2. In the text box change the current name to the new name. Click Ok
3. The folder will appear in the 'Workplace' panel with the new name.

7.3.3 Annotate a Folder or item

Users can change the default **annotation** for any of their folders or items in the 'Workplace' panel.

1. Using the *right mouse button*, click on the folder or item you want to annotate. Select *Annotate.*
2. In the text box enter the text you want to appear when the tooltip is displayed.
6. Click on the **OK button** .

7. Using the *mouse*, hover over the folder or item you just annotated.
8. The text you entered will display as a tool tip.

7.3.4 Delete a Folder or item

Users can remove a folder from the 'Workplace' panel.

> WARNING:
> All items in the folder will be deleted when the folder is removed. It is recommended that you move those items you want to keep to another folder.

1. Using the *right mouse button*, click on the folder or item you want to delete. Select ***Delete***.
2. Click on the **OK button to confirm.**
3. The folder and all of its contents will no longer appear in the 'Workplace' panel.

7.4 Using Items in 'Workplace' Panel

7.4.1 Items Draggable from Workplace

Items can be dragged and dropped (copied) from the 'Workplace' panel to other panels in the i2b2 Web client.

- Ontology Folder () and all its concepts (children)
- Modifier Folder () and all its modifiers (children)
- Concept ()
- Modifier ()
- Previous Query ()
- Patient Set ()
- Encounter Set ()

8. Data Requests

The **Create Data Table for Export** plugin enables the creation and request of data-obfuscated limited data sets (LDS) for researchers to extract patient-level data from i2b2 in a wide table format for analysis in tools like Excel, R, Python, or statistical packages.
With this plugin, a researcher can:

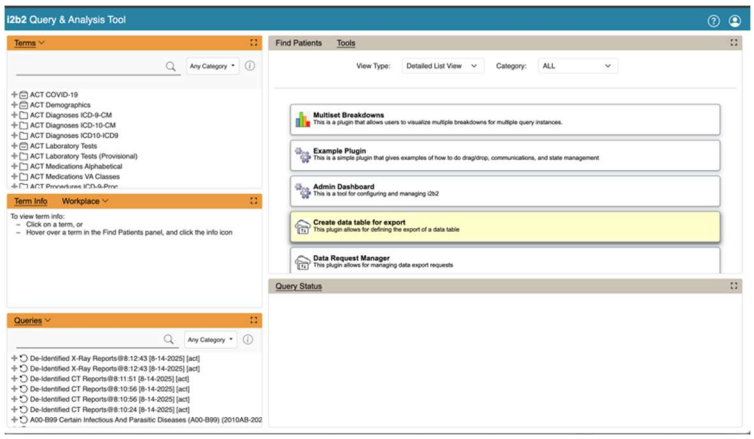
- Define custom table layouts by selecting variables and aggregation methods.
- Save table definitions for reuse in a shared project folder or personal folder.

After creating a table definition, run a patient query and choose the desired table. Once you submit the request, you can track its progress in the **Data Request Manager** plugin.

8.1 Accessing Data Table for Export Plugin

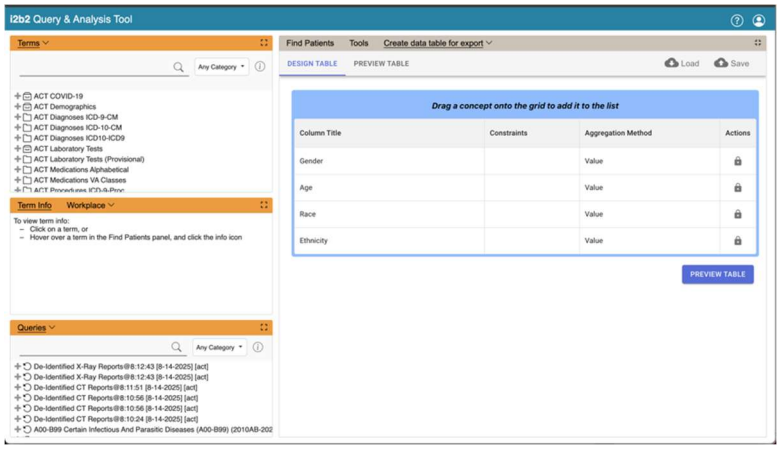
1. Click Tools
2. Select Create data table for export plugin

Note: Each institution will specify their own permission model



8.2 Creating a Table Definition

A default table definition will load. See image below.



1. **Select Columns.** Each row represents a column in the output file. To add additional columns:
    - Use the concept tree in the **Terms panel** to browse or search for columns.
    - Drag and drop the variable into the **Table Definition** panel.
2. **Arrange Column Order**
    - Drag and drop variables to adjust the order in which they appear in the CSV.
3. Define Constraints
    - Define Date Constraints
    - Define custom by values (applicable to some concepts)
4. **Select an Aggregation Type**
    - For each column variable, choose how multiple records for the same patient should be summarized.
    - Available options include:
        - Please note that availability of aggregation options depends on the type of concept it aggregates on.
        - **MIN** – smallest value found
        - **MAX** – largest value found
        - **AVG** – average value
        - **COUNT** – number of records
        - **FIRST** – earliest recorded value
        - **LAST** – most recent recorded value
5. **Rename the Columns**
    - Optional: Edit the default column names for clarity in your CSV output.

Key Concepts

- **Wide Table**: Each row represents a single patient. Each column represents a variable (e.g., lab value, diagnosis flag) with a single aggregated value.
- **Variable**: A concept or data point in i2b2 (e.g., Age, Hemoglobin, ICD-10 code).
- **Aggregation Type**: The method used to summarize data for a patient if multiple records exist (e.g., MIN, MAX, AVG, COUNT).

- **Table Definition**: A saved configuration of selected variables, aggregation types, and column ordering.

8.3.1 Saving a Table Definition to a personal folder

1. **Click Save.** On the modal, select a folder and name the file.

8.3.2 Saving to a Shared Project Folder

1. **Click Save.** On the modal, select the Project folder and name the file. Files in the folder will be shared across users who are members of this project.

8.4 Load an existing Table Definition

1. **Click Load.** On the modal, select a folder and file to load

8.5 Edit an existing Table Definition

1. **Click Load.** On the modal, select a folder and file to load.
2. Directly edit the file.

8.6 Delete a Table Definition

Click Save Or load to open the modal. Click the delete icon to remove a file.

8.7 Generating a Data Export Request

1. Run your patient query in i2b2 (to define which patients will be included).
2. On the Run Query Options, select one of the table definitions.
3. Run Query
4. Navigate back to the plug in Tools tab.
5. Select the Data Request Manager plugin
6. View the status of the request, write comments for the request.