



Release Notes for i2b2 Version 1.7.00 Release Candidate 1

These release notes address issues found and information about the i2b2 version 1.7.00 release candidate 1 (1.7.00-RC1). Unless otherwise specified, these notes apply to the following operating systems:

- Apple Macintosh OS x 10.4/5
- Apple Macintosh OS x 10.6 (Snow Leopard)
- Microsoft Windows XP Professional
- Microsoft Windows Vista Professional
- Microsoft Windows 7
- Microsoft Windows Server 2003

Additional Information

Included in this document are the following sections:

Section	Includes
Installation	Information related to installing the release.
Third Party Software	Software that is utilized by i2b2 but is owned, maintained and licensed by other companies is referred to as "Third Part Software". Any version changes made or needed to be made to the users system will be noted in this section.
New Features	A list of new enhancements will be included in this section. A brief description and a reference to the specification will be provided.
Updates	Any changes that are not considered an enhancement will be included in this section. This may be a fix for a problem found or may be a change to existing code but not related to a problem.
Licensing	i2b2 licensing information
Trademarks	Trademark information

Installation

This release of the 1.7.00 software is a release candidate (RC) and as with all i2b2 Release Candidates it should not be used in a production environment. They are intended to provide the Academic User Group (AUG) an opportunity to have an advanced look at the changes being made to the 1.7.00 version of the i2b2 software.

The release candidate versions of the i2b2 software can only be installed new. They are not eligible for an upgrade from a previous version. The install scripts have been provided as part of 1.7.00-RC1.

Third Party Software

In release 1.7.00-RC1, the **i2b2 Server** has been updated to use the following versions of third party software.

1. Jboss has been upgraded to 7.1.1
2. Apache Ant has been upgraded to 1.8.2
3. Apache Axis2 has been upgraded to 1.6.2

WARNING

Only the i2b2 Server was upgraded to use the above versions of Jboss, Ant, and Axis2. The i2b2 Workbench will continue to use the previous versions. As a result, the source codes for the server and the workbench client have different plug-ins for the commons.

Server	edu.harvard.i2b2.server-common
Client	edu.harvard.i2b2.common

New Features

i2b2 release 1.7.00-RC1 contains many new features, all of which have been outlined below.

Identity Management Cell (IM)

A new cell called the Identity Management (IM) Cell was developed in release 1.7.00. This new cell contains Protected Health Information (PHI), which can be used to identify patients. The IM cell is used to manage this PHI in a manner consistent with the HIPAA privacy rule. The patient data will be available only as a HIPAA defined “Limited Data Set” to most of the hive.

The full functionality of the IM cell will be developed in stages. The initial framework and key services are released as part of the 1.7.00-RC1 release. Some of the key features being release in 1.7.00-RC1 are:

1. New tables to store identifiers from different sites, and patients that are included in a project.
2. Audit Controls are implemented that are in compliance with the HIPAA privacy rules.
3. Services developed to set and validate an AES key for encrypting and decrypting patient MRNs in the IM cell.
4. Unencrypted patient identifiers sent in the PDO can be processed through the IM cell to retrieve all site IDs for the patient and project.

In addition to the above features, the i2b2 Workbench (eclipse client) has two new views that were created to support the new IM cell. These new views, called **Patient Mapping** and **Admin Tool** are further defined in the following two sections called *Patient Mapping View* and *Admin Tool View*.

Patient Mapping View

The **Patient Mapping View** was created to allow Project Managers and Administrators to view all the different Medical Record Numbers (MRN's) for a single patient or a set of patients. In addition to viewing the mappings users can perform the following tasks in this view.

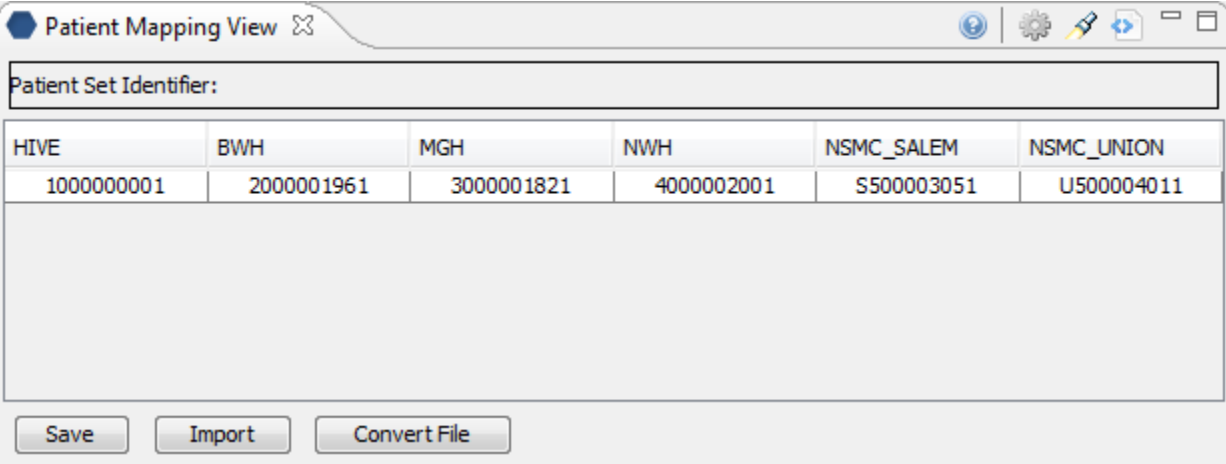
1. Drag a patient to other views like the Query Tool and Workplace. Any one of the patients site MRNs can be used; it doesn't have to be their i2b2 Hive number.
2. **Save** the patient mappings listed in the view to an external file.
3. **Import**; you can use an external file to “import” the mappings into the view.

NOTE:

The “import” in this view does **NOT** import the data into the i2b2 tables. It simply “imports” the data in the file to display in the view.

4. **Convert File** will convert the patient IDs in an external file. In other words:

- If the ids in the file are encrypted you can decrypt them and save in a new file.
- If the ids in the file are not encrypted you can encrypt them and save in a new file.



The screenshot shows a web application window titled "Patient Mapping View". It features a "Patient Set Identifier:" input field at the top. Below this is a table with six columns: HIVE, BWH, MGH, NWH, NSMC_SALEM, and NSMC_UNION. The table contains one row of data with the following values: 1000000001, 2000001961, 3000001821, 4000002001, S500003051, and U500004011. At the bottom of the window are three buttons: "Save", "Import", and "Convert File".

HIVE	BWH	MGH	NWH	NSMC_SALEM	NSMC_UNION
1000000001	2000001961	3000001821	4000002001	S500003051	U500004011

Send PDO requests to the IM cell

In the Options dialog window there is an option to send the PDO request to the IM cell instead of to the CRC cell. The default is to send it to the CRC cell. If you would rather send it to the IM cell you can click on the Options button at the top of the view and click on the checkbox next to Sending PDO requests to IM cell.

IMPORTANT:

If you do choose to send the PDO requests to the IM cell you need to make sure you have set your project key. If this key is not set the IM cell will return an error saying: “Key not

set”.

See the next section, *Admin Tool View* for information on setting the project key in the i2b2 demo project; including the VM image.

Admin Tool View

The **Admin Tool** view was developed in release 1.7.00-RC1 and works in conjunction with the IM Cell. It currently has two main functions.

1. Set and / or validate that the project key is defined in the IM Cell.
 - The project key is used by the IM cell to decrypt the patient id's that are encrypted.
 - The Set Key is used to define the key in the IM cell.
 - The Validate Key is used to verify the key is set.

IMPORTANT:

If you are using the IM cell and your patient identifiers are encrypted then you need to set the Project Key in the IM cell. It is important to note that if you restart your i2b2 server or in the case of the VM image restart the virtual machine you will need to re-enter the project key.

The project key for the i2b2 demo project is: **i2b2demodatakey1**

In the VM image you need to log into the i2b2 Workbench as the i2b2 Admin user.

User ID: i2b2

Password: demouser

2. View the audit information.

- As part of the IM cell an audit table was created to track when a patient in the IM cell was accessed. This new view allows Project Managers or Administrators to run a report to see that audit information. The report can be run for a particular user, patient, or all audit information for the project you are logged into.

The screenshot shows a web application window titled "Admin Tool". It features a header bar with a hexagonal icon and a close button. Below the header, there are two rows of input fields and buttons. The first row contains a "Project id:" dropdown menu set to "Demo", a "Key:" text input field, and two buttons: "Set Key" and "Validate Key". The second row contains "User id:", "Site Name:", and "Patient id:" text input fields, followed by an "Audit" button. Below these input fields is a table with six columns: "Project ID", "User ID", "Patient ID", "Site Name", "Import Time", and "Comments". The table is currently empty and has a vertical scrollbar on the right side.

Project ID	User ID	Patient ID	Site Name	Import Time	Comments

Temporal Query Tool

In release 1.7.00-RC1 we introduce the ability to create and run temporal queries, which are queries based on the timing of an event. The new **Temporal Query Tool** view extends the query functionalities provided by the classic *Query Tool* view.

In the Temporal Query Tool view there are three modes that can be used to run a query; (1) Non-temporal Query, (2) Temporal Query and (3) Get Everyone

MODE 1: Non-Temporal Query

The **non-temporal query** is the “classic” query that can be run in the existing *Query Tool* view. Although the layout of the view has been modified, the functionality of running a classic query still exists. You can define date constraints, value constraints, text constraints, as well as the number of occurrences.

The screenshot displays the 'Temporal Query Tool' window. At the top, the 'Query Name' field is empty, and a dropdown menu is set to 'Specify Non-Temporal Query'. On the left sidebar, under 'Groups Bounded by', a tree view shows 'Observation', 'Encounter', and 'Patient' with 'Patient' selected. Below this, three groups are listed: 'Group 1', 'Group 2', and 'Group 3', each with a checkbox and a checkmark. The 'Date Constraints' section has 'Group-Specific' selected. A button labeled 'No Date Constraints (Click to Change)' is visible. The main area contains three identical query group templates. Each template has a header bar with 'Group 1', 'Patient', 'No Date Constraints', and '>0'. Below each header is a large text area with the prompt 'Drop ontology Terms here'. At the bottom of the main area is a '+ Add Group' button. A 'Submit Query' button is located at the bottom center of the window.

There are some minor differences in terminology or layout that needs to be noted in this release notes.

NOTE:

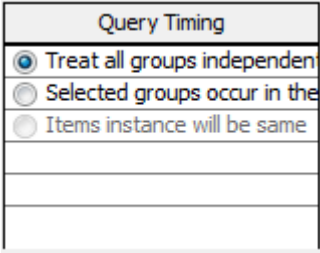
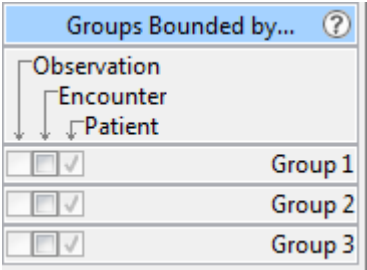
Please see the i2b2 Temporal Query Tool User Guide for detailed information about using

the new Temporal Query Tool view.

Defining the Query Timing:

Query timing is still available to be defined when creating a query. In the existing Query Tool view (“Classic” view) the section in which the Query Timing was defined is called **Query Timing**. In the new Temporal Query Tool view the section to define the query timing is called **Groups Bounded by ...**

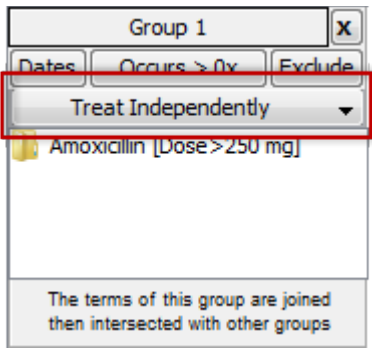
In addition to changing the name of the section, the labels for the different options have also been updated and are now more concise. The following table shows the equivalency between the two views.

Query Tool view (“Classic”)		Temporal Query Tool view (New)
Treat all groups independently	<i>is equivalent to</i>	Patient
Selected groups occur in the same financial encounter	<i>is equivalent to</i>	Encounter
Items instance will be same	<i>is equivalent to</i>	Observation
		

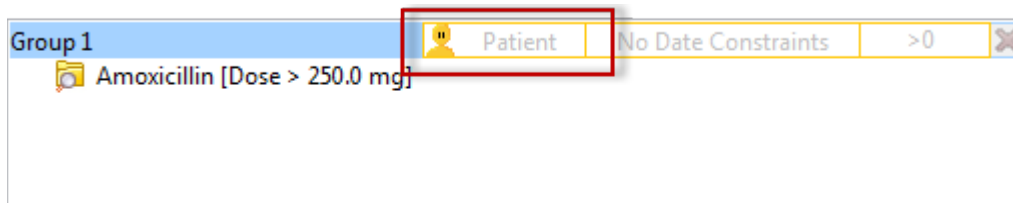
Defining the Panel Timing:

Non-temporal queries created in the new Temporal Query view can still have panel timing constraints defined. The functionality of this type of constraint remains the same but the way in which the user selects it has been slightly modified.




In the existing **Query Tool view** (classic) the panel timing was a drop-down selection box located at the top of the panel.



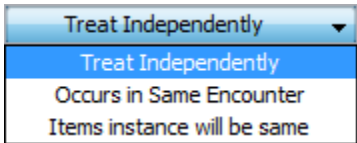
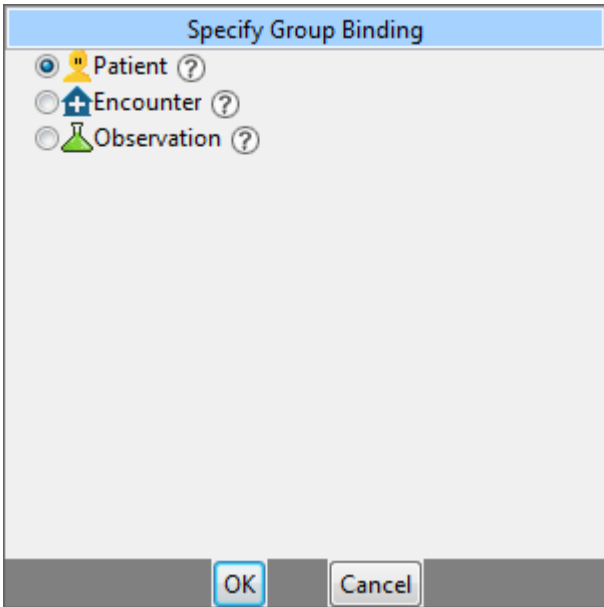
In the **Temporal Query Tool view** (new) the selection is available in the top of the panel. When you click on the box a new window will open allowing you to select the appropriate option.



The icon and label that display in this box will change based on what is selected (see below).

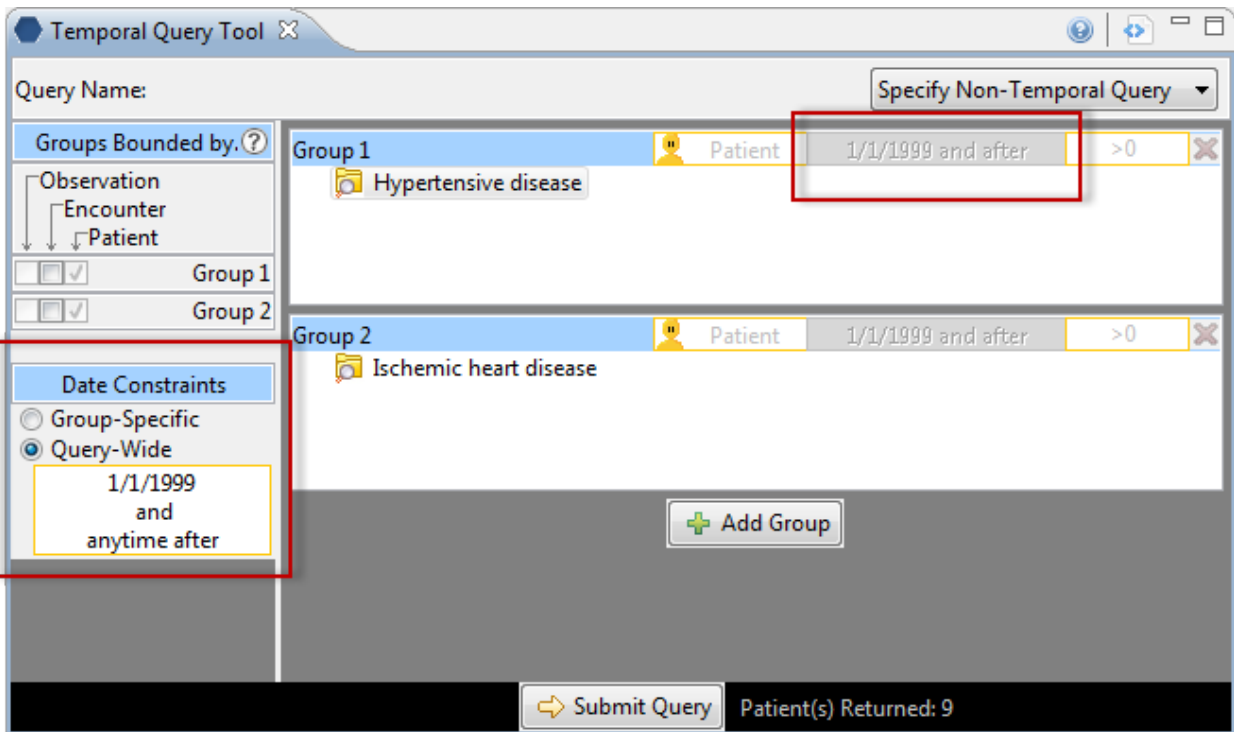
Patient	 Patient
Encounter	 Encounter
Observation	 Observation

In addition to changing how to select the panel timing, the labels for the different options have also been updated and are now more concise. These changes are similar to the query timing are shown in the following table.

Query Tool view ("Classic")		Temporal Query Tool view (New)
Treat independently	<i>is equivalent to</i>	Patient
Occurs in Same Encounter	<i>is equivalent to</i>	Encounter
Items instance will be same	<i>is equivalent to</i>	Observation
		

Defining the Date Constraints:

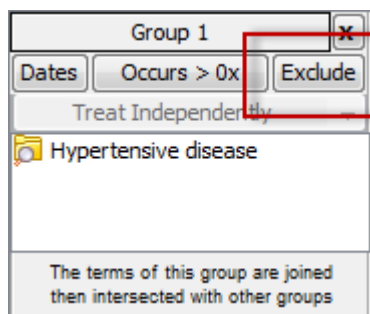
In the classic Query Tool view you can only define date constraints on the group / panel level. In the new Temporal Query Tool view you can now define a data constraint on either the query level or the group level. If you define it on the query level it will default the same date constraint for all the groups and the date constraint on the panel level will not be available for selection.



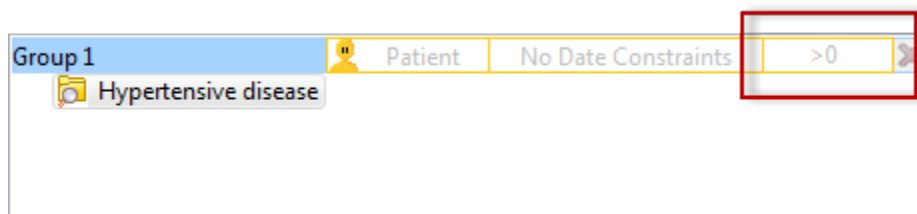
Exclude Panel:

The ability to exclude all items in a group does exist in the new Temporal Query Tool view. However, the method in which it is defined differs between the classic Query Tool view and the Temporal Query Tool view.

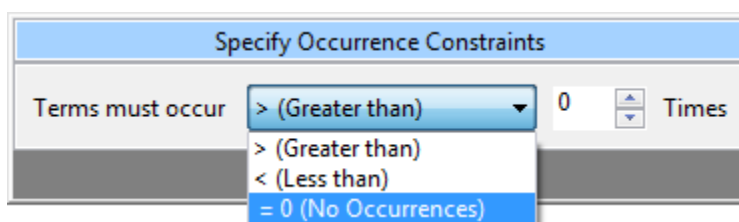
In the existing **Query Tool view ("Classic")** the exclusion constraint was defined by clicking on the button labeled *Exclude*.



In the **Temporal Query Tool view (New)** the exclusion constraint was rolled into the window for defining the Occurrence constraint.



The *Specify Occurrence Constraints* window will open when you click on the box that displays the occurrence constraint. To set the exclusion constraint you need to select “= 0 (No Occurrences)” from the drop-down list.



The above option is equivalent to the *Exclude* feature in the classic Query Tool view.

MODE 2: Temporal Query

The **temporal query** is a new type of query introduced in release 1.7.00-RC1. There are two components to these queries that make them a little more complex than the type of queries available prior to 1.7.00.

The first component to these queries is the list of events defined by the user.

The second component is the relationship between the events. This relationship is referred to a *Temporal Relationship*, which is best described as how the different events relate in regards to the time in which the event(s) occurred.

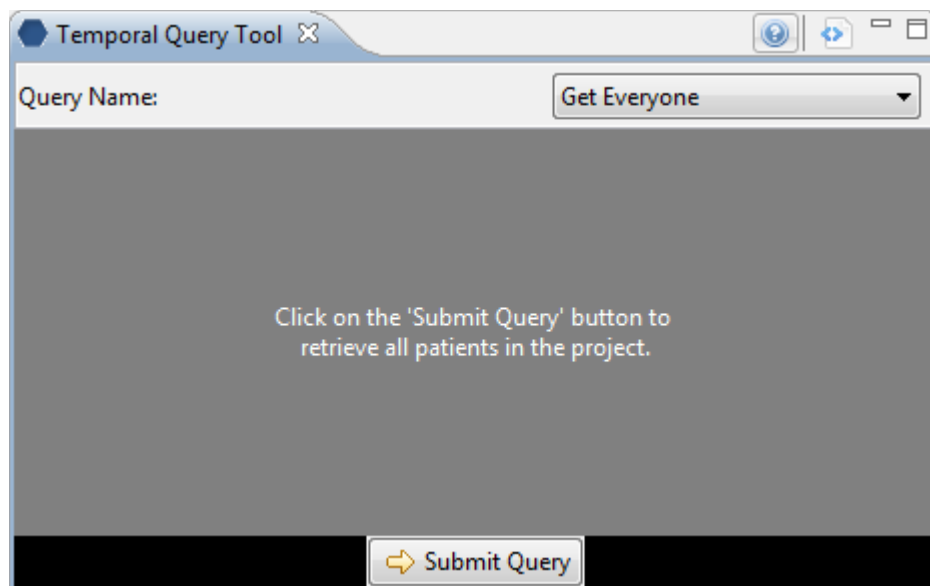
The screenshot displays the 'Temporal Query Tool' interface. It features a 'Query Name:' field at the top right with a dropdown menu labeled 'Specify Temporal Query'. The main area is divided into two panels. The left panel, titled 'Events in Query', contains two event definitions: 'Event 1' and 'Event 2'. Each event has a 'Group 1' dropdown, an 'Anchor' icon, and a 'No Date Constraints' label. Below each event is a text area labeled 'Drop ontology Terms here' and an '+ Add Group' button. At the bottom of the left panel is an '+ Add Event' button. The right panel, titled 'Define Temporal Relationships Among Events', shows a relationship between 'Event 1' and 'Event 2'. It includes dropdowns for 'Start of', 'the First Ever', and 'Occurs Before'. Below these are checkboxes for 'By' and 'And', each followed by a '>' dropdown, a numeric input field (set to '1'), and a unit dropdown (set to 'day(s)'). An '+ Add Temporal Relationship' button is at the bottom of this panel, with a note: 'Add Temporal Relationships among Events defined in the panel to the left.' At the bottom of the interface is a 'Submit Query' button.

NOTE:

Please see the i2b2 Temporal Query Tool User Guide for detailed information about using the new Temporal Query Tool view.

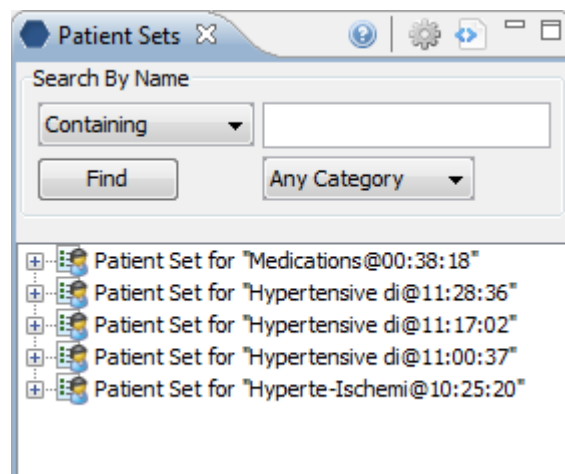
MODE 3: Get Everyone

The Get Everyone mode is equivalent to the get everyone check box that appears in the classic *Query Tool* view. The functionality remains the same as it will return every patient in the database.

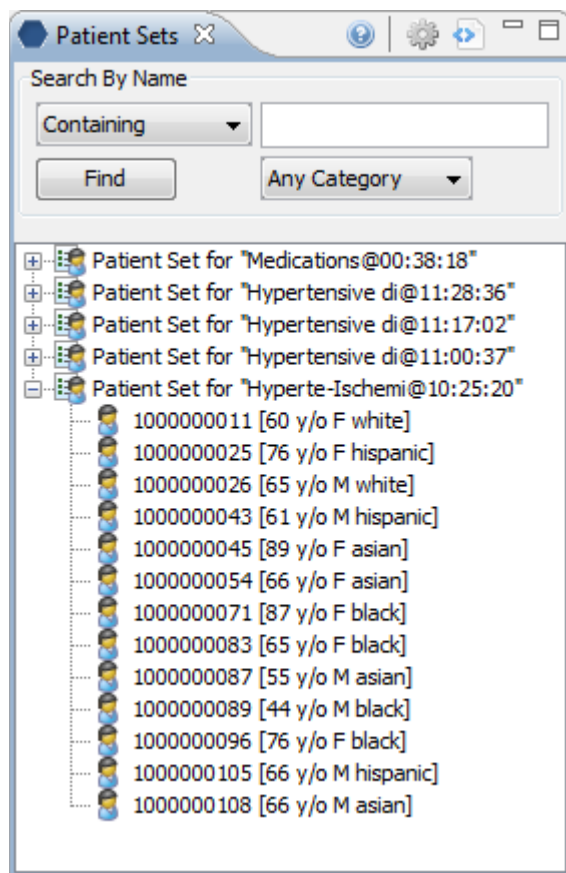


Patient Sets View

In release 1.7.00-RC1 a new view called **Patient Sets** was created. This new view will display a list of *Patient sets* that were created when a query was run. It is similar to the Previous Queries view except it only displays the patient sets and not the previous query or other results sets (i.e. Encounter sets, Number of patients, etc.).

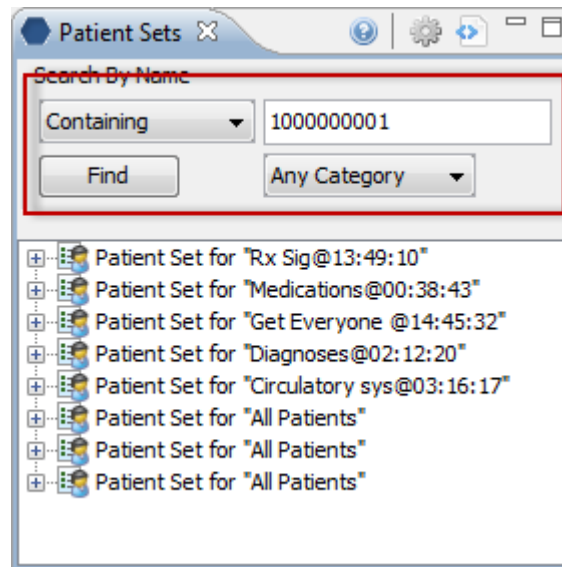


The Patient sets can be expanded to display a list of patients.



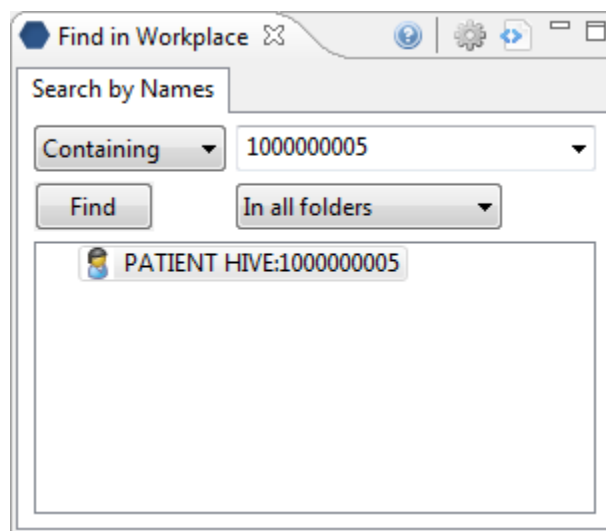
Users can drag an entire patient set or a single patient to other views in the i2b2 Workbench.

Users can also perform a search in which they can search by the name of the patient set or for a list of patient sets that contain a specific patient.



Workplace Find View

A new view called **Find in Workplace** was created in release 1.7.00-RC1. This view is very similar to the *Find Terms* view except it will search the *Workplace* view instead of *Navigate Terms* view.



Find Terms: New feature called “Jump to Term in Tree”

A new feature called **Jump to Term in Tree** has been added to the *Find Terms view*. Users can now easily jump directly to a term in the *Navigate Terms view* from the *Find Terms view*.

Once a term is found in the *Find Terms view* the user can click on the term using the *right mouse button* to display the pop-up menu. Selecting “Jump to Term in Tree” from the pop-up menu will bring the *Navigate Terms view* into focus and the hierarchical tree will automatically open to the location of the term selected in the *Find Terms view*.

Updates

Data

New Tables

The following new tables were created as part of the new IM cell.

Table Name	Description
IM_MPI_DEMOGRAPHICS	Contains general demographic information for the patients.
IM_MPI_MAPPING	Maps the patient's <i>i2b2 number</i> and their <i>local MRN</i> .
IM_PROJECT_SITES	Contains information about the different sites (Source Systems).
IM_PROJECT_PATIENTS	Stores the patients that are part of a project(s).
IM_AUDIT	Stores the audit details of patients accessed in the IM cell. This includes; the user, site, and project requesting the access as well the date in which it was accessed.

New Columns

A new column called **PROJECT_ID** has been added to both the **PATIENT_MAPPING** and **ENCOUNTER_MAPPING** tables in the CRC. The **PROJECT_ID** was added to support the IM cell. It will allow sites to track which project a patient is part of.

New / Updated Demo Data

The **PATIENT_MAPPING** table in the CRC has been updated to include the following:

- Mappings of existing patients to multiple site MRNs.
- Project IDs added to patients.

Demo data has been added to all of the new IM tables except the AUDIT table. This data was added to support the new IM cell.

IMPORTANT:

The mapping information added to the CRC and IM tables is strictly for demonstration purposes and does NOT contain real patient information.

Documentation:

The 1.7.00-RC1 release documentation can be found in a zip file located on the i2b2 release candidate web page. This file includes documentation for the following:

- The architecture, design, installation and messaging documents for the CRC, Ontology, File Repository, PM and Workplace Cells.
- The installation and developer's guide for the i2b2 Workbench.
- The startup guide for the web client.
- The data and hive installation guides.
- The VM Install document.
- The CRC Plug-in Analysis document.
- A process document for building queries from ontology terms.
- The architecture, design, installation and messaging documents for the Identity Management (IM) Cell. ****New****
- The design documentation for the new Temporal Query Tool plug-in. ****New****
- User guide for the new Temporal Query view ****New****

- Documentation for the new views (Patient Set, Patient Mapping, Admin Tool, and Find in Workplace ****New****)

Licensing

The i2b2 source code is licensed under the i2b2 Software License 2.1. This includes but is not limited to all code in the edu.harvard.i2b2.* package namespace.

Trademarks

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