

# User Guide for the Mimic2 WebStation

The Mimic2 WebStation is a user-friendly tool that simplifies search queries for the MIMIC II database. Primarily, it can help you to zero-in on the subset of patients that you wish to analyze.

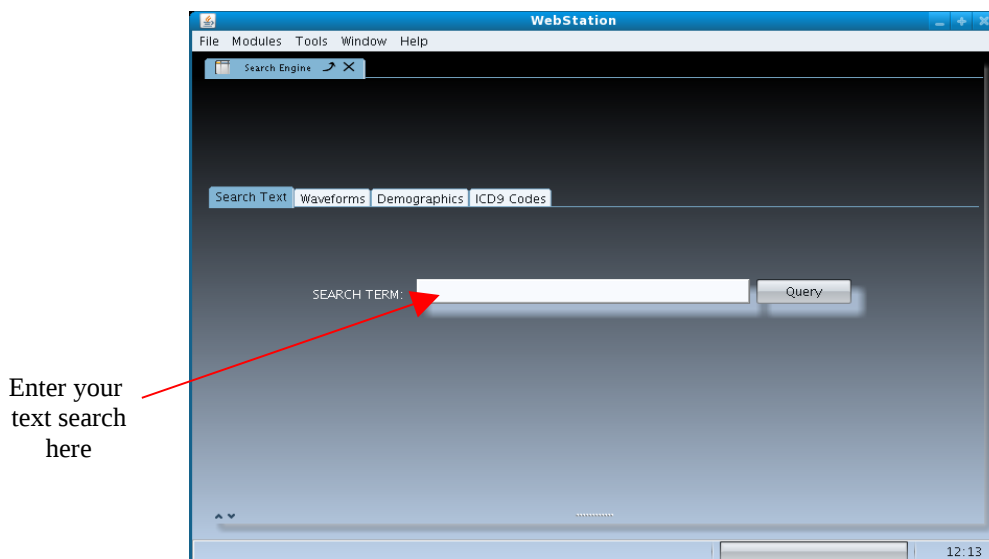
## 1. Launching the WebStation

- Go to <http://mimic.mit.edu> in your web browser.
- Click on “Login” at the top and enter your login information.
- Click on “Explorer” near the bottom of the left pane.
- Click on “Application Link” under “Rich Search” at the bottom of the page.
- Run the WebStation with Java Web Start. Install Java Runtime Environment (JRE) first if it is not installed on your computer. You can download the latest JRE from the following web site: <http://java.sun.com/javase/technologies/desktop/javawebstart/index.jsp>
- Enter your login information again in the pop-up window. After this step, a new WebStation window should appear.

## 2. Building a query

In the WebStation window, click on “Search for information” to launch the search engine. You will see 4 tabs in the new screen. Each tab lets you specify your inclusion criteria from a distinct perspective. Please note that these 4 tabs are integrated with one another, and your entries in all tabs are taken into account when you perform a query.

- *Search Text:*  
This tab lets you perform a text search in hospital discharge summaries. All patients whose discharge summaries contain entered key words are returned.



- *Waveforms:*  
You can search for the patient records that contain a desired set of waveform data. To build a query, click on appropriate waveform types and logical operators. For ECG, you can either

select a specific lead in the drop-down box left of the “ECG” button or specify the number of any ECG leads. You can also specify the number of any pressure waveforms. Your query is displayed in “Resulting query”. If you know the case IDs of the records you want to retrieve, you can type them in the “Case ID” field on the right, separated by space.

Select Waveform types

Specify the numbers of ECG and pressure waveforms

Enter case IDs

Logical operators

Your query is displayed here

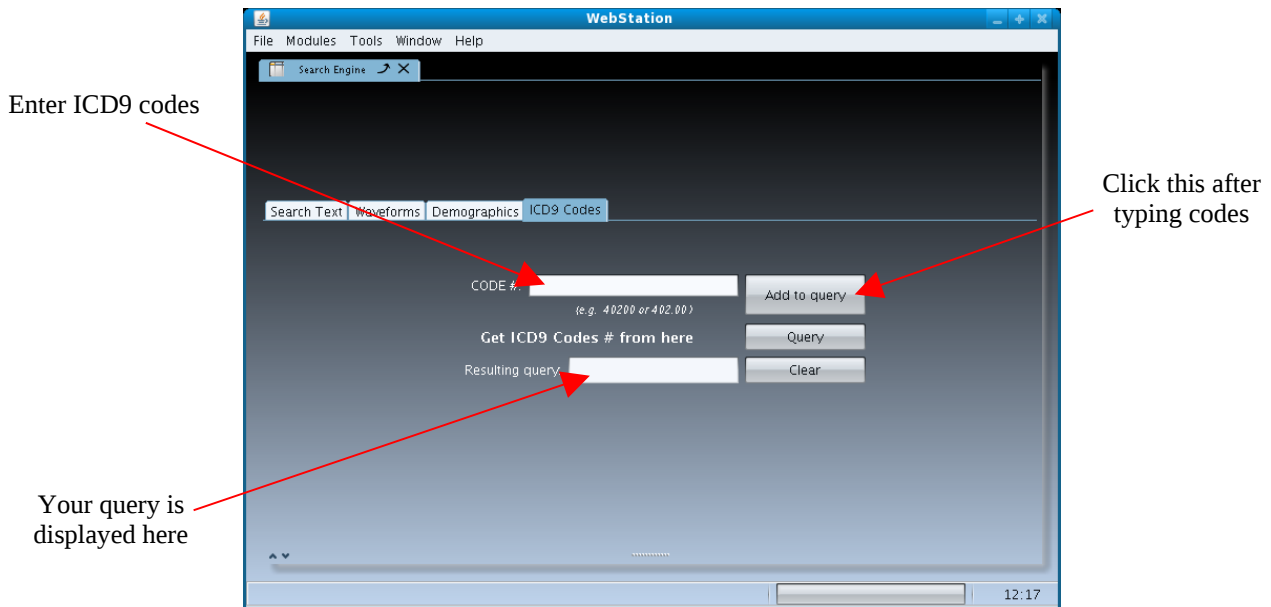
- Demographics:**  
 In this tab, you can set your demographic inclusion criteria. You can select a gender or limit the age range. If you are interested in particular patient IDs, you can enter them in “Pid list”, separated by space.

Select gender

Enter patient IDs

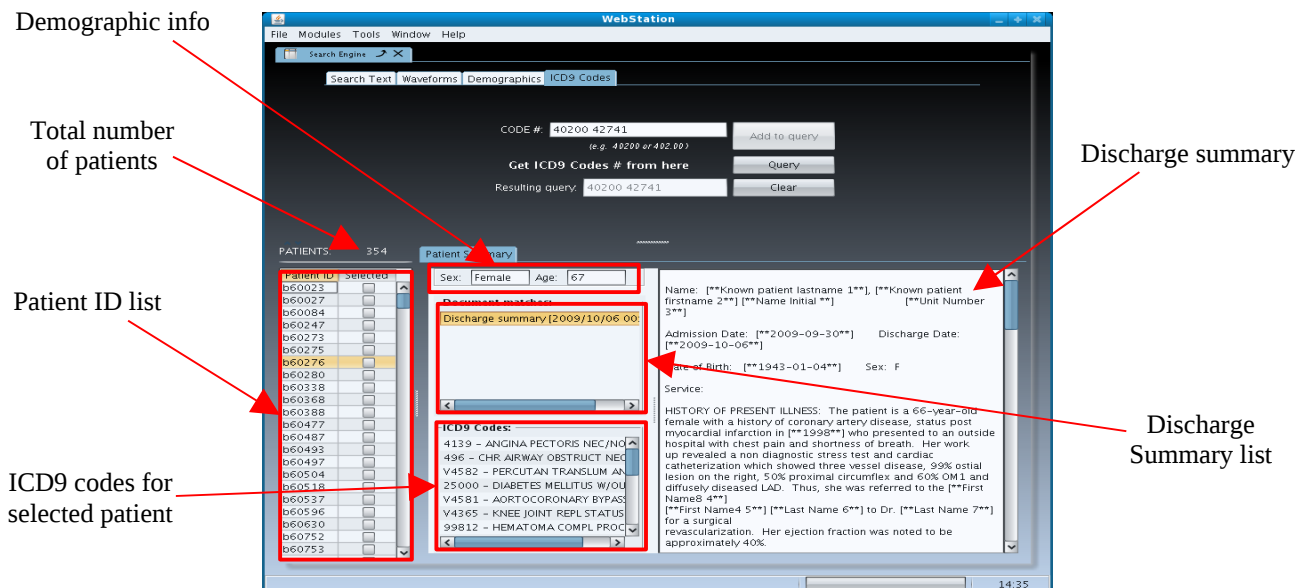
Set age range

- ICD9 Codes:**  
 You can enter ICD9 codes here so that the query will return only the patients associated with at least one of the specified ICD9 codes. Type codes in the “CODE #” field, separated by space, and click on “Add to query”. Verify your query in “Resulting query”. You can click on the “Get ICD 9 Codes # from here” link for a ICD9 code list.



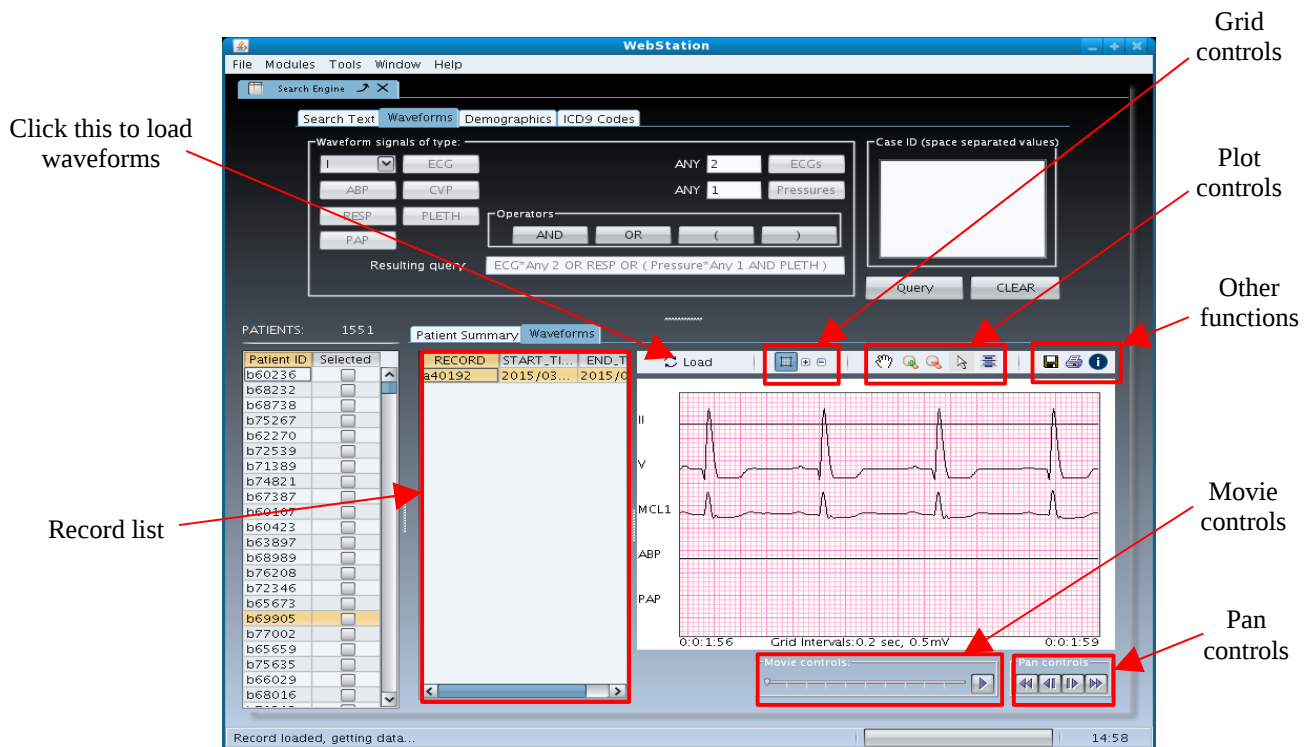
### 3. Interpreting query results

When your query is ready, click on “Query” in any of the 4 tabs. Returned query results are shown in the Patient Summary tab. The returned patient IDs are listed in the leftmost pane, while the total number of patients that meet your inclusion criteria is shown above the patient ID list.



You can select a particular patient in the patient ID list to display his or her information. If there are multiple discharge summaries for the selected patient, you can select a specific discharge summary in the list below the demographic information (sex and age), and it will be displayed in the rightmost text field. The ICD9 codes associated with the patient are listed below the discharge summary list.

If your query searched for specific waveforms, the Waveforms tab appears and you can select a record from the list immediately right of the patient ID list to view the waveforms. The waveforms in the selected record are displayed in the grid to the right of the record list, after clicking on “Load”.



The icons above and below the grid enable you to change visualization settings. For the following control groups, please refer to the screenshot above.

- **Grid controls:** The leftmost icon lets you turn on or off grid lines. The two remaining icons make grid lines finer or coarser.
- **Plot controls:** The hand icon lets you grab the grid and manually move different parts of the waveforms. The two magnifying glass icons are zoom-in and -out functions. The arrow icon changes your cursor to the default type after clicking on the hand icon. The rightmost icon in this group centers the waveforms.
- **Other functions:** From left to right, the three icons in this group let you save the waveforms, print the waveforms, and display detailed information about the current record in a pop-up window.
- **Movie controls:** Clicking on the play button will play the waveforms in real-time. Upon clicking, the play button becomes a pause button, which you can click to stop playback. You can set the movie speed on the slide bar; the more right, the faster the playback.
- **Pan controls:** These buttons let you manually slide along the waveforms, either in fast-forward or rewind.

#### 4. Starting a new query

To reset the search and start a fresh new query, click on the cross icon to the right of the tab label “Search Engine” at the top-left corner of the window. This will close the current search engine and load the WebStation main menu. Click “Search for information” to begin a new search. You can also reset the query without closing the current search by going into each of the 4 tabs and clearing all fields by either manually deleting entered information or clicking on a “Clear” button.

#### 5. Example exercises

To help you quickly familiarize yourself with the WebStation, here are two simple exercises that you can follow step-by-step.

- *Search for a subset of hypotensive patients:*

1. In the Search Text tab, type “hypotension” into the “Search Term” field.
2. In the Waveforms tab, click on “ABP”.
3. In the Demographics tab, check “FEMALE” and set the age range from 80 to 90.
4. Leave the fields in the ICD9 Codes tab blank.
5. Click on “Query” in any of the tabs.

The query results should list the following 9 patients: b74429, b68160, b76349, b64987, b73076, b67029, b69577, b73868, b71877. These are the patients who are female, between 80 and 90 years of age, and contain the word “hypotension” in their discharge summaries.

Now, read through the discharge summaries of the 9 patients. Can you identify which of these patients died in the hospital? The answer is b74429, b76349, b67029, b69577, b71877.

Select b68160 in the patient ID list and switch to the Waveforms tab. Select the record a42158 and click “Load” to display the waveforms. Which waveforms does this record contain? The answer is 5 ECG leads (II, III, AVR, V, and MCL1), ABP, and PAP. Verify that only ECG II shows a proper waveform at the beginning of the record, while III, AVR, V, and MCL1 show flat lines. Also note that ABP and PAP are unavailable at the beginning of the record. Can you find out the total length of the record? You can get this information by clicking the rightmost icon in the “Other functions” group. The answer is 102:09:31.216.

- *Search for a subset of patients with ventricular fibrillation:*

1. In the ICD9 Codes tab, type 427.41 (ventricular fibrillation) and click “Add to query”. Verify the code in the “Resulting query” field.
2. In the Demographics tab, check “MALE” and set the age range from 55 to 60.
3. In the Waveforms tab, type “2” in the field immediately left of the “ECGs” button (not to be confused with the “ECG” button on the left side of the screen). Click on the “ECGs” button. Now, click on the “AND” operator and click on “PAP”. The “Resulting query” field should show “ECG\*Any 2 AND PAP”.
4. Leave the Search Text tab blank.
5. Click on “Query” in any of the tabs.

The query should return four patients: b74785, b75305, b63946, b73961. These are the male patients who were assigned an ICD9 code of 427.41, between 55 and 60 years of age, and contain two ECG lead and a pulmonary arterial pressure waveforms.

Can you find out which of the 4 patients was 58 years old? The answer is b73961. Which of these patients have 2 records associated with them? They are b75305 and b63946. Among all the records associated with these 4 patients, which record does not contain ABP? The answer is a40545.