



Apelon TermWorks 6.1.2

Excel Add-In User Guide

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A. Introduction

The **Apelon TermWorks Excel Add-In** allows you to use *Microsoft Excel* to perform term searches against indexed data sources that reside on a TermWorks Server. A data source can be an indexed namespace or subset.

This capability is accomplished through the combination of an Apelon API and the standard features of *Microsoft Excel*.

You can configure searches to find a single search string in a selected data source index, or search for matches against a range of search strings that you select.

A.1 Installation Requirements

- *Microsoft Windows 7 or 10*
- *Microsoft Excel 2010, 2013, or 2016*
- *Microsoft.NET Framework Version 4.5*
- *Administrator privileges on the client computer*

B. Installing the TermWorks Excel Add-In

B.1 Install the TermWorks Excel Add-In Files

1. Contact your **TermWorks Server** administrator to receive your TermWorks Client Zip File
2. Create a folder on the computer for the TermWorks client.
3. Extract the contents of the client zip file to the folder. The following files are included:
 - **TermWorks.xla**
The TermWorks Excel Add-In
 - **TermWorks.ini**
The configuration file for the Add-In
 - **TermWorks.bmp & logo.gif**
Graphics files used by the Add-In
 - **TermWorks.pdf & TermWorksReleaseNotes.pdf**
Documentation
 - **register_termworks_dll.bat**
A batch file used during installation to register library files required to communicate with a TermWorks Server.
 - **unregister_termworks_dll.bat**
A batch file used unregister TermWorks library files. This batch file should only be used when removing the TermWorks Excel Add-In from the system.
 - **resource/TermWorksService.dll**
resource/TermWorksService.tlb
resource/RegAsm32.exe
resource/RegAsm64.exe
Resource files required for communicating with a TermWorks Server

B.2 Register the Required Resource Files

In the directory where the client zip file was extracted, run the **register_termworks_dll.bat** file. When the resources are properly registered, you should see this message:
Registering TermWorks 32-bit resources...

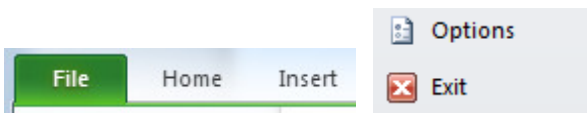
Types registered successfully
Assembly exported to [AddIn path]\resource\TermWorksService.tlb', and the type library was registered successfully

Press any key to continue...

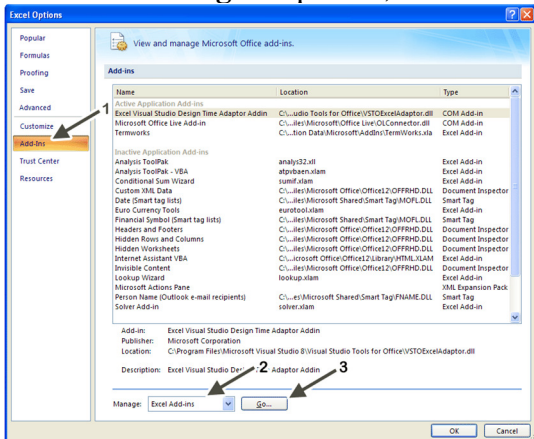
Note: If you are installing on a 64-bit version of Windows, you will see this message twice, as the resources are registered in the 64-bit system as well.

B.3 Install the Add-In in Microsoft Excel

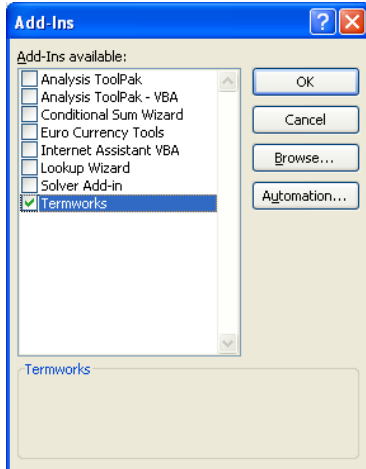
1. Select the **File** tab, and click **Options**.



2. On the left-hand menu, select **Add-Ins**. At the bottom of the window, select **Excel Add-Ins** in the **Manage** dropdown, then click **Go**.

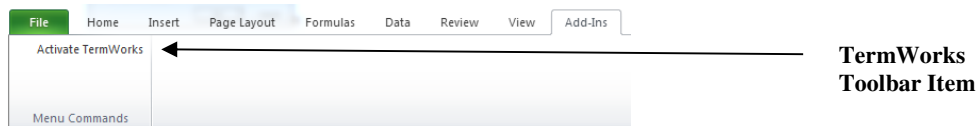


3. Click **Browse...**, and select the directory where the client zip file was extracted.
4. Select the TermWorks.xla file.
5. Insure that the TermWorks checkbox is checked, and click **OK**.



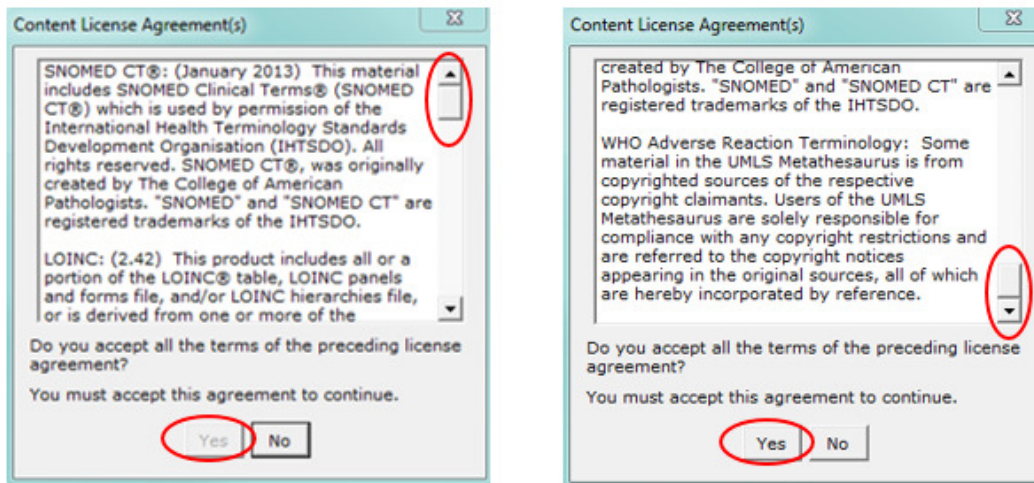
B.4 Activating the TermWorks Add-In

1. A TermWorks toolbar item is added under the **Add-Ins** tab. This icon allows you to turn TermWorks functionality in Excel on and off, as needed.



Click the **TermWorks** toolbar item to activate the **TermWorks Add-In**.

If content license terms are associated with one or more data sources, the **Content License Agreement(s)** window appears. Scroll to the bottom of the license terms to enable the **Yes** button, and click **Yes** to accept the license agreements.



Once the **TermWorks Add-In** is activated, the **Apelon Termworks** menu appears under the **Add-Ins** tab. The **TermWorks** menu is also accessible by right-clicking on a spreadsheet cell.



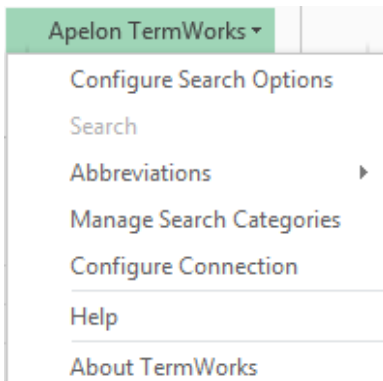
Click the TermWorks toolbar item again to deactivate the **TermWorks Add-In** and remove the **TermWorks** menu option from the *Excel* window menu bar.

C. Using Apelon TermWorks

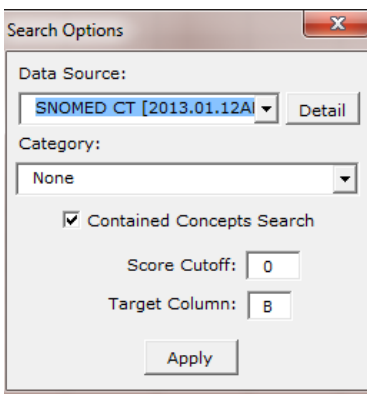
C.1 Configure Search Options

Before any searches can be submitted to TermWorks, your search options must be configured.

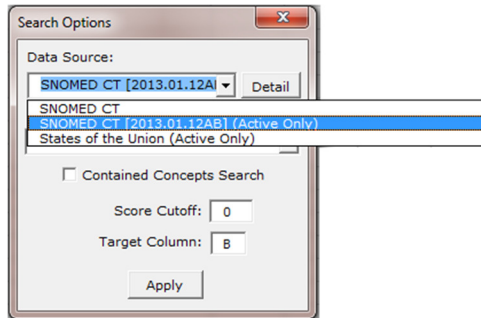
1. From the **Apelon TermWorks** menu (under **Add-Ins**), select **Configure Search Options**.



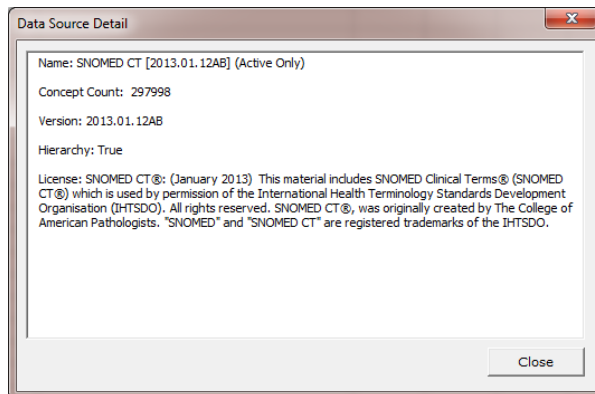
2. The **Search Options** window requires a **Data Source** and **Target Column** be selected before a search can be run. Other features included in this window include **Search Category**, **Contained Concepts Search**, and **Score Cutoff** may be applied but are not required. The search configurations you specify here remain effective throughout the current session, and are retained in future sessions until changed by the user.



- a. The **Data Source** field dropdown lists the TermWorks data sources to which you have access. From the list, select the data source in which to search for the specified term.



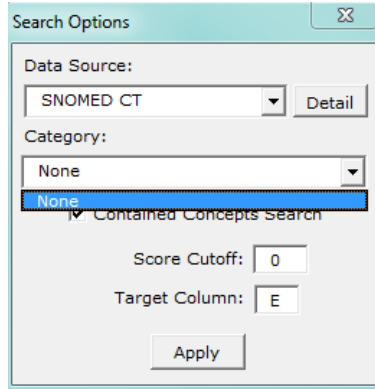
- b. You can display the details of the selected data source by clicking the **Detail** button, directly to the right of the **Data Source** drop-down field.



The **Data Source Detail** window lists the data source **name**, **concept count** (number of total concepts in that source), **version**, and **license terms** of the data source. **Hierarchy** (true/false) indicates whether the data source contains a concept hierarchy.

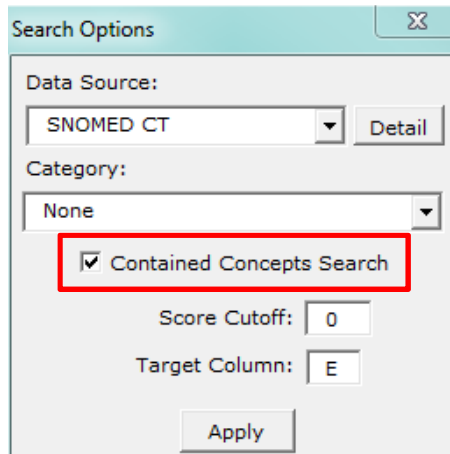
Click **Close** when you are finished viewing data source details.

- c. TermWorks allows you to create and maintain **Search Categories**. With this feature, you can group related concepts that you select from a desired data source, and save them for future searches by selecting the saved category. When selected under **Search Options**, search results will be filtered against the subconcepts of the concepts in the selected category.

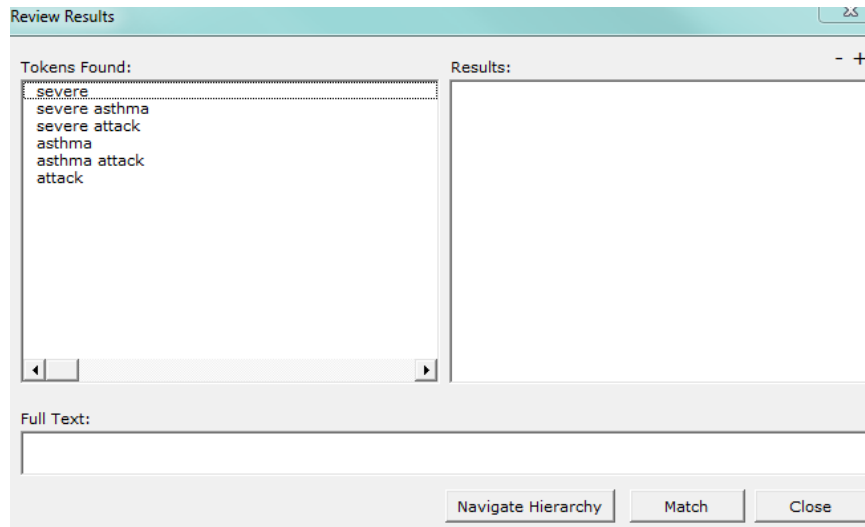


For further information about creating and using search categories, see the [Search Categories](#) section later in this guide.

- d. There is an option to check off *Contained Concepts Search*. The *Contained Concepts Search* feature is especially useful when you search for a phrase, or part of a phrase. By parsing the phrase and returning separate results for each token, you can view the individual results and simplify selection of matches.

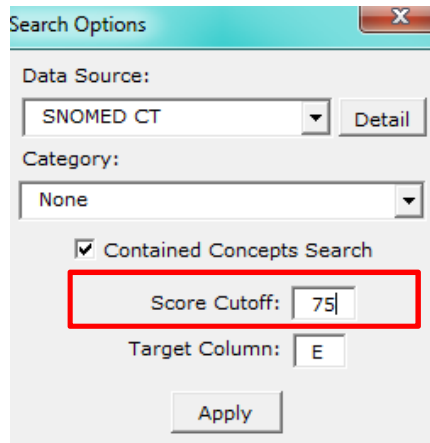


The *Contained Concepts Search* feature allows you to analyze returned match results in **separate views** that reflect matches against the **entire search string**, against **individual tokens** in the string, and against **each combination of tokens** in the string. You may select which data source index concepts to write to the spreadsheet from returned results in any of the separate views.



For more information, refer to the [Contained Concepts Search](#) section later in the guide.

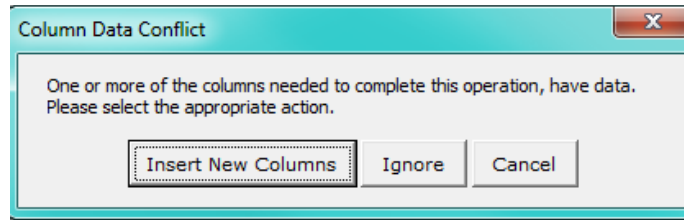
- e. There is an option to filtering searches so that only results that meet or surpass the matching accuracy level that you specify will be returned. In the **Score Cutoff** field you can designate this accuracy threshold as a percentage.



For example, if you enter **75**, only results that have at least a **75%** level of matching accuracy will be returned from the search. The default **Score Cutoff** level is **0** (which indicates that results will not be filtered based on matching accuracy level).

- f. In the **Target Column** field, specify the column to begin listing search results. When you select the column for search results to appear, you may see a **Column Data Conflict** window.

This will prompt you to either **Insert New Columns**, **Ignore**, or **Cancel**. These options are described in more detail under the [Target Column Data Conflicts](#) section.



3. When satisfied with all **Search Options** settings, click **Apply** at the bottom of the **Search Options** window to save your search configuration. These settings are retained for future searches.

C.2 Searching with TermWorks

TermWorks attempts to match concept names and/or synonymous terms against all tokens (i.e., words) within the search string, or a combination of search string tokens, or one or more individual tokens. Matched search results are ranked by match accuracy, with the most accurate matches listed first, followed by matches against individual tokens, and combinations of tokens. Refer to the discussion in Appendix A entitled [How is TermWorks Search Match Result Scoring Determined?](#) for more detailed information on how search results are ranked.

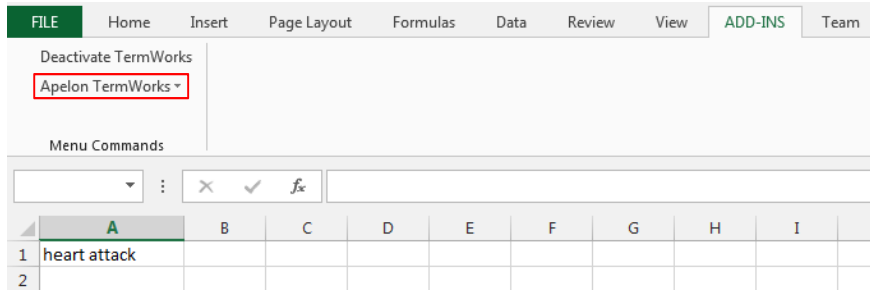
C.2.1 Search for Data Source Matches against a Single Term

The following procedure can be used to configure a TermWorks search for concepts in an indexed **data source** on the server (i.e. a namespace, data silo, or subset). Concepts with names and/or synonymous terms that contain the search term(s) you specify are returned from the TermWorks search. From the returned results, may select those concepts that you want to write to the spreadsheet.

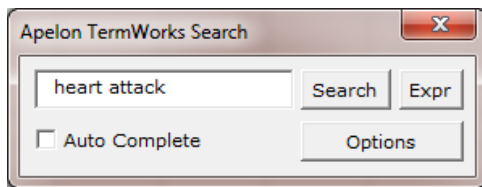
1. Configure your search options as described in [Configure Search Options](#).
2. Enter your search term or string (e.g. heart attack) in an empty cell.

For your search term value, you also can enter a search string that includes one or more **Query Syntax** operators (e.g. '*'). These operators allow you to filter search results, perform wildcard searches, and increase the accuracy of searches. Refer to the [Search String Operators](#) discussion later in the guide to determine the appropriate query syntax operators for your search.

3. Open the **Apelon TermWorks** menu, either by selecting **Apelon TermWorks** at the top left of the screen when the **Add Ins** tab is selected (see below) or by right clicking in the excel spreadsheet and selecting **Apelon TermWorks** from the bottom of the menu that appears.



Click **Search** from the **Apelon TermWorks** menu. The **Apelon TermWorks Search** window displays:



From this window you may view and select options for matching the search string to concept names and/or synonymous terms in the selected data source index (selected under **Configure Search Options**).

- The selected search string (e.g., heart attack) from the select cell in the excel sheet displays automatically in the **Search Term** field. TermWorks performs searches for concept names and/or synonymous terms that include one or more of the tokens (i.e., words) in your search string. Results for the entire search string are searched first.

If matches are found against the entire search string, the search terminates and the resulting matches for the entire string are the only ones returned. If no matches are found against the entire string, matches are then attempted against combinations of tokens in the search string, and then on individual tokens.

- When you activate the **Auto Complete** feature (for either a single search term or a range of search terms) the matched concepts returned from the search are listed in a comments box. The concept that represents the **best match** is written directly to the spreadsheet for the selected search term string(s). Check the **Auto Complete** field checkbox to activate the feature. Refer to the [Auto Complete](#) section later in the guide.
- The **Expr** button allows the user to enhance searches through the use of **search expressions**. A **search expression** designates criteria for the search, in addition to the text string entered in the spreadsheet cell. Refer to the [Search Expressions](#) section later in this guide.
- Click the **Options** button to modify the search options you configured earlier.
- Click **Search** to begin searching the selected data source index.

C.3 Search String Operators

Choose from the following **Query Syntax Operators** when you enter your search string value on the spreadsheet. Note that you can display these options online by clicking the *Help* option on the **Apelon TermWorks** submenu.

C.3.1 Boolean Operators

Boolean operators allow terms to be combined through **logic operators**. **Boolean operators** must be preceded with a '\$' character, in order to differentiate them from incidental appearances in the search term (e.g., **\$AND**, **\$OR**, **\$NOT**).

In TermWorks, the default search matching approach is to match concept names and synonymous terms in the selected data source index against the **entire** search string.

Example: For the search string **cell wall structure**, matches are first attempted against the tokens **cell and wall and structure**.

If matches are found against the **entire** search string, the search terminates and these resulting matches are the only ones returned. If no matches are found against the entire string, matches then are attempted against **combinations** of search tokens (**cell and/or wall**, **cell and/or structure**, etc.) then on each **individual** token.

Use Boolean operators **\$OR and/or \$NOT** to override the default search mapping approach for the entire string first, then combinations of search tokens, then individual tokens.

a. **\$AND**

The **\$AND** operator enforces that both clauses on either side of the operator are true. The search term **cell \$AND wall** will return only matches that contain both **cell** and **wall**.

b. **\$OR**

The **\$OR** operator enforces that a least one clause on either side of the operator is true. Searching for **cell \$OR wall** will return all matches containing **cell**, and all matches containing **wall**.

c. **\$NOT**

The **\$NOT** operator excludes concepts with names and synonymous terms containing the string after **\$NOT**. To search for concepts containing **blood type** but not **test**, the syntax **“blood type” \$NOT test** would apply.

You cannot use the **\$NOT** operator without a string prior to the operator to search all concepts with names excluding a particular word or string. e.g., **\$NOT “blood type”** would not return any concepts; searches for all concepts with names and synonymous terms excluding **‘blood type’** are not supported by this feature.

C.3.2 Include \$+

The **include** operator requires that the string after the **\$+** syntax exist in the concept name or synonymous terms respectively. To search for concepts with names that must contain

procedure, the syntax **\$+procedure** would apply. To search for concepts with names that must contain **laboratory** and may contain **procedure**, use the syntax **\$+laboratory procedure**.

C.3.3 Exclude **\$-**

The **exclude** operator excludes concepts and synonymous terms containing the string after the **\$-** syntax. To search for concepts with names and synonymous terms containing the literal phrase “**arterial rupture**” but not **valve**, the syntax “**arterial rupture**” **\$-valve** would apply.

C.3.4 Wildcard Search **\$***

Use the **\$*** syntax to perform a wildcard search. To search for all concepts with names and synonymous terms starting with **str**, **str\$*** would apply (returning **Strength**, **Structure**, and **Strange**).

TermWorks also supports the use of the wildcard search operator in the middle of a term (e.g., **he\$t**). Note that your search term must consist of at least **2** characters in order to use the wildcard search operator. For example, **H\$t valve** (with 2 search characters) is a valid wildcard search syntax, while **H\$t valve** (with 1 search character) is invalid.

C.3.5 Fuzzy Search **\$f**

Insert **\$f at the end** of a single word string to perform a “fuzzy” search. To search for concept names and synonymous terms similar in spelling to **heart**, the syntax **heart\$f** would apply (returning **Heat**, **Heart**, and **Health**).

C.3.6 Distance (Proximity) Search **\$d**

TermWorks supports searches for concepts by specifying a relationship between two strings via word distance. To search for concepts with names and synonymous terms containing the string **leg** followed or preceded immediately by **injury**, the syntax “**leg injury**”**\$d1** would apply. To search for concepts with names and synonymous terms containing the string **leg** within up to, and including, 4 words of **injury**, the syntax “**leg injury**”**\$d4** would apply.

C.3.7 Boost Relevance of a String **\$^**

To boost a search string’s relevance, insert **\$^** with a number greater than **1** at the end of the search string. The higher the number, the more the string’s relevance is boosted.

If you are searching for concepts with names and synonymous terms containing **blood** and (**type \$OR test**) but you would like concepts containing **type** to be given preference in search results, the syntax **blood (type\$^2 \$OR test)** would apply.

You can boost a phrase’s relevance using a syntax such as **blood type \$b=2 blood test** in the search string. Note that the boost operator overrides the traditional rankings of returned search results.

C.3.8 Grouping

Parentheses can be used to group clauses to form subqueries. To search for either **heart** or **lung** and **transplant**, the syntax **{heart \$OR lung} \$AND transplant** would apply. To return a concept with a concept name or synonymous term containing **left** that must contain **valve**, but must not contain **heart**, the syntax **left {\$+valve \$AND \$-=heart}** would apply.

Note that the default search matching approach is to match concept names and synonymous terms in the data source index against the **entire** search string (e.g., for the search string **cell wall structure**, matches are first attempted against the all the tokens, **cell and wall and structure**).

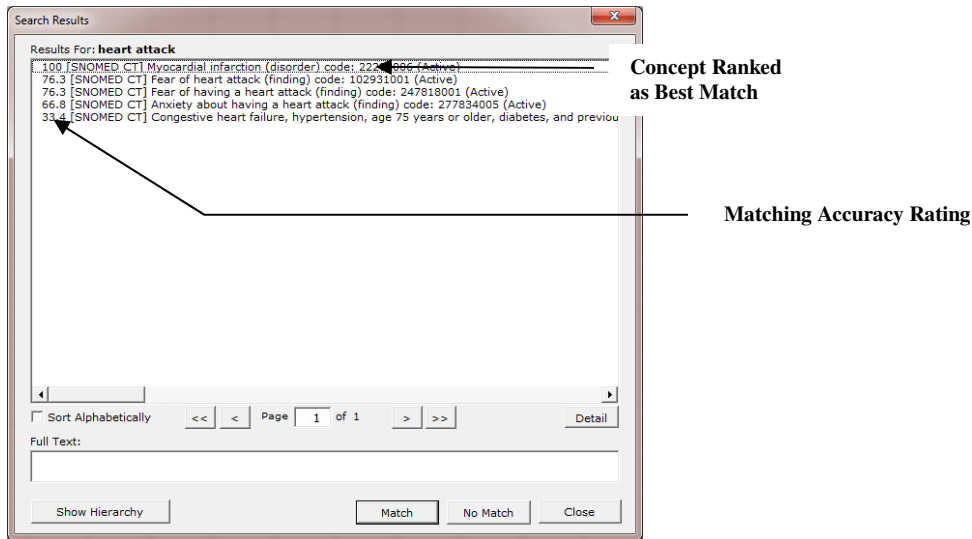
C.4 Search Results for a Single Term

The following discussions highlight results that are returned when you use the TermWorks options to search for matches against one single term string that you enter on the spreadsheet. A **single term** is a single word (e.g., **blood**).

For discussions of results when you perform searches on multiple term strings, refer to the [Search Results for a Range of Terms](#) section later in the guide.

C.5 Search Results for an Entire Search String

1. Search results are listed on the **Search Results** window. Results like the following may be returned from a data source index for matches against the search string **heart attack**. A phrase may be surrounded by double quotes to search for the entire string (e.g., the literal phrase “**blood type**”).
2. For each returned concept, the index that was searched is listed, as well as the concept code and name. Also indicated for each returned concept is the matching accuracy rating (listed as a percentage value). The value in the *Score Cutoff* field on the **Search Options** window establishes this matching accuracy threshold. The higher the rating for each concept on the **Search Results** window, the more accurate the match.

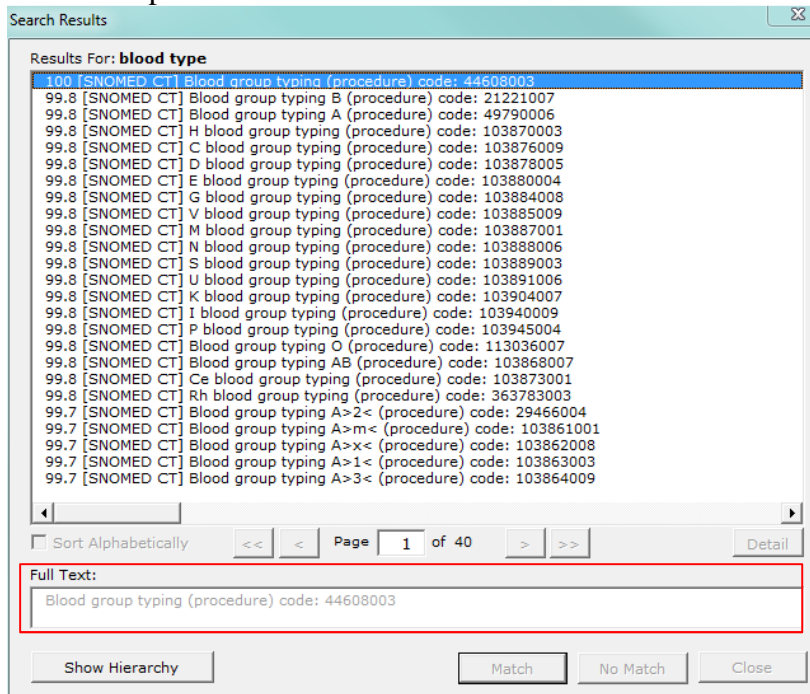






In the example shown above, most of the returned concepts include both of the search tokens, **heart** and **attack**, in either the concept name or within a synonymous term. The concept **Myocardial infarction (disorder)** is listed as the best match, with a matching accuracy rating of 100.

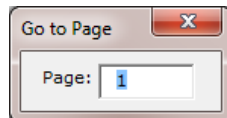
In TermWorks, each search attempts to match concept names or synonymous terms to the entire search string (A **and** B), then to any token combination (AB **or** AC **or** BC), then to any token in the search string (A **or** B). The first concept listed is ranked as the **best match**. Concepts lower in the list represent matches that are less precise.

3. The complete name of the concept displays in the *Full Text* field when you highlight

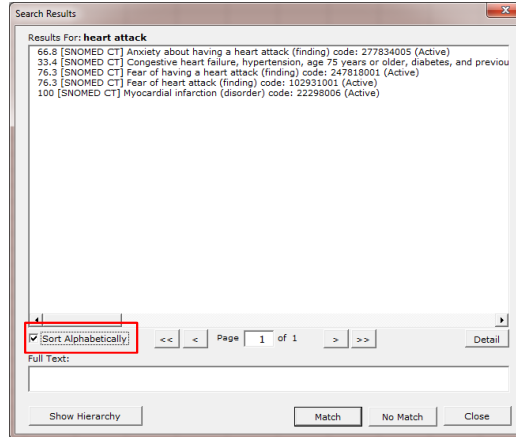
each concept.



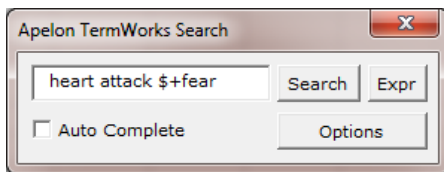
4. If the results require more than one page to display, you can scroll backward and forward through the list using the **Arrow** keys, or the **Page Forward** and **Page Backward** keys.
 - a. Use the **Paging Buttons** ( and ) to move forward and backward through the results list one page at a time. Click the  button to return to the first page of the results list, or the  button to advance to the last page of the list.
 - b. To display a specific page of the results list, use the keyboard combination **CTRL + G**. The following window displays.



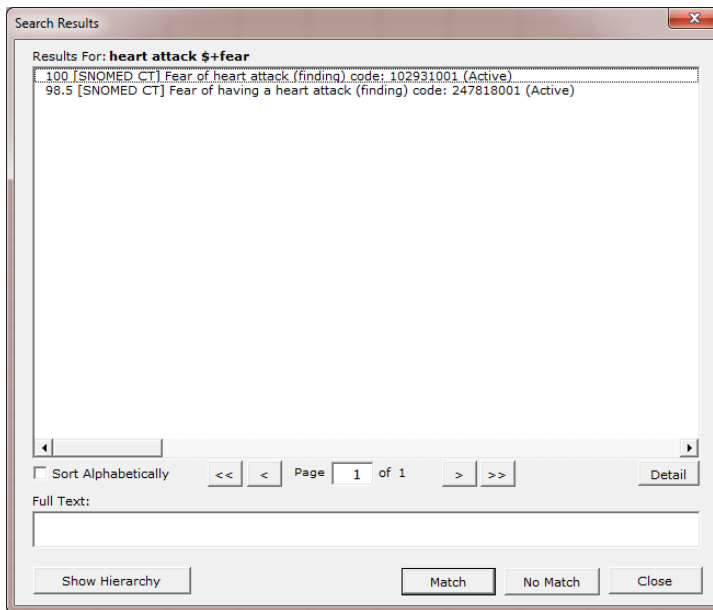
Specify the desired page number, then press **RETURN** to display that page. You have the option of sorting the results alphabetically. Click **Sort Alphabetically**.



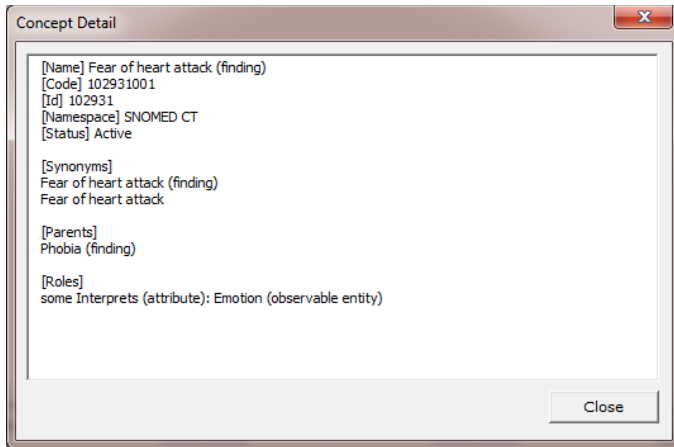
- The following is an example of a search for concepts performed with an operator. The previously searched term **heart** attack has an include operator **\$+** with the term **fear** after it, requiring that each returned concept also include the string **fear**.



The filtered search results are listed:

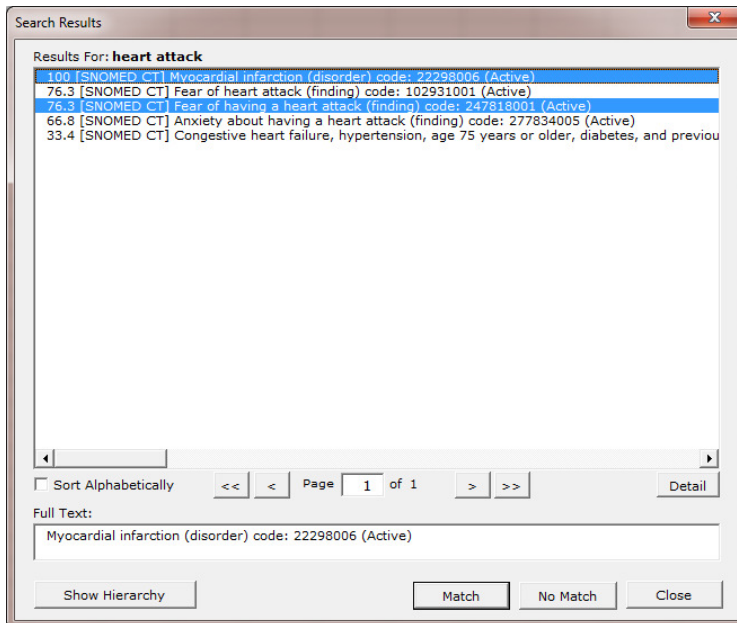


- To view details for any concept listed in the **Search Results** window, click the concept to highlight it, then click **Details**.



For the concept you selected, the **Concept Detail** window indicates the concept **Name**, **Code**, **ID**, and source **Namespace**. In addition, the concept **Synonym** (if any), **Parent** concept in the namespace hierarchy (if any), and concept **Properties** (if any) are listed. Click **Close** when you are finished viewing concept details.

- At this point you can use the standard *Windows* selection procedure (**CTRL+SHIFT**) to highlight multiple values you want to select for the spreadsheet. Note the illustration.



- Click **Match** to write all selected concepts to the target column on the spreadsheet. After clicking **Match**, the **Search Results** window remains displayed, allowing you to select additional concepts. Click **Match** again to write these additional concepts to the spreadsheet.

Click **Close** to exit the **Search Results** window and view the concepts you selected on the spreadsheet.

C.6 Search Results in Excel

Six pieces of information are written to the spreadsheet for each concept you selected from the returned search results: **concept code**, **data source index**, **concept name**, **concept status**, **search status** and **namespace version**.

Example Output 1:

	A	B	C	D	E	F	G
1	heart attack	22298006	SNOMED CT	Myocardial infarction (disorder)	Active	Complete	SNOMED CT [2013.01.12AB] (Active Only)
2	heart attack	102931001	SNOMED CT	Fear of heart attack (finding)	Active	Complete	SNOMED CT [2013.01.12AB] (Active Only)

In Column A, the search term, **heart attack**, is now in green text, indicating a matching concept was selected from the Search Results window. The data source name **SNOMED CT [2013.01.12AB] (Active Only)** and status **Complete** also display in green, indicating successful match completion.

The first target column, column B, reflects the concept code from the data source index. Column C indicates the source namespace of the concept. Column D lists the concept name, and column E lists the concept’s status (Active or Inactive). Column F indicates the matching status for the selected concept (**Complete** in this case), and column G lists the name of the data source that was searched.

Example Output 2:

If the search results do not include any concepts you want to select for the spreadsheet, click **No Match** on the Search Results window. On the spreadsheet, the search term, **heart attack**, is shown in red, as well as the data source name, **SNOMED CT [2013.01.12AB] (Active Only)** and status, **No Match**. **No Match** is written to indicate that potential match candidates were returned, but the user rejected these concepts for the spreadsheet.

	A	B	C	D	E	F	G
1	heart attack					No Match	SNOMED CT [2013.01.12AB] (Active Only)

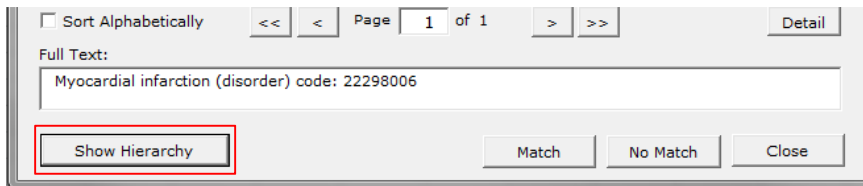
In contrast, if no results were returned based on your search parameters, the Search Results window does not display. The spreadsheet automatically displays with the search term and data source index text changed to red, and **Not Found** in the status to indicate no matching results.

	A	B	C	D	E	F	G
1	heart attack					Not Found	SNOMED CT [2013.01.12AB] (Active Only)

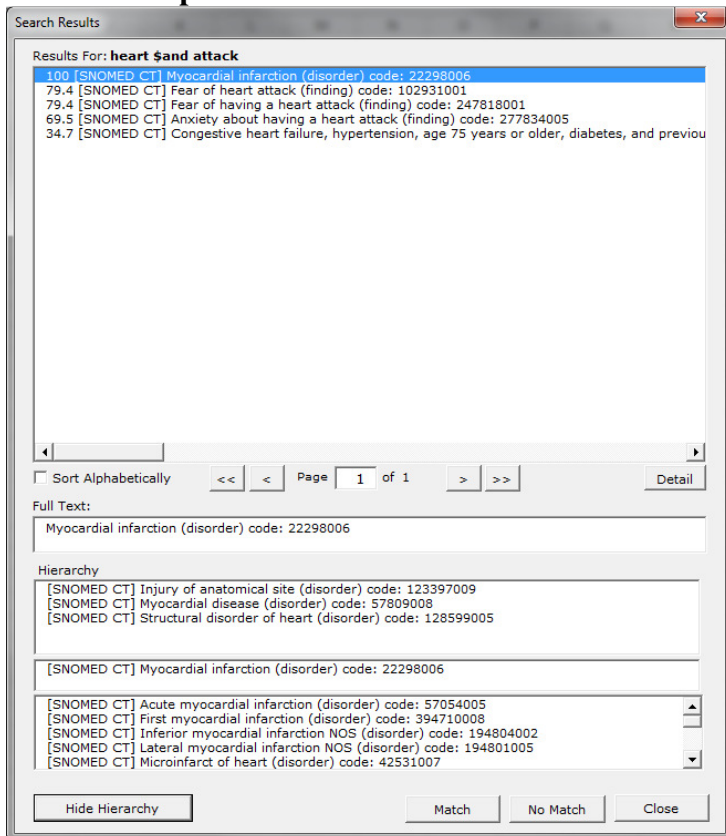
C.7 Navigate a Hierarchy

For any concept returned from the search, you can view concepts in the data source index hierarchy tree that are immediately above it (**superconcepts**) or below it (**subconcepts**). Viewing a returned concept’s position relative to concepts above or below it may help you to decide if you want to select the returned concept for the spreadsheet. You also have the option of selecting a **superconcept** or a **subconcept** for the spreadsheet.

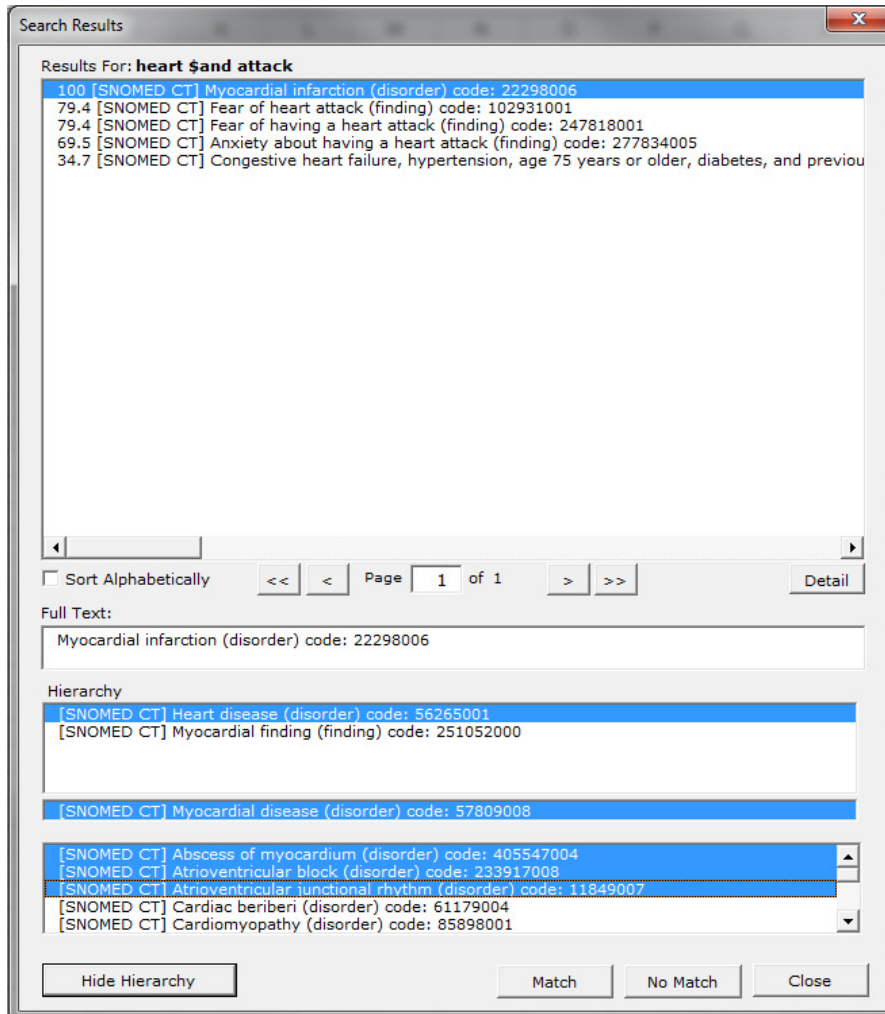
1. On the **Search Results** window, click *Show Hierarchy*.



2. The **Search Results** window will expand to include a *Hierarchy* pane. The **focus concept** appears in the middle of the Hierarchy pane, its parents (**superconcepts**) appear in the list above it, and its children (**subconcepts**) appear in the list below.
3. Double-click a **search result**, **superconcept**, or **subconcept** to make it the **focus concept**.



Use the standard *Windows* selection procedures (e.g. **CTRL + SHIFT** to select multiple values) to highlight any concepts displayed on the **Search Results** window, including the current **focus concept**, its **superconcepts**, and its **subconcepts**, you want to select for the spreadsheet.



4. Click **Match** to write all selected concepts to the target column on the spreadsheet. The **Search Results** window remains displayed, allowing you to select additional concepts.

Click **Match** again to write these additional concepts to the spreadsheet.

Click **Close** to close the window and view the concepts you selected on the spreadsheet.

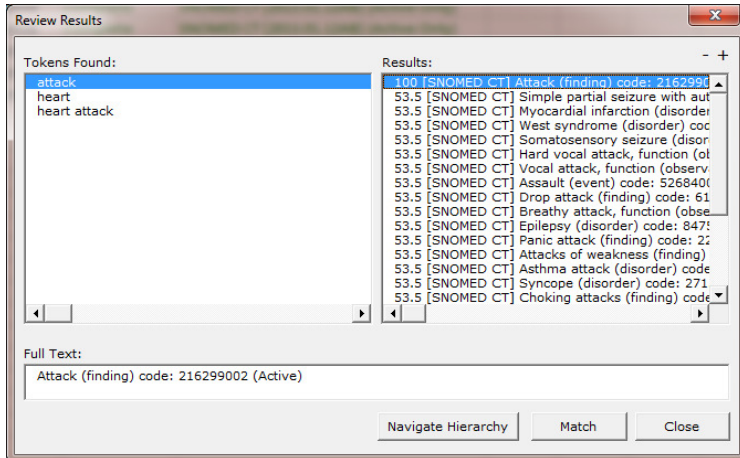
	A	B	C	D	E	F	G
1	heart attack	22298006	SNOMED CT	Myocardial infarction (disorder)	Active	Complete	SNOMED CT [2013.01.12AB] (Active Only)
2	heart attack	11849007	SNOMED CT	Atrioventricular junctional rhythm (disorder)	Active	Complete	SNOMED CT [2013.01.12AB] (Active Only)
3	heart attack	233917008	SNOMED CT	Atrioventricular block (disorder)	Active	Complete	SNOMED CT [2013.01.12AB] (Active Only)
4	heart attack	405547004	SNOMED CT	Abscess of myocardium (disorder)	Active	Complete	SNOMED CT [2013.01.12AB] (Active Only)
5	heart attack	56265001	SNOMED CT	Heart disease (disorder)	Active	Complete	SNOMED CT [2013.01.12AB] (Active Only)
6	heart attack	57809008	SNOMED CT	Myocardial disease (disorder)	Active	Complete	SNOMED CT [2013.01.12AB] (Active Only)

C.8 Contained Concepts Search

Using the search term string **heart attack**, results like the following may be returned if you selected the **Contained Concepts Search** option on the **Search Options** window. Note that you cannot specify [Query Syntax Operators](#) when you perform **Contained Concepts Searches**.



1. The search string was divided into **tokens**, which are listed in the **Tokens Found** (left) panel. Each search for a separate token produced a separate set of results. The results for each individual token display in the **Results** (right) panel when you highlight the token. Note the displayed results for the token **attack**.



The complete name of the concept displays in the **Full Text** field when you highlight it.

2. Click the *Expand* button (+) in the upper-right corner of the window to widen both panels in the **Review Results** window.
3. Click the *Contract* button (-) in the upper-right corner of the window to return the window to its original size.
4. To view **superconcepts** and **subconcepts** for a returned concept, click *Navigate Hierarchy* to display the **Concept Navigator** window. Click *Close* to exit the **Review Results** window without selecting a concept.
5. To select concepts from the **Review Results** window to write to the spreadsheet, use the standard *Windows* selection procedures to highlight the concepts you want. Click *Match* to write the selected concept(s) to the target column on the spreadsheet. The **Review Results** window remains displayed, allowing you to select additional concepts. Click *Match* to write these additional concepts to the spreadsheet.
6. Click *Close* on the **Review Results** window to exit the window and view the concepts you selected on the spreadsheet.

	A	B	C	D	E	F	G
1	heart attack						
2	heart attack	216299002	SNOMED CT	Attack (finding)	Active	Complete	SNOMED CT [2013.01.12AB] (Active Only)

7. The concept selected from the **Review Results** window is listed in **column D**. The search text **token (attack)** for which the returned concept was selected is highlighted to distinguish it from the original search term (**heart attack**).

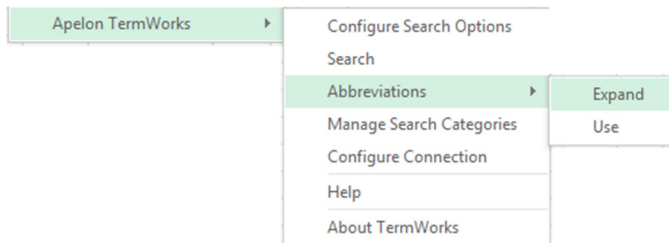
C.9 Expand Abbreviations in a Search String

If no results are returned from a search, it may be because the search term string you entered contained an abbreviation that could not be matched using the search criteria you specified. In the illustration below, a search was performed for a term string that contains the abbreviation **CAP**, and no matches were returned.

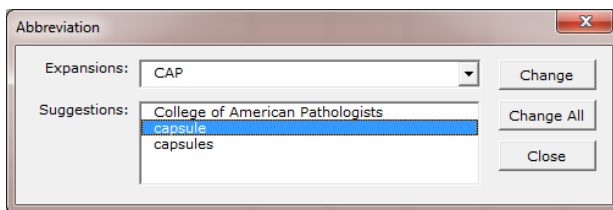
	A	B	C	D	E	F	G
1	asprin CAP					No Match	SNOMED CT [2013.01.12AB] (Active Only)

The **Expand Abbreviations** option allows you to search the selected data source index for complete words that could be represented by the abbreviation. You then can select from the results, expand the abbreviation in the search term, and perform another search against the revised (i.e., expanded) search term string.

1. Right-click on the cell(s) containing search term(s) with the abbreviation(s). On the resulting displayed menu, click **Apelon TermWorks** to display a submenu of options.



Click **Abbreviations**, then click **Expand**. The **Abbreviation** window displays.

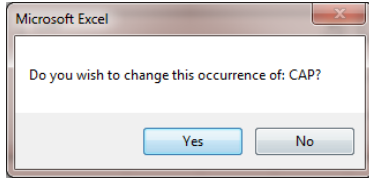


2. Select the abbreviation to be expanded in the **Expansions** field. The **Suggestions** field below it lists all possible matches for the abbreviation that included in TermWorks' abbreviation list.

Click on the desired expanded word(s) to highlight it.

Click **Close** to exit the window without selecting an expanded term for the spreadsheet.

3. To write the selected suggestion to the spreadsheet for the specific, selected occurrence of the abbreviation only, click **Change**. A confirmation window displays.



Click **Yes** to replace the abbreviated word with the expanded word(s) you selected. On the spreadsheet, the abbreviated word in the search term string is replaced with the complete word you just selected.

	A	B	C	D	E	F	G
1	asprin capsule					No Match	SNOMED CT [2013.01.12AB] (Active Only)

You now can perform a new search using the expanded term as the search string.

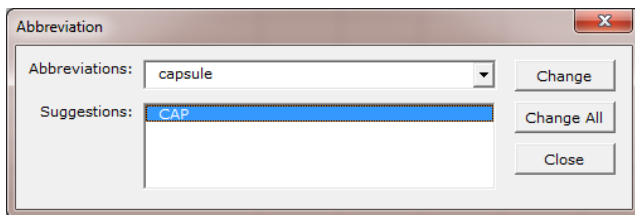
4. If you selected a **range of terms** to search, and desire to change an abbreviated word that is included in multiple cells, click **Change All** on the **Abbreviations** window. All of the abbreviated terms on the spreadsheet in the selected range are replaced with the complete word you selected.

C.10 Use Abbreviations in a Search String

The function the **Use Abbreviations** option performs is essentially the opposite of that performed by the **Expand Abbreviations** function.

Some concepts in a data source index may use abbreviations. In these instances you can choose the **Use Abbreviations** function to replace **completed search string words** with a manually selected abbreviation.

1. Right-click on the cell(s) containing the search term with the completed word or phrase you want to replace with an abbreviation. On the resulting displayed menu, click **Apelon TermWorks** to display a submenu of options.
2. Click **Abbreviations**, then click **Use**. The **Abbreviation** window displays, pictured below.



3. The term for which you want to search for abbreviations displays in the **Abbreviations** field. The **Suggestions** field directly below lists all possible abbreviations for the **search term string** that can be returned from the selected data source index. Click on the desired abbreviation to highlight it (in this illustration, the returned abbreviation match, **CAP**, displays).

Click *Close* to exit the window without selecting an abbreviation for the spreadsheet.

- To write the selected abbreviation to the spreadsheet, click *Change*. When the confirmation window appears, click *Yes* to replace the complete word with the abbreviation(s) selected. On the spreadsheet, the original, complete search word is replaced with the abbreviation you just selected.

	A	B	C	D	E	F	G
1	asprin CAP						

- If you selected a **range of terms** to search, and you want to change the complete word with the abbreviation in more than one of the search strings in the range, click *Change All* on the **Abbreviations** window. The complete word is replaced with the abbreviation in all of the search strings within the selected range. You now can perform a new search using search strings that include the abbreviation.

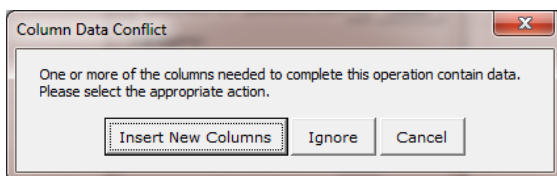
C.11 Custom Abbreviations and Expansions

The previous sections discussed searches for which the *Expand Abbreviation* and *Use Abbreviation* options were used with a pre-defined set of **Suggestions**, either abbreviation expansions (i.e., complete words strings represented by an abbreviation) or abbreviations (i.e., acronyms or condensed versions of complete word strings). These **Suggestions** are included as part of the TermWorks installation.

You have the option to create your own set of abbreviations and their corresponding expansions, which will be listed as suggestions **in addition to** those that were pre-defined for TermWorks. Refer to the *Create a Custom Abbreviations and Expansions File* discussion in the *TermWorks Administration Guide* for instructions on creating a customized list of abbreviations and expansions.

C.12 Target Column Data Conflicts

If you specify a search results target column that already is populated with data (e.g., results from an earlier search) on the **Search Options** window, the **Column Data Conflict** window displays to indicate the conflict.



At this point you have the option to insert **six** new columns to write the search results. Six pieces of information are written to the spreadsheet for each concept you select from either the **Search Results** or **Review Results** window: **concept code, data source index, concept name, concept status, search status and namespace version**.

Click *Insert New Columns* if you want the search results written to **six newly inserted columns** on the spreadsheet. For example, if the *Target Column* was **F**, six new columns would be

inserted, starting at column **F**, to accommodate the results of the current search. All previous spreadsheet text would be **offset to the right by six columns**.

If you click **Ignore**, the existing results in the populated column(s) will be overwritten. Select **Cancel** to go back to the previous window and select a different **Target Column**.

C.13 Search Categories

For searches of Ontylog-based data sources, and also for searches of Thesaurus-based data sources that include “**parent of**” associations, TermWorks allows you to create and maintain one or more of your own **search categories**. Each search category represents one or more subsets of concepts from a specific data source index; each subset in the category is represented by a parent concept. Search categories allow you to search against these data source index subsets, rather than against an entire data source index.

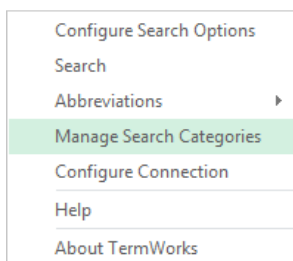
When you create a search category, you can select one or more parent concepts (**superconcepts**) within a specific data source index to populate the category. All child concepts (**subconcepts**) of the parent are therefore represented in the category.

For example, if you create a category for the parent concept **Oral Ibuprofen**, all of the children of **Oral Ibuprofen** are thereafter represented in the category (the parent concept itself is **not** represented in the category). You can create another category for the parent concept **Topical Ibuprofen**; all of the children of **Topical Ibuprofen** are thereafter represented in the category (again, the parent concept, **Topical Ibuprofen**, is **not** represented in the category). You also can create a single category called **Ibuprofen**, which consists of the subconcepts of **both** parent the concepts **Oral Ibuprofen** and **Topical Ibuprofen**.

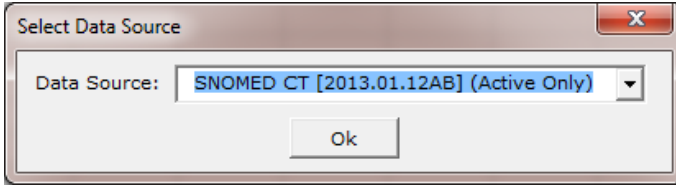
When you perform a search against a category, matches are attempted against all child concepts of the parent concept(s) that populate the category. Only matching **subconcepts** of those parent concepts in the category are returned for your review. You may then select which returned concepts to write to the spreadsheet.

C.13.1 Create a Search Category

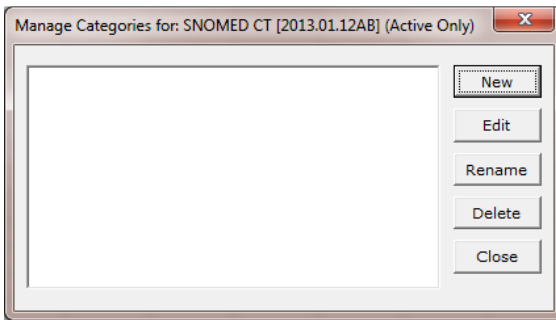
1. Click **Manage Search Categories** on the **Apelon TermWorks** menu.



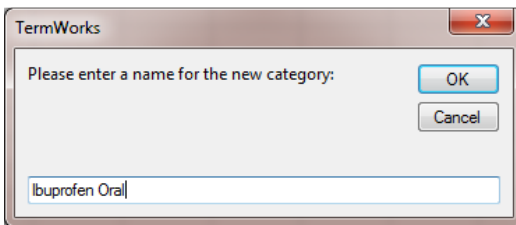
2. From the **Data Source** dropdown field list, select the data source for which you want to create the new category, then click **Ok**



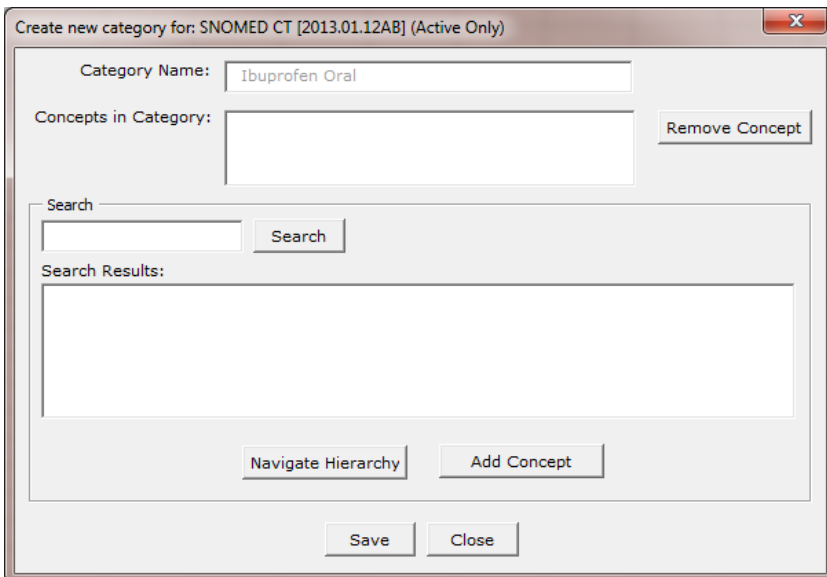
3. The **Manage Categories** window appears. If any categories exist in the selected data source index, these are listed. To create a new category, click *New*.



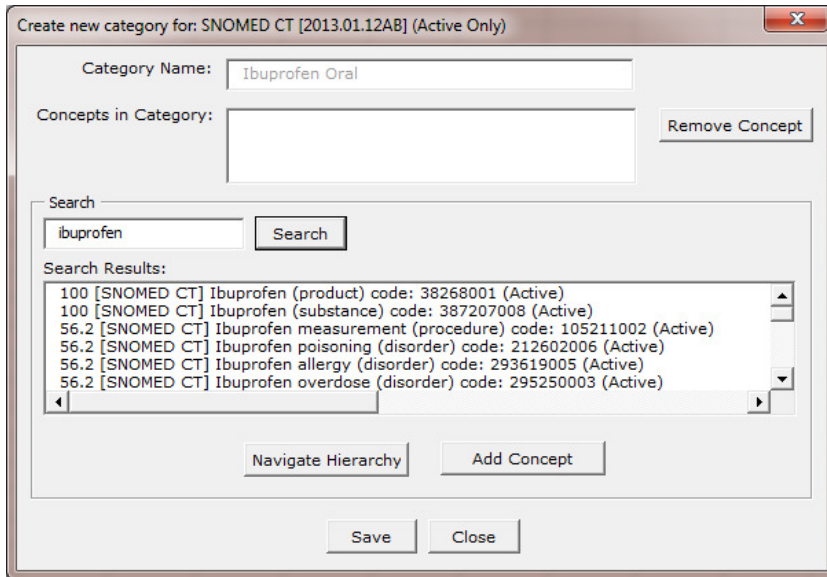
4. Enter a name for the new category, then click *OK*.



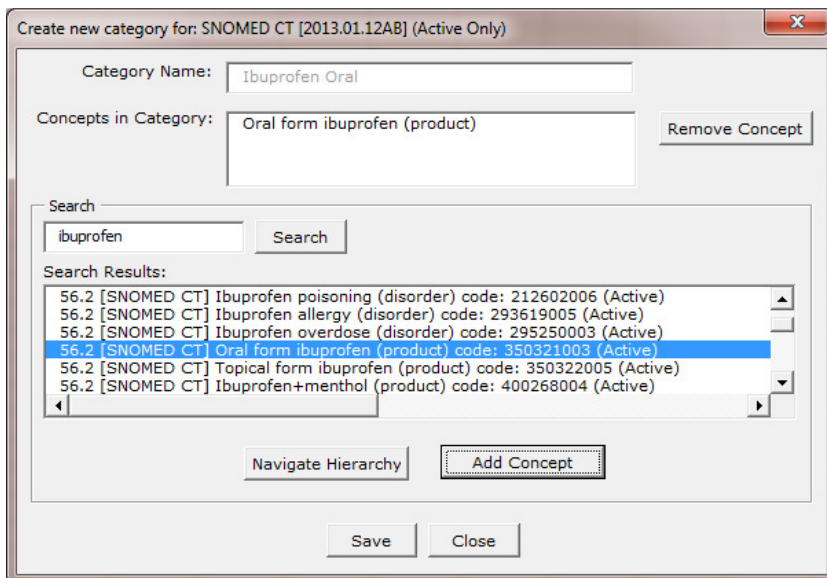
5. The **Create New Category** window appears. Note that the new category you specified displays in the *Category Name* field.



- At this step, you may search the selected **data source index** for parent concepts to populate the new category. In the **Search** field, specify the **search term string** (e.g., **ibuprofen**), then click **Search**. Matching concepts from the data source index are returned from the search and displayed in the **Search Results** area.

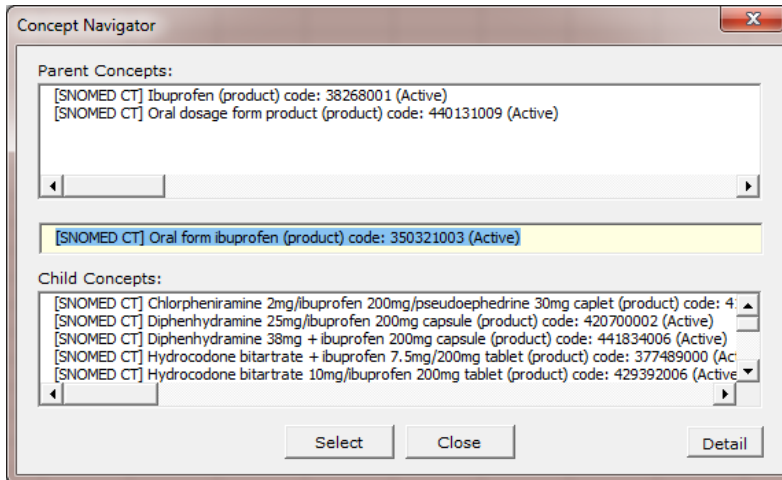


To add one of the returned concepts to the new category, click on the concept to highlight it, then click **Add Concept**. The concept displays in the **Concepts in Category** area.



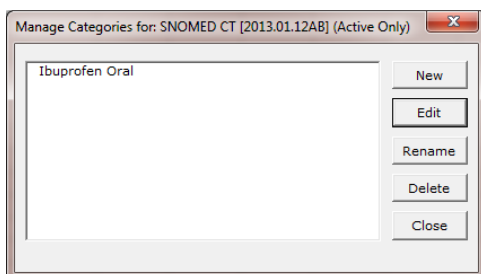
- You may continue selecting concepts for the category by clicking on each concept in the **Search Results** area to highlight it, then clicking **Add Concept**. Each concept you select displays in the **Concepts in Category** area above the search results. When you perform searches within this category, matches will be attempted only against **subconcepts** of these selected parent concepts.

8. To add additional concepts from the same data source index but based on a different search term, enter the new search term string in the **Search** area, then click **Search**. When the matching concepts returned display in the **Search Results** area, click on each desired concept to highlight it. Then click **Add Concept** to move the concept to the **Concepts in Category** area.
9. For any concept returned from the search (i.e., listed in the **Search Results** area) to populate a category, you can select **Navigate Hierarchy** to list the concept's **superconcepts** and **subconcepts**.



To select a listed **superconcept** or **subconcept**, click **Select** to add the term to the category (refer to the earlier discussion pertaining to the [Concept Navigator](#) window). Click **Close** to exit the window without selecting a **superconcept** or **subconcept** for the category.

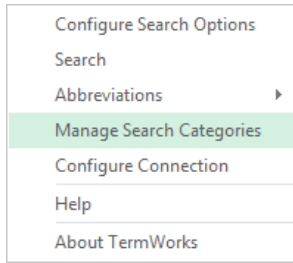
10. When the **Create new category** window displays again, click **Save**. The following window displays, indicating the new category has been created.



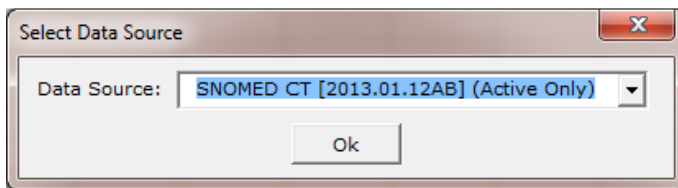
Click **Close** to exit the window.

C.13.2 Edit an Existing Search Category

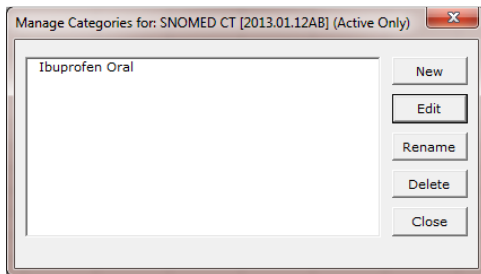
1. Click **Manage Search Categories** on the **Apelon TermWorks** menu.



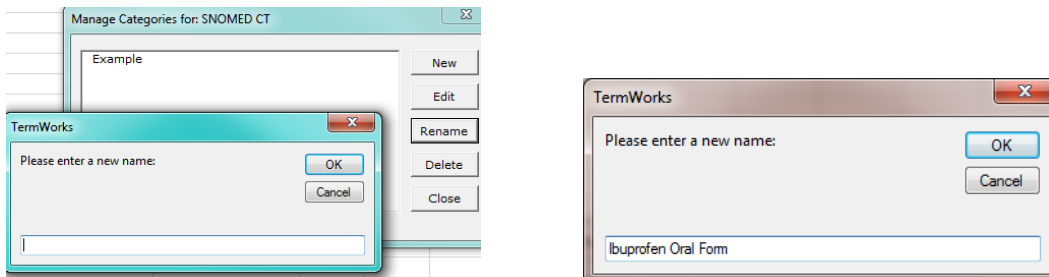
2. Select the **Data Source** you wish to use when editing an established category, then click **Ok**.



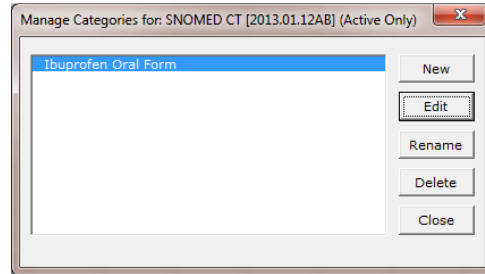
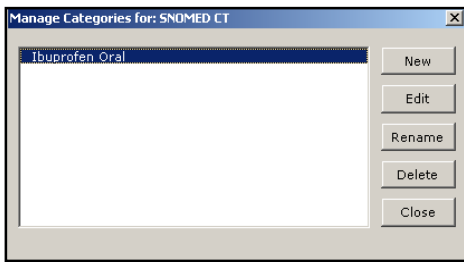
3. The **Manage Categories** window appears.



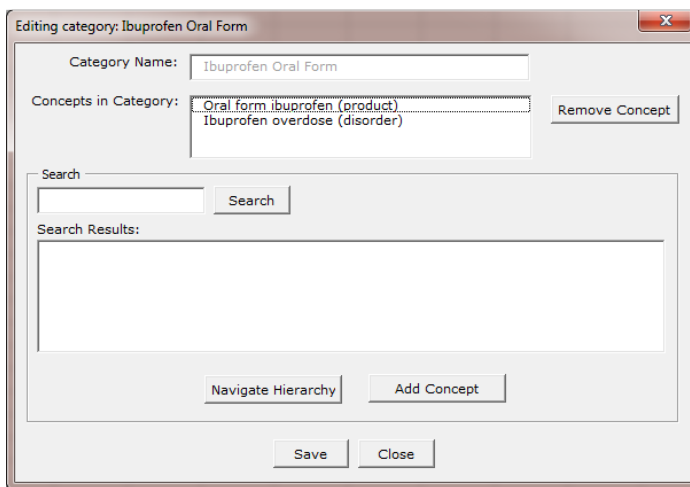
4. To rename the category, click on the desired category (to highlight it), and then click **Rename**. Enter the new category name, then click **OK** to complete the change.



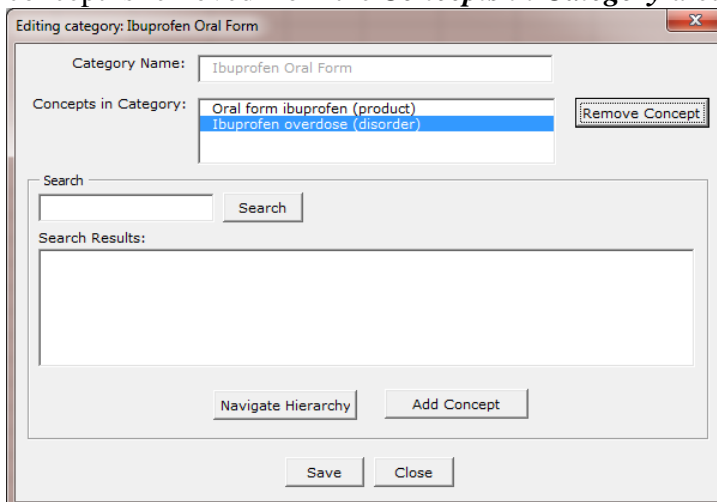
- To edit the (parent) concepts that populate a category, click on the category to highlight it, then click *Edit*.



The **Editing category** window displays.



- To remove one or more concepts from the category, click on each concept listed in the *Concepts in Category* area to highlight it, then click *Remove Concept*. The selected concept is removed from the *Concepts in Category* area.



To add concepts to the existing category, refer to the steps for [Add Concepts](#) to populate a new category (discussed earlier in this section).

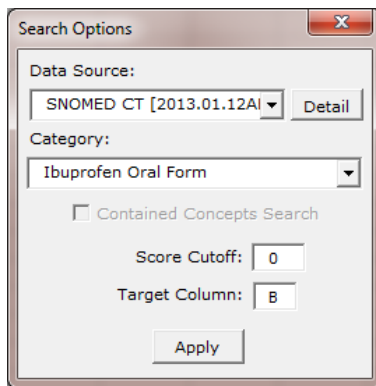
- Click **Save** to update these edits into the category. To disregard these category edits, click **Close** to exit the window.

C.13.3 Search in an Existing Category

- Open *Microsoft Excel* from your **Start** menu or from a shortcut.
- Select **Configure Search Options** from the **Apelon TermWorks** submenu. The **Search Options** window displays.

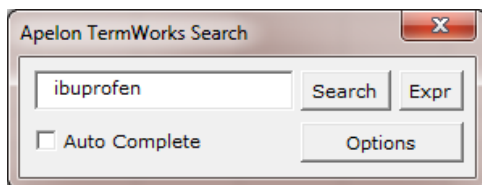
In the **Data Source** dropdown field, select the data source index from which you selected concepts to populate the category that will be searched, then designate the spreadsheet **Target Column** where results will be listed. If needed, establish a concept match accuracy threshold as a percentage value in the **Score Cutoff** field.

- In the **Category** dropdown field, each category that was populated from the data source index you selected in the **Data Source** field (**SNOMED CT** in this case) is listed. If no categories were created for the selected data source index, 'None' displays in the **Category** field list.

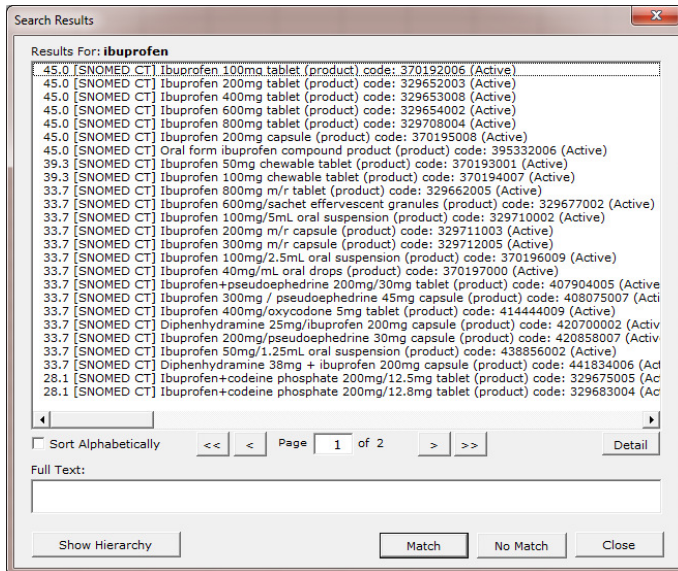


Click on the desired category to select it; **Ibuprofen Oral Form** is the category selected for search in the illustration above. Click **Apply** to search the category **Ibuprofen Oral Form** for concept matches.

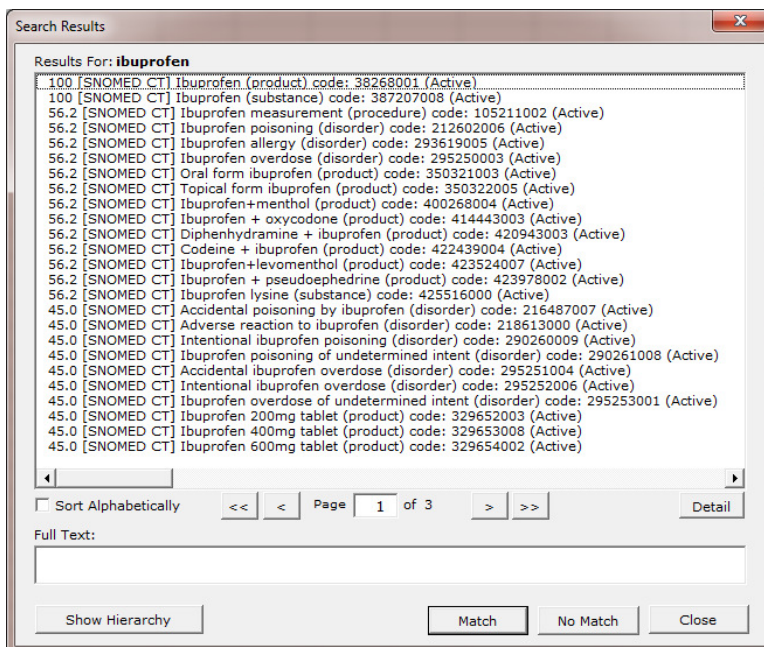
- Enter your search term (e.g., **ibuprofen**) in an empty cell
- Right-click on the cell that contains your search term string. On the resulting displayed menu, click **Apelon TermWorks** to display the submenu options, then click **Search**. The **Apelon TermWorks Search** window displays (referencing your search term string).



- Click **Search**. In the following illustration, only subconcepts of the parent concept **Oral form ibuprofen (product)** were returned from the search on the **Search Results** window. **Oral form ibuprofen (product)** was the only concept selected for the category **Ibuprofen Oral** in this example.



As a comparison, note the match results when no category was selected for the search. The entire data source index was searched for **ibuprofen**, returning a higher quantity of results, with matches being of a more general nature.



- Use the standard *Windows* selection procedures to highlight those concepts listed on the **Search Results** window that you want to select for the spreadsheet.

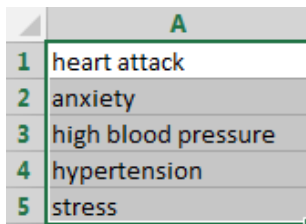
Click **Match** to write all selected concepts to the target column on the spreadsheet. The **Search Results** window remains displayed so you can select additional concepts (click **Match** to write additional concepts to the spreadsheet).

Click **Close** to close the **Search Results** window and view the concepts you selected on the spreadsheet.

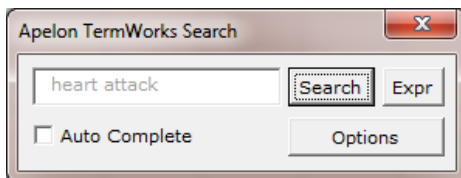
C.14 Search For Data Source Index Matches Against a Range of Terms

Follow this procedure to use **Apelon TermWorks** to perform a search of the data source index for concept names and synonymous terms that match an **entire range** of search terms. Even though the search is performed on a range of terms, returned results are listed for **each individual search string term** based on your search parameters.

1. Configure your search options as described in [Configure Search Options](#).
2. Enter your search terms in a single column.
3. Select and highlight the block of cells for which you want to perform the search.



From the **Apelon TermWorks** menu, select **Search**.



From this window you can select and display the options for matching the search string to concept names and/or synonymous terms in a selected data source index. The first search term string in the highlighted range (in this illustration, **heart attack**) displays automatically in the **Search Term** field.

TermWorks performs searches for concept **names** and/or **synonymous terms** that include one or more of the words (i.e., **tokens**) in each search string. Matches to concept names or synonymous terms in the selected data source index are attempted initially against the **entire** search string.

If matches are found against the **entire** search string, the search terminates and these resulting matches are the only ones returned. If no matches are found against the entire

string, matches then are attempted against **combinations** of search tokens, then on **individual** tokens.

4. When you activate the *Auto Complete* feature, in addition to returning a list of matched concepts from the search, the concept that represents the **best match** is written to the spreadsheet for the selected search term string(s). Check the *Auto Complete* field checkbox to activate the feature. Refer to the [Auto Complete](#) discussion later in the guide.
5. You have the option of enhancing your search through the use of a **search expression**, which you can specify after you click the *Expr* button. A search expression designates criteria for the search in addition to the text strings you entered. Refer to the [Search Expressions](#) discussion later in the guide.
6. Click *Search* to begin searching the selected data source index.

C.14.1 Search Results For a Range of Terms

Based on your search parameters, search results are written directly to comment pop-ups on the Excel spreadsheet. You then can select which returned concepts should be written to the spreadsheet. Using the search term range in the previous illustrations, results like the following may be returned.

	A	B	C	D	E	F	G
1	heart attack					Needs Review	SNOMED CT [2013.01.12AB] (Active Only)
2	anxiety					Needs Review	SNOMED CT [2013.01.12AB] (Active Only)
3	high blood pressure					Needs Review	SNOMED CT [2013.01.12AB] (Active Only)
4	hypertension					Needs Review	SNOMED CT [2013.01.12AB] (Active Only)
5	stress					Needs Review	SNOMED CT [2013.01.12AB] (Active Only)

Each search term in the range is highlighted in **blue** to indicate that a range search was performed and completed. The data source name (**SNOMED CT [2013.01.12AB] (Active Only)**) also is highlighted in blue.

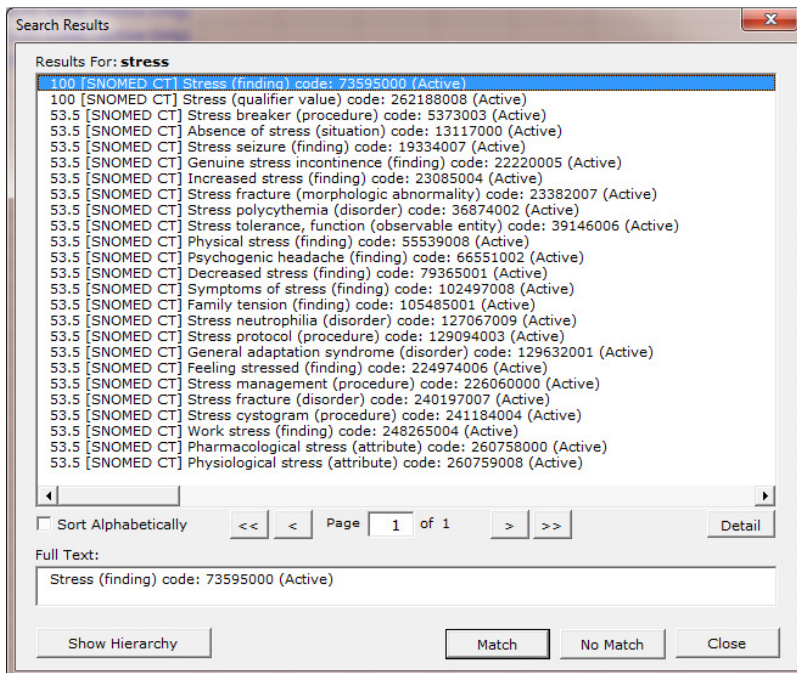
Needs Review displays in blue for each search term to indicate that one or more matched concepts were returned from the search, and that you must review the results that were returned for each search string. From these results, you can select those concepts you want written to the spreadsheet.

To review the search results for a search term, position the pointer above the small red triangle in the upper-right corner of the cell where the search string is listed. A pop-up displays listing the concepts returned from the search. Note the illustration.

	A	B	C	D	E	F	G
1	heart attack					Needs Review	SNOMED CT [2013.01.12AB] (Active Only)
2	anxiety					Needs Review	SNOMED CT [2013.01.12AB] (Active Only)
3	high blood pressure					Needs Review	SNOMED CT [2013.01.12AB] (Active Only)
4	hypertension					Needs Review	SNOMED CT [2013.01.12AB] (Active Only)
5	stress					Needs Review	SNOMED CT [2013.01.12AB] (Active Only)
6							
7							
8							
9							
10							





Note: Do not modify the search results listed in a cell’s pop-up display comment; this may compromise the accuracy of subsequent searches on the search string in that cell. It also may cause TermWorks to report an error in doing a search if the spreadsheet is protected when you double-click on that cell.

Double-click on a search term (e.g., **stress**) to display the list of returned concepts on the **Search Results** window, where you can select one or more concepts for the spreadsheet.

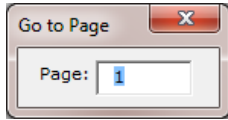


The complete description of the concept displays in the **Full Text** field when you highlight each concept.

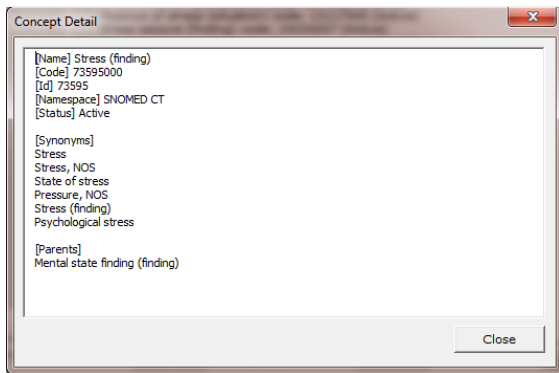
If the results require more than one page to display, you can scroll backward and forward through the list using the **Arrow** keys, or the **Page Forward** and **Page Backward** keys.

Use the **Paging Buttons** ( and ) to move forward and backward through the results list a page at a time. Click the  button to return to the first page of the results list, or the  button to advance to the last page of the list.

To display a specific page of the results list, use the keyboard combination **CTRL + G**. The following window displays.



Specify the desired page number, then press **RETURN** to display that page. To view details for any concept listed in the **Search Results** window, click the concept to highlight it, then click **Details**.



For the concept you selected, the **Concept Detail** window indicates the concept **Name**, **Code**, **ID**, and **source Namespace**. In addition, the concept **Synonym** (if any), **Parent** concept in the namespace hierarchy (if any), and concept **Properties** (if any) are provided.

Click **Close** when you are finished viewing concept details.

On the **Search Results** window, use the standard *Windows* selection procedures to select the desired concepts. Click **Match** to write the selected concepts to the spreadsheet target column. The **Search Results** window remains displayed, allowing you to select additional concepts. Click **Match** to write these additional concepts to the spreadsheet).

Click **Close** to close the **Search Results** window and view the concepts you matched.

	A	B	C	D	E	F	G
1	heart attack					Needs Review	SNOMED CT [2013.01.12AB] (Active Only)
2	anxiety					Needs Review	SNOMED CT [2013.01.12AB] (Active Only)
3	high blood pressure					Needs Review	SNOMED CT [2013.01.12AB] (Active Only)
4	hypertension					Needs Review	SNOMED CT [2013.01.12AB] (Active Only)
5	stress	73595000	SNOMED CT	Stress (finding)	Active	Complete	SNOMED CT [2013.01.12AB] (Active Only)

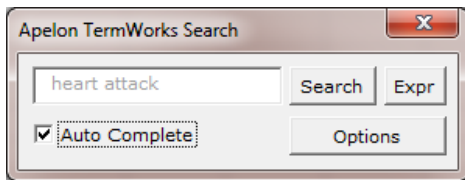
The concept you matched from the **Search Results** window are marked **Complete** (in green). This indicates that a search was performed, and that you selected matched concepts from the returned results.

C.15 Auto Complete

You can activate **Auto Complete** for a data source index search against a **single** search string term, or against your selected **range** of search string terms. In addition to returning a list of results for each term on which you search, the returned concept that represents the **best match** is written to the spreadsheet.

The discussion that follows illustrates a search performed on a **range** of search string terms. Refer to the [Search For Vocabulary Matches Against a Range of Terms](#) discussion for procedures on entering the criteria for a range search.

When entering your search criteria on the **Apelon TermWorks Search** window, click the **Auto Complete** checkbox.



Search results are written to the spreadsheet in a manner similar to listing of results for a regular range search.

	A	B	C	D	E	F	G
1	heart attack	22298006	SNOMED CT	Myocardial infarction (disorder)	Active	Auto-Complete	SNOMED CT [2013.01.12AB] (Active Only)
2	anxiety	48694002	SNOMED CT	Anxiety (finding)	Active	Auto-Complete	SNOMED CT [2013.01.12AB] (Active Only)
3	high blood pressure	38341003	SNOMED CT	Hypertensive disorder, systemic arterial (disorder)	Active	Auto-Complete	SNOMED CT [2013.01.12AB] (Active Only)
4	hypertension	38341003	SNOMED CT	Hypertensive disorder, systemic arterial (disorder)	Active	Auto-Complete	SNOMED CT [2013.01.12AB] (Active Only)
5	stress	73595000	SNOMED CT	Stress (finding)	Active	Auto-Complete	SNOMED CT [2013.01.12AB] (Active Only)

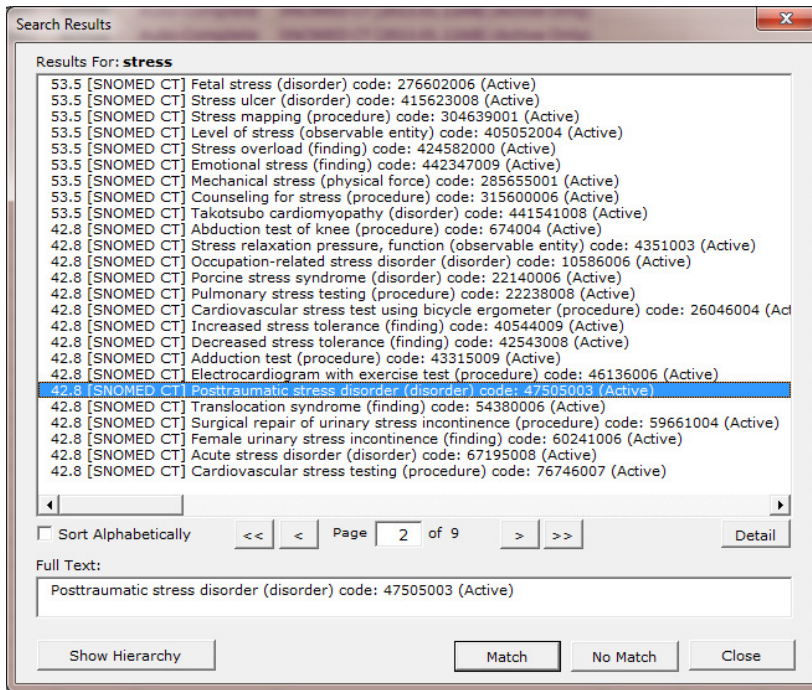
Auto Complete displays for each search term to indicate that one or more matched concepts were returned from the search, and that the best match was selected for each search term. To review all search results for each search term, position the pointer above the small red triangle in the upper-right corner of the cell where the search string is listed. A pop-up displays listing the concepts returned from the search. Note the illustration.

	A	B	C	D	E	F	G
1	heart attack	22298006	SNOMED CT	Myocardial infarction (disorder)	Active	Auto-Complete	SNOMED CT [2013.01.12AB] (Active Only)
2	anxiety	48694002	SNOMED CT	Anxiety (finding)	Active	Auto-Complete	SNOMED CT [2013.01.12AB] (Active Only)
3	high blood pressure	38341003	SNOMED CT	Hypertensive disorder, systemic arterial (disorder)	Active	Auto-Complete	SNOMED CT [2013.01.12AB] (Active Only)
4	hypertension	38341003	SNOMED CT	Hypertensive disorder, systemic arterial (disorder)	Active	Auto-Complete	SNOMED CT [2013.01.12AB] (Active Only)
5	stress	100 [SNOMED CT] Stress (finding) code: 73595000 (Active)			Active	Auto-Complete	SNOMED CT [2013.01.12AB] (Active Only)
6		100 [SNOMED CT] Stress (qualifier value) code: 262188008 (Active)					
7		53.5 [SNOMED CT] Stress breaker (procedure) code: 5373003 (Active)					
8		53.5 [SNOMED CT] Absence of stress (situation) code: 13117000 (Active)					
9		53.5 [SNOMED CT] Stress seizure (finding) code: 19334007 (Active)					
10		53.5 [SNOMED CT] Stress termination (finding) code: 19334007 (Active)					

Note: Do not modify the search results listed in a cell's pop-up display comment; this may compromise the accuracy of subsequent searches on the search string in that

cell. It also may cause TermWorks to report an error in doing a search if the spreadsheet is protected when you double-click on that cell.

Double-click on a search term (e.g., **stress**) to display all returned concepts on the **Search Results** window, where you can select one or more of the concepts to be written to the spreadsheet.



The complete description of the concept displays in the **Full Text** field when you highlight each concept. If the results require more than one page to display, you can scroll backward and forward through the list using the **Arrow** keys, or the **Page Up** and **Page Down** keys.

Use the standard *Windows* selection procedures to select the desired concepts. Click **Match** to write the selected concepts to the spreadsheet target column. The **Search Results** window remains displayed, allowing you to select additional concepts. Click **Match** to write these additional concepts to the spreadsheet.

Click **Close** to close the **Search Results** window and view the concepts you selected on the spreadsheet. Note the illustration.

	A	B	C	D	E	F	G
1	heart attack	22298006	SNOMED CT	Myocardial infarction (disorder)	Active	Auto-Complete	SNOMED CT [2013.01.12AB] (Active Only)
2	anxiety	48694002	SNOMED CT	Anxiety (finding)	Active	Auto-Complete	SNOMED CT [2013.01.12AB] (Active Only)
3	high blood pressure	38341003	SNOMED CT	Hypertensive disorder, systemic arterial (disorder)	Active	Auto-Complete	SNOMED CT [2013.01.12AB] (Active Only)
4	hypertension	38341003	SNOMED CT	Hypertensive disorder, systemic arterial (disorder)	Active	Auto-Complete	SNOMED CT [2013.01.12AB] (Active Only)
5	stress	73595000	SNOMED CT	Stress (finding)	Active	Complete	SNOMED CT [2013.01.12AB] (Active Only)
6	stress	47505003	SNOMED CT	Posttraumatic stress disorder (disorder)	Active	Complete	SNOMED CT [2013.01.12AB] (Active Only)

The concepts you selected from the *Search Results* window are marked **Complete** (in green). This indicates that a search was performed, and that you selected matched concepts from the returned results.

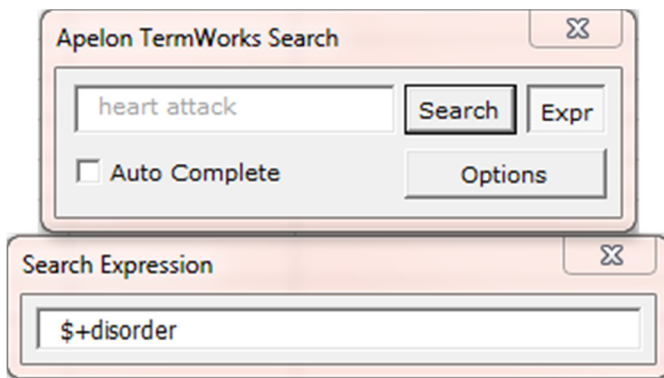
C.16 Search Expressions

You can enhance your search of a range of terms through the use of a **search expression**. A search expression is comprised of one or more Query Syntax Operators, each of which sets a parameter for performing the search of the term range (refer to the discussions of Query Syntax Operators earlier in the guide). You can specify a different search expression each time you select a different search term range on the spreadsheet.

In the following example, a range of terms is selected for search.

	A
1	heart attack
2	syncope
3	hypertension

You can enter a search expression to modify the search parameters for all terms in the search range. When the Apelon TermWorks Search window displays, click the *Expr* button to show the Search Expression window.



The Query Syntax Operators you include in the expression determine if the range of terms search will be more specific or more general.

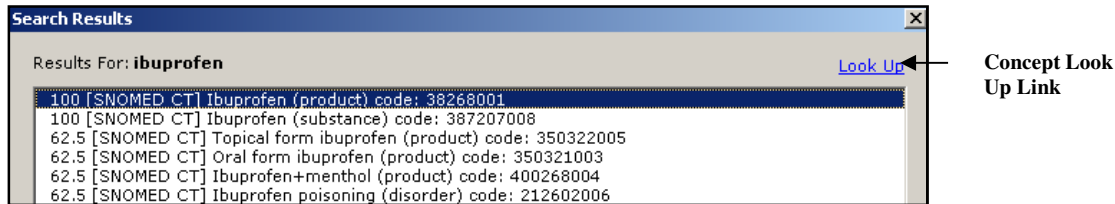
In this example, we use the **inclusive** operator indicates that if the portion of the search string after the **\$+** syntax (i.e., **disorder**) exists in the concept name or synonym, it will be retrieved from the data source index.

This is the equivalent of appending **\$+disorder** to each search term in the selected range. You can change the Query Syntax Operators in subsequent search expressions to produce different results.

Click the *Expr* button again to hide the Search Expression window.

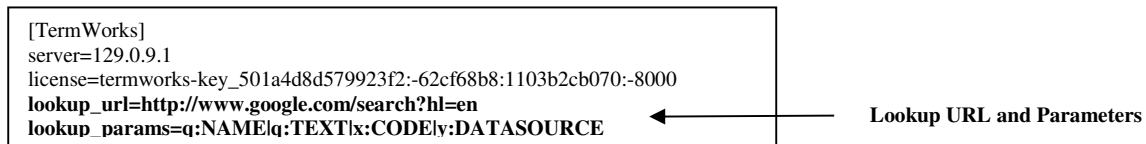
C.17 Concept Look Up

A **Look Up** feature is available on the **Search Results**, **Concept Navigator**, and **Review Results** windows. Use this link to select any listed concept returned from a search, then perform a separate search for that concept (and for the search string on which the search was based) using the search engine or browser tool of your choice. Note the Look Up link that is illustrated.



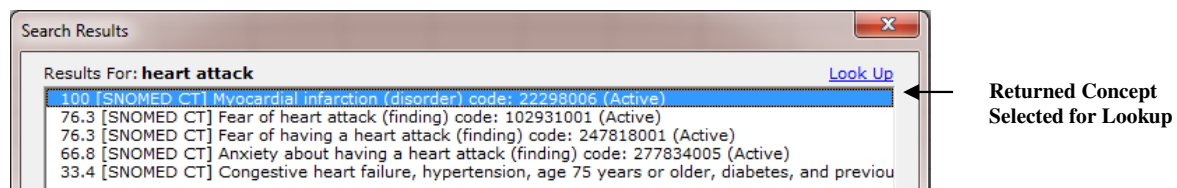
In order to use the **Look Up** feature, you must define the URL for the search tool to which the Look Up link will connect you. You also may define added parameters on which the lookup can be based. You define these values in the **TermWorks.ini** file, typically found in **Documents and Settings\[yourname]\Application Data\Microsoft\AddIns**.

The TermWorks.ini file is included with your TermWorks installation, and contains server and license settings for the application. Use your preferred editor to add the **lookup URL** and **lookup parameter** values in the TermWorks.ini to reflect the search tool and parameters for your lookups, then save the changes to the TermWorks.ini file. If you have an Excel session active, you must restart Excel to activate these changes.

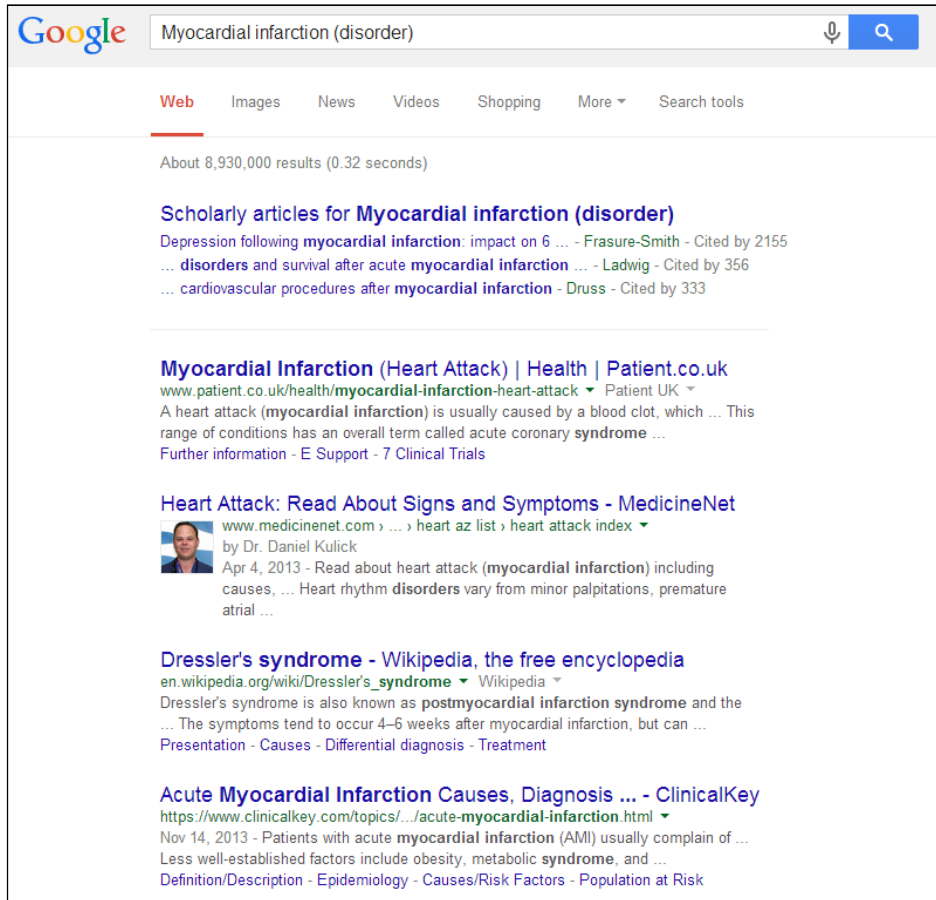


The illustrated URL value is for a lookup in **Google**. The defined parameters indicate that the lookup is for the concept name, text, concept code, and data source

As an example, assume you want to define a lookup for the concept **Myocardial infarction**, retrieved from a **SNOMED CT** data source index and listed in the *Search Results* window.



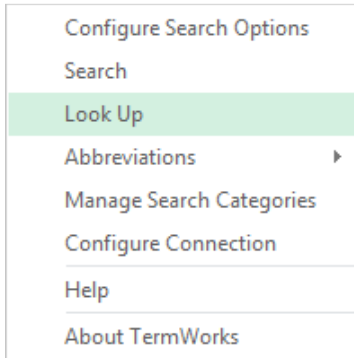
Based on the lookup values in the TermWorks.ini file example illustrated, a connection would be made when you click the **Look Up** link on the **Search Results**, **Concept Navigator**, or **Review Results** window. Results such as the following would be returned.



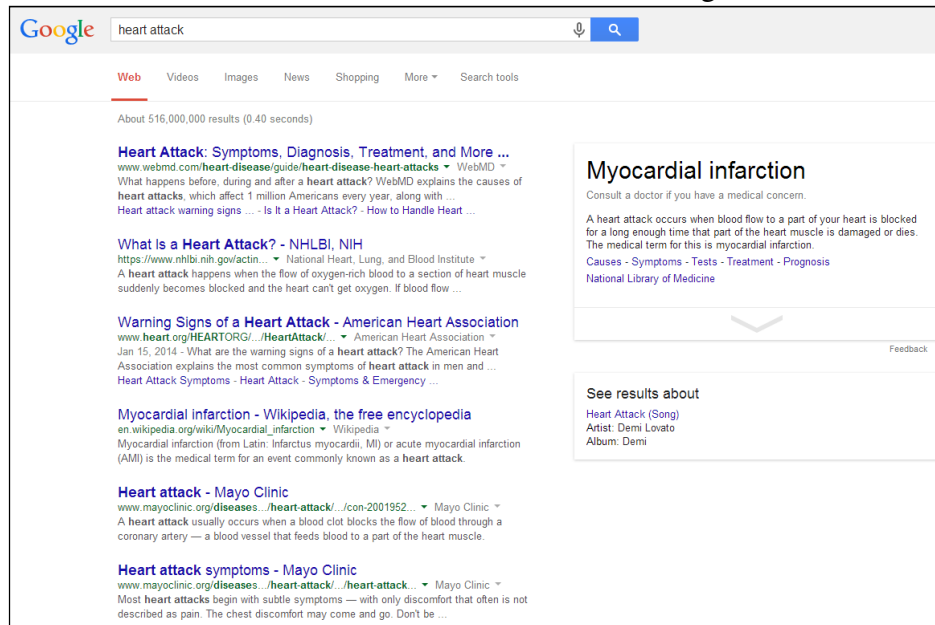
Note that the Google search is for the concept **Myocardial Infarction (disorder)** listed in the **Search Results** window. The concept code and data source are referenced in each returned item, in accordance with the lookup configuration in the TermWorks.ini file.

You can modify the lookup URL and lookup parameter values as needed in the TermWorks.ini file to return alternate lookup results.

To perform a lookup for a search string displayed in a spreadsheet cell, select **Look Up** from the **Apelon TermWorks** submenu, or from the **Apelon TermWorks** main menu.



Based on the TermWorks.ini file settings illustrated earlier, the Google search for the text string **heart attack** would return results such as the following.



D. Appendix A – Frequently Asked TermWorks Questions

D.1 How is TermWorks Search Match Result Scoring Determined?

- In a selected data source index, TermWorks attempts to **normalize** each term by means of **stemming**, as well as other means of converting regular and irregular word variants, to a **single base form**.
 - Example: The terms **running**, **ran**, or **runs** each would be normalized to **run**
 - This stemming and normalization process allows TermWorks to provide relevant results for various word forms

- The default query operator is **AND**, so the search for **Heart Attack** will attempt to find all concepts that contain the words Heart **AND** Attack
 - If no concepts are found that contain both terms, TermWorks will automatically execute the same search again using an **OR** operator, (i.e. find all concepts that contain Heart **OR** Attack)
 - Unless specified in the query, the order of the occurrence of the terms within a concept is not relevant

- When results are found, TermWorks then ranks the results using a modified version of a **Vector Space Model**
 - This model attempts to calculate the similarity between the query passed in, and the concepts contained in the index
 - Terms that occur less frequently throughout the index are assigned a higher relevance than terms that appear more frequently
 - Matched concepts are scored from 0 to 100. A score of 100 generally indicates a near-perfect match.
 - When multiple concepts are tied for the top score, the top scoring results are sorted by the length of the concept name, excluding any part of the name in parentheses, in ascending order.
 - Imposing word order constraints using quotes within searches can produce a more lexically relevant match, but often times the default search operators produce adequate results