AHRQ MapIT Software User's Guide

Version 5 (as of 2018)

Prepared for:
Agency for Healthcare Research and Quality
U.S. Centers for Disease Control and Prevention
U.S. Department of Health and Human Services

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Overview

The AHRQ MapIT tool is a robust application that maps diagnosis, external causes of morbidity, and procedure codes between versions 9 and 10 of the International Classification of Diseases (ICD) coding system. It is designed to use the source data from CMS General Equivalence Mapping (GEM) annually. It automates maps based on the forward method (ICD-9 to ICD-10) and the backward method (ICD-10 to ICD-9). These two methods are considered the proper directions when looking up each code for its equivalents in descriptions. This tool complements another feature as described in CMS GEM User's Guide that defines a reverse lookup as "using a GEM by looking up a target system code to see all the codes in the source system that translates to it". The tool employs a reverse lookup for the opposite directions of the forward and backward maps.

Examples:
- In the backward map, one looks up each ICD-10 code to identify the ICD-9 code (proper direction); whereas the reverse lookup allows us to look up each ICD-9 code to identify all possible ICD-10 codes (opposite direction).
- In the forward map, one looks up each ICD-9 code to identify the ICD-10 code (proper direction); whereas the reverse lookup allows us to look up each ICD-10 code to identify all possible ICD-9 codes (opposite direction).

Via an easy to use Graphical User Interface (GUI), this tool allows for the searching, comparison, importing, and exporting of ICD codes and consists of a mechanism that exports codes based on single lookup mode, batch lookup mode, and cluster mapping of codes between the ICD-9 and ICD-10 standards. The purpose is to provide a simple tool to support the healthcare and health research communities with reconciling the vast differences between the two ICD standards. As newer versions of the ICD become available, it is anticipated that new releases of the software will aid forward and backward and reverse translation of codes between different versions. The software was developed in C# and utilizes the .NET Framework. It is intended to be installed and run on machines running Microsoft® Windows 7 or later. The software incorporates the GEM files in a database of diagnosis, external causes of morbidity, and procedure codes that contain information about how these are relationally mapped between the two ICD standards, thereby allowing back-and-forth analysis and review of all plausible ICD codes.
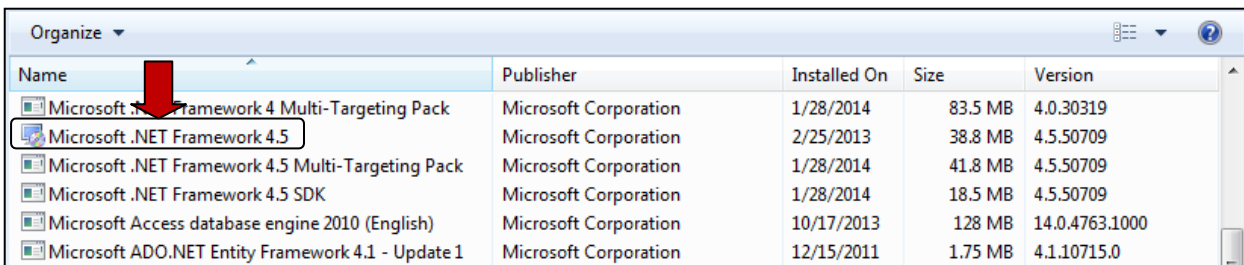
Table of Contents

1.0 Installation and Setup

1.1 Before You Begin

The .NET Framework 4.0 or higher should already be installed and running on the installation computer. You can check for this installation from the list of programs in your system's Control Panel. The .NET Framework can be downloaded from the Microsoft ® Download Center.

Name	Publisher	Installed On	Size	Version
Microsoft .NET Framework 4 Multi-Targeting Pack	Microsoft Corporation	1/28/2014	83.5 MB	4.0.30319
Microsoft .NET Framework 4.5	Microsoft Corporation	2/25/2013	38.8 MB	4.5.50709
Microsoft .NET Framework 4.5 Multi-Targeting Pack	Microsoft Corporation	1/28/2014	41.8 MB	4.5.50709
Microsoft .NET Framework 4.5 SDK	Microsoft Corporation	1/28/2014	18.5 MB	4.5.50709
Microsoft Access database engine 2010 (English)	Microsoft Corporation	10/17/2013	128 MB	14.0.4763.1000
Microsoft ADO.NET Entity Framework 4.1 - Update 1	Microsoft Corporation	12/15/2011	1.75 MB	4.1.10715.0

Note: This software was tested on a machine 64-bit running Microsoft$^{®}$ Windows 7. However, the source code is compiled as a 32-bit application and will work on systems with a 32-bit chipset and operating system (OS), as long as it is compatible with the Microsoft Common Run-time Environment.

1.2 Installation

The software can be installed simply by extracting the zip file contents into any folder. Double click the Ahrq.Mapped.UI.exe file within the extracted folder to execute the program. The codes and mapping default to the year 2018, but a different year (and its associated codes and mapping) can be selected in the UI once the program loads initially.

2.0 Getting Started

2.1 Equivalence Mapping Basics

The AHRQ MapIT software employs the CMS General Equivalence Mappings (GEMs) reference to map source diagnosis and procedure codes to their equivalent or related target codes, in both directions, between the ICD-9 and ICD-10 standards. The translation of codes from source to target uses a series of five flags to denote relationship and level of equivalence between the two ICD versions based on the direction of translation for that code. For example, diagnosis code 25052 in the ICD-9 version maps as follows to the ICD-10 version:

Source	Target	Flags
25052	E11311	10111
25052	E11319	10111
25052	E1136	10111
25052	E1139	10111
25052	E1165	10112

For an explanation of what each flag represents and to obtain more information about the GEMs and how to interpret mapping results, please refer to the *General Equivalence Mappings Documentation Technical Documentation* available by downloading the following zip file:

- 2018 General Equivalence Mappings (GEMs) (available at: https://www.cms.gov/Medicare/Coding/ICD10/2018-ICD-10-CM-and-GEMs.html and contains the document *GemsTechDoc.pdf* referred to above)

These and other resources, including previous years' code lists and GEMs mappings for both diagnosis (CM) and procedure (PCS) codes are available at https://www.cms.gov/Medicare/Coding/ICD10.

The files used to populate the mappings database can be found by navigating to the link above

and selecting the corresponding year and code type link on the left-hand side of the page. Those files which are utilized are described below.

2018 ICD-10 CM and GEMs
2018 ICD-10 PCS and GEMs
2017 ICD-10-CM and GEMs
2017 ICD-10 PCS and GEMs
2016 ICD-10-CM and GEMs
2016 ICD-10 PCS and GEMs
ICD-10-CM and ICD-10 PCS and GEMs Archive

1. **ICD-10-CM Diagnosis Files**
   This includes diagnoses (A00-T88, Z00-Z99) and external causes of Morbidity (V00-Y99). The first position is always an alpha character A99.xxxx (x is alphanumeric). The following types of files can be found within each ICD-10-CM diagnosis year and are utilized by MapIT.

   a) **Diagnosis Code Set General Equivalence Mapping** – Diagnosis Codes and Guide. This will provide the GEM text documents. This will provide only codes, with no descriptions. The codes and the GEM flags are kept for the AHRQ MapIT tool.

   b) **Code Descriptions in Tabular Order** - This will provide descriptions for both diagnoses and external causes. Diagnoses begin with first digit "A-T". External Causes begins with first digit, "V-Y". See the associated pdf file for information on the data file.

2. **ICD-10-PCS Procedure Files**
   This includes procedure codes beginning with 001-HZ9. There will be no alpha O or alpha I in this code set in any of the 7 positions (XXXXXXX, where x is an alpha-character). There are no decimals for this procedure code set.

   a) **General Equivalence Mappings** – Procedure Codes and Guides. This will provide the GEM text documents. This will provide only codes, with no descriptions. the codes and GEM flags are kept for the AHRQ MapIT tool.
      a. **gem_i9pcs.txt**:
         i. The 1st column has the ICD-9-CM procedure codes.
         ii. The 2nd column has the ICD-10-PCS procedure codes.
         iii. The 3rd column has the GEM flags.

[6]

b. **gem_ipcsi9.txt**:
   i. The 1ˢᵗ column has the ICD-10-PCS procedure codes.
   ii. The 2ⁿᵈ column has the ICD-9-CM procedure codes.
   iii. The 3ʳᵈ column has the GEM flags.

b) **PCS long and Abbreviated Titles.** This will provide <u>descriptions</u> for procedures. See the associated pdf file for information on the data file.

3. **ICD-9-CM Diagnosis and Procedures and External Causes at:**
   https://www.cms.gov/Medicare/Coding/ICD9ProviderDiagnosticCodes/codes.html

This link has the files for ICD-9-CM Codes and Descriptions for diagnosis, procedure, and external causes. The files available on this link are no longer being updated as the transition period from ICD-9 to ICD-10 has ended. All years beyond 2014 will continue to use the version illustrated below.

a) **Version 32 Full and Abbreviated Code Titles – Effective October 1, 2014 [ZIP, 1 MB].**
<u>Codes and long descriptions</u> are utilized for the AHRQ MapIT tool.

   a. **CMS32_Desc_Long_Short_DX.xlsx** for diagnosis and external causes.
      i. The 1ˢᵗ column has the ICD-9-CM codes.
      ii. The 2ⁿᵈ column has the long descriptions which are used in the AHRQ MapIT tool.
      iii. The 3ʳᵈ column has the short descriptions which will **not** be used in the AHRQ MapIT tool.

   b. **CMS32_Desc_Long_Short_SG.xlsx** for procedures.
      i. The 1ˢᵗ column has the ICD-9-CM procedure codes.
      ii. The 2ⁿᵈ column has the long descriptions which are used in the AHRQ MapIT tool.
      iii. The 3ʳᵈ column has the short descriptions which will **not** be used in the AHRQ MapIT tool.

2.2 Starting the Software

To begin using the AHRQ MapIT tool, follow the instructions below.

1. Navigate to wherever the downloaded zip file resides and extract the zip to a destination of your choosing. Once extracted, double-click on the executable called Ahrq.Mapped.Ui.
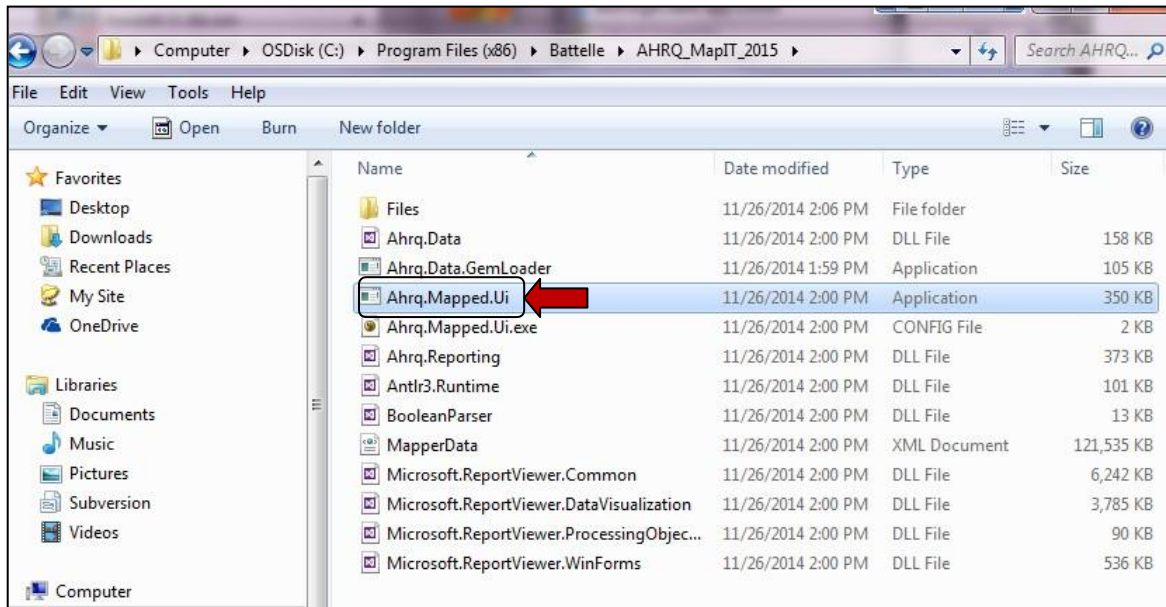
2. A status indicator will appear as the database is loaded into memory. This can take a minute or two.
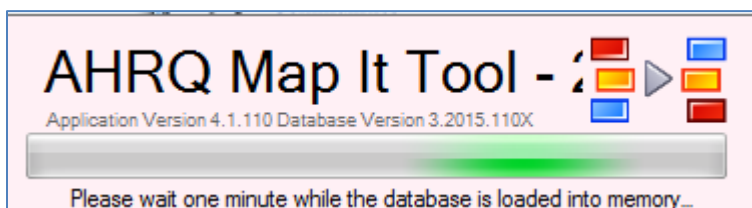
3. Once the database is loaded, the main GUI will appear showing both the 'Single Lookup' and 'Batch Lookup' panes. The software is now ready to use.

2.3 Exploring the GUI
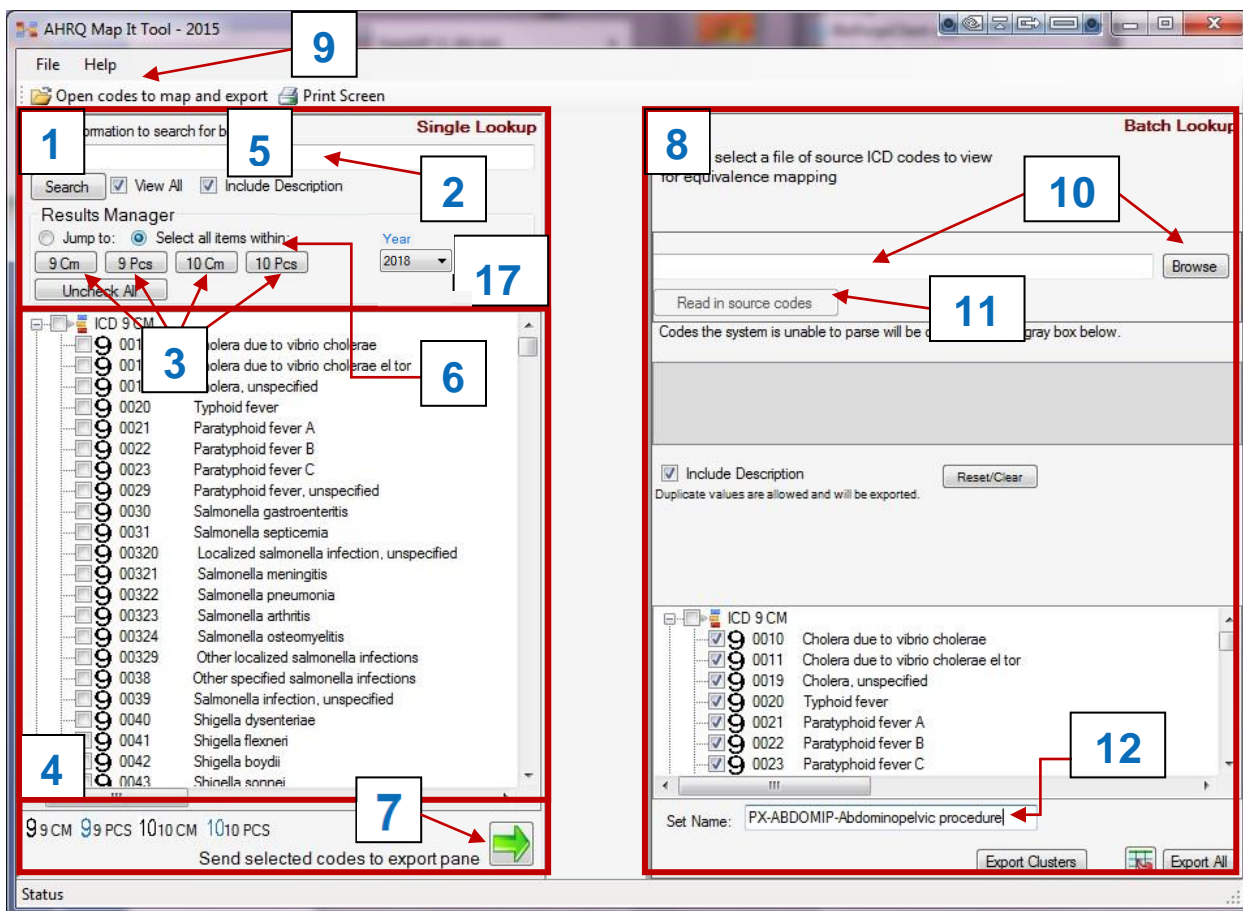
The GUI consists of two panes arranged horizontally as well as other features, each of which are explained briefly below:

- **1** The 'Single Lookup' allows codes to be filtered by entering a keyword or code in the text box **2**

- Results can be further filtered by selecting one of the 4 combinations of diagnosis/procedure categories and ICD version **3**

- To change the year, select the Year dropdown. **17** Note that is will take some time to load in a new year's data. Only one year can be viewed, selected, and exported at a time.

- Results of searches and filters will be shown in the results output window **4**

- By default, the code descriptions will be shown in the output, but if desired, this option can be turned off by unselecting 'Include Descriptions" **5**

- Specific codes can be selected by checking the box to the left of the code number. To select all codes within one of the four combination groups, choose "Select all items within:" **6**

- To send selected codes to the "Batch Lookup" pane **8** for export and reporting, click the green arrow at the bottom of the pane. **7** A Set Name must first be entered into the text box at the bottom of pane 2 to generate a report **12**

- **8** The batch lookup allows the user to import a file containing a list of codes and perform batch mapping, click either the "Open codes to map and export" menu item at the top of the form, **9** or browse to the file by clicking the "Browse" **10** button in the "Batch Lookup" pane. When using the latter method, the path to the file will appear in the text box and the file will be read in by clicking the "Read in source codes" button **11** Select the type of mapping based on the type of codes in the file. Remember that a given file can only contain one type of source code. Read further information in Section 2.4 Batch Mapping, step 4.

Please select the type of codes you would like to import. Mixed types are currently not supported.

Forward Mappings
- ○ ICD 9 to ICD 10 CM
- ○ ICD 9 to ICD 10 PCS

Backward Mappings
- ○ ICD 10 to ICD 9 CM
- ○ ICD 10 to ICD 9 PCS

Import

- Batch code files must contain only a single valid ICD code per line with no decimals, for example:

53570
53571
538
5550
5551
5552
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5561
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5565
5566
5568
5569
5581
5582
5583
55841
55842
5790
5791
5792
5793
5794
5798
5799

2.4 Batch Mapping

1. Start with the code set in a text file such as the example above. The name of the text file will be populated as the default Set Name. All the codes must be either diagnosis codes (CM) or procedure codes (PCS) and must all come from the same ICD 9 or ICD 10 version/year.
2. Click the Browse button in the upper right to specify the code set file $\boxed{10}$
3. Click the "Read in source codes" button.
4. Select the type of mapping based on the type of source codes in the text $\boxed{11}$ Remember that a given text file can only contain one type of source code.

Please select the type of codes you would like to import. Mixed types are currently not supported.

Forward Mappings
○ ICD 9 to ICD 10 CM
○ ICD 9 to ICD 10 PCS

Backward Mappings
○ ICD 10 to ICD 9 CM
○ ICD 10 to ICD 9 PCS

Import

*   Forward ICD-9 to ICD-10 CM: the text file contains ICD-9 diagnosis codes (source) that the user wants to have mapped to ICD-10-CM.
*   Forward ICD-9 to ICD-10 PCS: the text file contains ICD-9 procedure codes (source) that the user wants to have mapped to ICD-10-PCS.
*   Backward ICD-10 to ICD-9 CM: the text file contains ICD-10 diagnosis codes (source) that the user wants to have mapped to ICD-9-CM.
*   Backward ICD-10 to ICD-9 PCS: the text file contains ICD-10 procedure codes (source) that the user wants to have mapped to ICD-9-PCS.

5. Click Import.
6. The system will read in the source codes. Codes not recognized are added to the gray box. A code may not be recognized because
    a) it is not the selected type (diagnosis or procedure),
    b) it is not included in the current version of the code and GEM files with the software, or
    c) it is simply an entry error. Codes that are recognized will be added to next box down. $\boxed{12}$
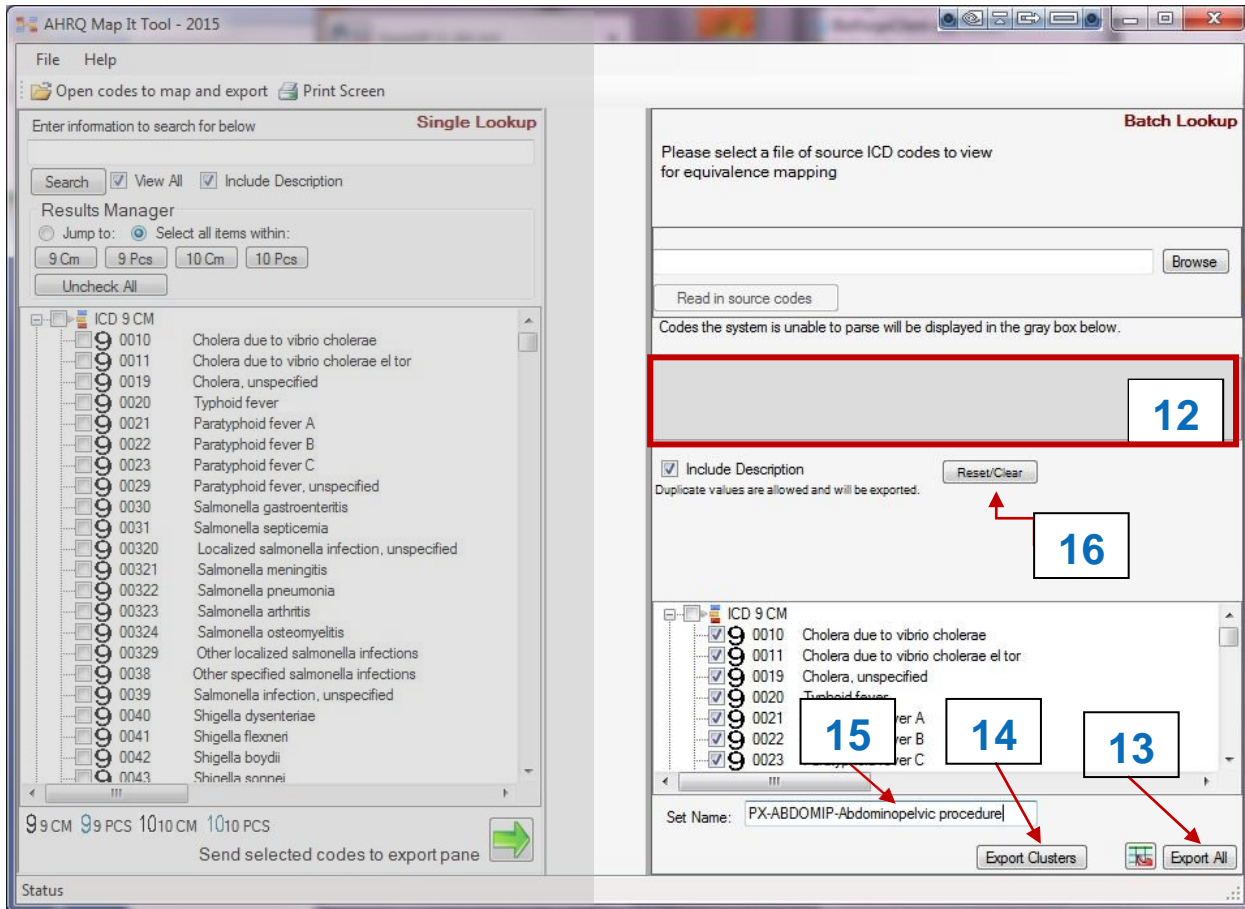
7. Note the Set Name displayed in the text box at the bottom of the pane. [15] You can edit this if desired. It is used as a header in the report.
8. Click "Export All" to create a report of the mapping stages [13]. A new window containing a report of the mappings will appear.
9. Click the Export button (looks like a diskette with a green arrow pointing to it) on the toolbar at the top of that window. Select Excel from the list. Supply a directory and file name in the dialog that displays. The default name will include the set name.

Mapping Report

| ◀◀ 1 | of 2? ▶ ▶▶ | ⬅ ⊗ 🔄 | 🖨 🗐 📖 💾▾ | 100% ▾ | Find | Next |

Start: Original ICD-9 Codes From Set PX-ABDOMIP-Abdominopelvic procedure

ICD-9 Code	Description	Add	Delete	Comment
380.4	Impacted cerumen			
381.4	Nonsuppurative otitis media, not specified as acute or chronic			
412.	Old myocardial infarction			
414.2	Chronic total occlusion of coronary artery			
414.3	Coronary atherosclerosis due to lipid rich plaque			
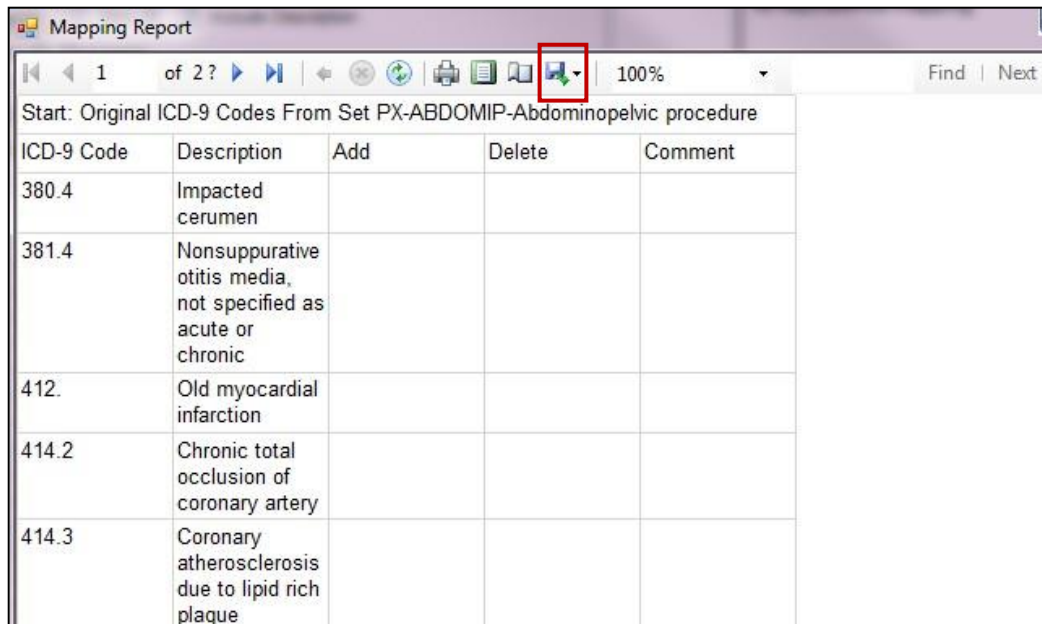
10. Click Export Clusters ☐ **14** ☐ to export a report of the combination clusters identified during each stage of mapping. Clusters are only identified during normal forward and backward mapping, not reverse mapping. A new window containing a report of the mappings will appear.

11. Click the Export button (looks like a diskette with a green arrow pointing to it) on the toolbar at the top of that window. Select Excel from the list. Supply a directory and file name in the dialog that displays. The default name will include the set name.

12. To perform another batch mapping, click Reset/Clear in the middle part of the right pane. ☐ **16** ☐

3.0 Export Results and Interpretation

3.1 Export Results

1. Every 'export' spreadsheet will have the standard cell sizes, and these can be re-sized, as desired.

ICD-9 Code	Description	Map Type	ICD-10 Code	Description	Approx	No Map	Combo	Scenario	Choice	Add	Delete	Comment
451.11	Phlebitis and thrombophlebitis of femoral vein (deep) (superficial)	F Map	I80.10	Phlebitis and thrombophlebitis of unspecified femoral vein	1	0	0	0	0			
451.11	Phlebitis and thrombophlebitis of femoral vein (deep) (superficial)	RB Map	I80.11	Phlebitis and thrombophlebitis of right femoral vein	1	0	0	0	0			

2. The re-sized spreadsheet will first show the list of original codes and descriptions selected for mapping to ICD-10-CM codes. The last three columns "Add, Delete, Comment" are optional for use.

Start: Original ICD-9 Codes From Set DX-DEEPVID-Deep vein thrombosis				
ICD-9 Code	Description	Add	Delete	Comment
451.11	Phlebitis and thrombophlebitis of femoral vein (deep) (superficial)			
451.2	Phlebitis and thrombophlebitis of lower extremities, unspecified			
451.81	Phlebitis and thrombophlebitis of iliac vein			
451.9	Phlebitis and thrombophlebitis of unspecified site			
453.40	Acute venous embolism and thrombosis of unspecified deep vessels of			
453.41	Acute venous embolism and thrombosis of deep vessels of proximal lower			
453.42	Acute venous embolism and thrombosis of deep vessels of distal lower			
453.9	Other venous embolism and thrombosis of unspecified site			

3. In Stage 1, every original ICD-9 code was mapped to ICD-10-CM equivalences (in red). It will display the map type (F map = forward map, RB map = reverse backward map), the GEM flags (Approx, No Map, Combo, Scenario, Choice), and the last three columns "Add, Delete, Comments". The yellow highlighted row indicates the exact match of description between two ICD standards. This stage is most useful for a first review of ICD codes.

										Stage 1	F Map	RB Map
										Results	9-to-10	10-to-9

Stage 1: ICD-10 Codes Identified Through Forward and Reverse Backward Mapping from Original ICD-9 Codes												
ICD-9 Code	Description	Map	ICD-10	Description	Approx	No Map	Combo	Scenario	Choice	Add	Delete	Comment
451.11	Phlebitis and thrombophlebitis of femoral vein (deep) (superficial)	F Map	I80.10	Phlebitis and thrombophlebitis of unspecified femoral vein	1	0	0	0	0			
451.11	Phlebitis and thrombophlebitis of femoral vein (deep) (superficial)	RB Map	I80.11	Phlebitis and thrombophlebitis of right femoral vein	1	0	0	0	0			
451.11	Phlebitis and thrombophlebitis of femoral vein (deep) (superficial)	RB Map	I80.12	Phlebitis and thrombophlebitis of left femoral vein	1	0	0	0	0			
451.11	Phlebitis and thrombophlebitis of femoral vein (deep) (superficial)	RB Map	I80.13	Phlebitis and thrombophlebitis of femoral vein, bilateral	1	0	0	0	0			
451.2	Phlebitis and thrombophlebitis of lower extremities, unspecified	F Map	I80.3	Phlebitis and thrombophlebitis of lower extremities, unspecified	0	0	0	0	0			
451.81	Phlebitis and thrombophlebitis of iliac vein	RB Map	I80.211	Phlebitis and thrombophlebitis of right iliac vein	1	0	0	0	0			
451.81	Phlebitis and thrombophlebitis of iliac vein	RB Map	I80.212	Phlebitis and thrombophlebitis of left iliac vein	1	0	0	0	0			
451.81	Phlebitis and thrombophlebitis of iliac vein	RB Map	I80.213	Phlebitis and thrombophlebitis of iliac vein, bilateral	1	0	0	0	0			
451.81	Phlebitis and thrombophlebitis of iliac vein	F Map	I80.219	Phlebitis and thrombophlebitis of unspecified iliac vein	1	0	0	0	0			

4. Stage 2 takes the ICD-10 codes found in Stage 1 and uses them to identify additional ICD-9 codes that were not in the original list of codes submitted for mapping, but which also have a mapping relationship (in the appropriate GEM file). Only the new ICD-9-CM code (in blue) that was not displayed in Stage 1 is shown.

These codes are brought to your attention because including all the ICD-10 codes identified in Stage 1 may result in a broader definition that encompasses ICD-9 clinical

concepts that were deliberately omitted from your original ICD-9 list. Reviewing this Stage 2 list of ICD-9 codes, in conjunction with the list of ICD-10 codes generated in Stage 1, this may lead you to drop some of these ICD-10 codes from your original intent.

<table>
<tr><td></td><td colspan="2" align="right">Stage 2 B Map RF Map</td></tr>
<tr><td></td><td colspan="2" align="right">Results 10-to-9 9-to-10</td></tr>
</table>

Stage 2: New ICD-9 Codes Identified Through Backward and Reverse Forward Mapping from Stage 1 ICD-10 Codes

ICD-9 Code	Description	Map Type	ICD-10 Code	Description	Approx	No Map	Combo	Scenario	Choice	Add	Delete	Comment
453.79	Chronic venous embolism and thrombosis of other specified veins	B Map	I82.91	Chronic embolism and thrombosis of unspecified vein	1	0	0	0	0			

5. Stage 3 takes the ICD-9 codes found in Stage 2 and uses them to identify additional ICD-10 codes that were not in Stage 1, but which also have a mapping relationship (in the appropriate GEM file). Only the new ICD-10 code (in red) is displayed that was not displayed in Stage 1 or 2.

Reviewing this Stage 3 list of new ICD-10 codes, in conjunction with the list of ICD-9 codes generated in Stage 2, this may lead you to drop some of these ICD-9 codes from your original intent or add enhancements that ICD-10 code sets have to offer.

<table>
<tr><td></td><td colspan="2" align="right">Stage 3 F Map RB Map</td></tr>
<tr><td></td><td colspan="2" align="right">Results 9-to-10 10-to-9</td></tr>
</table>

Stage 3: New ICD-10 Codes Identified Through Forward and Reverse Backward Mapping from Stage 2 ICD-9 Codes

ICD-9 Code	Description	Map Type	ICD-10 Code	Description	Approx	No Map	Combo	Scenario	Choice	Add	Delete	Comment
453.79	Chronic venous embolism and thrombosis of other specified veins	F Map	I82.891	Chronic embolism and thrombosis of other specified	1	0	0	0	0			

6. While the ICD codes are duplicated to show the source and target codes. After the target codes in Stage 1 are selected, the next step would be to induplicate the codes by

using Excel "Remove Duplicates" icon. In this example, this will allow the reviewer to determine if all or specific veins are of interest for a project. Add colors for emphasis, rename the tab, and/or add additional columns.

Stage 1: ICD-10 Codes Identified Through Forward and Reverse Backward Mapping from Original ICD-9 Codes			
ICD-9 Code	Description	ICD-10 Code	Description
451.11	Phlebitis and thrombophlebitis of femoral vein (deep) (superficial)	I80.10	Phlebitis and thrombophlebitis of unspecified femoral vein
451.19	Phlebitis and thrombophlebitis of deep veins of lower extremities, other	I80.11	Phlebitis and thrombophlebitis of right femoral vein
451.2	Phlebitis and thrombophlebitis of lower extremities, unspecified	I80.12	Phlebitis and thrombophlebitis of left femoral vein
451.81	Phlebitis and thrombophlebitis of iliac vein	I80.13	Phlebitis and thrombophlebitis of femoral vein, bilateral
451.9	Phlebitis and thrombophlebitis of unspecified site	I80.201	Phlebitis and thrombophlebitis of unspecified deep vessels of right lower extremity
453.40	Acute venous embolism and thrombosis of unspecified deep vessels of lower extremity	I80.202	Phlebitis and thrombophlebitis of unspecified deep vessels of left lower extremity
453.41	Acute venous embolism and thrombosis of deep vessels of proximal lower extremity	I80.203	Phlebitis and thrombophlebitis of unspecified deep vessels of lower extremities, bilateral
453.42	Acute venous embolism and thrombosis of deep vessels of distal lower extremity	I80.209	Phlebitis and thrombophlebitis of unspecified deep vessels of unspecified lower extremity
453.9	Other venous embolism and thrombosis of unspecified site	I80.211	Phlebitis and thrombophlebitis of right iliac vein
		I80.212	Phlebitis and thrombophlebitis of left iliac vein
		I80.213	Phlebitis and thrombophlebitis of iliac vein, bilateral
		I80.219	Phlebitis and thrombophlebitis of unspecified iliac vein
		I80.221	Phlebitis and thrombophlebitis of right popliteal vein
		I80.222	Phlebitis and thrombophlebitis of left popliteal vein
		I80.223	Phlebitis and thrombophlebitis of popliteal vein, bilateral
		I80.229	Phlebitis and thrombophlebitis of unspecified popliteal vein
		I80.231	Phlebitis and thrombophlebitis of right tibial vein
		I80.232	Phlebitis and thrombophlebitis of left tibial vein
		I80.233	Phlebitis and thrombophlebitis of tibial vein, bilateral
		I80.239	Phlebitis and thrombophlebitis of unspecified tibial vein
		I80.291	Phlebitis and thrombophlebitis of other deep vessels of right lower extremity
		I80.292	Phlebitis and thrombophlebitis of other deep vessels of left lower extremity
		I80.293	Phlebitis and thrombophlebitis of other deep vessels of lower extremity, bilateral
		I80.299	Phlebitis and thrombophlebitis of other deep vessels of unspecified lower extremity
		I80.3	Phlebitis and thrombophlebitis of lower extremities, unspecified

3.2 Cluster Export Results

1. In the forward or backward map from Stage 1, the combination clusters will be captured from the GEM flag "Combination" flag = 1. This display will show every possible combination separated by a separator line.

ICD-9 Code	Description	Map Type	ICD-10 Code	Description
Cluster: As a result of forward mapping, combination clusters of codes were identified. These target codes in column E, when used together, described the original code in column B.				
250.12	Diabetes with ketoacidosis, type II or unspecified type, uncontrolled	F Map	E11.69	Type 2 diabetes mellitus with other specified complication
250.12	Diabetes with ketoacidosis, type II or unspecified type, uncontrolled	F Map	E11.65	Type 2 diabetes mellitus with hyperglycemia
250.13	Diabetes with ketoacidosis, type I [juvenile type], uncontrolled	F Map	E10.10	Type 1 diabetes mellitus with ketoacidosis without coma
250.13	Diabetes with ketoacidosis, type I [juvenile type], uncontrolled	F Map	E10.65	Type 1 diabetes mellitus with hyperglycemia
250.22	Diabetes with hyperosmolarity, type II or unspecified type, uncontrolled	F Map	E11.00	Type 2 diabetes mellitus with hyperosmolarity without nonketotic hyperglycemic-hyperosmolar coma (NKHHC)
250.22	Diabetes with hyperosmolarity, type II or unspecified type, uncontrolled	F Map	E11.65	Type 2 diabetes mellitus with hyperglycemia
250.23	Diabetes with hyperosmolarity, type I [juvenile type], uncontrolled	F Map	E10.69	Type 1 diabetes mellitus with other specified complication
250.23	Diabetes with hyperosmolarity, type I [juvenile type], uncontrolled	F Map	E10.65	Type 1 diabetes mellitus with hyperglycemia
250.32	Diabetes with other coma, type II or unspecified type, uncontrolled	F Map	E11.01	Type 2 diabetes mellitus with hyperosmolarity with coma
250.32	Diabetes with other coma, type II or unspecified type, uncontrolled	F Map	E11.65	Type 2 diabetes mellitus with hyperglycemia
250.33	Diabetes with other coma, type I [juvenile type], uncontrolled	F Map	E10.11	Type 1 diabetes mellitus with ketoacidosis with coma
250.33	Diabetes with other coma, type I [juvenile type], uncontrolled	F Map	E10.65	Type 1 diabetes mellitus with hyperglycemia

When scrolling to the right, each scenario and the choice flag will be displayed. It allows the user to determine if some or all combinations are needed; or if limited to one code, then the user can determine which code would best meet the intent.

ICD-10	Description	Combination	Scenario	Choice	Add	Delete	Level	Comment
E11.69	Type 2 diabetes mellitus with other specified complication	1	1	1				
E11.65	Type 2 diabetes mellitus with hyperglycemia	1	1	2				
E10.10	Type 1 diabetes mellitus with ketoacidosis without coma	1	1	1				
E10.65	Type 1 diabetes mellitus with hyperglycemia	1	1	2				
E11.00	Type 2 diabetes mellitus with hyperosmolarity without nonketotic hyperglycemic-hyperosmolar	1	1	1				
E11.65	Type 2 diabetes mellitus with hyperglycemia	1	1	2				
E10.69	Type 1 diabetes mellitus with other specified complication	1	1	1				
E10.65	Type 1 diabetes mellitus with hyperglycemia	1	1	2				
E11.01	Type 2 diabetes mellitus with hyperosmolarity with coma	1	1	1				
E11.65	Type 2 diabetes mellitus with hyperglycemia	1	1	2				
E10.11	Type 1 diabetes mellitus with ketoacidosis with coma	1	1	1				
E10.65	Type 1 diabetes mellitus with hyperglycemia	1	1	2				

3.1 Interpreting and Using Report Results

1.For interpretation, it is important to understand the intent of the original source codes for a project, study, report, or product.

2. Then review the results and determine if the new target codes meet the intent. Here are some issues to consider:

> Inappropriate Codes, such as incorrect gender, incorrect age group (adult for a pediatric indicator), incorrect anatomic site, a newly codable clinical concept that does not fit with the original intent, or an unnecessary component of a cluster that is better captured by other code(s).

> Clinical input is required due to uncertainty about whether a code in the new ICD-10 code sets is consistent with the clinical intent. For example, in the new ICD-10-PCS structure, eponyms and pre-coordinated combination codes are not used, so some root operations require surgeons' interpretation regarding overlap with the clinical intent.

3. Documenting thought processes, and comments are critical for further decisions.