

Follow the ICD-10-CM Road Map with GEM

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This month we follow the ICD-10-CM roadmap to crosswalking with general equivalence mappings (GEMs). The GEM system, developed by the National Center for Health Statistics (NCHS), maps ICD-10-CM and the ICD-9-CM volumes one and two and helps facilities and payers create crosswalks. You can access it on the CMS Web site at: www.cms.hhs.gov/ICD10.

Mapping—or crosswalking—helps you find the corresponding diagnosis between two codes sets and their correlation. In ICD-9-CM, codes are three to five digits in length plus alphanumeric E and V codes, approximately 13,500 codes in total. ICD-10-CM consists of three to seven alphanumeric characters with more than 68,000 codes possible. There isn't a simple crosswalk from ICD-9-CM to ICD-10-CM, and the GEM files attempt to organize the differences. When mapping a code from ICD-9-CM to ICD-10-CM, there may be more than one code in ICD-10-CM that maps to ICD-9-CM. There are separate GEM files for ICD-9-CM Volume 3 to ICD-10-PCS.

GEMs are available for your computer as “flat” text files with each file containing a list of code pairs identifying the correspondence between a source system code and a target system code. The code set is mapped from the system of origin (source system) to the destination system (target system). There is one GEM file for mapping ICD-9-CM to ICD-10-CM and one file for mapping from ICD-10-CM to ICD-9-CM. Included are the ICD-10-CM code descriptions in a text file.

When one ICD-9-CM or ICD-10-CM code contains several diagnoses, it is considered a “combination code.” The following are combination codes:

ICD-9-CM

- 250.21** Diabetes mellitus; diabetes with hyperosmolarity; type I [juvenile type], not stated as uncontrolled
- 404.00** Hypertensive heart and chronic kidney disease; malignant; without heart failure and with chronic kidney disease stage I through stage IV, or unspecified
- 823.02** Fracture of tibia and fibula, upper end, closed; fibula with tibia

ICD-10-CM

- R65.21** Severe sepsis with toxic shock
- T58.01** Toxic effect of carbon monoxide from motor vehicle exhaust, accidental
- E08.21** Diabetes mellitus due to underlying condition with diabetic nephropathy

When ICD-9-CM codes are more detailed than ICD-10-CM, a single ICD-10-CM code may link to more than one ICD-9-CM code or vice versa, as indicated in Table 1:

Table 1

ICD-9-CM	ICD-10-CM
010.00 Primary tuberculous infection; unspecified examination	A15.7 Primary respiratory tuberculosis
010.01 Primary tuberculous infection; bacteriological or histological exam not done	
010.02 Primary tuberculous infection; bacteriological or histological exam unknown (at present)	
010.03 Primary tuberculous infection; tubercle bacilli found (in sputum) by microscopy	
010.04 Primary tuberculous infection; tubercle bacilli found (in sputum) by microscopy	
010.05 Primary tuberculous infection; tubercle bacilli not found by bacteriological examination, but tuberculosis confirmed histologically	
010.06 Primary tuberculous infection; tubercle bacilli not found by bacteriological or histological examination, but tuberculosis confirmed by other methods [inoculation of animals]	

Mapping where a combination code corresponds to two or more diagnoses in the other code sets requires linkage to two or more codes in the other code set.

Table 2 illustrates crosswalking from ICD-9-CM to ICD-10-CM.

Table 2

ICD-9-CM Source	ICD-10-CM Target
115.11 Histoplasmosis; infection by <i>Histoplasma duboisii</i> ; meningitis	B39.5 Histoplasmosis <i>duboisii</i> G02 Meningitis in other infectious and parasitic disease classified elsewhere

Mapping from ICD-10-CM to ICD-9-CM is shown in Table 3.

Table 3

ICD-10-CM Source	ICD-9-CM Target
125.710 Atherosclerosis of autologous vein coronary artery bypass graft(s) with unstable angina pectoris	414.02 Other forms of chronic ischemic heart disease; coronary atherosclerosis; of autologous biological bypass graft 411.1 Other acute and subacute forms of ischemic heart disease; intermediate coronary syndrome

Because the files are “flat” text files, they load into databases, such as Access. (Excel can be cumbersome as multiple files are simultaneously referenced.) Each file contains a list of code pairs. Each code pair identifies a corresponding code in the source file (ICD-9-CM or ICD-10-CM) and in the target system. The first step would be to perform forward mapping from ICD-9-CM to ICD-10-CM as shown in Table 4, and then backward mapping from ICD-10-CM to ICD-9-CM.

Table 4

ICD-9-CM Source	ICD-10-CM Target
599.7 Other disorders of urethra and urinary tract; hematuria	R31.0 Gross hematuria R31.1 Benign essential microscopic hematuria R31.2 Other microscopic hematuria R31.9 Hematuria, unspecified

Note: Table 4 has one ICD-9-CM code that maps to four ICD-10-CM codes. Detailed documentation in the medical record is required to determine the correct diagnosis code.

Backward mapping, shown in Table 5, from ICD-10-CM to ICD-9-CM describes an ICD-10-CM combination code for severe sepsis with shock. An ICD-9-CM combination code does not exist for both conditions, and each condition (if both exist) is reported together.

Table 5

ICD-10-CM Source	ICD-9-CM Target
R65.21 Severe sepsis with shock	995.92 Certain adverse effects not elsewhere classified; systemic inflammatory response syndrome (SIRS); severe sepsis 785.52 Symptoms involving cardiovascular system; shock without mention of trauma; septic shock

When using GEM, there are two files for ICD-9-CM and ICD-10-CM. **Note:** Table 6 shows that the ICD-9-CM and ICD-10-CM codes do not have decimals between the additional characters in column one and column two. Column one is the source file (ICD-10-CM) because we are mapping the codes to the target file (ICD-9-CM).



Table 6

ICD-10-CM (Source)	ICD-9-CM (Target)	GEMS Flags
R6521	99592	10111
R6521	78552	10112

In the third column, the first three digits are flags and the last two digits are used for combination entries. In GEM systems, there are combination code flags that map from the source to the target of the table. When there is not a code in the target system or a combination code with the same meaning, an approximate flag is turned on. The digits applicable to the flag are:

- **0**—approximate flag is turned off and there is not a code or combination code in the target system.
- **1**—the approximate flag is turned on and there is a linked code or combination code in the target system.

Often, ICD-9-CM and ICD-10-CM codes have “1” in column three’s first digit. Column three’s second digit is a flag called the “no map” flag and is used when a diagnosis cannot be identified. The digits used in the no map file are “0” and “1.”

- **0**—indicates a code for mapping the source code to the target code, either a single code or combination code.
- **1**—indicates no code for mapping the source code to the target code that identifies the diagnosis.

As shown in Table 7, the third column is the combination flag. If the combination flag is turned on from the source to the target, a combination code exists. Table 7 identifies flags in the third column and Table 8 shows the GEM text file.

Table 7

ICD-10-CM	ICD-10-CM-Description	ICD-9-CM Code	ICD-9-CM Description	Approximate Flag	No Map Flag	Combination Flag
R65.21	Severe sepsis with shock	995.92	Severe sepsis	1	0	1
R65.21	Severe sepsis with shock	785.52	Septic shock	1	0	1

With code 65.21 in ICD-10-CM, there is a linked code (approximate flag), and a combination code (combination flag) in GEM. In Table 8, The Scenario and Choice List are the third column’s last two digits in the GEM text files. The meaning of the third column digits is the same for the ICD-9-CM GEM and the ICD-10-CM GEM files. When a combination flag is turned on with a “1,” a scenario (digit 4) and a choice list field (digit 5) have a number other than “0.” If there is a “0” a combination code does not exist.

What is meant by a scenario?

Note: In R65.21 of Table 8, “1” appears in column three’s fourth digit indicating that when mapping with R65.21 for a patient who had severe sepsis with shock, two codes are required in ICD-9-CM.

The last digit in column three of the GEM table is the Choice List. If a combination code does not exist, and there is a one to one mapping relationship between the source code and target code, the digit is “0.”

If a combination code exists, there is either a “1” or “2” as the last digit in the column.

- No combination code exists; column three’s last digit is “0”
- Combination code exists with only one combination; choice “1”
- Combination code exists with more than one code combination; choice “2”

Table 8

ICD-10-CM	ICD-10-CM Description	ICD-9-CM Code	ICD-9-CM Description	Approximate Flag	No Map Flag	Combination Flag	Scenario	Choice List
R65.21	Severe sepsis with shock	995.92	Severe sepsis	1	0	1	1	1
R65.21	Severe sepsis with shock	785.52	Septic shock	1	0	1	1	2


For example, 995.92 only maps to R65.21 as there is not a code in ICD-10-CM to cover sepsis only; however, R65.21 maps to both 995.92 and 785.52.

In a medical practice, it’s not necessary to map every code in ICD-9-CM to ICD-10-CM and vice versa (for example, the insurance carrier and/or hospital might map every code and crosswalk in ICD-9-CM and ICD-10-CM because their ICD-9-CM code use is more extensive). However, it is important for the medical practice to map and crosswalk between the two coding systems prior to implementation.

How do you begin using GEM?

Here are key steps to follow:

1. It is helpful to utilize a database when using the text files.
2. Make sure the person using the system understands coding and crosswalks.
3. Obtain the GEM files from the CMS Web site at www.cms.hhs.gov/ICD10. The files are in a zip format, and the user needs to save the files on the hard drive.
4. Unzip the files and review the guidelines for using the GEM system. You may need to read the guidelines several times to understand the methodology.
5. Pull down the ICD-9-CM text files for the CDC Web site which is helpful for obtaining ICD-9-CM descriptors in GEM.
6. Map the files from ICD-9-CM (source) to ICD-10-CM (target).
7. Map the files in reverse from ICD-10-CM (source) to ICD-9-CM (target).

Don’t rely on your hardware and/or software vendor to map files for you. As ICD-10-CM moves ahead, vendors may be available to map and crosswalk for you, but to fully understand the system you should learn to map on your own. 



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