ICD-10 General Equivalence Mappings: Bridging the Translation Gap from ICD-9

by Rhonda Butler, CCS, CCS-P

In healthcare, diagnosis and procedure codes and their attached descriptions are the currency for many critical data transactions. Healthcare organizations rely heavily on coded data to govern reimbursement, monitor the health of the population, track trends in disease and treatment, and optimize the delivery of healthcare in the US.

The possible implementation of the ICD-10 code set is a historic opportunity to upgrade the quality of healthcare data, but like everything worth having, it comes at a cost. One cost is mapping between the old and new code sets.

A recurring theme in the ongoing ICD-10 implementation debate has been the need for a crosswalk between the old and new code sets to help the industry make the transition. The lack of an "official" mapping between ICD-9-CM and ICD-10-CM/-PCS has long been seen as a major challenge to ICD-10 implementation. The General Equivalence Mappings (GEMs) are an attempt to meet that challenge.

What Are GEMs?

The GEMs are the product of a coordinated effort spanning several years and involving the National Center for Health Statistics (NCHS), the Centers for Medicare and Medicaid Services (CMS), AHIMA, the American Hospital Association, and 3M Health Information Systems. The GEM files are a public domain reference mapping designed to give all sectors of the healthcare industry that use coded data a tool to convert and test systems, link data in long-term clinical studies, develop application-specific mappings, and analyze data collected during the transition period and beyond.

It would be impossible to produce a "one size fits all" set of mappings because a mapping is heavily dependent on its purpose. A map for reimbursement uses different rules and contains different entries than a map for research.

The GEMs are more than simple crosswalks. They cannot be used in a legacy system in unaltered form to get from a code in one set to a code in the other. A clear one-to-one correspondence between an I-9 or I-10 code is the exception rather than the rule.

It is useful to think of GEMs as two-way translation dictionaries for diagnosis and procedure codes from which crosswalks can be made for specific purposes. They elucidate the differences between the code sets and assist users in making informed decisions about how to link the codes in a way that meets their needs.

While ICD-9-CM diagnosis codes and ICD-9-CM procedure codes are maintained by two different government entities, the GEMs were developed separately but collaboratively to maintain consistency insofar as possible. The resulting files can be merged seamlessly as needed—subsets extracted, analyzed, and applied—without taking extra steps to make them compatible.

How GEMs Work

The diagnosis and procedure GEMs use the same method and format. They consist of two mappings for the diagnosis codes and two mappings for the procedure codes: one in which ICD-9 is the source system and one in which ICD-10 is the source system (see the table below). Technical documentation and a user's guide accompany the files.

2 Code Sets x 2 Directions = 4 GEMs

Diagnosis Code Set	Procedure Code Set

Source (from)	Target (to)	AKA	Source (from)	Target (to)	AKA
ICD-9-CM	ICD-10-CM	diagnosis forward mapping	ICD-9-CM	ICD-10-PCS	procedure forward mapping
ICD-10-CM	ICD-9-CM	diagnosis backward mapping	ICD-10-PCS	ICD-9-CM	procedure backward mapping

The four GEMs consist of two mappings for the diagnosis codes and two mappings for the prcedure codes: one in which ICD-9 is the source system and one in which ICD-10 is the source system.

The code in the source system is followed by a possible equivalent in the target system, then followed by the attributes that further characterize the information in that row of the entry (e.g., whether the codes are an approximate match or not). The codes, their descriptions, and the attributes can be loaded into a database for developing applied mappings for training or to extract subsets of the files for testing.

The mapping entry for ICD-9-CM diagnosis code 599.7, Hematuria, is highlighted in the table “Excerpt from a GEM File” as it would appear with descriptions added and attributes labeled. The documentation and user’s guide define all attributes and demonstrate how they are used.

Excerpt from a GEM File

ICD-9 Code	Description	ICD-10 Code	Description	Approximate	No Map	Combination	Scenario	Choice List
599.7	Hematuria	R31.0	Gross hematuria	1	0	0	0	0
599.7	Hematuria	R31.1	Benign essential microscopic hematuria	1	0	0	0	0
599.7	Hematuria	R31.2	Other microscopic hematuria	1	0	0	0	0
599.7	Hematuria	R31.9	Hematuria, unspecified	1	0	0	0	0

The GEMs present the code in the source system followed by a possible equivalent in the target system. Attributes further characterize the match. In this instance, the single ICD-9 code for hematuria links to multiple ICD-10-CM codes, three of which carry greater specificity. The GEMs are provided as text files for maximum flexibility. In the first entry above, code 599.7, Hematuria, appears in the text file as 5977 R310 10000.

No Exact Match

It stands to reason that a diagnosis or procedure code in ICD-9 may not have a close correspondent in ICD-10. If the systems were not significantly different, there would be no incentive to change. What this means for the GEMs is that in many cases, the code in the source system is linked to more than one alternative in the target system.

Because the GEMs are general reference mappings, all reasonable equivalents are included, based on the particulars of the code in the source system. For example, in the case of the ICD-9-CM code 599.7, Hematuria, the system uses one code for all instances of hematuria documented in the medical record. Therefore, it is linked to all ICD-10-CM hematuria codes. There are four of them, three of which are more specific than the ICD-9-CM code.

In the case of hematuria coding, the difference between the two code sets lies in the level of specificity. However, there are whole areas reclassified in ICD-10-CM using different clinical emphases. In these cases, where the codes in the two code sets are not alike along an entire axis of classification, and where an all-inclusive mapping would contain an overwhelming and indiscriminate number of entries, rules were developed to link groups of codes in a consistent manner.

Obstetrics diagnosis codes are a clear example of this. In ICD-9-CM, the patient is classified by diagnosis in relation to the episode of care. In ICD-10-CM the patient is classified by diagnosis in relation to the patient’s stage of pregnancy. The GEM rules applied to linking these diagnosis codes are shown in the table below.

Mapping Where Differences Are Great

ICD-9-CM Source	ICD-10-CM Target	ICD-10-CM Source	ICD-9-CM Target
Unspecified episode of care	Unspecified trimester	Unspecified trimester	Unspecified episode of care
Antepartum	First trimester Second trimester Third trimester	First trimester	Antepartum
Delivered	Childbirth	Second trimester	Antepartum
Delivered with postpartum complication	Complication of puerperium	Third trimester	Antepartum
Postpartum complication	Complication of puerperium	Childbirth	Delivered
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When ICD-9 and -10 differ greatly due to differing clinical emphases, the GEMs avoid an all-inclusive mapping that would contain an overwhelming and indiscriminate number of entries. Instead they link groups of codes in a consistent manner. An example is in obstetrics, where patients are classified by diagnosis in relation to the episode of care under ICD-9 and are classified by diagnosis in relation to stage of pregnancy in ICD-10.

Accompanying the GEMs on the NCHS and CMS Web sites is a detailed user's guide. It contains the information common to both sets of GEMs and uses the same terminology for introducing the GEMs and explaining how to use them, with examples specific to the diagnosis and procedure GEMs in their respective guide. It also contains a glossary of terms and an appendix containing file names and format layout.

To reap the full benefits of switching to a new code currency, the healthcare industry needs to invest two ways: in the cost and time required to migrate to software and systems that use the new codes; and in educating HIM professionals to be able to translate meaning effectively between the old and new codes. The GEMs aim to help the industry plan for the best possible return on investment.

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