

ICD-10-CM/PCS to ICD-9-CM Reimbursement Mappings

2011 Version

Documentation and User's Guide

Preface

Purpose and Audience

This document accompanies the 2011 update of the Centers for Medicare and Medicaid Studies (CMS) public domain one-to-one applied reimbursement mappings of the ICD-10-CM (diagnosis) and ICD-10-PCS (procedure) code systems to the ICD-9-CM Volume 1 (diagnosis) and ICD-9-CM Volume 3 (procedure) code systems respectively. The Reimbursement Mappings can be found on CMS' ICD-10 website at <http://www.cms.gov/ICD10>. The purpose of this document is to give readers the information they need to understand the intent and structure of the mappings so they can use the information correctly. The intended audience includes but is not limited to professionals working with health services reimbursement systems. General readers may find section 1 useful. Software engineers and IT professionals interested in the details of the file formats will find this information in Appendix A.

Document Overview

For readability, when no distinction is necessary between diagnosis codes and procedure codes, ICD-10-CM or ICD-10-PCS is abbreviated "ICD-10", and ICD-9-CM Volumes 1 or 3 is abbreviated "ICD-9".

- **Section 1** is a general interest discussion of mapping between ICD-10 and ICD-9 and the rationale for the development of the Reimbursement Mappings. The meaning of "one-to-one" in the context of an applied mapping is discussed.
- **Section 2** contains detailed information on how to use the Reimbursement Mappings, for users who will be working directly with mapping between applications.
- **Appendix A** describes the technical details of the file formats. One mapping file is provided for diagnosis codes and one for procedures, both in the same format.
- **Appendix B** contains the frequency rule set applied to make the mapping choices for the Reimbursement Mappings. Also included are codes whose frequencies are so low that they did not fall within the parameters of any rule in the frequency rule set. In such cases, the coding and clinical members of the team chose the code deemed the closest match.

Section 1 – Reimbursement Mapping Rationale

Converting ICD-10 Data for ICD-9 Systems

After the ICD-10 implementation date as specified in the Final Rule, health care claims for services on or after October 1, 2013 will be submitted to payers with diagnoses coded in ICD-10-CM for all provider types, and procedures coded in ICD-10-PCS for hospital inpatient services only. The Reimbursement Mappings were created to provide a temporary but reliable mechanism for mapping records containing ICD-10 diagnosis and procedure codes to “reimbursement equivalent” ICD-9 diagnosis and procedure codes, so that while systems are being converted to process ICD-10 claims directly, the claims may be processed by the legacy systems.

The ICD-10 diagnosis codes submitted on the claim are mapped via the Diagnosis Reimbursement Mapping into ICD-9 diagnosis codes that can then be processed by the ICD-9-based reimbursement system. Similarly the ICD-10 procedure codes submitted on the claim are mapped via the Procedure Reimbursement Mapping into ICD-9 procedure codes that can then be processed by the ICD-9-based reimbursement system. The claim may then be priced using the rules written for ICD-9 codes.

Derivation from General Equivalence Mappings (GEMs)

CMS annually publishes updates of the General Equivalence Mappings (GEMs). The GEMs are mappings between ICD-10-CM and PCS and ICD-9-CM codes. These annual updates can be found on the CMS ICD-10 website at <http://www.cms.gov/ICD10>.

The reader is advised to see the User’s Guides provided with the GEM files. Each contains a general discussion of the challenges inherent in translating between code sets, and the strategies that may be adopted to develop mappings from the GEMs for specific applications. Those discussions are not repeated here. The GEM User’s Guides also provide a comprehensive glossary, which may be of use to readers unfamiliar with the terminology of code set translation.

The Reimbursement Mappings were derived from the GEMs using the techniques discussed below.

One-to-one and one-to-many mappings

The ICD-10 to ICD-9 General Equivalence Mappings are one-to-many mappings in two different senses:

Alternatives. More than one ICD-9 code may be a valid translation of a given ICD-10 code. Which one of those ICD-9 codes is the most correct translation cannot be determined based on the meaning of the codes themselves. For example, ICD-10 procedure 0LQ70ZZ, *Repair Right Hand Tendon, Open Approach*, translates to ICD-9 procedure 83.61, *Suture of tendon sheath*, or to procedure 83.64, *Other suture of tendon*. Both are valid translations of the ICD-10 procedure code.

Clusters. At times it requires multiple ICD-9 codes combined to reproduce the complete meaning of one ICD-10 code. This is the case with ICD-9 principal procedure codes such as coronary angioplasty that require the use of “adjunct”

ICD-9 codes to provide additional detail. For example, ICD-10 procedure code 02733ZZ, *Dilation of Coronary Artery, Four or More Sites, Percutaneous Approach*, requires two ICD-9 codes to be fully represented in ICD-9: 00.66, *PTCA or coronary atherectomy*, and 00.43, *Procedure on four or more vessels*. Reimbursement systems may depend for correct pricing on the additional meaning provided by adjunct ICD-9 codes. A reimbursement system which pays more for a procedure performed on four or more vessels would pay incorrectly if the 02733ZZ were translated into 00.66 only.

The Reimbursement Mappings are one-to-one mappings only in the sense that they choose one ICD-9 translation for each ICD-10 code. The translation may be one ICD-9 code or one ICD-9 cluster. For ICD-10 codes that translate to multiple single ICD-9 codes in the GEMs, one ICD-9 code was selected for reimbursement purposes. For ICD-10 codes that translate to multiple ICD-9 clusters in the GEMs, one ICD-9 cluster was selected for reimbursement purposes. The mapping of one ICD-10 may require as many as six ICD-9 codes to reproduce the meaning of the ICD-10 code. In such cases, where an ICD-10 code maps to an ICD-9 cluster in the Reimbursement Mappings, the ICD-9 codes comprising the cluster are *not* to be treated as alternatives. All of them must be included in the translated ICD-9 claim sent to the ICD-9 legacy reimbursement system in order to reproduce the information in the submitted ICD-10 claim.

Frequency data used to derive ICD-9 mapping

The Reimbursement Mappings are an applied mapping of the ICD-10 to ICD-9 GEMs. More than 65,000 of the 69,000 ICD-10 diagnosis codes (95%) in the ICD-10 to ICD-9 diagnosis GEM translate to a single ICD-9 code. Similarly, more than 66,000 of the 72,000 ICD-10 procedure codes (93%) in the ICD-10 to ICD-9 procedure GEM translate to a single ICD-9 code. Approximately 3,500 ICD-10 diagnosis codes and 5,000 ICD-10 procedure codes required rules for choosing among ICD-9 code alternatives.

Translation Alternatives in ICD-10 to ICD-9 GEMs

Code set	ICD-10 Codes with only 1 ICD-9 alternative	ICD-10 Codes with >1 ICD-9 alternative	ICD-10 Codes with no ICD-9 alternative	Total ICD-10 codes
ICD-10-CM (diagnosis)	65,060	3,675 (5%)	633	69,368
ICD-10-PCS (procedure)	66,835	5,246 (7%)	0	72,081

The rules for choosing among ICD-9 code alternatives operated on frequency data from ICD-9 based records. Selection of a single ICD-9 code for both diagnosis and procedure codes made use of two *reference data sources*:

Medicare Approximately 35 million MedPAR records, from 10/1/2006 to 9/30/2009

All-payer Approximately 12 million inpatient hospital records available from the California Office of Statewide Health Planning and Development (OSHPD) from 10/1/2005 to 9/30/2008

Because both data sets come from hospital inpatient data, the resultant mapping reflects frequencies characteristic of inpatient rather than outpatient data when the two differ. A clear example of this can be found in the obstetrics codes specifying complications of pregnancy. Because ICD-10 does not specify encounter information, i.e., whether the patient delivered during the encounter, the reimbursement mapping must choose between two ICD-9 alternatives, one that specifies antepartum encounter, the other a delivery. For inpatient hospital data, the ICD-9 codes specifying delivery are far more frequent, while in outpatient and physician data, one would expect the ICD-9 codes specifying antepartum encounter to dominate.

When the ICD-10 to ICD-9 GEM offered more than one translation for an ICD-10 code, these reference data sources were queried to find the most frequently coded of the alternative ICD-9 codes. For all but about 300 diagnosis codes and 60 procedure codes, one of the ICD-9 alternatives was clearly dominant—often more than twice as frequent as any of the other alternatives.

Reimbursement Mapping of dominant ICD-9 code alternative

ICD-10 code	ICD-9 code alternatives in the ICD-10 to ICD-9 GEM	MedPAR records	MedPAR %	Calif. Records	Calif. %	Reimbursement Mapping
J45.22 Mild intermittent asthma with status asthmaticus	493.01 Extrinsic asthma with status asthmaticus	657	86%	5,416	99%	X
	493.11 Intrinsic asthma with status asthmaticus	94	14%	55	1%	

The dominant ICD-9 alternative was chosen as the ICD-9 code for the Reimbursement Mapping. Where an ICD-10 code translated to multiple ICD-9 clusters, the first ICD-9 code in the cluster as determined by the GEM “choice list” order was used to determine the dominant alternative.

When the Medicare reference data set and the all-payer reference data set disagreed, the code with the highest Medicare frequency was chosen for non-obstetric and non-newborn diagnosis codes, and for non-obstetric procedure codes. For obstetric and newborn diagnosis codes, and obstetric procedure codes, the all-payer data set was given precedence. When there were too few records (defined as <30 records) in either reference data set alone, the two were combined to achieve a higher frequency. Finally, coding expertise was used to select the mapping deemed the “closest match in meaning between

the codes,” for approximately 300 diagnosis and 60 procedure codes which were so rarely recorded (fewer than 30 records in the combined reference data sets) that the reference data sets were unable to identify a dominant alternative.

Reimbursement Mapping of ICD-9 "closest match" code alternative

ICD-10 code	ICD-9 code alternatives in the GEM	MedPAR records	MedPAR %	Calif. Records	Calif. %	Reimbursement Mapping
3E0B7KZ Introduction of Other Diagnostic Substance into Ear, Via Natural or Artificial Opening	20.72 Injection into inner ear	3	27%	1	20%	X
	20.94 Injection of tympanum	11	88%	4	80%	

This process resulted in the Reimbursement Mapping files documented in Appendix A. Each mapping file has one and only one entry for each valid ICD-10 code. An entry contains one ICD-10 code and from one to six ICD-9 codes. An ICD-9 cluster (more than one ICD-9 code combined to represent one ICD-10 code) is used to ensure that potentially reimbursable components of the meaning of the ICD-10 code are reproduced in the ICD-9 translation. The distribution of mappings from one ICD-10 code to one ICD-9 code, and from one ICD-10 code to one ICD-9 cluster, are shown in the following table.

ICD-10 Reimbursement Mapping

Distribution of mappings to single I9 codes and ICD-9 code clusters

Code set	Mapped to single ICD-9 code	Mapped to two-code cluster	Mapped to three-code cluster	Mapped to four-code cluster	Mapped to five-code cluster	Mapped to six-code cluster	Total ICD-10 codes
ICD-10-CM (diagnosis)	65,684	3,647	31	6	0	0	69,368
ICD-10-PCS (procedure)	69,946	1,127	502	458	36	12	72,081

Section 2 – Using the Reimbursement Mapping

Accommodating system requirements

The two text files accompanying this document—one for diagnosis codes, one for procedure codes—are listed in ICD-10 code order. Users are advised to download the

files and load them into a database or table structure that allows efficient lookup based on the ICD-10 code at the beginning of each mapping entry.

Certain ICD-10-CM diagnosis codes specify conditions or external causes which are not represented in ICD-9-CM. For those codes, the mapping entry contains the text “NODX” in the ICD-9 code field. ICD-10 codes that have no equivalent in ICD-9 can safely be ignored by an ICD-9 based pricing system, since they represent conditions or external causes which could never have been coded with ICD-9-CM, and which an ICD-9 based pricing system would therefore not have used.

A health care claim will typically contain a list of ICD-10 diagnosis codes, one of which is designated as principal diagnosis. The Reimbursement Mapping can be adapted to a claims system using the following:

- Reserve space in the system for the maximum number of ICD-9 codes possible in a mapping entry. Since one ICD-10 code may map to a cluster of multiple ICD-9 codes, the mapped output ICD-9 entry may be longer than the input ICD-10 entry. Though the use of clusters in the mapping is uncommon, as shown in the table above, the way to ensure that there is enough space for the mapped ICD-9 output is to reserve space for four ICD-9 diagnosis codes and six ICD-9 procedure codes.
- Map the ICD-10 principal diagnosis first, by looking up the ICD-10 designated principal diagnosis code in the mapping. If the ICD-10 code maps to one ICD-9 code, then this becomes the ICD-9 principal diagnosis. If the ICD-10 code maps to an ICD-9 code cluster, then take the first ICD-9 diagnosis code in the cluster as the principal diagnosis, and use the remaining diagnosis codes in the cluster as ICD-9 secondary diagnosis codes on the translated record. All of the ICD-9-CM diagnosis code clusters are arranged so that the first listed ICD-9 code in a cluster is the recommended principal diagnosis when the combination ICD-10 code it translates from is the principal diagnosis.
- For each additional diagnosis, look up the ICD-10 code in the mapping. If the ICD-9 mapping is “NODX” then do not place anything in the ICD-9 code list for this input ICD-10 code and move on to the next ICD-10 input code. Because a mapping entry may contain more than one ICD-9 code, the placement of the secondary codes in the output ICD-9 space must be tracked independently from the input ICD-10 codes if a correlation between input and output codes is desired.
- For procedures, the process for translating ICD-10 codes on the record is straightforward. Map the codes in the order in which they were received. If the mapping supplies an ICD-9 code cluster, all of the codes in the cluster must be included in the mapping to equal the detail contained in the ICD-10 procedure code.

Testing the mapping

The Reimbursement Mapping contains an entry for every ICD-10 code. However, not every ICD-9 code is used in the mapping. Because the mapping was developed using hospital inpatient frequency data to choose among ICD-9 mapping alternatives in the GEMs, the resultant mapping reflects the coding patterns characteristic of inpatient rather

than outpatient records when the two differ. An ICD-10 code is mapped to the clearly dominant ICD-9 code in the recorded data, or mapped according to additional frequency rules in Appendix B, or mapped to the "closest match" ICD-9 code, in the process outlined in Section 1. Naturally, a process that chooses a single ICD-9 code among alternatives must leave the other ICD-9 alternatives unused.

Users of the Reimbursement Mapping may want to sort the mapping entries by ICD-9 code to determine if any particular ICD-9 codes used by their legacy systems (for example, those qualifying for carve-outs or other special treatment) are not mapped. Such codes would not be used when ICD-10 codes are mapped to their legacy systems via the Reimbursement Mapping.

If ICD-9 codes not used by the Reimbursement Mapping are essential to a legacy system, then the Reimbursement Mapping can be modified for that system's needs by doing the following:

- Consult the relevant ICD-9 to ICD-10 GEM, or one of the commercial tools built from it. This will enumerate the valid ICD-10 translations of the unused ICD-9 code.
- Find the valid ICD-10 codes enumerated above in the first column of the Reimbursement Mapping.
- Substitute the unused ICD-9 code into the Reimbursement Mapping entry or entries found, and document the change as appropriate.

Appendix A – Format of the Reimbursement Mapping Files

reimb_map_dx_2011.txt contains the Reimbursement Mapping from ICD-10-CM diagnosis codes to ICD-9-CM diagnosis codes or diagnosis clusters.

reimb_map_pr_2011.txt contains the Reimbursement Mapping from ICD-10-PCS procedure codes to ICD-9-CM (Volume 3) procedure codes or procedure clusters.

Both files are formatted the same way. “Code” below means either “diagnosis code” or “procedure code” depending on which file is being used. Decimal points have all been removed. F10.151, for example, is F10151 in the file. Codes may contain both alphabetic and numeric characters. All alphabetic characters are upper case.

There is one entry in the file for each valid ICD-10 code. Each entry is from 16 to 40 characters long. The files may be made fixed length by padding each record less than 40 characters out to 40 characters with blanks.

Each Reimbursement Mapping record is formatted as follows:

Position	Length	Contents
1	8	ICD-10 code (3 to 7 characters) left justified in 8-character field. Last character in field is blank.
9	1	Number of ICD-9 codes this ICD-10 code maps to. Values 1 through 6.
10	6	First ICD-9 code (2 to 5 characters) left justified in a 6-character field. Last character in field is blank.
16	6	Second ICD-9 code (2 to 5 characters) left justified in a 6-character field if ICD-10 code mapped to two or more ICD-9 codes. Last character in field is blank.
22	6	Third ICD-9 code (2 to 5 characters) left justified in a 6-character field if ICD-10 code mapped to three or more ICD-9 codes. Last character in field is blank.
28	6	Fourth ICD-9 code (2 to 5 characters) left justified in a 6-character field if ICD-10 code mapped to four or more ICD-9 codes. Last character in field is blank.
34	6	Fifth ICD-9 code (2 to 5 characters) left justified in a 6-character field if ICD-10 code mapped to five ICD-9 codes. Last character in field is blank.
40	6	Sixth ICD-9 code (2 to 5 characters) left justified in a 6-character field if ICD-10 code mapped to six ICD-9 codes. Last character in field is blank.

Appendix B – Reimbursement Mapping Rule Set

The following table presents a detailed breakdown of the frequency based rules used to choose among ICD-9-CM code alternatives, where more than one translation alternative was given in the 10 to 9 GEM. The first two columns give the number and percentage of ICD-10 codes mapped using a given rule. The third column contains the name of the rule and the last column describes the specific components of the rule, i.e., the specific conditions that are met when a map choice is made using the rule.

ICD-10 Diagnosis codes mapped	ICD-10 Procedure codes mapped	Mapping Rule	Rule Detail
65,693 (95%)	66,835 (93%)	None	There is only one ICD-9 translation alternative for the ICD-10 code, and therefore no mapping rule is necessary.
1,490 (2%)	4,151 (6%)	Not OB/NB, Medpar >= 30, pct >= 60, Calif agree	<p>The ICD-10 code is not an obstetric diagnosis, a newborn diagnosis, or an obstetric procedure.</p> <p>There are at least 30 records in the MedPAR data for the ICD-9 code alternative with the highest frequency.</p> <p>The ICD-9 code alternative with the highest frequency represents at least 60% of the total number of records of all ICD-9 alternatives.</p> <p>The ICD-9 code alternative with the highest MedPAR frequency also has the highest frequency in the OSHPD data.</p>
191 (0.3%)	432 (0.6%)	Not OB/NB, Medpar >= 30, pct > 50, Calif agree, All same DRG	<p>The ICD-10 code is not an obstetric diagnosis, a newborn diagnosis, or an obstetric procedure.</p> <p>There are at least 30 records in the MedPAR data for the ICD-9 code alternative with the highest frequency.</p> <p>The ICD-9 code alternative with the highest frequency represents more than 50% of the total number of records of all ICD-9 alternatives.</p> <p>The ICD-9 code alternative with the highest MedPAR frequency also has the highest frequency in the OSHPD data.</p> <p>All of the ICD-9 code alternatives available reside in the same list in the DRG logic. (This is only meant as a general indicator that though the highest frequency ICD-9 code is not overwhelmingly dominant, the other available choices are not strikingly different.)</p>

ICD-10 Diagnosis codes mapped	ICD-10 Procedure codes mapped	Mapping Rule	Rule Detail
1,275 (2%)	75 (0.1%)	OB/NB, Calif >= 30, pct >= 60	The ICD-10 code is an obstetric diagnosis, a newborn diagnosis, or an obstetric procedure. There are at least 30 records in the OSHPD data for the ICD-9 code alternative with the highest frequency. The ICD-9 code alternative with the highest frequency represents at least 60% of the total number of records of all ICD-9 alternatives.
93 (0.1%)	2 (0%)	OB/NB, Calif >= 30, pct > 50, All same DRG	The ICD-10 code is an obstetric diagnosis, a newborn diagnosis, or an obstetric procedure. There are at least 30 records in the OSHPD data containing the ICD-9 code alternative with the highest frequency. The ICD-9 code alternative with the highest frequency represents more than 50% of the total number of records of all ICD-9 alternatives. All of the ICD-9 code alternatives available reside in the same list in the DRG logic. (This is only meant as a general indicator that though the highest frequency ICD-9 code is not overwhelmingly dominant, the other available choices are not strikingly different.)
291 (0.4%)	66 (0.1%)	Combined < 30, Closest match	The MedPAR and OSHPD frequency data combined equal less than 30 records for the ICD-9 code alternative with the highest frequency. Coding expertise was used to determine the closest matching ICD-9 code alternative for the ICD-9 code.
335 (0.5%)	520 (0.7%)	Combined >=30, Combined pct > 50, All same DRG	The MedPAR and OSHPD frequency data combined equal at least 30 records for the ICD-9 code alternative with the highest frequency. The ICD-9 code alternative with the highest frequency represents more than 50% of the total number of records of all ICD-9 alternatives. All of the ICD-9 code alternatives available reside in the same list in the DRG logic. (This is only meant as a general indicator that though the highest frequency ICD-9 code is not overwhelmingly dominant, the other available choices are not strikingly different.)
69,368	72,081	N/A	N/A

