8 Steps to Success in ICD-10-CM/PCS Mapping: Best Practices to Establish Precise Mapping Between Old and New ICD Code Sets

By Dr. Suman De

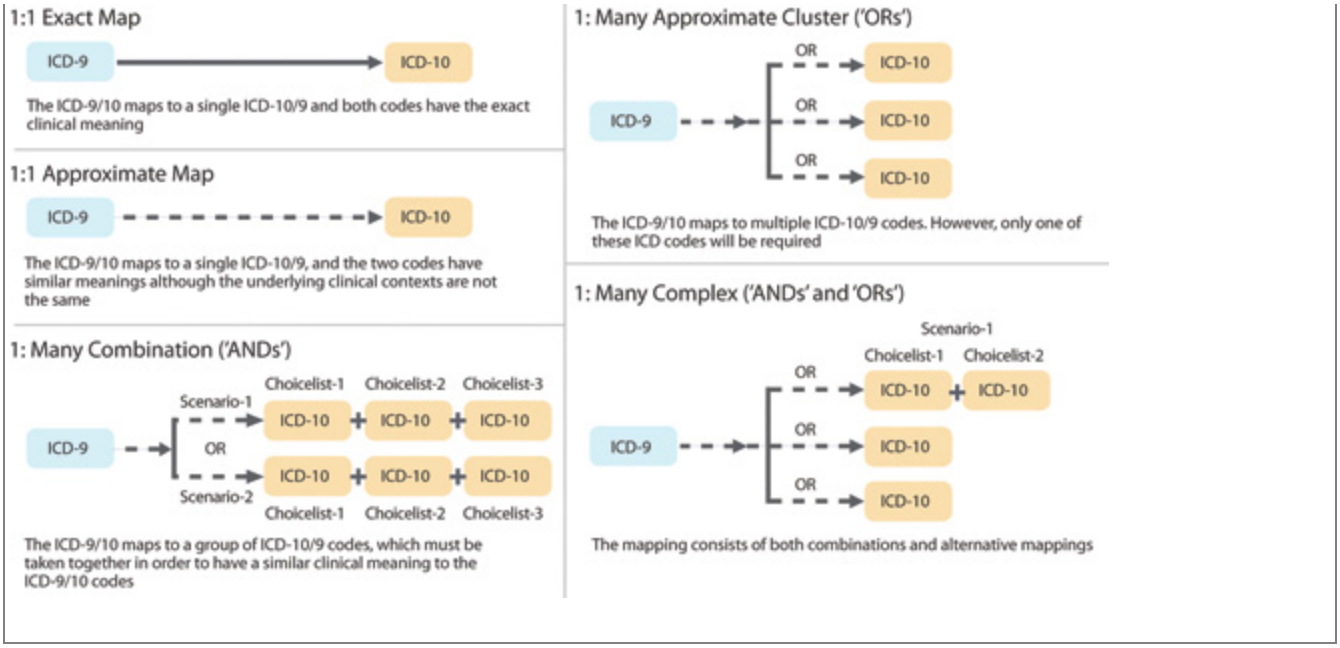
Just as drivers must select the proper road map for planning a trip, healthcare organizations must also manage their code translation process through a defined road map.

This article provides essential guidance to healthcare organizations on adopting best practices that will help to establish a precise mapping between the old and new ICD code sets. These best practices, based on the author's experience from working with multiple healthcare organizations, also help to ensure proper applicability of the mapped codes across various business domains and long-term business requirements—in essence, paving the way to a successful ICD-10 implementation.

The implementation of ICD-10-CM/PCS is a significant opportunity for healthcare organizations to upgrade the quality of healthcare transactional data. It is also a big, complex amendment in the area of clinical coding. Even if organizations decide to move natively in ICD-10 through strategic system upgrades, mapping between ICD-9 and ICD-10 is still a vital cog in their ICD-10 implementation cycle. And even if not in a production environment, static one-time mapping is an absolute requirement for organizations in many of their business situations, such as matching historical data for member cost analysis, care management program designing, supporting certain claims adjudication decisions, or analyzing financial neutrality prior to stepping into the ICD-10 world. Finally, there are the challenges of upgrading legacy platforms deemed to be on the brink of obsolescence within the next couple of years, as their strategic upgrades are complicated and both time- and cost-intensive.

The General Equivalence Mappings (GEMs) provided by the Centers for Medicare and Medicaid Services (CMS) have been a starting point to assist organizations in transitioning from ICD-9 to ICD-10. Prudent organizations are attempting to simplify the GEM complexities to derive custom maps as defined business uses. However, the mapping exercise is not that simple—it requires robust governance, defined processes and frameworks, incorporation of business decisions, and effective management of the translated codes. Organizations that overlook any of these in their mapping exercise may be at significant risk of impacting themselves negatively from a potential productivity, financial, and compliance standpoint.

1:1, Cluster, Combination, and Complex



Understanding ICD-10 Mapping

The exercise of ICD-10 mapping is associated with a number of terms, such as source code, target code, forward map, backward map, 1:1, cluster, combination, complex, and no-maps. It is important for organizations to understand these terms accurately as they venture into the mapping exercise.

- **Source Code:** The origin of the map, or the data set from which one maps
- **Target Code:** The destination map, or the data set in which one attempts to find equivalence or establish the code relationship
- **Forward Map:** A map that translates an ICD-9 code, as source code, to ICD-10 as its target code
- **Backward Map:** A map that links the two coding systems in the opposite direction, moving from the newer ICD-10 version to the older ICD-9 version
- **1:1, Cluster, Combination, and Complex:** The types of mapping relations between source and target codes that exist both in forward and reverse directions
- **Cluster:** This is an entry in a GEM where one code from the many target codes can become a map to the source code ('OR')
- **Combination:** This is an entry where more than one code is required in the target code set to replicate the complete meaning of the source system ('AND')
- **Complex:** This mapping represents multiple code combinations and alternatives that are required to translate a source to a target code ('AND' and 'OR')

The Concerns

With the majority of the codes in GEMs sitting in the category of "approximate maps" (even if having a one-to-one relationship), there are potential chances that some information will be lost in the course of mapping, or some information will be assumed when there is no evidence to support the new detail. No-maps, or orphan codes, are a big concern. The transition to ICD-10-CM/PCS will require substantial improvement in existing documentation practices, including policies, rules, and clinical charts, to ensure that the definitions help consistent clinical interpretation of the new codes when mapped from their precursors. The reason for such complexities is that we are moving from a relatively simpler code set to an inherently more complicated and detailed code set.

The ICD-10 Mapping Approach: 8 Steps to Success

An ideal mapping should aim to relate the source codes to their targets based on a clear understanding of the medical intent, and shouldn't compromise the underlying clinical concept post translation. Just as drivers must select the proper road map for

planning a trip, healthcare organizations must also manage their code translation process through a defined road map.

This section details the eight steps that are deemed necessary to design a useful, logical, and accurate map.

Gather a full inventory of various business functions and systems that currently process in ICD-9 or execute business rules that comply with logic based on ICD-9. Next, perform an in-depth analysis of the proposed implementation plans across the identified business functions and systems (covering all tangential elements) to specify the need to invoke a map or a type of map for supporting those business operations and systems.

It's important to note that there are many instances where maps are not fitting or useful. Organizations should not depend on maps for ongoing use in transactions. When there is a justified need to link one code set to another, it is usually for data trending or analysis, not for active code designation.

Business functions can include:

- Product/benefit groups
- Clinical policy
- Claims adjudication
- Authorization and utilization management
- Care management and member stratification
- Claims pricing and provider reimbursement
- HIM—coding and DRG assignment
- Clinical documentation
- Contracting and reimbursement modeling
- Quality reporting

This core mapping team must consist of skilled resources, including coders who are knowledgeable in ICD-10 codes and CMS GEMs. Stakeholders from various business domains and lines of business will need to provide required business inputs and validate the intent of the created maps. For example, business domain stakeholders can be from medical policy, benefit configuration, contracting, case management, claims, HIM, utilization review, and clinical documentation among others, whereas line-of-business stakeholders can be drawn from Medicare, health maintenance organizations (HMOs), and other similar organizations. Creating this mix ensures genuine cross-functional collaboration.

2012 GEM Statistics per CMS

Mapping Direction		**Foward Map**		**Backward Map**	
ICD-9 Code Type - Diagnosis		Code Count	% of Total	Code Count	% of Total
		14567	100.00%	69833	100.00%
Mapping Types	Exact Map	3533	24.25%	3533	5.06%

	Approximate Map	9964	68.40%	61820	88.53%
	Combination	645	4.43%	3811	5.46%
	No Map	425	2.92%	669	0.96%

Procedure Code Sets

Mapping Direction		**Foward Map**		**Backward Map**	
ICD-9 Code Type - Procedure		Code Count	% of Total	Code Count	% of Total
		3877	100.00%	71918	100.00%
Mapping Types	Exact Map	47	1.21%	47	0.07%
	Approximate Map	3409	87.93%	69800	97.05%
	Combination	211	5.44%	2071	2.88%
	No Map	210	5.42%	0	0.00%

Some of the criteria that can be used to identify the ICD-9 codes for mapping include:

- Codes present in high volumes across transactions
- Codes associated with high-dollar reimbursements
- Unique codes involved in critical business rules across functions and lines of business
- Codes associated with various contracts, critical diagnosis related groups (DRGs), and risk adjustments
- Codes critical from an actuarial, underwriting, and informatics/reporting standpoint

Based on their GEM relationship, the identified ICD-9 codes can be further segregated into categories with respect to defined criticality and complexity parameters. The criticality parameters are based on mapping decisions, and the complexity parameters are based on target code choices. The parameters are given in the table on page 48.

The percentage of occurrences of the code categories given in the table have to be re-evaluated across identified business processes, rules, transactions, data sets, and system databases. Doing so will define the mapping preference, calculate the effort, and help in publishing an accurate timeline.

Create a Master Reference Mapping List

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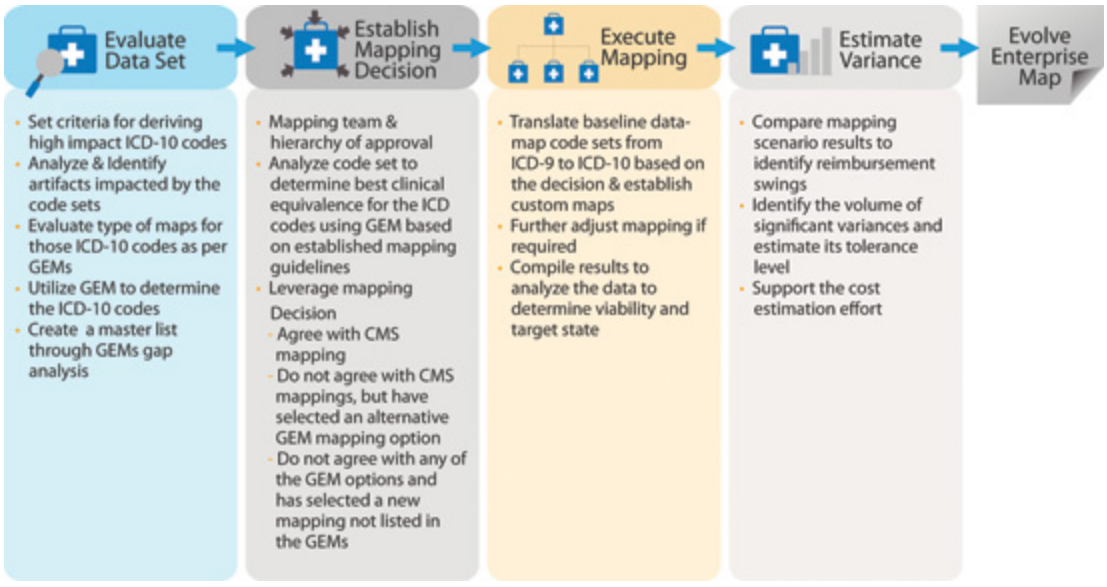
To establish a comprehensive master mapping list that consists of a complete reference of ICD-10 codes, carry out a proper gap analysis between the forward and backward GEM files, with respect to the commonly used ICD-9 codes, or the priority list of ICD-9 codes. For example, in the forward direction, an ICD-9 code for malignant carcinoma of breast has a simple 1:1 map, whereas in the reverse direction there are three different ICD-10 codes that map to the same ICD-9 code based on laterality. A GEM gap analysis, in this case, will help determine the two additional ICD-10 codes that have relationships with the ICD-9 code that were not mentioned in the forward map.

The Code Set Translation—An Iterative Process



Define an Absolute Mapping Guideline

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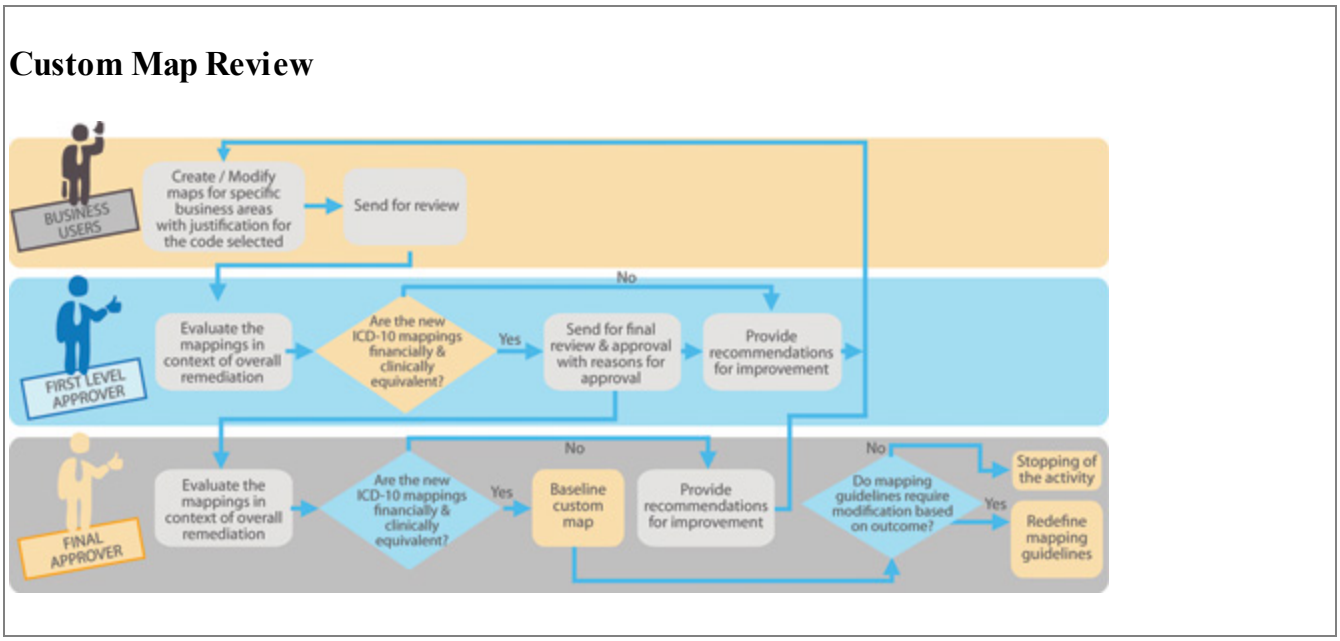
Define an absolute mapping guideline to ensure that the mapping intent is clearly stated and that the code translations from the diversified versions assure consistency in clinical interpretation. An absolute mapping guideline will also remove any loss of clinical concept or prevent assumption of any clinical concept that may not be true. The guideline also helps define the best map that can ensure clinical, financial, and operational neutrality. It should describe how to map to the nearest relationship, how the code translation alternatives should be handled, and whether mapping rules should comply with or override GEMs. The GEMs can be overridden in the following ways:

- Do not agree with GEM guidelines. For example, override GEMs defined by the scenario-choice list rule and narrow down a combination map to a 1:1 exact map by selecting the best clinical equivalent code from the list, or select more than one code from a cluster map.
- Do not agree with the options provided by GEMs for a source code. Instead, select target codes from another GEMs option to satisfy the clinical equivalence.
- Do not agree with any of the GEM options. Instead, select a new mapping not listed in the GEMs.

Every map must include a set of guidelines or rules that will govern the creation and use of the map. These rules and guidelines must be consistent with the stated purpose of the map and must include guidance developed by authoritative sources of the systems. Some of the considerations in developing custom mapping rules to produce meaningful and reliable relationships between ICD codes are:

- Determine the purpose of the applied mapping, such as translating applications, historical data conversion, clinical, or financial process translation.
- Apply contextual data or any additional data available for reference, such as service area, age, gender, provider type, LOS, and member medical history.
- Comply with existing coding practices, reference to alphabetical and tabular indexes, and ICD-10 coding guidelines, namely exclusion and inclusion notes and principal and secondary relations.
- Map codes with consideration to benefit categorization, medical policies, and business rules.
- Establish ontology-based closest clinical match of the codes to ensure clinical equivalence.

While creating individual maps, members of the mapping team from each domain need to provide a detailed justification on why a particular code was selected so that it can be interpreted correctly during the review process.



Establish multi-level, closed-loop mapping governance with defined roles and responsibilities. This governance structure facilitates proper decision making and review of maps at each step, especially in a situation where there are multiple alternatives and judgment is required to determine the code in the target list that best represents the medical concepts in the source code set. There are definite clinical and financial implications for any defined map. Thus, some level of control and approval is obviously needed to oversee the mapping activity. Organizations need to decide how they will handle this decision making process. Organizations also need to decide how to handle the type of experts and stakeholders involved in the following:

- Assuring an interdisciplinary approach
- Guiding accurate code translations
- Ensuring accountability and visibility at the right level within the organization

Test the maps so that they are deemed "fit for purpose," meaning they should perform as desired by the business—clinically, financially, and operationally. This is done by using random samples of statistically significant size, and any identified variance with respect to trending and benchmarked data from the expected result. For example, factors such as shift in DRG assignment, reimbursement swing, and change in current business logic have to be resolved through an iterative process. Reproducibility is a fundamental principle during mapping. The validation process helps determine areas in the mapping

process that require more detailed analysis. It also helps determine whether the established custom map has to be further refined.

Criticality and Complexity Parameters

Codes	Complexity	Criticality
Codes with 1:1 Exact Maps	Low	Low
Codes with 1:1 Approximate Maps	Low	Medium
Codes with 1: Many Approximate Maps in Clusters	Medium	Medium
Codes with 1: Many Combination Maps	Very high	Very high
Codes with 1: Many Complex Maps (cluster and combination entry)	Very high	Very high
Codes with Many: 1 Approximate Maps	Medium	Medium
Codes with Many: Many Approximate Maps	High	High
Codes with no map or orphans	Very high	Very high

Maintain the maps accurately, particularly when the sources and targets are added or deleted, when there are changes in terminologies or code definitions, or when the reference maps (GEMs) are revised by CMS. The level of effort required for this must not be underestimated because updates may occur many times a year.

Maps have specific and limited value; they should not be used when an organization is migrating to a new standard. Reliance on maps that are not properly maintained can cause data integrity loss.

Mapping is complex and requires careful analysis, planning, and coordination within the organization. Since mapping appears likely to play a key role in the ICD-10 implementation processes, it is recommended that best practices are adopted.

Dr. Suman De (suman_de@infosys.com) is an ICD-10 consultant and product manager at Infosys Public Services.

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