

**APPLICATIONS AND TECHNOLOGIES COLLABORATIVE**

# ICD-10 – Vendor Evaluation

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## The Business Challenge

The challenge of the transition to ICD-10 requires that specific tools are available to assist in the process of translation and the migration of the current business environment that operates with ICD-9 codes to an environment where the health condition of the patient is defined through ICD-10 codes. Business impact analysis, assessment of the impact on groupers logic, crosswalk development and redefinition of policies, rules, and analytic categories will be a major effort moving forward into this new environment. This effort will require tools that are currently offered by a large variety of vendors. The vendor offerings may or may not meet the business requirement of the organization. Promises of capabilities may not meet expectations.

This white paper is focused on key factors to consider in evaluating vendor capabilities to meet organizational needs in the migration from the ICD-9 environment to ICD-10. Some of these capabilities may be delivered in-house, but even with in-house development, some process for evaluation of the how well application development meets business needs should be considered similar to an evaluation of external vendor offering.

## Determining Functional Needs

Technology support for readmission prevention will become an increasing priority as prior to an evaluation of vendors, a clear definition of functional needs is required. The functional needs related to assessment, remediation, implementation, operation, and maintenance of ICD-10 codes fall into the following areas:

### Maintenance of Code Sets

Ongoing maintenance of codes sets can be done based on publically available files, however there are advantages to vendor acquired files.

- Notification of updates is handled by the vendor
- The data files may contain more robust metadata around valid begin and end dates and change maintenance.
- Other value-add files may be available that provide machine readable versions of documentation that would be difficult to from tabular or index documents.
- A careful evaluation will be needed to determine the level of value-add over publically available files when balanced against the cost

### Searching for Codes

Robust code searching will be critical to a variety of operational business needs as well as ICD-10 migration requirements. Coding from source documentations, code research, and a variety for other functional activities will require the ability to accurately and efficiently identify proper codes to represent documented clinical concepts. Searching includes the ability to search for ICD-9 and ICD-10 diagnosis and procedures codes. Applications that support accurate and efficient code searches should include the following functionality:

- **Robust term based search of codes** – The ability to search for codes based on terms defined within the code description. This should include the ability to search of multiple terms, partial strings with wild card and nested ‘and’, ‘or’ and ‘not’ logic.
- **Code based search** – This would include the ability to search by multiple code ranges as well as multiple individual codes. It should also support partial code

searches or searches for characters in different positions. For example the ability to search for codes with the first three characters =‘nnn’ and the 7th character = ‘n’.

- **Tabular based search** – The ability to search for codes based on the published tabular index
- **Alphabetical index search** – The ability to search for codes based on the published alphabetical index
- **Concept based search (Evolving vendor capability)** – The ability to search based on clinical concepts. For example the ability to search on the concepts of “fracture”, “distal” and “radius” and identify codes for “Colles’”, “Smith’s”, and “Barton’s” fractures since these are fractures of the distal radius. (This search ability requires considerable sophistication in the underlying data engine. Current vendor ability to accurately support this level of concept searching appears limited.)

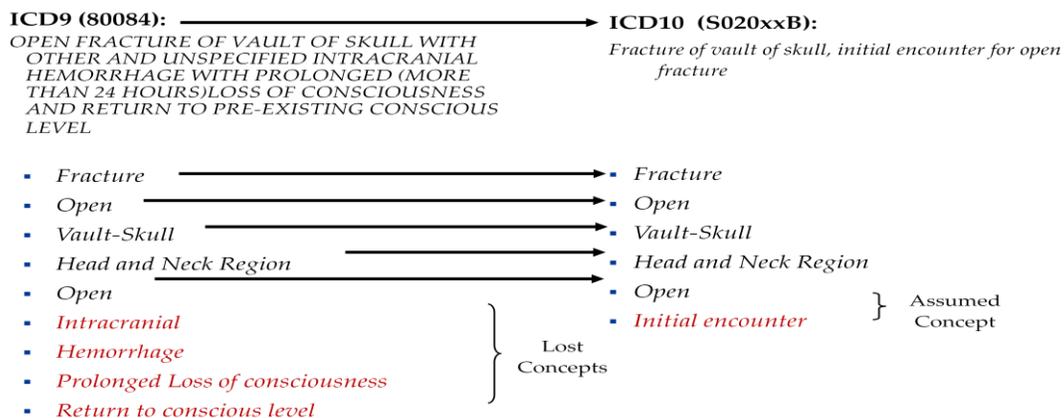
### Code Crosswalking

During the transition period from ICD-9 to ICD-10, data environments will include both ICD-9 and ICD-10 codes. Though most organizations should support the ability to process native ICD-9 and ICD-10 codes in a dual processing environment, there may be certain conditions where crosswalking will be required from ICD-9 to ICD-10 as well as from ICD-10 to ICD-9. For the purpose of this discussion, we will define a crosswalk based on the definition proposed by WEDI (Workgroup for Electronic Data Interchange).

*A crosswalk is: “The specification for the translation of one code within the source code set to one or more codes within the target code set without human intervention.”<sup>1</sup>*

When codes are crosswalked between ICD-9 and ICD-10, certain concepts will be lost or assumed in the process for over 90% of code matches. The ability to identify the crosswalking logic that minimizes the loss or assumption of information is important to support the best possible data integrity during this transition period.

The following illustrates an example of crosswalking where the map from ICD-9 to ICD-10 results in information that is lost as well as the assumption of some information that may not be true.



<sup>1</sup> WEDI SNIP ICD-10 Crosswalks Primer White Paper

[http://www.wedi.org/snip/public/articles/dis\\_publicDisplay.cfm?docType=6&wptype=1](http://www.wedi.org/snip/public/articles/dis_publicDisplay.cfm?docType=6&wptype=1)

Features necessary to develop, maintain and document the development of crosswalk specifications include.

- **Workflow** – The ability to support the workflow of crosswalk definition, approval, output, maintenance, and governance.

The workflow should support the selection of one or more codes in the crosswalk from any search method or from candidate codes from either GEM (General Equivalency Mapping) or reimbursement maps

- **A robust search engine** – The ability to effectively search for a code based on a robust set of search criteria.

This level of search engine sophistication is needed to provide support to independent research of crosswalk candidates.

- **Reimbursement map support** – The ability to demonstrate mapping as defined from ICD-10 to ICD-9 in the reimbursement files.

This will provide a comparison in ICD-10 to ICD-9 mapping to those cross walks reported to maintain revenue neutrality.

- **GEM support** – The ability to identify GEM based matches in both directions.

This should include the ability to identify codes where ICD-9 or ICD-10 codes are either the ‘source’ or ‘target’ of the crosswalk or both.

- **Crosswalking quality (ideal vendor capability)** – The ability to provide measures of the quality of the match based on the concepts that are lost or assumed in the match.

Currently there do not appear to be any vendors that can rate the quality of the match in definitive terms.

- **Crosswalking financial modeling (Evolving vendor capability)** – The ability to test the financial implications of the crosswalked code on payment as well as the volume and extent of claim impacted by the crosswalk.

There are vendors who purport to have a financial modeling tool, but there are limitations and assumptions made in the modeling process that may not be true. For example, there are some vendors who look at existing ICD-9 codes, create a map to one or more ICD-10 codes and then run financial projections based on the new codes and how they would impact payment models such as DRGs. The problem with some of these models is that they assume a specific model of translation and also assume that the provider will submit codes based on this translation model. Currently the big unknown is how providers will code and how organization will choose to translate. There are substantial differences in payment depending on what code is selected in the migration from ICD-9 to ICD-10 from the choices available.

#### **Definition of Code Set Aggregation or Grouping**

Most policies, rules and analytics are based on groups or categories of codes. These groups of codes are critical to drive business intelligence and business decision algorithms for many healthcare information systems. Defining these groups appropriately in ICD-10 requires analysis of the intent of the policy, rule or category

in order to assure the selected ICD-10 codes represent that intent. A crosswalk from sets of ICD-9 codes that have historically been defined in these groups will not provide the appropriate set of ICD-10 codes to accomplish the original intent. The mixed granularity, changes in medical concept content, and many-to-many relationship of ICD-9 and ICD-10 codes makes crosswalking problematic for this purpose.

Features necessary to support this effort of redefining code based policies, rules and categories include:

- **Codes set aggregation database system** – A database model will be required that provides the ability to support an unlimited number of aggregation schemes and ad hoc aggregation sets for selected purposes. Appropriate metadata for each aggregation set and scheme must be supported by the database, in other words, once groups of codes are created and defined, there must be a way to manage and retrieve those groups for any number of purposes. The metadata needed to accomplish this will include:
  - A name for the aggregation or set of codes
  - A definition of the intent of the code set
  - A unique identifier for the code set
  - Data about versioning, modification, access, approval, etc.
  - Other metadata as needed that will help manage create, read, update and delete function for the code set file(s)
- **Workflow** – A workflow interface will be needed to provide the environment for research and identification of the appropriate grouping of codes, a governance (approval) process and maintenance interface, and the ability to name, date, and apply other metadata to the set of codes for use in downstream analysis and algorithms. Workflow will vary by organization, but some basic workflow steps might include.
  - A clear definition of the purpose and intended uses of the code set.
  - Searching for the appropriate codes to include or exclude in the data set by terms, concepts, tabular listings, index listings, code value searches or any number of other parameters.
  - Naming and cataloging the code set for use in rules, policies and analytic categories
  - Creating the link between these defined codes and rules, policies and categories
  - Retrieval and modification of existing code sets
  - Approval processes
- **Robust search engine** – Research and definition of the appropriate code sets requires a sophisticated search engine as outlined above. In particular the ability to define sets of codes that include defined concepts is important to this effort.

### Analytics

Analytics that use ICD procedure and/or diagnosis codes will change dramatically under ICD-10. Any software vendors that provide business intelligence solutions should support ICD-9 and ICD-10 codes simultaneously during the transition. Additionally Business Intelligence schemas should support 'n' number of ICD codes per record with a definition of code type (ICD-9 or ICD-10). Any defined reporting models such as quality (HEDIS), efficiency (i.e., ETGs, owned by Urx), population risk models (i.e., DxCGs, owned by Symmetry) or other aggregation schemes should be fully remediated to support native ICD-10 as well as native ICD-9 codes.

Considerable research will be required to assure that defined categorization models are appropriate for both and ICD-9 and ICD-10 environment. There should be a clear definition of the plan for fully leveraging ICD-10 analytic capabilities in future releases.

## Managing the Vendor Selection Process

A wide range of vendors may offer solutions to address one or more of the functional transition needs noted above. The process of narrowing this list to an appropriate set of candidates and then selecting the best candidate can be complex. Accomplishing this requires a process that includes:

### Inventory of Candidates

An inventory of candidates can be established through research through any number of sources. Regardless of the source a catalog or repository of vendor candidate information will be needed. This repository should include

- An unique identifier for the vendor
- The vendor corporate name
- The vendor product(s) name(s)
- A description of the products offered
- The type of products offered (coding applications, search engine, crosswalking tool...)
- The underlying logic used by the products (GEM, terminology engines, etc.)
- A list of customers for each product
- Contact information

### Defining Acceptance Criteria

Prior to the selection process a set of criteria to provide for a thorough and objective review of vendor options. Criteria should be applied where appropriate to all candidate products. Criteria should include:

- Match of features to business needs (this assumes a process to prioritize these features to meet the organizations specific functional priorities)
- Customers and references
- Comparable industry experience
- Vendor financial and longevity stability
- Support services offered

- Architectural solutions that provide technical platform compatibility (monolithic, n-tier, SOA, web/cloud, etc.)
- Ease of integration in existing models (web services, XML transactions, class libraries, older HL7 2.X transactions, etc.)
- Alignment of workflow interfaces with organizational workflow
- Performance score to testing against defined business and data test scenarios

### **Assuring Performance**

In order to assure that expectations are met, the contracting process should carefully consider.

- A clear service level agreement that defines:
  - Functioning of all required features
  - System performance requirements
  - Upgrade policies (number of versions supported or latest version supported, along with number of upgrades per year)
  - Error remediation and new feature response requirements
  - Support requirements
    - Level of support
    - Response time
    - 7X24, 8X5...
- Clear and acceptable licensing agreements
  - Favored Nation Status
  - Business Associate and data use agreements
  - Coverage for federal mandate changes
  - Updates for standards version changes
- Remedies in the event of failure
  - Remediation requirements
  - Penalties
  - Disaster recovery requirements
- Data and concept ownership

## **Vendor Testing**

Assuming that the vendor candidate provides an appropriate response to defined functional requirements and meets other predefined criteria, there is still a need to validate that requirements are actually met. **This will require the development of specific test scenarios that accomplish the following:**

- Pre-defined clinical scenarios<sup>1</sup> that reflect known challenges to the coding process

<sup>1</sup> Scenario based testing will be discussed in greater detail in a subsequent white paper.

- Pre-defined ICD-9 and ICD-10 codes for translation that represent known challenges to the translation process and mimic varying translation models.
- Workflow testing by operational staff to assure that workflow supports existing business processes.
- Test cases that reflect codes and scenarios that represent high volume or high dollar impacts to the organization.
- Pre-defined categories of codes to test the ability of the product to support the definition of categories of ICD-10 codes as expected.
- Testing of data streams to support computer assisted coding?

## Action Items

Effective transitioning to ICD-10 will require tools to analyze, remediate, test, implement, and leverage ICD-10 related business and information processes. Appropriate evaluation, testing and selection of vendor tools is a key factor toward success. Application support may come from internal or external development or COTS products. Regardless of the source tools must be able to meet functional requirements. The following represent the key action items to consider in moving forward with the evaluation and selection of the tools needed to support his effort.

- **Clear identification of all functional requirements to support the transition to ICD-10 including:**
  - Maintenance of ICD-10 codes and related categorization schemes
  - Sophisticated code searching based on a wide array of parameters
  - Code crosswalk development
  - The definition of code set aggregation or groups
  - Analytics in transition and new analytic models in an ICD-10 environment
- **Identify the approach to managing the vendor selection process**
  - Identify and manage the inventory of candidates
  - Define acceptance criteria
  - Define requirements for contracting
    - Service level agreements
    - Performance requirements
    - Failure remedies
    - Standards updates
    - Data and concept ownership
- **Define the approach to vendor testing**
  - Define scenarios for testing
  - Define proof of concept models
  - Identify expected result from test cases

## ACRONYM KEY

**DRG**

Diagnosis Related Group

**ETG**

Episode Treatment Groups

**GEM**

General Equivalency  
Mapping

**HEDIS**

Health Employer Data  
Information Set

**HL7**

Health Level 7

**ICD-9**

International Classification  
of Diseases (9<sup>th</sup> Edition)

**ICD-10**

International Classification  
of Diseases (10<sup>th</sup> Edition)

**XML**

Extensible Markup  
Language

This paper describes at a high level some of the considerations for assuring that the technology tools needed to support the transition to ICD-10 are aligned with clearly defined business requirements that support the needs of the organization.

