Health Data Consulting

ICD-10

Scenario Based Testing

Analysis, Planning and Testing Driven by a Reference Implementation Model

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THE BUSINESS CHALLENGE

The transition from ICD-9 to ICD-10 represents one of the most significant changes to healthcare information in decades. These codes are a critical component in defining the patient's health state and institutional procedures done to improve or maintain that health state. They drive business processes such as payment, contracting, auditing, case mix adjustment and many other important business processes. They are also critical in analysis of healthcare services and conditions for the purpose of quality measures, utilization patterns, population risk analysis, patient safety, clinical research and multiple other reporting and analytic purposes.

ICD-10 represents far more than a simple version change. Besides the major expansion in the number of diagnosis and procedures codes, there have been major changes in the structure, definition and coding rules. As a result the way that healthcare conditions and institutional procedures are described in most healthcare data will be significantly different resulting in major changes in claims processing, business rules and analysis of healthcare delivery patterns.

As we move into this transition, we have no historical reference for the way these codes will be used and what the resulting impacts will be on the business of healthcare delivery. Predicting the future without a historical reference is a challenge. Current models that claim to predict what the future will be like after transition make assumptions that may or may not be true. These models arbitrarily map current ICD-9 code data using a General Equivalency Mapping (GEM) type map. How providers will code today's conditions in ICD-10 however, cannot be determined by a simple mapping of today's codes.

Example:

We can look at a case of a patient with an open fracture of the femoral shaft that presents in September of 2013 that will be described by a set of ICD-9 codes. If we now assume that the same case presented after October 1, 2013 the condition is the same, but how we describe that same case in ICD-10 has substantially changed. Figure one illustrates the difference in how the same event is described very differently in ICD-10 vs. ICD-9. In addition it can be seen that in ICD-9 there are a total of 16 codes available to describe all of the variations in fractures of the femur where as in ICD-10 there are over 1530 codes to accommodate significant differences in the various types of fractures of the femur that may present for treatment.

Fig.1

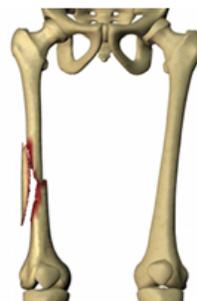If we look at healthcare delivery today, we can predict that in general most of the conditions and procedures that we see prior to the transition will also be seen after October 1, 2013. The conditions and procedures are the same, it is just the way that we are expressing them in codes that is changing.

Assessing the transition impact and testing the feasibility of proposed solutions requires that we use a consistent understanding of conditions and procedures today, redefine these conditions and procedures natively in ICD-10 and model the results in an ICD-10 environment.

WHAT IS SCENARIO BASED TESTING?

When you mention the word "testing" most will think of something that system QA professionals undertake to assure that the results of development meet business requirements and the technical specifications for business change. The ICD-10 transition however takes us into an environment where requirements may not be readily apparent since we have no historical reference on which to base these requirements. In addition this change is far more of a business and informatics change than it is an information technology change. "Testing" takes on a new meaning in ICD-10. "Virtual testing" is needed to discover risks and to assess the feasibility of proposed solutions by modeling what we know today with what we anticipate tomorrow.

WHAT IS A SCENARIO?

A scenario has the following characteristics:

- It identifies some event or condition that we are familiar with today

- It recreates that event virtually through some verbal or data representation
- We can then define a variety of assumptions and variables around this virtual representation to assess potential risks under different business conditions.

Scenarios are created to establish a reference point around which we a have some historical familiarity.

GOALS FOR SCENARIO BASED TESTING?

The goal of scenario based testing is to model todays experience to minimize risks and leverage the opportunities of future change by:

- Identifying points of risk
- Identifying requirements
- Virtually applying alternative assumptions and variables
- Virtually testing remediation options
- Establishing the test plan and test cases for post-development systems testing

PICKING THE RIGHT SCENARIOS?

It will be impossible to identify every process and potential area of risk, but we can greatly minimize risk and improve the efficiency of assessment, remediation and testing by picking the scenarios that represent:

- High Volume
- High Cost/Revenue
- High complexity, or likely points of failure
- Anticipated opportunities for improvement of existing processes

It will be important to analyze your organizations data to determine where to focus efforts by defining those scenarios that are most likely to reflect those areas that matter the most. The following illustrates how this focus may be driven by these considerations.

HIGH VOLUME

The distribution of the use of ICD-9 diagnosis and procedure codes in claims data is highly concentrated to a relatively small set of codes. In analyzing a data set[1] of institutional and professional claims, 5% of the unique codes represented approximately 70% of the volume of codes submitted.

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[1] Based on a multi-payer data set over 1 year of claims accounting for ~ 560 million codes (Health Data Consulting)
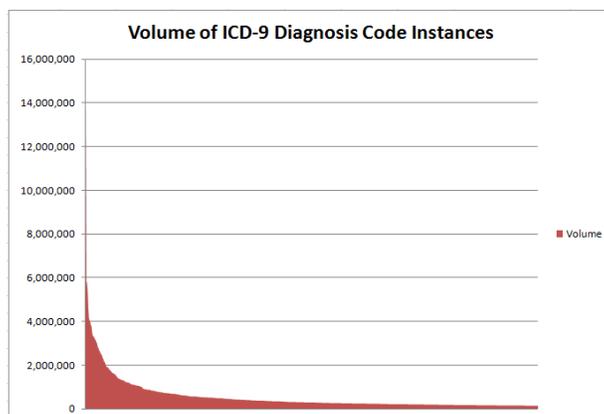
Fig.2

HIGH COST/REVENUE

Similar to the skewed distribution of the volume of codes there is a similar concentration of codes that represent high revenue for providers or conversely a disproportionate share of the medical loss ratio for payers. In an analysis of inpatient data[2] the following findings were noted:

- ✓ Only 28% of the 14,432 possible ICD-9 diagnosis codes were ever used in the 3 years of inpatient data
- ✓ 3% of the possible codes based on primary diagnosis accounted for 80% of billed charges

The distribution of billed charges for claims by clinical category using the AHRQ clinical classification scheme based on primary claim diagnosis demonstrated the following top five categories of charges:

- ✓ 17.5% = Diseases of the circulatory system
- ✓ 13.8% = Diseases of the musculoskeletal system and connective tissue
- ✓ 9.7% = Injury and poisoning
- ✓ 8.9% = Diseases of the digestive system
- ✓ 8.8% = Neoplasms

Based on MDC categories of DRGS, the top 5 MDCs included the following:

- ✓ 17.3% = Diseases& disorders of the musculoskeletal systems & connective tissue
- ✓ 16.6% = Diseases and disorders of the circulatory systems
- ✓ 8.7% = Diseases and disorders of the digestive system
- ✓ 8.5% = Pregnancy, child birth & the puerperium
- ✓ 7.1% = Newborns and other neonates with conditions originating in the perinatal period

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[2] Based on a data set of inpatient claims over 3 years for a commercial payer with 1 million lives. (Health Data Consulting)

HIGH COMPLEXITY

The complexity of mapping between ICD-9 and ICD-10 is similarly concentrated to a smaller set of codes. Based on billed charges related to the primary diagnosis or procedure on this same data set[3], the following findings were noted.

- ✓ 1.4% of billed charges were related to claims where the primary diagnosis code (ICD-9) required more than one ICD-10 code for mapping purposes

- ✓ 7.6% of billed charges were related to claims where the primary procedure code (ICD-9) required more than one ICD-10 code for mapping purposes

- ✓ 23% of billed charges were related to claims where the primary diagnosis code (ICD-9) mapped to one ICD-10 code, but there was more than one choice in the GEM[4] mapping.

- ✓ 85.3% of billed charges were related to claims where the primary procedure code (ICD-9) mapped to one ICD-10 code, but there was more than one choice in the GEM mapping.

A limited set of other codes represent high complexity because of significant changes in structure, definition, coding rules and terminology.

POTENTIAL IMPACT TO CURRENT KEY BUSINESS OPERATIONS AND FUTURE OPPORTUNITIES

The above mentioned areas will generally address many of the current business risks, but there may be other business activities where scenarios will help identify areas of focus for the current business as well as the business road map moving forward. Some of these areas might include:

- Quality measures
- Case mix/severity adjustment
- Hospital acquired conditions
- Fraud, waste and abuse detection
- Contracting scope
- Capitation and carve-outs

REFERENCE IMPLEMENTATION MODEL

A Reference Implementation Model (RIM) is a method of simulating today's processes in a future environment by using key scenarios and virtually walking these scenarios through existing systems and processes to test for risk, requirements and the feasibility of potential solutions.

Reference Implementation Models are commonly used outside of healthcare to test disaster responses, security measures and a variety of other situations where we may

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[3] Based on a data set of inpatient claims over 3 years for a commercial payer with 1 million lives. (Health Data Consulting)

[4] General Equivalency Mapping (GEM) files - http://www.cms.gov/icd10/

have limited historical experience, but we anticipate the need for a change or response given some future variable.

The following is an illustration of how a scenario that was created in response to an analysis that illustrated an area of potential business risk for a hospital based on the factors mentioned above.

THE SCENARIO

- A 27 year old pregnant female is involved in an accident where she sustains an open fracture of the right femur as well as a skull fracture.
- She has a chronic history of urinary tract infection.
- At the time of admission the patient has an MRI and a spinal tap performed.
- The patient is taken to the operating room where a debridement of the wound is accomplished as well as an open reduction and internal fixation of the femoral fracture.
- The patient had a Caesarian Section for a preterm delivery three days after admission.

Based on this scenario, a virtual walk through of the hospital care processes provides a visualization of potential areas of risk and creates a model to virtually test the feasibility of proposed remediation efforts.

SUBJECT AREAS AND KEY QUESTIONS

Key questions need to be addressed in all functional areas related to the scenario. The following is an illustration of some, but certainly not all questions that would need to be addressed in this example of a Reference Implementation Model.

FIRST ENCOUNTER:

- Has assessment and documentation included information about:
  - ✓ The patient's level of consciousness?
  - ✓ The anatomical details of the skull fracture?
  - ✓ The nature of intracranial injury and/or bleeding?
  - ✓ Trimester of pregnancy?
  - ✓ Anatomical location of the Femur fracture?
  - ✓ Type of fracture (transverse, oblique, comminuted)?
  - ✓ Size of the wound?
  - ✓ Muscle, nerve and vascular damage at the fracture site?
  - ✓ Details on the nature and cause of the accident?
  - ✓ … multiple other parameter need to code in ICD-10

- What diagnostic procedures (MRI, Spinal tap, etc.) where done at the time of admission?
- How are admission, eligibility and other intake processes impacted by ICD-10?
- Do the emergency rooms systems support ICD-10 codes and the level of documentation needed?

- Are triage procedures or documentation impacted by ICD-10?
- Is public health, disease surveillance or external reporting impacted?
- Are present on admission conditions such as the history or recent urinary tract infection documented?

OPERATIVE PROCEDURE:

- Did the operative report for the repair of the femur and the C-section include sufficient documentation of the nature of the operation to support proper coding under PCS?
- Do operating room systems support ICD-10?

INPATIENT CARE:

- Does the electronic medical record system include support for documentation of the new parameters required by ICD-10?
- Does nursing documentation support ICD-10 documentation?

HEALTH INFORMATION MANAGEMENT / MEDICAL RECORDS/CODING:

- Do templates and documentation requirements/guidelines support ICD-10 requirements?
- Are systems to support coding updated?
- Is there an ongoing process in place to measure coder productivity and accuracy?
- Is a governance model in place for oversight of coding practices?
- What is the process for querying clinicians for additional data required for ICD-10?
- How is coding segmented (specialty, diagnostic, procedures)?

BILLING:

- Have billing systems been updated to support ICD-10 codes?
- Can the increased number of codes supported by ICD-10 be supported by the billing systems?
- Have DRG groupers been updated to support ICD-10?

PAYMENT:

- Are AR days impacted?
- Are denials impacted?
- How are present on admission and preventable admissions measures impacted?
- Are there impacts related to pay for performance?
- Are HCC or other case mix adjustments impacts?

COMPLIANCE AND AUDITS:

- How is external reporting impacted?
  - ✓ State reporting
  - ✓ Accreditation
  - ✓ Quality measures
- How will audits change?
- Fraud and abuse detection changes?
- Are codes valid and are documentation requirements for codes met?

VENDORS:

- Besides internal systems are there external vendors that will be impacted?

CONTRACTING:

- How is contracting impacted?

EXTERNAL TRANSACTIONS:

- How will the outbound 837 transaction change?
- How and when will testing with trading partners occur?
- Which payers are crosswalking submitted data and how is that crosswalking happening in their systems?
- How will inbound transactions (eligibility, Remittance advice and other inbound transaction change?)
- How will prior authorizations change?
- How will external provider communications change?

ANALYTICS:

- How is ICD-10 data managed in the data warehouse?
- How are categories going to be redefined?

These and other subject areas are defined and key questions are applied before, during and after the walkthrough to build 'threads' of the reference implementation. By using multiple 'threads' based on various prioritized scenarios, organizations can create a virtual 'fabric' to predict how the transition will unfold. This same process can also be used to establish a plan for remediation and system testing post-remediation.

SUMMARY

- Testing is not just to confirm what you have done…
- Test driven assessment using key scenarios provides an effective low cost method of reducing substantial risk early in transition.
- Selection of the proper scenarios is important to get the maximum value from the assessment and planning effort and is critical to minimizing risk moving into implementation
- True end to end testing starts with patient entry into the system and ends with reconciled payment and data warehouse storage.

ACTION STEPS

1. Identity a prioritized focus by:

    ✓ Using existing ICD-9 data to identity areas of high volume and high cost/revenue.

    ✓ Researching ICD-10 maps (GEM), rules, definitional changes and terminology changes to identify areas of high complexity

    ✓ Evaluating key coding domains that will impact critical business process or analytics

2. Create a set of scenarios that will provide a historical reference for today's experience based on these areas of prioritization.

3. Use a Reference Implementation Model to walk these scenarios through the organization to answer key questions around implementation, discover requirements and virtually test the feasibility of proposed solutions.

4. Based on this discovery define the plan for remediation.

5. Use these scenarios to create test cases that will be part of the system remediation test plan.

6. Use the same scenarios to identify variations in processing external parties given the same scenario describe in ICD-9 vs. ICD-10.