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Modeling the Reimbursement Implications of ICD9 to ICD10 Conversion

By Andrew Käser
Director, Revenue
PeaceHealth Southwest Medical Center
Vancouver, WA

Executive Summary

The current uncertainty as to when ICD-10 will become mandatory encourages hospitals and others to reconsider implementation priorities and calendars. Regardless of when the actual implementation date occurs, hospitals and providers are well served to anticipate changes that might occur once the final date arrives.

An effective definitive forecast of the reimbursement impact related to changes to clinical coding is premature until such time as CMS releases the relevant version of the DRG reimbursement parameters that will be in effect with ICD-10. Until that release, any preliminary forecast will be considerably subjective, in particular appreciating the complexities of developing reasonable translation proxies—for which a default standard the industry has declined to produce—for all codes in both sets.

In order to accommodate the dramatic increase in the number of diagnostic codes, the DRG assignment process predicated through excluded codes provisions is more systemic in its design and less iterative than its predecessor. This change seems to impact a small but significant percentage of cases resulting in assignment into different DRG classes with, depending on the situation, a higher or lower ranked DRG weight.

Until the relevant version is released, developing a reasonable model will require to a considerable degree more art than science. Decision makers will thus have to be comfortable with some level of 'fudge' in the result, and accept that the best results are only approximations. Considerable resources can be expended to fine tune results in the near term, but the point of diminishing returns for resources invested may occur much earlier than later.

A key challenge in any analysis will be based on the reasonableness of the cross-walk of code relationships from ICD-9 to ICD-10. In many cases there are no one-to-one relationships. Absent an actual chart review to effect accurate coding—any analysis based on an over-arching summary cross-walk will be prone to some degree of margin of error.

Based on the best estimates and our current understanding of the code migration coupled with the impact of code relationships for purposes of DRG assignment, this analysis of a representative data set suggests a very minor increase in net case mix index of 0.2%. This analysis presumes in considerable part that current standards for code capture will remain constant after the code migration. Additionally, this analysis presumes that all other factors affecting the computation of DRG weight values and DRG assignments are held constant.

Introduction

This document discusses the differences in Complication and Co-Morbidity codes[1] (CC) and situational code exclusion between ICD9 (c9) and ICD10 (c10) and their impacts on DRG assignment and related reimbursement. The new coding environment will require acquiring a new education and appreciation of a coding structure, which in many

ways is a departure from what the industry has used for decades. This document will attempt to illuminate some of the key changes in the code and CC capture process and how it differs between the old and new coding systems.

To achieve on a macro level a reasonable degree of Medicare program cost neutrality, the coding change migration will require CMS to make proactive adjustments to the DRG case rate reimbursement paradigms.[2] Individual hospitals may experience a result that may or may not vary; depending in part e.g., on the case mix of services, the focus or specialization of certain hospital services, and the relative competence and accuracy of coding. Generally speaking, any detailed analysis of impacts to reimbursement resulting from the migration to c10 coding would be at best subjective with the potential of a significant margin of error. Considerable opportunities are still available to CMS to make changes in reimbursement systems, which make this environment very dynamic.[3]

Understanding the theory and nuances of coding and code capture and its impact on reimbursement can be often described at times as a term of 'art' as much as in terms of 'science'. The investment of resources for the 'art' and design of the new system, and its impact on reimbursement has value when it comes time to apply the science as final rules are promulgated and implemented.

Reimbursement analysis of the Medicare payment system is not only meaningful to hospitals, but commercial payers alike, given their reliance on this system for pricing and processing reimbursements for hospital inpatient services. Elements like DRG assignment logic and related parameters (Grouper), individual DRG Case rates, Medicare Code Edits, and other elements of the system are commonly adopted in the industry with little customization. The reimbursement paradigm, designed for a mainly elderly population, may be reasonably argued inappropriate for a commercial aged population. Appreciating this limitation, the system as a whole is nonetheless considered a reasonable, cost effective alternative to individually developed payment systems.

It is anticipated that CMS will announce that relevant DRG version compulsory with c10 on the same schedule used in previous years for revisions and updates to the reimbursement systems.

Although individual hospitals have limited influence on the make-up of the DRG Grouper based reimbursement systems, they can have considerable impact on how they are reimbursed. Effective documentation and capture of relevant CC codes is critical to assigning the highest appropriate DRG classification and reimbursement level. The considerable investments that hospitals have made in recent years to achieve effective CC capture, coupled with the anticipated shift from c9 to c10 provides a compelling imperative to further enhance accuracy and correct anomalies in current operations.

The focus of this analysis is the impact to reimbursements based on assignment of c10 CC codes instead of c9 CC codes, given inherent changes in the shift from c9 to c10. It is important to acknowledge that other impacts may arise from structural changes to the Grouper paradigms that reposition a primary c9 diagnostic code to a different DRG assignment in c10. This analysis does not address those impacts.

Data Set and Analysis Parameters

The data set for this analysis is derived from all inpatient admissions at a large regional medical center for a three year period ending in September 2010. The volume of over 68,000 cases represents reasonable distribution of almost all clinical areas with a few exceptions:

- clinical services associated with higher ranked trauma admissions, burns, and transplants are under represented compared with the population as a whole;
- there is no significant pediatric program at this facility, therefore those volumes are understated;
- a large obstetrics program at this facility denotes a higher than average rate of births;
- an adult psychiatric unit exists, but does not offer chemical dependency services.

For consistency of analysis, codes appropriate for use in the earlier years of the data set (Grouper versions 25 through 27) were migrated forward. As appropriate, obsolete codes were revised for application suitable for Grouper version 28, which was in effect for the year through September 2011.

Mapping Codes from c9 to c10

It is well established that mapping

c9 codes to c10 is not straightforward. There are many complexities and considerations involved, which are discussed below. CMS and the developers of the c10 coding structure have elected not to create a boilerplate translation for all codes, but instead have provided under the General Equivalence Mappings (GEM) a framework on which to conduct the needed equivalency analysis.

For purposes of this analysis and the corresponding reimbursement impacts, codes were mapped based upon the GEMs published by CMS, supplemented by suggestions and recommendations for code translation provided by a number of publically available resources. In occasions where a logical mapping was not obvious or intuitive, an RN with clinical process and management experience reviewed the clinical descriptions of the original c9 code along with suggested possible c10 translations and provided recommendations for an appropriate mapping.

With the absence of a code translation crosswalk recommended by CMS, the industry or hospital associations; any effective analysis would therefore require hospitals and other users of the system to develop their own proprietary model based on their experience and expertise.

Mapping Parameters, Starting with GEMs

CMS provides a working data set of c9 to c10 GEM translations describing 23,484 translation relationships for 14,432 individual c9 codes. These relationships are not uniform and encompass the following variety of possible relationships:

- One c9 code to one c10 code
- One c9 code to many c10 codes, in other words multiple options in c10 for a single c9 code
- Many c9 codes to one c10 code, in other words multiple c9 codes for a single c10 code
- Many-to-many, c9 to c10 relationships
- No recommendation (mostly certain'E' codes)[4]

The c9 code set includes approximately 17,000 different codes describing diseases and disorders that range from very common to extremely rare. Within the data set, a total of 5,974 unique codes were utilized, or only about one-quarter of those available. There were 507,373 code assignments within the 68,525 hospital records, which average 7.4 codes per record.

Development of a mapping paradigm for all 17,000 c9 codes[5] would require considerable time and effort, with diminishing returns for those that are less commonly encountered. In the interest of time and resource usage, this analysis focused on codes most relevant to the prospect of influencing reimbursement through accurate assignment in c10.

Furthermore, those codes that are classified on the CC schedule are arguably most meaningful for appropriate reimbursement. Correspondingly those codes that c10 proposes to *exclude* as valid CC codes by redefining their relationship to the primary diagnostic code are no less impactful to reimbursement. Therefore an analysis and understanding of the various subsets of codes and the way that changes between c9 and c10 and their impact on reimbursement is an important step.

Code Migration Groups

Codes migrate from c9 to c10 in consistent patterns. The first consideration was to identify and give low priority to codes that are immaterial to this analysis because of their relationship to other codes. These are codes that are not on the c9 CC list and map to codes that are likewise absent from the c10 CC list.

Group 1 below describes c9 codes that:

- occur with a single reference in the GEM table
- is a direct 1:1 mapping, and
- are not on CC list in both c9 and c10

Group 1	
Portion of 14,432 c9 codes	7,630
Portion of 23,484 GEM translation mappings	7,630
Portion of 5,974 codes used	3,038
Portion of 507,373 code assignments	323,346

Group 2 (top left of page 4) describes c9 codes that:

- occur with multiple references in the GEM table
- is a complex 1:N mapping, and
- are not on CC list in both c9 and c10

Group 2	
Portion of 14,432 c9 codes	1,510
Portion of 23,484 GEM translation mappings	7,003
Portion of 5,974 codes used	830
Portion of 507,373 code assignments	64,214

The next consideration was to identify codes that are material to reimbursement considerations resulting from their listing on the CC schedule.

Group 3 below describes c9 codes that:

- occur with a single reference in the GEM table
- is a direct 1:1 mapping, and
- maintains the same CC rank in both c9 and c10

Group 3		
	CC	MCC
Portion of 14,432 c9 codes	2,544	793
Portion of 23,484 GEM translation mappings	2,544	793
Portion of 5,974 codes used	1,063	346
Portion of 507,373 code assignments	63,561	28,309

Group 4 (top middle of this page) describes c9 codes that:

- occur with multiple references in the GEM table
- is a complex 1:N mapping, and
- maintains the same CC rank in both c9 and c10

Group 4		
	CC	MCC
Portion of 14,432 c9 codes	726	382
Portion of 23,484 GEM translation mappings	2,127	1,284
Portion of 5,974 codes used	340	117
Portion of 507,373 code assignments	13,191	5,913

Group 5 below describes c9 codes that:

- occur either with a single or multiple references in the GEM table
- are either a simple 1:1 or a complex 1:N mapping, and
- regardless of the mapping destination, uniformly change the CC rank in c9 to a different CC rank in c10, either up or down

Group 5		
	Up	Down
Portion of 14,432 c9 codes	206	249
Portion of 23,484 GEM translation mappings	260	351
Portion of 5,974 codes used	69	62
Portion of 507,373 code assignments	2,140	1,792

Group 6 below describes c9 codes that:

- occur with multiple references in the GEM table
- is a complex 1:N mapping,
- change the CC rank in c9 to a different CC rank in c10, either up or down, and
- New CC rank in c10 is inconsistent across all mapped destinations.

Group 6	
Portion of 14,432 c9 codes	392
Portion of 23,484 GEM translation mappings	1,492
Portion of 5,974 codes used	109
Portion of 507,373 code assignments	4,907

The data set provided two examples of codes which met the group six critiera and had significant assignment volumes in excess of 1,000.

Example 1:

c9: 2948—Other persistent mental disorders due to conditions classified elsewhere (**No CC**)

maps to

c10: F060—Psychotic disorder with hallucinations due to known physiological conditions (**CC**)

c10: F063—Mood disorder due to known physiological conditions(**No CC**)

Based on review, the default map-

ping was to F060 which reflected a upward change in the CC classification.

Example 2:

c9: 65681—Other specified fetal and placental problems delivered with/without mention of antepartum condition (**No CC**)

maps to

c10: O368910—Maternal care for other fetal problems—first trimester—single fetus (**No CC**)

c10: O368920—Maternal care for other fetal problems—first trimester—second fetus (**No CC**)

c10: O368930—Maternal care for other fetal problems—first trimester—third or other fetus (**No CC**)

c10: O68—Labor and Delivery complicated by fetal acid-base inbalance (**CC**)

c10: O770—Labor and Delivery complicated by meconium in amniotic fluid (**No CC**)

Based on review, the default mapping was to O368910 which reflected no change in the CC classification.

MCC/CC Exclusion List (CCEL)

The CCEL list identifies specific primary diagnostic and secondary or subsequent CC code relationships, or 'code-pairs' that have an impact on reimbursement. Generally, a CC code has the potential to place a case into a higher ranked DRG class.[6] However, if a specific code-pair appears on a record, that corresponding CC code is excluded or disqualified in that particular instance as an eligible CC code and cannot be used in the computation of a DRG assignment.

In c9, there are 5,092 codes identified as CC codes (CC and MCC). Such codes which, when connected with all eligible primary diagnostic codes, result in over 500,000 individual relationships. The CMS CCEL was derived based on decades of experience using the current coding set and structure. While the CCEL has proportionately expanded to 17,177 codes in c10, perhaps most significantly, the number of exclusion relationships or code-pairs has grown to over 150 million. Although the exclusion list in c10 appears to follow the same general design of these codes in c9, the increased total size and volume, and specificity in c10 seems to require a higher level of organization.

Perhaps with this consideration in mind the designers of CCEL for use with c10 have redefined the way that CCEL codes are associated with primary diagnoses. Exclusions appear to be no longer based on individual relationships, but on 'collections' of relationships, with each of the 17,177 CC codes assigned only once, to one of 1,489 collections. Some of these collections contain only 1 or 2 codes, while one collection consists of over 5,000 codes—almost one-third of all CC codes.

In a similar manner, primary diagnosis codes are also assigned into the same collection structure, but unlike CC codes, primary codes can be members of several collections—in some cases over 100.

As a result, exclusion from usage as an eligible CC to determine DRG assignment presumably occurs when a primary diagnostic code and a CC code are members of the same collection.[7]

Summary of Volumes Impacted

Within the dataset of 68,525 cases, over 93% of the cases translated from c9 to c10 intact with no changes. A code which was a CC or MCC in c9 was ranked the same in c10. If a code was excluded in c9, the same new code was excluded in c10. Cases which changed to some degree numbered 4,310 cases or 6.3% of the total.

Within the subset of 4,310 cases that changed to some degree, 71% of these cases (3,067) did not experience a change which materially impacted the DRG assignment specific to CC considerations. While there may have been individual codes that through translation either gained or lost their CC designation, or had a different CC designation rank, or were treated differently through the CC exclusion process; any impact these changes may have had to a DRG assignment were rendered moot resulting to the existence of other codes which translated cleanly and as a result kept a particular case in the same DRG classification.

The remaining subset of the 1,243 cases represents those cases which impacted changes in Case-Mix and would therefore have the potential to impact DRG assignment and a change in the DRG weight. These cases represent 1.8% of the total volume in the dataset. The data found that 86% of the cases (1,072) experienced a net migration down CC ladder, and 14% of the cases (171) moved up the CC ladder.[8]

Of the 1,243 cases here, 28 were assigned into a DRG for which CC capture is not relevant. The remaining 1,214 cases are assigned into DRG classes wherein CC capture is relevant and impacted the overall Case Mix Index.

Estimated Impact to Reimbursement

The summary impact of the migration from c9 to c10 and the corresponding capture of CC codes suggest an almost negligible impact on reimbursement.

After translation of codes from c9 to c10 and the application of the CCEL criteria; the overall volume of code assignments in the data that would be relevant for CC purposes increased 1.7%. The increase was a product of the actual reduction of the number of instances wherein a code was disqualified through the CCEL criteria, and a modest increase in the number of instances effected as described in Group 6 above.

The overall impact on this change to the data set found 1,214 cases (1.8% of the total) were assigned to a higher or lower DRG class. The net impact of these changes increased the CMI index (using version 28 values) from 1.2971 to 1.2998, or 0.2% overall.

Indications

There is no straightforward conclusion to be drawn as to whether existing processes and strategies will need to be reviewed or changed in substantial degree.

The analysis reaffirms the value of competent coding practices and prudent CC capture. This model provides a method for hospitals to bench mark their individual performance in comparison to other hospitals, or to compare prior experience with actual current experience.

Similar to government, private payers that use the DRG system are going to be motivated to protect their position resulting from the impacts of the migration to c10. An understanding of the dynamics would help both parties sort through possible conflicts.

Considering the common use of CMI for measures for financial and productivity measures, certain accommodations might be required to mitigate any shift or 'creep' that might occur with c10.

There are clearly codes that are going to change in significance in the migration as to their inclusion or exclusion from the CCEL.

Andrew Käser is the Director for Revenue at PeaceHealth Southwest Medical Center (formally Southwest Medical Center) in Vancouver, Washington. In his career he has worked in a number of leadership roles with responsibilities for Decision Support, Financial Analysis, Revenue Cycle and Business planning. Andrew has over 25 years of experience in the industry and has been with Southwest since 1990. Andrew can be reached at 360 514-2065, or via email at akaser@swmedicalcenter.org or andrewkaser@iinet.com

Notes:

[1]Inclusive of both the CC list and the Major CC list (MCC)

[2]Individual DRG weight assignments, the assignment of primary diagnostic codes to specific DRG classes, complicating condition codes, and the exclusion of certain codes in their relationship to the primary diagnosis.

[3]CMS has instituted a "code freeze" which for two years will considerably restrict the number of code change, additions and retirements. Considering the emphasize on the code freeze, it is reasonable to presume that strategies to hold gross program reimbursement constant would support a focus on the DRG weight structure or into the DRG structure itself.

[4]'E' codes commonly denote some relevant event of a non-medical nature that is a key factor in the onset of the medical situation. Commonly, 'E' codes designate in general terms an accident or mishap. An 'E' code cannot be used as a primary diagnosis for purposes of DRG assignment.

[5] The estimate of number codes in c10 is about 141,000.

[6]There are some DRG assignments for which the existence or absence of a CC is not relevant. Within the data set, only about 70% of cases were assigned into a DRG in which a CC was relevant.

[7]Some CC codes and Primary Diagnostic codes are not assigned to any collection, and therefore have no application as part of CC exclusion.

[8]CC Ladder defined as 3 ranks ascending from None, CC, and MCC.

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