Lessons Learned from an ICD-10-CM Clinical Documentation Pilot Study

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Abstract

On October 1, 2013, the International Classification of Diseases, Tenth Revision, Clinical Modification (ICD-10-CM) will be mandated for use in the United States in place of the International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM). This new classification system will used throughout the nation's healthcare system for recording diagnoses or the reasons for treatment or care. A pilot study was conducted to determine whether current levels of inpatient clinical documentation provide the detail necessary to fully utilize the ICD-10-CM classification system for heart disease, pneumonia, and diabetes cases. The design of this pilot study was cross-sectional. Four hundred ninety-one de-identified records from two sources were coded using ICD-10-CM guidelines and codebooks. The findings of this study indicate that healthcare organizations need to assess clinical documentation and identify gaps. In addition, coder proficiency should be assessed prior to ICD-10-CM implementation to determine the need for further education and training in the biomedical sciences, along with training in the new classification system.

Key words: ICD-10-CM, clinical documentation, clinical documentation improvement teams, coding proficiency, biomedical sciences

Introduction

The US Secretary of Health and Human Services has issued a final rule mandating that the International Classification of Diseases, Tenth Revision, Clinical Modification (ICD-10-CM) and the International Classification of Diseases, Tenth Revision, Procedure Coding System (ICD-10-PCS) be used in place of the International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM) beginning on October 1, 2013.[1] ICD-9-CM is currently used throughout the nation's healthcare system for recording diagnoses or the reasons for treatment or care. It is also used to measure the quality, safety, and effectiveness of care; design payment systems; process claims for reimbursement; conduct research, epidemiological studies, and clinical trials; and set health policy.

The utilization of ICD-10-CM for all diagnostic coding is expected to have an impact across the healthcare industry. ICD-10-CM consists of more than 68,000 diagnosis codes compared to approximately 13,000 ICD-9-CM diagnosis codes. The greater levels of specificity and clinical detail as well as the improvements in the capture of medical technology advances in ICD-10-CM are expected to result in an improved ability to analyze clinical and cost data. Further anticipated benefits of ICD-10-CM include a reduced need for manual review of health records to perform research and data mining, more accurate adjudication of reimbursement claims, and the improved ability to ascertain disease severity for risk and severity-of-illness adjustments.

Many publications that contain information related to the US ICD-10-CM implementation reference the need to improve clinical documentation.[2, 3] However, to date, none have included information regarding which diseases and conditions will require improved documentation so that more detailed ICD-10-CM codes can be assigned.

Objective

The objective of this exploratory pilot study was to determine whether current levels of clinical documentation provide the detail necessary to fully utilize the ICD-10-CM classification system for heart disease, pneumonia, and diabetes cases.

Design

The design of this pilot study was cross-sectional. Four hundred ninety-one de-identified records from two sources were coded using the 2010 versions of the ICD-10-CM guidelines and codebook.

Methodology

The first phase of the pilot study required obtaining access to de-identified patient records that could be recoded in ICD-10-CM. Following Institutional Review Board (IRB) review and approval from Texas State University and Texas A&M University, the researchers were able to access a set of records at the Texas A&M Health Science Center Rural and Community Health Institute. They were also granted approval to utilize the de-identified records in the American Health Information Management Association (AHIMA) Virtual Lab database. Two coders were recruited using a combination of ICD-9-CM coding proficiency assessments as well as phone and in-person interviews. The two coders and the researchers were trained to use ICD-10-CM by an AHIMA-certified ICD-10-CM trainer.

The coders and quality assurance reviewer used the 2010 versions of ICD-10-CM codebook and ICD-10-CM coding guidelines to recode 491 records. Of this total, 445 records (90.63 percent) were selected from the Texas A&M Health Science Center Rural and Community Health Institute database. The remaining 46 records (9.37 percent) were selected from the AHIMA Virtual Lab database. The data collection tool, an Excel spreadsheet, allowed for a principal diagnosis and 29 secondary diagnoses to be assigned for each record. In addition to the codes, age and gender were recorded for each record.

Within the available de-identified record population, the researchers elected to focus on three common and costly healthcare conditions due to study funding limitations. The population of records was reduced to those with a principal diagnosis of heart disease, pneumonia, or diabetes mellitus. The list of ICD-9-CM codes used to select the record population can be found in Appendix A.

After the coding was completed, a quality assurance process to assess the accuracy of the coding was conducted on a randomly selected sample of 10 percent of the cases. The quality assurance reviewer was one of the researchers, who is CCS credentialed and had attended the ICD-10-CM training previously referenced. Examples of inaccurate code assignment, as exhibited in Table 1, include valid ICD-10-CM codes assigned incorrectly and use of invalid ICD-10- CM codes. The overall accuracy rate of the coding was found to be 95.3 percent. This rate was determined to be acceptable for the purpose for which the data were collected. Data analysis consisted of the tabulation of descriptive statistics (frequencies and percentages) both by total and by condition utilizing a Microsoft Access database.

Results

A total of 491 health records were coded with 4,283 ICD-10-CM codes assigned. Only 935 unique codes were assigned across all of the records. An average of 8.7 codes was assigned per record. One hundred eighty-two records (37 percent) had 10 or more secondary codes. There were 1,180 "unspecified" codes assigned, which accounted for 27.6 percent of the total codes assigned.

Specific findings for heart disease revealed that 178 (86 percent) of 207 records with heart disease as a principal or secondary diagnosis had an unspecified ICD-10-CM heart disease code assigned. For code I50.9 (heart failure, unspecified), the physician documentation lacked the specific type of heart failure, such as acute systolic (congestive) heart failure, acute on chronic systolic (congestive) heart failure, or chronic diastolic (congestive) heart failure, even though codes for these conditions exist in ICD-9-CM. Other unspecified heart disease codes assigned were I46.9 (cardiac arrest, cause unspecified), I25.9 (chronic ischemic heart disease), and R07.9 (chest pain, unspecified).

Coding for pneumonia cases resulted in frequent assignment of code J18.9 (Pneumonia, unspecified organism). In addition, codes J18.0 (Bronchopneumonia, unspecified organism) and J18.1 (Lobar pneumonia, unspecified organism) were assigned in numerous cases. In these cases, a more specific pneumonia code could not be used since the clinical documentation did not state the causal organism.

Interestingly, the coders assigned very few "unspecified" codes for diabetes mellitus. Diabetes mellitus was rarely used as a principal diagnosis. In a few cases, code E11.40 (Type 2 diabetes mellitus with diabetic neuropathy, unspecified) was assigned. In a majority of cases, code E11.9 was assigned for the stated diagnosis of Type 2 diabetes mellitus without complications.

Of the 1,180 "unspecified" codes assigned, some particularly generic codes were assigned. Table 2 lists examples of these code classifications. Codes such as K82.9 (Disease of gallbladder, unspecified) and N19(unspecified kidney failure) were unexpected findings for codes assigned from inpatient acute care records.

Two additional findings resulted from the manual coding process used in this study. The first involved numerous validity-type errors that included incorrect assignment of the seventh-character extension, failure to use placeholders, and incomplete ICD-10-CM codes. Table 1 lists examples of validity errors found among the codes assigned in this study. The second finding was a an error in coding accuracy in which specific clinical documentation existed but the coder assigned a nonspecific residual category code.

A final result was noted in two instances in which the coder was unable to locate a specific code in ICD-10-CM for factors influencing healthcare that were detailed in the clinical documentation. The coder reported difficulty in locating a specific code for dependence on a walker for mobility and daily use of a CPAP (continuous positive airway pressure) machine for sleeping.

Discussion

This pilot study had several limitations. First is the small scope of the study and the fact that the researchers felt the need to limit the research to certain conditions. Second, the majority of the records came from an existing database of de-identified records from rural hospitals. Given this source, the conditions and documentation may not be comparable to those found in larger, urban, or academic facilities. Third, the contracted coders were not familiar with the format of the records. In fact, because the records came from a variety of facilities, the coders were working with a variety of formats. Fourth, the funding available was not sufficient to allow coders the use of assistive technologies such as an encoder or even a code editor to check the validity of the codes. Fifth and finally, the study did not include any assessment of interrater reliability between the coders. Therefore, some variation in code assignment could exist that was not measured or controlled.

Basing their conclusions on the findings of this study, the researchers believe that healthcare organizations cannot presume that clinical documentation contains the detail needed for ICD-10-CM. More than 25 percent of the codes assigned were for unspecified disease conditions. Of concern are the many unspecified codes for commonly occurring diseases such as heart disease and pneumonia.

According to these findings, with the use of ICD-10-CM, more specific physician documentation will be needed to capture specific types of heart disease. The National Center for Health Statistics (NCHS) reports that the leading cause of death in the United States is heart disease.[4] Some of the potential benefits of ICD-10-CM with increased specificity of documentation regarding heart disease cases include the increased ability to study the relationship of costs and benefits of treatments for specific heart conditions,

more accurate payments, a better understanding of health outcomes, and improved quality-of-care measures for heart disease patients.

For instance, with heart failure, the type and severity of heart failure such as acute systolic heart failure or chronic diastolic failure are of great significance. Codes for these conditions already exist in ICD-9-CM, and the fact that they were not used for this study may be more a function of the age and source of the records rather than lack of physician documentation. However, this is not the case for all heart disease conditions. Cardiac arrest codes have been expanded in ICD-10-CM to include codes for cardiac arrest due to an underlying cardiac condition and cardiac arrest due to another underlying condition. ICD-9-CM contains only one code for cardiac arrest. It is reasonable to expect that payers will ultimately require reporting of the additional level of detail related to cardiac arrest. Chronic ischemic heart disease codes also have undergone revision in ICD-10-CM and now include combination codes to capture the site of the atherosclerosis, such as native coronary vessel, as well as the presence of angina pectoris. Physicians will have to document the condition to this level of detail. Lastly, physicians will need to fully describe chest pain. In ICD-10-CM, there is a code to describe ischemic (cardiac-related) chest pain (I20.9), whereas in ICD-9-CM, all codes for chest pain describe unspecified or vague conditions, such as precordial pain.

For the pneumonia cases in this study, the results clearly indicate that more specificity is needed in clinical documentation for classifying bacterial pneumonia because the majority of the cases were coded as pneumonia caused by an unspecified organism. According to *Coding Clinic*, the American Hospital Association's official publication of ICD-9-CM coding guidelines, a coder cannot assign a bacterial pneumonia code from a sputum culture.[5] Only the physician's documentation of pneumonia and the causative organism will suffice for assigning a more specific bacterial pneumonia code. These coding guidelines for bacterial pneumonia are expected to continue in ICD-10-CM.

The diabetes coding results provided an interesting contrast to the results for pneumonia. While a few "unspecified" diabetes codes were assigned, the majority of the codes sufficiently captured the diagnoses as expressed in the documentation. The researchers believe that the specific coding changes made for diabetes in ICD-10-CM have vastly improved coding for this disease. Simply put, the coding classification system is catching up to the medical science. Specifically, having separate category codes for Type I diabetes and Type 2 diabetes along with combination codes to capture the body system affected with complications is viewed as a major improvement over ICD-9-CM, in which fifth digits were used to indicate the type of diabetes and whether or not the diabetes was controlled or uncontrolled. Additionally, in ICD-10-CM the diabetes codes are no longer distinguished as controlled or uncontrolled.

The results related to manual coding in ICD-10-CM raise issues of concern. Without an assistive technology such as an encoder, validity errors may be more prevalent. The new code structure for disease coding in ICD-10-CM allows for the use of "x" as a placeholder and the use of specific seventh-character extensions in some code categories, such as those found in the musculoskeletal chapter for fractures. The results of this study indicate that it is quite easy for a coder to make coding errors when manually writing or typing a code into a data field. Another concern may be overreliance on ICD-9-CM logic when manually searching for a code in the ICD-10-CM Tabular List. As an example, ICD-9-CM does not provide a specific code for fibromyalgia, whereas in ICD-10-CM much more specific codes are available. A proficient coder using ICD-9-CM logic may quickly jump to the Tabular List and look for a residual or "unspecified" code when a more specific code exists.

ICD-10-CM is a robust classification with approximately 50,000 more disease codes than ICD-9-CM. In one sense, coders may feel more comfortable knowing there is a specific code that can accurately classify a disease condition when the supporting clinical documentation exists. Yet this study reflected challenges as well. In a few instances, coders searched for specific codes without success, such as when trying to record dependence on a walker for mobility and daily use of a CPAP device.

Furthermore, coders may have varying degrees of proficiency. Coders are trained in many different ways that range from on-the-job training to four-year health information management (HIM) degree programs. Some coders have significant clinical backgrounds, such as having been a registered nurse. In

other instances, the coder may have a high school education with minimal knowledge in the biomedical sciences. As a result of their differing education and training, coders will interpret the clinical documentation in different ways, which may lead to inconsistent code assignment. With the implementation of ICD-10-CM on the horizon, coder proficiency should be carefully assessed by healthcare organizations.

Conclusion

Healthcare organizations need to assess clinical documentation and identify gaps. HIM professionals should take a leading role in this work process. HIM professionals working together with clinical documentation improvement teams can devise a customized plan for conducting educational sessions for physicians. These sessions will provide an opportunity to educate physicians on the benefits of a new classification system. These benefits include a better understanding of health outcomes, the ability to analyze the relationship of costs and benefits related to the treatment of specific medical conditions, and the potential for more accurate payments to providers. Organizations should begin analyzing their documentation now and preparing their clinicians regarding necessary changes in clinical documentation.

Currently, organizations will need to address the possibility of a chasm in coding proficiency as they plan for ICD-10-CM implementation. ICD-10-CM diagnosis codes will touch every type of health record from those found in solo practices to those used in large, integrated healthcare delivery systems. The increased specificity in ICD-10-CM will require coders to have a good understanding of the biomedical sciences, including medical terminology, anatomy and physiology, pathophysiology, and pharmacology. At a minimum, assessment of coders' knowledge of biomedical sciences should be performed early on to identify specific areas of deficiency. Training and education in the biomedical sciences should be carried out in 2012 prior to concentrated training on ICD-10-CM and ICD-10-PCS in 2013.

The results of this pilot study support the many claims that have been made regarding the need for more detailed clinical documentation to support ICD-10-CM coding. Additionally, this study provides organizations with information regarding the adequacy of clinical documentation for heart disease, pneumonia, and diabetes. Finally, this study provides an outline for organizations to follow should they wish to focus on improvement of clinical documentation and ICD-10-CM coding for their own priority conditions.

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Notes

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Appendix A

ICD-9-CM Code Ranges Used to Select Health Records

ICD-9-CM Code Range for Diabetes Mellitus (250.0x–250.9x)

250.0	Diabetes mellitus without mention of complication
250.1	Diabetes with ketoacidosis
250.2	Diabetes with hyperosmolarity
250.3	Diabetes with other coma
250.4	Diabetes with renal manifestations
250.5	Diabetes with ophthalmic manifestations
250.6	Diabetes with neurological manifestations
250.7	Diabetes with peripheral circulatory disorders
250.8	Diabetes with other specified manifestations
250.9	Diabetes with unspecified complication

ICD-9-CM Code Range for Heart Disease (425.0–429.9)

425.0	Endomyocardial fibrosis
425.1	Hypertrophic obstructive cardiomyopathy
425.2	Obscure cardiomyopathy of Africa
425.3	Endocardial fibroelastosis
425.4	Other primary cardiomyopathies
425.5	Alcoholic cardiomyopathy
425.7	Nutritional and metabolic cardiomyopathy
425.8	Cardiomyopathy in other diseases classified elsewhere
425.9	Secondary cardiomyopathy, unspecified
426.0	Atrioventricular block, complete
426.10	Atrioventricular block, unspecified
426.11	First degree atrioventricular block
426.12	Mobitz (type) II atrioventricular block
426.13	Other second degree atrioventricular block
426.2	Left bundle branch hemiblock
426.3	Other left bundle branch block
426.4	Right bundle branch block
426.50	Bundle branch block, unspecified
426.51	Right bundle branch block and left posterior fascicular block
426.52	Right bundle branch block and left anterior fascicular block
426.53	Other bilateral bundle branch block
426.54	Trifascicular block
426.6	Other heart block
426.7	Anomalous atrioventricular excitation
426.81	Lown-Ganong-Levine syndrome

426.82	Long QT syndrome
426.89	Other (Dissociation: atrioventricular)
426.9	Conduction disorder, unspecified
427.0	Paroxysmal supraventricular tachycardia
427.1	Paroxysmal ventricular tachycardia
427.2	Paroxysmal tachycardia, unspecified
427.31	Atrial fibrillation
427.32	Atrial flutter
427.41	Ventricular fibrillation
427.42	Ventricular flutter
427.5	Cardiac arrest
427.60	Premature beats, unspecified
427.61	Supraventricular premature beats
427.69	Other (Ventricular premature beats, contractions, or systoles)
427.81	Sinoatrial node dysfunction
427.89	Other (Rhythm disorder)
427.9	Cardiac dysrhythmia, unspecified
428.0	Congestive heart failure, unspecified
428.1	Left heart failure
428.20	Systolic heart failure, unspecified
428.21	Systolic heart failure, acute
428.22	Systolic heart failure, chronic
428.23	Systolic heart failure, acute on chronic
428.30	Diastolic heart failure, unspecified
428.31	Diastolic heart failure, acute
428.32	Diastolic heart failure, chronic
428.33	Diastolic heart failure, acute on chronic
428.40	Combined systolic and diastolic heart failure, unspecified
428.41	Combined systolic and diastolic heart failure, acute
428.42	Combined systolic and diastolic heart failure, chronic
428.43	Combined systolic and diastolic heart failure, acute on chronic
428.9	Heart failure, unspecified

ICD-9-CM Code Range for Pneumonia (480.0–486)

480.0	Pneumonia due to adenovirus
480.1	Pneumonia due to respiratory syncytial virus
480.2	Pneumonia due to parainfluenza virus
480.3	Pneumonia due to SARS-associated coronavirus
480.8	Pneumonia due to other virus not elsewhere classified
480.9	Viral pneumonia, unspecified
481	Pneumococcal pneumonia
482.0	Pneumonia due to Klebsiella pneumoniae
482.1	Pneumonia due to Psuedomonas
482.2	Pneumonia due to Hemophilus influenza
482.30	Pneumonia due to Streptococcus, unspecified
482.31	Pneumonia due to Streptococcus, Group A
482.32	Pneumonia due to Streptococcus, Group B
482.39	Pneumonia due to other Streptococcus
482.40	Pneumonia due to Staphylococcus, unspecified
482.41	Methicillin susceptible pneumonia due to Staphylococcus aureus
482.42	Methicillin resistant pneumonia due to Staphylococcus aureus
482.49	Other Staphylococcus pneumonia
482.81	Pneumonia due to Anaerobes
482.82	Pneumonia due to Escherichia coli
482.83	Pneumonia due to other gram-negative bacteria
482.84	Pneumonia due to Legionnaires' disease
482.89	Pneumonia due to other specified bacteria
482.9	Bacterial pneumonia, unspecified
483.0	Pneumonia due to Mycoplasma pneumonia
483.1	Pneumonia due to Chlamydia
483.8	Pneumonia due to other specified organism
484.1	Pneumonia in cytomegalic inclusion disease
484.3	Pneumonia in whooping cough
484.5	Pneumonia in anthrax
484.6	Pneumonia in aspergillosis
484.7	Pneumonia in other systemic mycoses
484.8	Pneumonia in other infectious diseases classified elsewhere
485	Bronchopneumonia, organism unspecified
486	Pneumonia, organism unspecified

Table 1

Examples of Validity Errors Resulting from Manual Coding in ICD-10-CM

Invalid ICD-10-CM Code	Why the Code Is Wrong	Correct ICD-10-CM Code
S09.8xx1	Wrong use of seventh-character extension; the only acceptable characters are *A* for initial encounter, *B* for subsequent encounter, and *S* for sequela	S09.8xxA
W19	Failure to use placeholders and seventh-character extension	W19.xxxA
Z87.9	No such code; coder left out the fourth digit of the code	Z87.79

Table 2

Examples of Generic Codes Found among Codes Assigned from Acute Care Health Records

Code	Description
K82.9	Disease of gallbladder, unspecified
N19	Unspecified kidney failure
S80.219	Abrasion, unspecified knee
M79.643	Pain in unspecified hand
M79.609	Pain in unspecified limb
M85.9	Disorder of bone density and structure, unspecified
I51.9	Heart disease, unspecified
G31.9	Degenerative disease of nervous system, unspecified
I77.6	Arteritis, unspecified
N39.9	Disorder of urinary system, unspecified