7-2013

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Alberto Coustasse
Marshall University, coustassehen@marshall.edu

David P. Paul III

Recommended Citation
Coustasse, A., & Paul III, D. P. (2013). Adoption of the ICD-10 Standard in the United States: The time is now. The Health Care Manager, 32(3), 260-267.

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Alberto Coustasse, DrPH, MD, MBA, MPH
Associate Professor
Healthcare Administration Program
College of Business
Marshall University Graduate College
100 Angus E. Peyton Drive
South Charleston, WV 25303
304-746-1968
coustassehen@marshall.edu

and

David P. Paul, III, DDS, PhD*
Associate Professor of Marketing and Health Care Management
Department of Marketing and International Business
Monmouth University
West Long Branch, NJ 07764
732-996-9587
dpaul@monmouth.edu

* Contact Author

The authors report no conflicts of interest in the preparation of this article.

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ABSTRACT

The United States is facing a revolution in the healthcare system soon, when the present coding system (ICD-9) will be replaced with what has for some years been the international standard: ICD-10. The CD-10 system will provide a tremendous opportunity for better capturing information in the increasingly complex delivery of healthcare. Although the transition to ICD-10 will undoubtedly result in substantial short-term costs, the long-term benefits make the transition imperative.

Key Words: ICD-9, ICD-10, insurance coding, health IT

INTRODUCTION

The standard, world-wide system for classifying the incidence, prevalence and treatment of diseases and other health problems is the International Classification of Diseases (ICD), which was developed by the World Health Organization. In the United States (U.S.), the ninth version of this system (ICD-9) has been in use since 1979, but as technological advancements demanded a movement towards a universally compatible electronic health record system and advances were made in medical diagnosis and treatment, the current ICD codes have proven to be inadequate. The ICD-9 classification codes simply lack the detail needed to accurately reflect current medical terminology and procedures, and cannot be expanded further to include new discoveries and procedures in medicine. Each year there are hundreds of new diagnoses submitted to the Centers for Medicare and Medicaid Service (CMS) from medical research and technological advances in medical procedures that need greater specificity for adequate reimbursement and which cannot be obtained due to the insufficiency of detailed coding capacity in ICD-9 (Haugh 2005). This inhibits the ICD-9 coding system's ability to be utilized effectively as a tool in the measurement of quality and outcomes (LeMier, Cummings and West, 2001).

As of 1999, the WHO revised the ICD-9 to create ICD-10 (WHO 2010a). That this change due to insufficiency of available codes in ICD-9 was necessary is indisputable; i.e., ICD-9 had dozens of codes for tuberculosis codes, but only one code for human immunodeficiency virus (Harris 2012). More accurate procedure descriptions with ICD-10 can facilitate better outcome measurement such as laterality; i.e., whether a surgeon operated on the left or the right hand or hip (Leon-Chisen, 2010).

One-hundred and fifty three countries have adopted an updated ICD-10 classification which is touted as allowing not only increased specificity with diagnosis and coding but also

interoperability in global sharing of records and statistics (Schlom and Battani, 2009). Since 1999 the U.S. has only used the ICD-10 system for tracking mortality (Dimick, 2009).

The purpose of this research study was to compare differences between ICD-9 and ICD-10, evaluate the cost of transition to ICD-10, and identify the benefits of transitioning to ICD-10 in the U.S.

METHODOLOGY

The methodology utilized in this literature review conformed to the principles of a systematic search. The stages in the search included: defining the search strategy, identifying the inclusion criteria, assessing the relevance and validity of the studies retrieved, and data extraction and synthesis.

Search Strategies

The aim of the search was to retrieve published literature, which complied with the inclusion criteria given below. The terms used in the search strategy were 'ICD-10 codes' OR 'New ICD-10 Codes' OR 'ICD coding' OR 'procedure codes' OR 'diagnosis codes' OR 'ICD-10' OR 'ICD-9' AND 'Benefits of ICD-10' OR 'Costs of ICD-10' OR 'American Recovery and Reinvestment Act' OR 'ICD-11' OR 'Anesthesia Codes for ICD'.' To identify papers, six electronic databases were searched: PubMed, ProQuest, Ebscohost, Department of Health and Human Services (DHHS), Centers for Health Services Research and Agency for Healthcare Research and Quality (AHRQ), the American Association of Professional Coders (AAPC), Center for Disease Control and Prevention (CDC), the World Health Organization (WHO), the American Health Information Management Association (AHIMA), the American Medical

Association (AMA), the American Hospital Association (AHA), and several other reputable sources.

Inclusion, Exclusion and Assessments

Letters and editorials as well as original papers, reviews and monographs were all included, including primary and secondary data. Citations and abstracts identified by the search were assessed in order to identify relevant papers. Studies before 2000 were not included and only articles published in English were utilized. Full text copies of such papers were then reviewed. The literature review yielded 51 sources which were assessed for information pertaining to this research study.

RESULTS

The Center for Medicare Services originally mandated the complete transition to ICD-10 codes throughout the U.S. healthcare industry by October 1, 2011 (CMS, 2010), but delayed the transition date until October 1, 2013 (CMS 2012a), and more recently until October 1, 2014 (CMS, 2012b). The reason for the most recent delay was because provider groups had expressed concern about their ability to comply with the 2013 deadline due to financial and administrative concerns (Mearian 2012), a contention which also caused the original two year implementation date postponement. The American Medical Association had lobbied for a delay until 2015 (Madara, 2012), but additional delay is almost certainly inadvisable. In a survey of senior healthcare professionals attending the 2012 ICD-10 Summit, 64% indicated that a further delay in the requirement for implementation would harm other healthcare efforts, and 69% felt that a two-year delay would be either "unrecoverable" or "potentially catastrophic." Nearly half of the

respondents said that a one-year delay would increase their costs by 11%-25%, and over a third indicated that their costs would rise up to 50% (Miliard, 2012).

The transition from ICD-9 to ICD-10 will give the U.S. the ability to track and respond to international health threats as well as better use the benefits associated with an Electronic Health Record (International Healthlink Professionals, Inc., 2010). Any claims reported after the transition date using ICD-9 codes will be rejected and reimbursement will not be allocated (American Medical Association, 2010a). The necessity of this change has become overwhelmingly evident if the U.S. is to catch up with the technological advances in healthcare systems of other countries and to improve cost and quality of care.

It is estimated that the conversion from ICD-9 to ICD-10 CM/PCS can cost as much as $8 billion in the US; most of these costs will be incurred by training staff, systems upgrades, and contract negotiations (American Academy of Professional Coders, 2009). ICD-10 implementation will thus be a costly conversion, but it will provide many advantages over the ICD-9 coding system. Two of the biggest and most important improvements seen in the ICD-10 code set will be the addition of sixth and seventh characters and the use of significantly more alphanumeric characters which will allow for more specific classification of various diseases and diagnoses (see Table I).

--- Insert Table I about here ---

The new code set will allow for the inclusion of laterality, expanded injury codes, and information relevant to ambulatory and managed care encounters (Centers for Disease Control, 2001).

Comparison of ICD-9 to ICD-10

One of the most noted differences between the two classifications is the enhanced specificity (see Table I) of ICD-10 codes (Quan et al., 2008). The improved level of detail provided in this revision is primarily due to the growth of diagnosis and procedure codes (AAPC 2010b). For example, it is possible to differentiate between an initial visit with diagnosis and subsequent follow up visits related to the same diagnosis while identifying any secondary complications. ICD-10 also allows for differentiation between right or left sided structures and procedures (AAPC, 2010c).

The ability to be more exact with classification has resulted in a nine-fold increase in the number of codes (DHHS, 2008a). In addition to combining diagnosis and symptom codes, ICD-10 has also been structured to include new coding for ambulatory care, home health care, and skilled nursing care facilities, as well as new technological advancements and procedures (see Table II), (Nagel, 2004).

--- Insert Table II about here ---

For example, the ICD-10 has four categories and more than 46 codes related specifically to anesthesia, a significant increase, as currently ICD-9 contain fewer than 20 anesthesia-related codes (WHO, 2006; Vlessides, 2009). The basic format of the revised coding structure is such that it can facilitate future expansion in addition to the already substantial increase in the number of codes (TMA, 2010).

While the providers and payers eventually should see significant benefits, transitioning to ICD-10 will require large adjustments. Unlike ICD-9, ICD-10 differentiates its procedural codes into a distinct entity, called ICD-10 –PCS. Apart from having more codes, ICD-10 codes are

alphanumeric, containing letters and numbers. ICD-10 diagnosis codes have three to seven digits rather than three to four digits of ICD-9. In addition the ICD-9 and ICD-10 code designations for similar diagnoses and procedures are entirely different. Normally there are not exact one to one matches between ICD-9 and ICD-10 diagnosis and procedural codes. As per CMS, about 76% of all ICD-9 codes map approximately to ICD-10 codes. But in reverse direction, 95% of all ICD-10 codes map approximately to ICD-9 codes. In addition many ICD-9 codes match more than one ICD-10 code and vice versa.

In the procedural coding system, nearly 99% of all ICD-9 codes have only an approximate one to one match with an ICD-10 codes and some ICD-9 procedural codes map to several hundred ICD-10 codes. If providers aren't watchful in their codes utilization, these differences could have serious reimbursement consequences; e.g., underpayments or overpayments. Substantially, ICD-10 codes capture far more useful detail. ICD-10-PCS differentiates body parts, surgical approaches, medical/surgical devices used, resource consumption and outcomes; e.g., under ICD-9; there is only one procedure code for angioplasty, but under ICD-10, 1,196 codes are available for that procedure. Under the ICD-9 code a physician may provide information on what blood vessel was involved in an angioplasty, but with ICD-10, the physician can describe the exact location of the blockage and the instruments used. It allows the provider to be reimbursed correctly for the true level of acuity. Under ICD-9 diagnostic coding for wrist fracture, if a patient has two doctor visits in a month, there is no option to determine if the second visit was related to a same fracture of a same wrist, a fracture of the other wrist, poor healing of the original fracture, or incorrect billing. The ICD-10 diagnostic codes clearly specify whether it is a left wrist or right wrist, whether it is an initial or

subsequent encounter, and also indicates whether there was routine healing or complications. Under ICD-10, gaming of the system is less possible than under ICD-9.

ICD-10 varies most dramatically from ICD-9 in its Information Technology (IT) structure. ICD-10-PCS (procedure codes) utilizes standardized terminology consisting of codes which are seven alpha-numeric characters in length, with each character having a specific meaning (TMA, 2010), (Table II). The ICD-9 procedure classification system, in contrast, consists of three - four character numeric codes (Frieden, 2009). Similarly, the diagnosis codes for the ICD-10 system vary from ICD-9 as they are greater in length and have an increased use of both alpha and numeric characters (AHIMA, 2008). The ICD-10 codes are not case sensitive and this standardized format can help to facilitate interoperability and sharing of data internationally (Table II).

ICD-10 - A Costly Necessity?

Despite an international transition to the revised ICD codes, the DHHS delayed mandatory participation in the U.S. based on public protest (Schneider, 2008; American Medical Association [AMA], 2010a). One major concern voiced by the medical community was the cost of the transition (American Academy of Orthopedic Surgeons [AAOS], 2009). Many organizations have tried to estimate the cost for transitioning to ICD-10, and these estimated costs vary widely. A recent report estimated costs for individual physicians practices, concluding that cost to a "small practice" (defined as three physicians and two administrative staff) to be $87,000 and to a "large practice" (defined as 100 providers and 64 coding staff members) as $2.7 million (MediMobile, 2012). America's Health Insurance Plans' Center for Policy and Research (2010) estimated costs to implement ICD-10 from the standpoint of

insurance plans, concluding that total costs for a small plan (less than one million members) would be $99 million, and for a large plan (more than five million members) would be $1.7 billion).

These costs include funds needed for training and education on the new system, fees related to contract changes in health plans and coverage determinations, expenses to upgrade computer and information systems to function with the new coding system, increase in billing and documentation charges, and a possible disruption in monetary transactions related to billing and reimbursement (AAOS 2009). The issues of substantial financial and time investment are reasons cited by the AMA as concerns with the transition to ICD-10, especially with the nearing implementation deadline and simultaneous switch to electronic medical records (AMA, 2010a).

Proponents of the conversion to ICD-10, such as the American Hospital Association (AHA), have made arguments that the improved coding system can actually decrease healthcare costs in the long run and allow for increased reimbursement to providers (Bowman 2008; AMA 2010a). The increased specificity of diagnosis codes can reduce the need for additional documentation and be more efficient. This will help to ease processing and payment on claims and allow for better reimbursement on newer procedures (DHHS, 2009). Overall, such a simple improvement as more uniform and accurate documentation can enhance monitoring of outcomes and lead to improved quality of care. As CMS moves towards to a Pay-for-Performance reimbursement, the lack of detail in the ICD-9 coding system will not be supportive of such a reimbursement model (Bowman, 2008). In any event, HHS has estimated that society will not break even on the ICD-10 conversion costs until 2018 (Conn, 2008; Kappel and Schenk, 2011).

More precise data can not only improve the quality of care provided by an organization, but also allow for fiscal benchmarking (AMA, 2010a). There will be a greater capability for

identification of risk and growth trends as well as enhanced marketing strategies and management of portfolios (Piselli, Wall, and Boucher, 2010). The RAND study concluded that benefits of the revised ICD system could easily outweigh concerns about the cost of transition (Libicki and Brahmakulam, 2004).

Benefits of ICD-10 Utilization

The ICD-9 coding system has been utilized for almost 30 years and despite the continual addition of new codes was not designed to accommodate the level of detail needed in today's age of electronic health records (DHHS, 2008b). ICD-9 consists of approximately 17,000 codes which have evolved since 1979 and reached a point in 2009 where many chapters were full and the possibility of further expansion had been exhausted (DHHS, 2008a). The U.S. is the only nation in the Group of Seven (which also includes Canada, France, Italy, Japan, Great Britain, and Germany) that continues to use ICD-9 classifications for morbidity. The other nations, which have converted to ICD-10 for morbidity classification and which also use a modification of ICD-10 for billing and reimbursement, are already reaping the benefits of the revised system (DHHS, 2008b). In fact, many countries are currently using trial versions of ICD-11 which is scheduled for final release in 2014. This version is intended to update ICD-10 and allow for further development of systems integration and the use of more uniform terminology (WHO, 2010b).

The ICD-10 system consists of over 87,000 codes and offers the capability for further growth (AMA, 2010b). This coding system will allow for greater specificity with coding, fewer coding errors and less incidence of rejected medical claims (Libicki and Brahmakulam, 2004; American Health Information Management Association [AHIMA] 2010). This will also decrease the incidence of fraudulent claims. This reduction in inaccurate coding will increase efficiency in billing and reimbursement, thus lowering cost (AAPC, 2010b). The current movement towards

electronic record keeping will also be facilitated with the transition to a more accurate and efficient coding system (AHIMA, 2010). An added advantage will also include improved patient safety as a more detailed coding system will allow for a universal assessment of medication side effects, treatment outcomes, and compliance of providers with quality of care protocols (Deloitte Center for Health Solutions [DCHS], 2008). An integrated coding system will create more ease in the sharing of medical data not only in the U.S. but internationally (DCHS, 2008).

The use of a universal coding system combined with the ability to electronically transmit medical record data will align the U.S. globally and facilitate research related to disease etiology, progression, transmission, and management (CDC, 2001). This can provide improvement in identification and treatment of public health threats (AAPC, 2010b). The worldwide sharing of such data can provide universal treatment protocols, improved quality of care, and better outcomes globally (Bowman, 2008). In a time with fears of bioterrorism and epidemic outbreaks, the transmission of medical data which is internationally coded in a uniform manner creates the ability to have the greatest level of preparedness in the event of a medical disaster (AMA, 2010a). This conversion, despite its worthiness, is likely to be the most difficult feat for the U.S healthcare system in decades, being compared to sparking fears such as the Year 2000 phenomenon (Schneider, 2008).

DISCUSSION

The U.S. healthcare system is currently undergoing major transformations. The transition to ICD-10 is one aspect of these changes which has sparked great debate, controversy and research. As adoption of ICD-10 is one of the major factors at the forefront of discussion in U.S. healthcare, there is a wealth of information about this topic. The transition to ICD-10 for procedural and diagnostic coding is long overdue. Historically, as new technologies and medical

discoveries developed, the ICD system had been updated and revised to incorporate these changes approximately every ten years. Yet, despite great advances in medicine over the past 30 years, the U.S. has remained stagnant in its coding system. Fears of change coupled with substantial transitional cost, as acknowledged by the AMA (Carmel, 2011), have been major barriers to implementing ICD-10 in the U.S. However, the benefits of ICD-10 adoption are huge, including advantages in format, potential for healthcare cost savings, and the overall benefits of utilization when compared to the ICD-9 system. WHO statistics which reports that 70% of worldwide healthcare payments are based on ICD-10 coding and 110 countries, which embody 60% of world's population, currently use ICD-10 for cause of death monitoring and health planning (WHO, 2010b).

A simple increase in the number of characters and the use of an alpha-numeric system will greatly increase the number of codes from ICD-9. This creates the capability for more specific and detailed coding, allowing for greater accuracy in recording diagnoses and procedures. It also allows the ICD-10 system to evolve along with future advances in medical technology. The accuracy of future medical research will be greatly enhanced by the capability with ICD-10 to identify laterality and to give greater detail about anatomical sites, diagnoses, and procedures. The benefits of being able to code greater detail and side of surgical site improves billing as well as greater specificity with future research studies (Zeisset, 2009). The advance to ICD-10 also allows for coding of home healthcare, outpatient, ambulatory care, skilled nursing and post-acute care services. This permits outcome-based research to continue outside the acute care setting and on through the continuum of care. Coding in the ambulatory, skilled nursing, and rehabilitative settings may also facilitate more accurate billing and could change the way providers of these post-acute care services are reimbursed.

Although the initial cost may be substantial, the long term return on this investment makes it a worthy transition and is a major reason for its endorsement by the AHA ("Testimony", 2011). The standardized codes will facilitate claims processing, decrease the number of errors and rejected claims, and also allow for billing and reimbursement on newer procedures. Providers will be able to better utilize the data for fiscal benchmarking. The more detailed diagnosis and procedure information will also make it easier for providers to plan future risk and growth management.

Unfortunately, the fragmented U.S. healthcare system has failed to find any sense of urgency to adopt the more advanced ICD-10 coding. Adoption and implementation of ICD-10, as has been done by other countries globally, could offer a solution to this lack of cohesiveness in the U.S. and create a more efficient healthcare system. The passage of legislation in the U.S., such as the Health Information Technology for Economic and Clinical Health as part of the American Recovery and Reinvestment Act and the Affordable Healthcare Act, initiated a movement for the U.S. to become more globally aware and inter-connected (DeVore and Figlioli, 2010; Steindel, 2010). The conversion to ICD-10 is one specific means of reaching goals set by these acts, such as a transition to a fully integrated and electronic medical records system. Such a transition can spark employment opportunities for IT professionals and coding specialists (DCHS 2008). The utilization of ICD-10 for mortality tracking in the U.S would result in consistency of these risk reports with other nations. A higher degree of detail in diagnosis and comorbidity coding would lead to greater validity due to increased accuracy, and therefore the improvement of the healthcare in the U.S.

CONCLUSIONS

Advantages of ICD-10, with its well defined and commonly understood terminology codes, are clear. CMS and several other health care providers (such the Geisinger Health System in Danville, PA [Dugan 2012]) are currently in the process of adopting the newly created ICD-10 coding system, but many of the players in the health care system are comfortable with the current system (ICD-9) and are still in the learning process regarding ICD-10. The current economic downturn, coding inconsistencies, political and provider disputes, complicated health care regulations and reform, excessive costs, and other implementation issues are the main reasons for delay in adopting ICD-10-CM codes. The HHS-mandated transition to ICD-10 does not provide any funds or incentives to cover the costs to providers, payers and claims clearing houses, although CMS continues to attempt to give providers adequate time and flexibility for implementing ICD-10 by pushing the deadline for the transition forward again and again. Despite the past several deadline extensions in the past, the time to ensure the successful transition is quickly approaching as further deadline extensions are unlikely. The benefits of the new system are substantial, but the inertia associated with the transition from ICD-9 to ICD-10 must be overcome.

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Table I: Comparison of Key Differences between ICD-9 and ICD-10

ICD-9	ICD-10
Lacks specificity	Highly specific
14,000 codes	87, 000 codes
Limited ability to expand and add new codes	Capable of expansion
Lacks identification of anatomical site laterality	Identifies anatomical site laterality
Lacks codes for ambulatory care, home health and skilled nursing	Creates new codes for ambulatory care, home health and skilled nursing
Procedure codes: 3 to 4 character numeric codes	Procedure codes: 7 character alpha numeric codes (each having a specific meaning)
Diagnosis codes: 3-5 characters in length. First digit may be alpha (E or V) digits 2-5 are numeric	Diagnosis codes: 3-7 characters in length. Digit 1 alpha; digits 2 and 3 are numeric; digit 4-7 are alpha or numeric

Sources: Nagel 2004; Bowman 2008; DHHS 2008a; AAPC 2010b; Leon-Chisen 2010; TMA 2010; Meyer 2011; AMA 2012

Table II: ICD-10-PCS Medical and Surgical Procedure Coding

1	2	3	4	5	6	7
Section	Body system	Root Operation	Body Part	Approach	Device	Qualifier