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Holly Johns
Marshall University

Cara Havens
Marshall University

Danielle Robinson
Marshall University

Bala S. Pothakamuri

David P. Paul III

See next page for additional authors

Authors
Holly Johns, Cara Havens, Danielle Robinson, Bala S. Pothakamuri, David P. Paul III, and Alberto Coustasse

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Holly Johns, Marshall University
Cara Havens. Marshall University
Danielle Robinson, Marshall University
Bala S. Pothakamuri, Monmouth University
David P. Paul, III, Monmouth University
Alberto Coustasse, Marshall University

ABSTRACT

The United States faces 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. ICD-10 will provide a tremendous opportunity for better capturing the 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.

INTRODUCTION

International disease classification systems date back to 1763, when French physician Francois Bossier de Lacrois published a classification system listing ten major classes of diseases and 2400 individual diseases for helping his fellow doctors in making diagnoses (Knibbs 1929). In 1898, the American Public Health Association recommended that Canada, Mexico and the United States adopt the Bertillon Classification of Causes of Death, the international standard at the time.

In 1946 at the International Health Conference, the World Health Organization (WHO) accepted the responsibility of the sixth revision of the International List of Causes of Death and included illness and injury classifications in the system (Schoenbach, 2000; ACEP, 2010). The resulting classifications accepted by the conference, as proposed by the WHO, were deemed as the International Classification of Diseases, Injuries, and Causes of Death which through later revisions came to be known as the International Classification of Diseases (ICD) (World Health Organization, 2010a). Through several decades of revision, ICD-9 was developed by the WHO in order to classify and globally compare statistical data related to mortality (Colorado Department of Public Health and Environment, 2001).

In 1979, the Center for Medicaid and Medicare Services (CMS) modified the ninth revision to create the ICD-9-CM (Clinically Modified) for coding diagnoses and procedures in order to facilitate reimbursement and incorporate diagnosis and procedure codes as a means of statistically monitoring disease (American Academy of Professional Coders, 2010a; CDC, 2009). The U.S began using the ICD-9 system the same year and continues to utilize this system (AAPC, 2010a). Today these codes, which are annually updated, are used in the U.S. healthcare system as a means of billing and reimbursement (ACEP, 2010).

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 to include new discoveries and procedures in medicine. Each year there are hundreds of new diagnoses submitted to CMS from medical research and technological advances of procedures that need greater specificity for adequate reimbursement and it cannot be requested due to the ICD-9 insufficiency of detailed coding (Haugh 2005). This inhibits the coding system's ability to be utilized 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). The ICD-10 has been modified into the ICD-10-CM and the ICD-10-PCS (Procedural Coding System). The ICD-10-CM, which is regulated by the National Centers for Health Statistics (NCHS) and the CMS, covers codes for reporting diagnoses and symptoms. The ICD-10-PCS, which is regulated by the CMS was created to code inpatient hospital procedures (American

Medical Association, 2010). More accurate procedure descriptions with ICD-10 can facilitate better outcome measurement by discovering previously unknown correlations related to details such as laterality (Leon-Chisen, 2010).

One-hundred fifty three countries have adopted an updated ICD-10 classification which is touted as allowing not only for increased specificity with diagnosis and coding but also for interoperability in global sharing of records and statistics (Schlom and Battani, 2009). Since 1999 the U.S. has only used this updated classification for tracking mortality (Dimick, 2009). The ICD-10 eventually will replace the International Classification of Diseases, 9th edition, Clinical Modifications (ICD-9-CM), which has codes dated from 1979-1998 (ACEP, 2011).

The Center for Medicare and Medicaid Services (CMS) mandated the 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, and more recently until October 1, 2014 ("Federal Register", 2012). This transition will give the US the ability to track and respond to international health threats as well as better use the benefits associated with an Electronic Health Record (EHR), (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 eight billion dollars 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-CM/PCS implementation will 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 alphanumeric characters which will allow for more specific classification of various diseases and diagnoses. 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 of ICD-10 codes (Quan et al., 2008), (Table 1). 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), (Table 1). \

--- insert Table 1 about here ---

The ability to be more exact with classification has resulted in a three-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 (Nagel, 2004). For example, the ICD-10 has around four categories and more than 46 codes related specifically to anesthesia, a significant increase, as currently ICD-9 contain less than 20 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), (see Table 2).

--- insert Table 2 about here ---

While the providers and payers eventually should see significant benefits, transitioning to ICD-10 will require big 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 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. But with the ICD-10 diagnostic codes, it clearly specifies whether it is a left wrist or right wrist, is it an initial or subsequent encounter and also indicates whether there was routine healing or complications. With this specificity, physician and patient may know the side of the body, location, and condition, and helps them to identify the surgical errors. Under ICD-10, gaming of the system is prevented which is lacked under ICD-9.

The ICD-10 also 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 2). The ICD-9 procedure classification system, in contrast, consists of 3-4 character numeric codes and just two letters, the E and V 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 2).

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], 2010). 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. Implementation costs estimates vary widely. The RAND Corporation estimates (for National Committee on Vital Health Statistics) initial costs between $475 million and $1.55 billion, plus additional long-term costs of between $20 million and $170 million (Libicki and Brahmakulam, 2004); the Robert E. Nolan Company estimates (for the Blue Cross Blue Shield Association) costs to be between $11.65 billion and $39.45 billion ("Nolan", 2003); and The Hay Group's estimates (for America's health insurance plans) costs to range from $3.2 billion to $8.3 billion (Wildsmith, 2006).

On a more micro level, costs for physician practices will also be high, averaging around $83,000 for a three-doctor practice, $285,000 for a ten-doctor practice, and $2.7 million for a 100-doctor practice, according to a study commissioned by the Medical Group Management Association . The American Hospital Association doesn't appear to have done a cost estimate for hospitals, but one system, Christiana Care, a two- hospital, 1,100-bed system in Wilmington, Delaware, estimated the total implementation cost around $15 million to $20 million (Meyer, 2011).

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 2013 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 valid 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 increase specificity with 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 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 is not supportive of such a reimbursement model (Bowman, 2008).

The 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

Despite the adding of new codes, the ICD-9 coding system has been utilized for almost 30 years and it was not designed with the intent 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 68,000 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 an anticipated 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 ICD-10 is 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), are 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). Many countries are continuing to further develop a more integrated and uniform system as they trial ICD-11, the next ICD revision by the WHO.

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 created the capability for more specific and detailed coding, allowing for greater accuracy in coding 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 are facilitation of billing as well as greater specificity with future research studies (Zeisset, 2009). The revision of the ICD also allows for coding of home healthcare, outpatient, ambulatory care, skilled nursing and post-acute care services. This will allow for outcome based research to continue outside the acute care setting and on through these various phases of healthcare. 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 utilize the data better 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 standardized ICD-10 coding, and HHS has even delayed its implementation again, to October 1, 2014 (Frieden, 2012). Adoption and implementation of ICD-10, as it has been 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 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 could spark employment opportunities for IT professionals and coding specialists (DCHS 2008), but only if the mandated electronic medical record (EMR) is unable to code directly to ICD-10, which may be possible. The utilization of ICD-10 for mortality tracking in the U.S would result~~ed~~ 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.

The advantages of ICD-10 are pretty clear, because of its well defined and commonly understood terminology codes. CMS and several other health care providers are currently in the process of adopting the newly created ICD-10-CM coding system. But most of the players in the health care system are comfortable with the current system and are 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 like for the EMR to cover the conversion costs to providers, payers and claims clearing houses. As per CMS it is giving the providers adequate time and flexibility for implementing it. The deadline for the switch to ICD-10 has been pushed back (again!), but the time to ensure the successful transition is quickly coming. The benefits of the new system are many, but the inertia associated with the present system (ICD-9) must be overcome

REFERENCES

American Academy of Orthopaedic Surgeons [AAOS]. 2009. *Switching to ICD-10: The impacton physicians.* Retrieved January 21, 2012 from http://www.aaos.org/news/aaosnow/ feb09 /reimbursement1.asp.

American Academy of Professional Coders [AAPC]. 2009. *The cost ICD-10 implementation.* Retrieved January 21, 2012 from http://news.aapc.com/index.php/2009/09/the-cost-of-icd-10-implementation.

American Academy of Professional Coders [AAPC]. 2010a. *What is ICD-9-CM?* Retrieved February 3, 2012 from http://www.aapc.com/resources/medical-coding/icd9.aspx.

American Academy of Professional Coders [AAPC]. 2010b. *Benefits of implementation.* Retrieved January 21, 2012 from http:/news.aapc.com/index.php/2010/01/benefits-of-implementation.

American Academy of Professional Coders [AAPC]. 2010c. *ICD-10 frequently asked questions.* Retrieved January 21, 2012 from http://www.aapc.com/ICD-10/faq.aspx

American College of Emergency Physicians [ACEP]. 2011. *ICD-9 and ICD-10 frequently asked questions.* Retrieved January 21, 2012 from: http://www.acep.org/ practres.aspx?id=30476.

American Health Information Management Association [AHIMA], 2008. *AHIMA Comments on the Nachimson Report "The Impact of Implementing ICD-10 on Physician Practices an Clinical Laboratories*". Retrieved on February 3, 2012 from: http://www.ahima.org/downloads/pdfs/resources/nachimson.pdf.

American Health Information Management Association [AHIMA]. 2010. *The value of ICD-10.* Retrieved January 21, 2012 from http://www.ahima.org/icd10/value.aspx.

American Medical Association [AMA]. 2010a. *ICD-10 101: What it is and why it's being implemented.* Retrieved January 21, 2012 from www.ama-assn.org/go/ICD-10.

American Medical Association [AMA] 2010b. *ICD-10 deadline causing worry, even 3 years away.* Retrieved on February 3, 2012 from http://www.ama-assn.org/amednews/2010/01/04/ gvsc0104.htm.

Bowman, S., 2008. Why ICD-10 is worth the trouble? *Journal of AHIMA / American Health Information Management*, 79 (3), 22-29.

Carmel, P. W. (2011), "AMA hoping to stop ICD-10 use in billing," *American Medical News*, November 11. Retrieved May 3, 2012 from http://www.ama-assn.org/amednews/2011/ 11/28/ prsh1128.htm on May 3, 2012.

Centers for Disease Control and Prevention [CDC]. 2001 *International classification of diseases 10th revision (ICD-10).* Retrieved January 21, 2012 from http://www.cdc.gov/nchs/data/dvs/ icd10fct.pdf.

Centers for Disease Control and Prevention [CDC]. 2009 *International classification of diseases ninth revision (ICD-9-CM).* Retrieved April 5, 2012 from http://www.cdc.gov/nchs/ icd/icd9cm.htm.

Centers for Medicare and Medicaid Services [CMS]. 2010. *ICD-10 overview*. Retrieved January 21, 2012 from http://www.cms.gov/ICD10/01_Overview.asp.

Colorado Department of Public Health and Environment. (2001). New international classification of disease (ICD-10): The history and impact. Retrieved April 5, 2012, from http://www.cdphe.state.co.us/hs/briefs/icd10brief.pdf.

Deloitte Center for Health Solutions [DCHS]. 2008. *ICD-10 turning regulatory compliance into strategic advantage.* Retrieved January 21, 2012 from http://www.nahq.org/enews/pdfs/0510_leader.pdf

Department of Health and Human Services [DHHS]. 2008a. *HHS proposes adoption of ICD-10 code sets and updated electronic transaction standards.* Retrieved January 21, 2012 from http://www.hhs.gov/news/press/2008pres/08/20080815a.html.

Department of Health and Human Services [DHHS]. 2008b. HIPAA administration simplification modification to medical data code set standards to adopt ICD-10-CM and ICD-10-PCS; Proposed rule. *Federal Register part III, 73 (164).* Retrieved January 21, 2012 from http://edocket.access.gpo.gov/2008/pdf/E8-19298.pdf.

Department of Health and Human Services [DHHS]. 2009. *HHS issues final ICD-10 code sets and updated electronic transaction standards rules.* Retrieved January 21, 2012 from http://www.hhs.gov/news/press/2009pres/01/20090115f.html.

DeVore, S. and Figlioli, K. 2010. Lessons premier hospitals learned about implementing electronic health records. *Health Affairs*, 29 (4), 664-667.

Dimick, C. 2009. Mortality coding marks 10 years of ICD-10. *Journal of AHIMA*, 80 (70), 30-33.

"Federal Register" 2012. Federal Register, 77 (162), 54664-54720. 45 CFR Part 162. Downloaded November 4, 2012 from http://www.gpo.gov/fdsys/pkg/FR-2012-09-05/pdf/2012-21238.pdf.

Frieden, J. 2009. ICD-10 will be complicated but more useful. Retrieved January 21, 2012 from http://www.entrepreneur.com/tradejournals/article/202437878.html.

Frieden, J. 2012. HHS announces ICD-10 delay. *MedPage Today*. Retrieved May 7, 2012 from http://www.medpagetoday.com/practicemanagement/informationtechnology/32095.

Haugh, R. 2005. Will Codes Turn 10? *Hospitals and Health Networks*, 79 (6), 18-20.

International Healthlink Professionals, Inc. (2010). Frequently asked questions. Retrieved January 21, 2012 from http://www.ihelpinc.net/FAQs/index.html.

Knibbs, G.H. (1929), "The international classification of disease and causes of death and its revision," Medical Journal of Australia, 1, 2-12.

Leon-Chisen, N. 2010. Introducing a clinically richer coding system. National Association of Healthcare Quality. Retrieved April 5, 2012 from http://www.deloitte.com/assets/DcomUnitedStates/Local%20Assets/Documents/us_lshc_ImpacOfICD10_081409.pdf.

LeMier, M, Cummings, P and West, T.A. 2001. Accuracy of external cause of injury codes reported in Washington State hospital discharge records. *Injury Prevention,* 7 (4):334–338.

Libicki, M. and Brahmakulam, I. 2004. *The cost and benefit of moving to the ICD-10 code sets.* (TR-132-DHHS) RAND Science and Technology. Retrieved January 21, 2012 from http://www.rand.org/pubs/technical_reports/2004/RAND_TR132.pdf.

Meyer, H. (2011), **"**Coding complexity: US health care gets ready for the coming of ICD-10," *Health Affairs*, 30 (5), 968-74.

Nagel, S. 2004. The migration to the ICD-10-CM. Preparing for the inevitable. *For the Record*, 16 (12), 30.

"Nolan" (2003), "Replacing ICD-9-CM with ICD-10-CM and ICD-10-PCS: Challenge, Estimated cost and potential benefits," Robert E. Nolan Company. Retrieved April 30, 2012 from http://www.renolan.com/healthcare/icd10study_1003.pdf.

Piselli, C., Wall, K., and Boucher, A. 2010. A new language for healthcare? *Healthcare Financial Management*, 64 (1), 94-100.

Quan, H., Li, B., Duncan Saunders, L., Parsons, G., Nilsson, C., Alibhai, A., Ghali, W. A., and IMECCHI Investigators. 2008. Assessing Validity of ICD-9-CM and ICD-10 Administrative Data in Recording Clinical Conditions in a Unique Dually Coded Database. *Health Services Research*, 43 (4), 1424-1441.

Schlom, A. and Battani, J. 2009. *Responding to ICD-10: Healthcare payer strategy to achieve regulatory compliance and ROI.* Retrieved January 21, 2012 from http://assets1.csc.com/ health_services/downloads/ CSC_Responding_to_ICD-10.pdf.

Schneider, M. 2008. *Physician groups protest timeline for ICD-10 switch. Clinical Psychiatry News.* Retrieved February 3, 2012 from http://www.entrepreneur.com/tradejournals/article/189668716.html.

Schoenbach, V. 2000. *Phenomenon of Disease*. Retrieved January 21, 2012, from http://www.epidemiolog.net/ evolving/PhenomenonofDisease.pdf.

Steindel, S. J. 2010. International classification of diseases, 10th edition, clinical modification and procedure coding system: descriptive overview of the next generation HIPAA code sets. *Journal of the American Medical Informatics Association,* 17 (3), 274-282.

"Testimony". 2011. Testimony of the American Hospital Association before the Standards Subcommittee of the National Committee on Vital and Health Statistics. Retrieved May 4, 2012 from http://www.aha.org/advocacy-issues/testimony/2011/ 110617-tes-hipaaicd10.pdf.

Tricare Management Activity [TMA]. 2010. *International Classification of Diseases-Tenth Revision(ICD-10).* Retrieved February 3, 2012 from http://www.tricare.mil/tma/hipaa/icd10.aspx.

Vlessides, M. 2009. *Study confirms anesthesia safety: Mortality rate now approximately one in 100,000.* Retrieved April 5, 2012 from http://www.anesthesiologynews.com/ViewArticle.aspx?d_id=21&a_id=12277.

Wildsmith, T. F. (2006), "Examining the Cost of Implementing ICD-10," Retrieved April 30, 2012 from www.cdpublications.com/etc2/docfiles/chf/AHIP%20Study.doc.

World Health Organization [WHO]. 2006. *ICD-10 version 2007.* Retrieved February 3, 2012 from http://apps.who.int/classifications/ apps/icd/icd10online/.

World Health Organization [WHO]. 2007. *Production of ICD-11: The overall revision process. WHOFIC Network*. Retrieved on April 5, 2012 from https://extranet.who.int/icdrevision/help/ICD/docs/ICDRevision.pdf.

World Health Organization [WHO]. 2010a. *History of development of the ICD.* Retrieved January 21, 2012 from http://www.who.int/classifications/icd/en/HistoryOfICD.pdf.

World Health Organization [WHO]. 2010b. *ICD revision project plan, version 2.0.* Retrieved February 3, 2012 from http://www.who.int/classifications/icd/\ICDRevisionProjectPlan_March2010.pdf.

Zeisset, A. 2009. ICD-10-CM enhancements; a look at the features that will improve coding accuracy. *Journal of AHIMA,* 80 (2), 55-58.

Table 1: Comparison of Key Differences between ICD-9 and ICD-10

ICD-9	ICD-10
Lacks specificity	Highly specific
13,000 codes	68, 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

Table 2: 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