

REVIEW

Ready or not! Here comes ICD-10

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ABSTRACT

The International Classification of Diseases-10 (ICD-10) is a new system that is a federally mandated change affecting all payers and providers, and is expected to exceed both the Health Insurance Portability and Accountability Act (HIPAA) and Y2K in terms of costs and risks. In 2003, HIPAA named ICD-9 as the code set for supporting diagnoses and procedures in electronic administrative transactions. However, on 16 January 2009, the Department of Health and Human Services published a regulation requiring the replacement of ICD-9 with ICD-10 as of 1 October 2013. While ICD-9 and ICD-10 have a similar type of hierarchy in their structures, ICD-10 is more complex and incorporates numerous changes. Overall, ICD-10 contains more than 141 000 codes, a whopping 712% increase over the <20 000 codes in ICD-9, creating enormous complexities, confusion and expense. Published statistics illustrate that there are instances where a single ICD-9 code can map to more than 50 distinct ICD-10 codes. Also, there are multiple instances where a single ICD-10 code can map to more than one ICD-9 code. Proponents of the new ICD-10 system argue that the granularity should lead to improvements in the quality of healthcare whereas detractors of the system see the same granularity as burdensome. The estimated cost per physician is projected to range from \$25 000 to \$50 000.

The US healthcare industry has been undergoing many changes and is poised to undergo many more radical changes in the coming years.^{1–6} The enormous pace of innovation in healthcare, increasing complexity of healthcare interventions and systems, pervasive and persistent unexplained variability in clinical practice and high rates of perceived inappropriate care combined with increased expenditures have helped fuel a steady increase in regulations and changes.^{7–18}

The International Statistical Classification of Diseases and Related Health Problems, known as ICD, provides codes to classify diseases and a wide variety of signs, symptoms, abnormal findings, complaints, social circumstances and external causes of injury or disease.¹⁹ One significant policy change that we believe has been overshadowed by the current healthcare reform discussion is the ICD, 10th revision, or ICD-10.⁶ The rationale for transformation is that the greatly expanded ICD-10 coding system allows for more precision and specificity about both disease conditions and the healthcare interventions provided to patients; savings from elimination of inappropriate diagnoses and identification of fraud; and a suggestion that ICD-10 will allow the USA to report morbidity and

mortality statistics to the WHO that are comparable with those of other countries.^{6 19 20}

The costs for physician practices have been estimated to be steep, averaging over \$83 000 for a three doctor practice, \$285 000 for a 10 doctor practice and \$2.7 million for a 100 doctor practice, based on a study conducted by the Medical Group Management Association.²¹ Furthermore, hospital expenses have been estimated to range from \$15 million to \$20 million per hospital. These are the best case scenario estimates, and some expect the cost to be considerably more.

BACKGROUND

The history of ICD dates back at least to 1763 when French physician Francois Bossier de Lacroix, seeking to aid his fellow physicians in making diagnoses, published a classification system listing 10 major classes of diseases and 2400 individual diseases.²²

In 1853, the first International Statistical Congress appointed William Farr and Jacob Marc d'Espine to create an internationally acceptable classification of causes of mortality.²³ Consequently, the general arrangement proposed by Farr was selected as the basis of the International List of Causes of Death (ILCD). The first ILCD was developed by a committee chaired by Jacques Bertillon (Chief Statistical Services of the City of Paris) in 1893, and was introduced at the International Statistical Institute in Chicago.²³ In 1898 it was adopted by Canada, Mexico and the USA.²³ Subsequently, ILCD classifications for mortality reporting were officially published in 1900, 1910, 1920, 1929 and 1938.²³

The WHO became the custodian of ICD in 1948, and in 1949 adopted the ICD, which was expanded to include morbidity coding.²³ As the WHO assumed responsibility for preparing and publishing the revisions in 1948, revisions have been performed every 10 years; thus WHO sponsored the seventh and eighth revisions in 1957 and 1968, respectively. The ICD-9 revision provided additional, detailed four digit level categories and some optional five digit subdivisions. ICD-9 was published in 1977 by the WHO Department of Knowledge Management and Sharing. However, the WHO no longer publishes or distributes the ICD-9 as it is now in the public domain.

Work on ICD-10 began in 1983 and was completed in 1992. The code set allows more than 155 000 different codes and permits tracking of many new diagnoses and procedures, a significant expansion on the 17 000 codes available in ICD-9.^{6 19 23} The unchanged international version of ICD-10 is used in about 110 countries for cause of death



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reporting and statistics. Nonetheless, many countries have not adopted it for mortality and morbidity coding.^{6 20}

In 2003, the Health Insurance Portability and Accountability Act (HIPAA) of 1996²⁴ named ICD-9 as the code set for reporting diagnoses and procedures in electronic administrative transactions. On 16 January 2009, the Department of Health and Human Services published a regulation requiring the replacement of ICD-9 with ICD-10 as of 1 October 2013. The ICD-10-CM will be used for diagnoses coding and the procedure coding system (ICD-10-PCS) for inpatient procedure coding.^{6 25} All HIPAA 'covered entities' must make the change; a prerequisite to ICD-10 is the adoption of electronic billing (EDI) V5010 by 1 January 2012.

EVOLUTION OF ICD-10

The ICD-9-CM, the clinical modification of ICD-9, developed by the National Center for Health Statistics for reporting morbidities, was adopted for use in the US in 1979. In 1983, the Inpatient Prospective Payment System was adopted, and ICD-9-CM volumes 1, 2 and 3 were used for assigning cases to diagnoses related groups. As a result of the advances in medicine since ICD-9-CM was implemented, the system has been updated and revised periodically with the establishment of regular updates annually via a coordination and maintenance committee. Responsibility for maintenance of the ICD-9-CM lies with the National Center for Health Statistics and the Centers for Medicare and Medicaid Services (CMS).

HIPAA²⁴ has identified 10 standard transactions for electronic data interchange for the transmission of healthcare data, claims and encounter information, payment and remittance advice, and claims status and inquiry. Code sets are the codes used to identify specific diagnoses and clinical procedures on claims and encounter forms. Such examples of code sets for procedures, diagnoses and drugs with which providers are familiar include Healthcare Common Procedures Coding System (HCPCS), Current Procedural Terminology (CPT), ICD-9 and National Drug Code (NDC).

STRUCTURE OF ICD-10

The ICD-10-CM has the same type of hierarchy in its structure as ICD-9-CM. All codes have the same first three digits describing common traits, with each character beyond the first three providing more specificity. However, ICD-10-CM is alphanumeric with up to seven digits of specificity. It also has the same organization and use of notes and instructions. When a note appears under a three character code, it applies to all codes within that category, and notes under a specific code apply to that single code.²⁶

However, there are substantial differences between ICD-9 and ICD-10. These are described as improvements in the content and format of the ICD-10-CM, which include:²⁶

1. The addition of information relevant to ambulatory and managed care encounters.
2. Expanded injury codes in which ICD-10-CM groups injuries by the site of the injury, as opposed to grouping in ICD-9-CM by type of injury or type of wound.
3. Creation of combination diagnoses and symptom codes, which reduces the number of codes needed to fully describe a condition.
4. Greater specificity in code assignment.
5. V and E codes being incorporated into the main classification in ICD-10-CM.
6. ICD-10-CM codes being alphanumeric and including all letters except U.

7. The length of codes in ICD-10-CM being a maximum of seven characters, as opposed to five digits in ICD-9.
8. Some vacant, three character codes in ICD-10 to allow for revision and future expansion.

Overall, ICD-10-CM far exceeds its predecessors in the number of codes available. Table 1 illustrates the comparison of chapter numbers and titles in ICD-9-CM with those in ICD-10-CM.²⁶ However, diseases of the eye and its adnexa and diseases of the ear and mastoid process will have their own chapters in ICD-10-CM.

ICD-10-CM characteristics are as follows:

- ▶ Tabular lists containing cause of death titles and codes (volume 1).
- ▶ Inclusion and exclusion terms for cause of death titles (volume 1).
- ▶ Alphabetic index to diseases and nature of injury.
- ▶ External causes of injury.
- ▶ Table of drugs and chemicals (volume 3).
- ▶ Description, guidelines and coding rules (volume 2).

Table 2 illustrates the differences between ICD-9 and ICD-10.²²

LACK OF NEED FOR ICD-10 AND ITS COMPLEX MECHANISM

ICD-10 proponents argue that in ICD-9 the number of diagnostic codes based on alphanumeric name badges the diagnoses carry for insurance billing and other purposes will increase from 14 000 to 69 000. In addition, the number of codes for procedures that can be performed on an inpatient basis in hospitals will jump from about 3800 to 72 000. The shift will affect just about every aspect of clinical and business operations as the codes document what clinicians do with patients and are embedded in nearly all clinical information and billing operations nationwide. Proponents also agree that in effect, switching to ICD-10 means that every diagnosis and piece of claims activity will operate under a different language than it does now.¹⁹

It has been argued that ICD-10 implementation requirements are much more extensive than any encountered with HIPAA to date, or even with Y2K.²⁷ The most valuable lesson from both HIPAA and Y2K is that successful ICD-10 implementation will cost more than present estimations, potentially by a large amount. While it is guaranteed that the costs will be a part of ICD-10, the benefits are only potential. Understandably, physicians, hospitals, health plans, software vendors, government agencies and nearly all other healthcare entities bracing for the implementation of the inevitable ICD-10 coding system are anxious as ICD-10 introduces a monumental new set of diagnostic and procedural codes. The anxiety is most severe for small physician practices, hospitals and health plans which may not be ready for ICD-10 by the October 2013 deadline. An additional concern is that some organizations will not be ready for the transaction system conversion on 1 January 2012.¹⁹ In fact, ICD-10, similar to various healthcare regulations in the past, including implementation of HIPAA and the Occupational Safety and Health Administration (OSHA) compliance regulations, has created a cottage industry of consultants. While there is no proof of savings or improved efficiency, there are estimations of overriding costs and inconvenience for practitioners. These include overhauling computer software systems, training staff and making other needed changes. The Department of Health and Human Services projects a total cost to the US healthcare system to be in the range of \$2.3 billion to \$2.7 billion over a period of 15 years. Furthermore, other cost estimates are highly variable, with one consulting firm estimating \$3.2 billion to as much as \$8.3 billion and another consulting firm estimating \$15.2 billion to

Table 1 Comparison of chapter numbers and titles in ICD-9-CM with those in ICD-10-CM

Chapter	ICD-9-CM	ICD-10-CM
1	Infectious and parasitic diseases	Certain infectious and parasitic diseases
2	Neoplasms	Malignant neoplasms
3	Endocrine, nutritional and metabolic diseases, and immunity disorders	Malignant neoplasms
4	Diseases of the blood and blood forming organs	Endocrine, nutritional and metabolic diseases
5	Mental disorders	Mental and behavioral disorders
6	Diseases of the nervous system and sense organs	Diseases of the nervous system
7	Diseases of the circulatory system	Diseases of the eye and adnexa
8	Diseases of the respiratory system	Diseases of the ear and mastoid process
9	Diseases of the digestive system	Diseases of the circulatory system
10	Diseases of the genitourinary systems	Diseases of the respiratory system
11	Complications of pregnancy, childbirth and the puerperium	Diseases of the digestive system
12	Disease of the skin and subcutaneous tissue	Disease of the skin and subcutaneous tissue
13	Diseases of the musculoskeletal system and connective tissue	Diseases of the musculoskeletal system and connective tissue
14	Congenital anomalies	Diseases of the genitourinary system
15	Certain conditions originating in the perinatal period	Pregnancy, childbirth and the puerperium
16	Symptoms, signs and ill defined conditions	Certain conditions originating in the newborn (perinatal) period
17	Injury and poisoning	Congenital malformations, deformations and chromosomal abnormalities
18	N/A	Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified
19	N/A	Injury, poisoning and certain other consequences of external causes
20	N/A	External causes of morbidity
21	N/A	Factors influencing health status and contact with health services
Supplementary classification	Classification of factors influencing health status and contact with health services (V codes)	N/A
Supplementary classification	Classification of external cause of injury and poisoning (E codes)	N/A

Source: Grider DJ.²⁶

\$34.1 billion.²¹ America's Health Insurance Plans (AHIP), the Health Plan Trade Group, projects that the cost to health plans alone will be \$2 billion to \$3 billion.²⁸ Aetna's estimation is approximately \$50 million to \$70 million a year through 2013 to make the conversion.¹⁹ Finally, estimated costs for physician practices will vary from \$83 000 for a three doctor practice to \$2.7 million for a 100 doctor practice.²¹ Hospitals are estimating the costs to be approximately \$15 million to \$20 million for each hospital.

A Research and Development study estimated that cost, as well as lost productivity and time to resolve coding issues, could range between \$5 million and \$25 million nationally for the first year and would decline to \$16 million after 6 months. However, the amount of productivity lost in a practice depends on the level of understanding of ICD-10 and training obtained by the physicians and staff. The Research and Development study also estimated that software costs could range from \$500 million up to \$1.6 billion nationally, with smaller or solo practices expected to spend \$180 million overall. The American Medical Association, in a guide to preparing for ICD-10, has presented cost projections²⁹ for a small surgical practice of three physicians to be \$44 000 whereas for a typical medium sized practice with 10 physicians the cost will be \$93 000.

ICD-10 CHANGES FOR PRACTICE

Conversion of ICD-9-CM codes to ICD-10-CM codes will likely be very complicated. Supplementary table 1 (available online only) illustrates the select examples of codes utilized in neuro-interventional practices, showing codes variable from 2 to 20 ICD-10 codes for each ICD-9 code. This example illustrates the complicated nature of conversion, creating further confusion. To understand the transition and mapping, one would need to expand multiple precious resources, including time and financial resources. Furthermore, as illustrated in table 3, one ICD-10 code represents multiple ICD-9 codes compounding the complexity and complications. The entire argument of granularity increasing and simplicity are lost with further restrictions than ICD-9.

PRACTICAL IMPACT

To help facilitate care and commerce, the government has invested in providing mappings between ICD-9 and ICD-10 and vice versa. There are two such mappings endorsed by CMS: the general equivalence mappings (GEMs) (for both ICD-9 to ICD-10 and ICD-10 to ICD-9) and the reimbursement maps (for ICD-10 to ICD-9 only). The GEMs established links among codes that are generally equivalent in each code set. The reimbursement maps were created after the GEMs maps and are

Table 2 Comparison between the WHO ICD-9 and ICD-10 classifications

Name of classification	ICD-9 International Classification of Diseases	ICD-10 International Statistical Classification of Diseases and Related Health Problems
No of volumes	(1) Volume 1—tabular list (2) Volume 2—alphabetical index	(1) Volume 1—tabular index (2) Volume 2—instruction manual (3) Volume 3—alphabetical index
No of sections vs chapters	17 sections (001–099)	21 chapters (A00–Z99) Except for U codes U00–U49: reserved for the provisional assignment of new diseases of unknown causes U50–U99: for research purposes
Supplementary classifications	Two supplementary classifications (1) External causes of injury and poisoning (E800–E999) (2) Factors influencing health status and contact with health services (V01–V82)	No supplementary classifications (prior supplementary classifications are now their own chapters) (1) Chapter XX: external causes of morbidity and mortality (V01–Y98) (2) Chapter XXI: factors influencing health status and contact with health services
Categories	909	2036
Subcategories	5161	12 159
Total codes	6882	12 420

Source: Jetté N, *et al.*²²

more specific, identifying the top candidate mappings from within the GEMs.

Some published statistics³⁰ may illuminate the challenges inherent in linking across the code sets. In the GEMs maps for procedures from ICD-9 to ICD-10, multiple examples are provided, although these are not specific to neurointerventional radiology or interventional pain management.⁶

- ▶ There are 255 instances where a single ICD-9 code can map to more than 50 ICD-10 codes.
- ▶ There are 119 instances where a single ICD-9 code can map to more than 100 ICD-10 codes.

Some GEMs maps of ICD-9 to ICD-10 are not specific:

- ▶ There are 7239 instances in the mappings for diseases where a single ICD-10 code can map to more than one ICD-9 code.
 - ▶ There are 7241 instances in the mappings for procedures where a single ICD-10 code can map to more than one ICD-9 code.
- In the reimbursement maps from ICD-10 to ICD-9:

- ▶ There are 3684 instances in the mappings for diseases where a single ICD-10 code can map to more than one ICD-9 code.
- ▶ There are 2135 instances in the mappings for procedures where a single ICD-10 code can map to more than one ICD-9 code.

Furthermore, different rules exist for different purposes. While CMS has tried to create clarity with GEMs and reimbursement mappings, the results are extremely disappointing. It has been shown that GEMs ICD-10 to ICD-9 mappings have a 5.1% exact match for diseases and only 0.1% exact match for procedures. In contrast, GEMs ICD-9 to ICD-10 mappings have an approximately 20.1% exact match for diseases and 1.2% exact match for procedures. With so few exact matches, it may be impossible for struggling practices to continue.

The troubles do not seem to stop with the different rules and different purposes and multitude of codes. They are also related to adopting software with multiple crosswalk variations. Independent package software vendors will have different offerings and divergent approaches to cross walking. Some may support sophisticated rules and others will not.³⁰ Either way, if medical systems, claims systems and financial systems have different tools, things will become extremely difficult, causing hardship. On some occasions, it appears the data may have to be entered

into multiple programs. Wollman³⁰ describes that any business rules for mappings would need to be entered and stored in at least five systems, plus any analytic systems that source data from the applications. Thus with cross walking systems the potential for errors and rework is astronomical, due to the over 250 GEMs mappings, approximately 150 000 reimbursement mappings and over 160 000 ICD-9/ICD-10 codes used to manage a total of approximately 600 000 records and potentially tens of thousands of overrides in addition to the GEMs and reimbursement maps. Most prudent practices and providers require at least 3 years of historical data for trending and analysis purposes.

On September 30 2013, all of this history will be encoded in ICD-9 nomenclature. On the following day and going forward, the 'new history' will start to be encoded in ICD-10. Consequently, any type of trending will either require a migration of all of the history to ICD-10 or some mechanism for stepping up ICD-9 codes to ICD-10 or stepping back ICD-10 codes to ICD-9 for analysis. However, it may be necessary to use both. Considering other major issues, this may be a minor problem.

PREPARING FOR THE INEVITABLE

Appropriate preparation about switching to ICD-10 is of paramount importance. Some of the most important concerns are as follows:

1. Whether organizations will be able to undertake the huge array of changes to make the conversion possible.
2. Whether organizations can do so in time to meet the government imposed deadline of 1 October 2013 for the transition.
3. Where does the money come from and is US healthcare ready for more expenses.

Timing is crucial to manage practices in the USA. Most provider systems, health plans and software vendors, despite reporting that they are on schedule in their conversions to ICD-10 and the new electronic transaction format, it is evident that some have not even started their preparations. As an example, the American Hospital Association survey in October 2010 found that only one-half to two-thirds of hospitals had taken the recommended planning and assessment steps.¹⁹ Not

Table 3 One ICD-10 code with multiple ICD-9 codes

ICD-10	ICD-9	Description
I6359 Cerebral infarction due to unspecified occlusion or stenosis of other cerebral artery	433.31	Multiple and bilateral pre-cerebral artery occlusion/stenosis with cerebral infarct
	433.81	Other specified pre-cerebral artery occlusion/stenosis with cerebral infarct
	434.91	Cerebral artery occlusion, unspecified with cerebral infarction
I6601 Occlusion and stenosis of right middle cerebral artery	434.00	Cerebral thrombosis w/o cerebral infarction
	434.10	Cerebral embolism w/o cerebral infarction
	434.90	Cerebral artery occlusion, unspecified w/o cerebral infarction
I6602 Occlusion and stenosis of left middle cerebral artery	434.00	Cerebral thrombosis w/o cerebral infarction
	434.10	Cerebral embolism w/o cerebral infarction
	434.90	Cerebral artery occlusion, unspecified w/o cerebral infarction
I6603 Occlusion and stenosis of bilateral middle cerebral arteries	434.00	Cerebral thrombosis w/o cerebral infarction
	434.10	Cerebral embolism w/o cerebral infarction
	434.90	Cerebral artery occlusion, unspecified w/o cerebral infarction
I6609 Occlusion and stenosis of unspecified middle cerebral artery	434.00	Cerebral thrombosis w/o cerebral infarction
	434.10	Cerebral embolism w/o cerebral infarction
	434.90	Cerebral artery occlusion, unspecified w/o cerebral infarction
I6611 Occlusion and stenosis of right anterior cerebral artery	434.00	Cerebral thrombosis w/o cerebral infarction
	434.10	Cerebral embolism w/o cerebral infarction
	434.90	Cerebral artery occlusion, unspecified w/o cerebral infarction
I6612 Occlusion and stenosis of left anterior cerebral artery	434.00	Cerebral thrombosis w/o cerebral infarction
	434.10	Cerebral embolism w/o cerebral infarction
	434.90	Cerebral artery occlusion, unspecified w/o cerebral infarction
I6613 Occlusion and stenosis of bilateral anterior cerebral arteries	434.00	Cerebral thrombosis w/o cerebral infarction
	434.10	Cerebral embolism w/o cerebral infarction
	434.90	Cerebral artery occlusion, unspecified w/o cerebral infarction
I6619 Occlusion and stenosis of unspecified anterior cerebral artery	434.00	Cerebral thrombosis w/o cerebral infarction
	434.10	Cerebral embolism w/o cerebral infarction
	434.90	Cerebral artery occlusion, unspecified w/o cerebral infarction
I6621 Occlusion and stenosis of right posterior cerebral artery	434.00	Cerebral thrombosis w/o cerebral infarction
	434.10	Cerebral embolism w/o cerebral infarction
	434.90	Cerebral artery occlusion, unspecified w/o cerebral infarction
I6622 Occlusion and stenosis of left posterior cerebral artery	434.00	Cerebral thrombosis w/o cerebral infarction
	434.10	Cerebral embolism w/o cerebral infarction
	434.90	Cerebral artery occlusion, unspecified w/o cerebral infarction
I6623 Occlusion and stenosis of bilateral posterior cerebral arteries	434.00	Cerebral thrombosis w/o cerebral infarction
	434.10	Cerebral embolism w/o cerebral infarction
	434.90	Cerebral artery occlusion, unspecified w/o cerebral infarction
I6629 Occlusion and stenosis of unspecified posterior cerebral artery	434.00	Cerebral thrombosis w/o cerebral infarction
	434.10	Cerebral embolism w/o cerebral infarction
	434.90	Cerebral artery occlusion, unspecified w/o cerebral infarction
I663 Occlusion and stenosis of cerebellar arteries	434.00	Cerebral thrombosis w/o cerebral infarction
	434.10	Cerebral embolism w/o cerebral infarction
	434.90	Cerebral artery occlusion, unspecified w/o cerebral infarction
I669 Occlusion and stenosis of unspecified cerebral artery	434.10	Cerebral embolism w/o cerebral infarction
	434.90	Cerebral artery occlusion, unspecified w/o cerebral infarction

surprisingly, many providers are not even aware of ICD-10 changes, let alone the implementation date. Very few physicians have completed the impact survey. This is a major issue for smaller practices.

CONCLUSION

There are numerous issues related to ICD-10. None of the issues has been addressed appropriately as part of healthcare reform. Thus far, there is no scientific evidence for ICD-10

implementation based on the principles of evidence based medicine, as dictated by US authorities and world authorities. The US healthcare system has been overwhelmed with numerous regulations, many of which are not particularly well understood. ICD-10 will be a new blow to the healthcare system at a time when the Independent Payment Advisory Board (IPAB), Patient-Centered Outcomes Research Institute (PCORI) and other initiatives related to evidence based medicine, quality and access are struggling to come out.

The authors favor postponing implementation of ICD-10 and prefer a focus on core issues of improving care and access.

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“The implementation of ICD-10 will create significant burdens on the practice of medicine with no direct benefit to individual patients’ care,” said AMA President Peter W. Carmel. “At a time when we are working to get the best value possible for our healthcare dollar, this massive and expensive undertaking will add administrative expense and create unnecessary workflow disruptions. The timing could not be worse, as many physicians are working to implement electronic health records into their practices. We will continue working to help physicians keep their focus where it should be—on their patients.” We are penning this brief letter to the editor because we see this AMA position as a relevant postscript to the paper.

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LETTERS TO THE EDITOR

Response to ready or not! Here comes ICD-10

In October 2011 *JNIS* published our article on the implementation of the ICD-10 codes.¹ The final line of the paper was “The authors favor postponing implementation of ICD-10 and prefer a focus on core issues of improving care and access.”

The Centers for Medicare and Medicaid Services will require all health professionals and facilities to transition to ICD-10 by October 2013. ICD-10 is viewed as being more nuanced and providing a greater level of detail for what had led to an injury or illness. ICD-9 has 14 000 codes. As outlined in the article, implementing ICD-10 nationally will require tremendous allocation of resources. The upcoming change would require practices to learn 69 000 new codes for billing purposes. The American Medical Association (AMA) apparently agrees. During the 65th House of Delegates Interim Meeting of the AMA on 15 November 2011,² delegates adopted a policy to work to stop implementation of the new diagnosis coding set ICD-10. Alabama and Mississippi delegations, the American Association of Clinical Urologists and the American Urological Association introduced the resolution to stop ICD-10 implementation.

Supplement 1. Illustration of examples of multiple ICD-10 codes for a single ICD-9 code.

ICD-9	Description	ICD10	Description
430	Subarachnoid hemorrhage	I6000	Nontraumatic subarachnoid hemorrhage from unspecified carotid siphon and bifurcation
		I6001	Nontraumatic subarachnoid hemorrhage from right carotid siphon and bifurcation
		I6002	Nontraumatic subarachnoid hemorrhage from left carotid siphon and bifurcation
		I6010	Nontraumatic subarachnoid hemorrhage from unspecified middle cerebral artery
		I6011	Nontraumatic subarachnoid hemorrhage from right middle cerebral artery
		I6012	Nontraumatic subarachnoid hemorrhage from left middle cerebral artery
		I6020	Nontraumatic subarachnoid hemorrhage from unspecified anterior communicating artery
		I6021	Nontraumatic subarachnoid hemorrhage from right anterior communicating artery
		I6022	Nontraumatic subarachnoid hemorrhage from left anterior communicating artery
		I6030	Nontraumatic subarachnoid hemorrhage from unspecified posterior communicating artery
		I6031	Nontraumatic subarachnoid hemorrhage from right posterior communicating artery
		I6032	Nontraumatic subarachnoid hemorrhage from left posterior communicating artery
		I604	Nontraumatic subarachnoid hemorrhage from basilar artery
		I6050	Nontraumatic subarachnoid hemorrhage from unspecified vertebral artery
I6051	Nontraumatic subarachnoid hemorrhage from right vertebral artery		
I6052	Nontraumatic subarachnoid hemorrhage from left vertebral artery		
I606	Nontraumatic subarachnoid hemorrhage from other intracranial arteries		
I607	Nontraumatic subarachnoid hemorrhage from unspecified intracranial artery		
I608	Other nontraumatic subarachnoid hemorrhage		
I609	Nontraumatic subarachnoid hemorrhage, unspecified		
431	Intracerebral Hemorrhage	I610	Nontraumatic intracerebral hemorrhage in hemisphere, subcortical
		I611	Nontraumatic intracerebral hemorrhage in hemisphere, cortical
		I612	Nontraumatic intracerebral hemorrhage in hemisphere, unspecified
		I613	Nontraumatic intracerebral hemorrhage in brain stem
		I614	Nontraumatic intracerebral hemorrhage in cerebellum

ICD-9	Description	ICD10	Description
		I615	Nontraumatic intracerebral hemorrhage, intraventricular
		I616	Nontraumatic intracerebral hemorrhage, multiple localized
		I618	Other nontraumatic intracerebral hemorrhage
		I619	Nontraumatic intracerebral hemorrhage, unspecified
433.01	Basilar artery occlusion/stenosis with infarction	I6302	Cerebral infarction due to thrombosis of basilar artery
		I6312	Cerebral infarction due to embolism of basilar artery
		I6322	Cerebral infarction due to unspecified occlusion or stenosis of basilar arteries
433.10	Carotid artery occlusion/stenosis w/o cerebral infarction	I6521	Occlusion and stenosis of right carotid artery
		I6522	Occlusion and stenosis of left carotid artery
		I6523	Occlusion and stenosis of bilateral carotid arteries
		I6529	Occlusion and stenosis of unspecified carotid artery
433.11	Carotid artery occlusion/stenosis with cerebral infarction	I63031	Cerebral infarction due to thrombosis of right carotid artery
		I63032	Cerebral infarction due to thrombosis of left carotid artery
		I63039	Cerebral infarction due to thrombosis of unspecified carotid artery
		I63131	Cerebral infarction due to embolism of right carotid artery
		I63132	Cerebral infarction due to embolism of left carotid artery
		I63139	Cerebral infarction due to embolism of unspecified carotid artery
		I63231	Cerebral infarction due to unspecified occlusion or stenosis of right carotid arteries
		I63232	Cerebral infarction due to unspecified occlusion or stenosis of left carotid arteries
		I63239	Cerebral infarction due to unspecified occlusion or stenosis of unspecified carotid arteries
433.21	Vertebral artery occlusion/stenosis with cerebral infarction	I63011	Cerebral infarction due to thrombosis of right vertebral artery
		I63012	Cerebral infarction due to thrombosis of left vertebral artery
		I63019	Cerebral infarction due to thrombosis of unspecified vertebral artery
		I63111	Cerebral infarction due to embolism of right vertebral artery
		I63112	Cerebral infarction due to embolism of left vertebral artery
		I63119	Cerebral infarction due to embolism of unspecified vertebral artery
		I63211	Cerebral infarction due to unspecified occlusion or stenosis of right vertebral arteries
		I63212	Cerebral infarction due to unspecified occlusion or stenosis of left vertebral arteries

ICD-9	Description	ICD10	Description
		I63219	Cerebral infarction due to unspecified occlusion or stenosis of unspecified vertebral arteries
434.00	Cerebral thrombosis w/o cerebral infarction	I6601	Occlusion and stenosis of right middle cerebral artery
		I6602	Occlusion and stenosis of left middle cerebral artery
		I6603	Occlusion and stenosis of bilateral middle cerebral arteries
		I6609	Occlusion and stenosis of unspecified middle cerebral artery
		I6611	Occlusion and stenosis of right anterior cerebral artery
		I6612	Occlusion and stenosis of left anterior cerebral artery
		I6613	Occlusion and stenosis of bilateral anterior cerebral arteries
		I6619	Occlusion and stenosis of unspecified anterior cerebral artery
		I6621	Occlusion and stenosis of right posterior cerebral artery
		I6622	Occlusion and stenosis of left posterior cerebral artery
		I6623	Occlusion and stenosis of bilateral posterior cerebral arteries
		I6629	Occlusion and stenosis of unspecified posterior cerebral artery
		I663	Occlusion and stenosis of cerebellar arteries
434.01	Cerebral thrombosis with cerebral infarction	I6330	Cerebral infarction due to thrombosis of unspecified cerebral artery
		I63311	Cerebral infarction due to thrombosis of right middle cerebral artery
		I63312	Cerebral infarction due to thrombosis of left middle cerebral artery
		I63319	Cerebral infarction due to thrombosis of unspecified middle cerebral artery
		I63321	Cerebral infarction due to thrombosis of right anterior cerebral artery
		I63322	Cerebral infarction due to thrombosis of left anterior cerebral artery
		I63329	Cerebral infarction due to thrombosis of unspecified anterior cerebral artery
		I63331	Cerebral infarction due to thrombosis of right posterior cerebral artery
		I63332	Cerebral infarction due to thrombosis of left posterior cerebral artery
		I63339	Cerebral infarction due to thrombosis of unspecified posterior cerebral artery
		I63341	Cerebral infarction due to thrombosis of right cerebellar artery
		I63342	Cerebral infarction due to thrombosis of left cerebellar artery
		I63349	Cerebral infarction due to thrombosis of unspecified cerebellar artery
		I6339	Cerebral infarction due to thrombosis of other cerebral artery

ICD-9	Description	ICD10	Description
		I636	Cerebral infarction due to cerebral venous thrombosis, nonpyogenic