Preparing for ICD-10:

Automate coding to off-set
potential Productivity and Revenue Losses
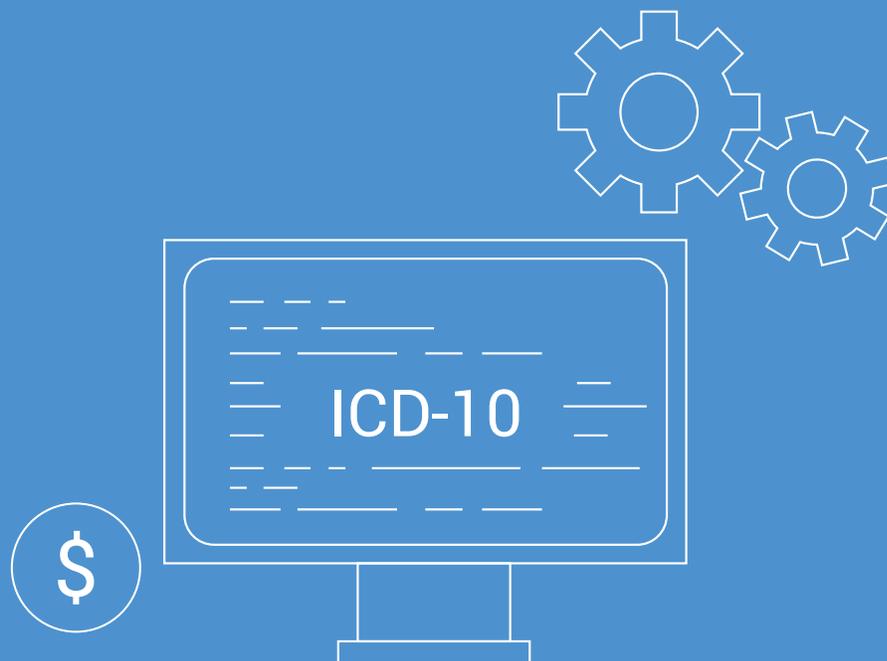
ICD-10

Table of Contents

Executive Summary

On October 1, 2015, the ICD-9 code sets used to report medical diagnoses and inpatient procedures will be replaced by ICD-10 code sets.

The Centers for Medicare and Medicaid Services (CMS) estimate that the total cost associated with the ICD-10 conversion may reach $640 million in 2013 alone. Hospitals with less than 100 beds are expected to pay between $100,000 and $250,000 or between $1.5 million and $5 million for hospitals with more than 400 beds. Issues with improper and returned claims may account for an estimated $329 million in productivity losses in 2015, as organizations may be hindered by the learning curve associated with a more comprehensive coding system.

Data from Canada, who converted to ICD-10 between 2001 and 2003, indicate that coder productivity declined as much as 30 to 50%. ICD-10 would effect change on three major parameters: Physicians and their documentation; payor and their claims processing; and medical coders.

The solution to the challenge lies in harnessing advanced technology to automate as much of the process as possible. What seems at the outset to be a daunting and catastrophic event, instead has the potential to be a technological revolution for the HIM domain.

Advanced Natural Language Processing (NLP) and Semantic Technology has proven to be capable of automating mundane tasks of data aggregation, abstractions, code assigning and much more. Understanding this, ezDI has developed an integrated solution featuring an encoder, computer-assisted-coding, a clinical document improvement module, compliance audit tools and analytics that can simplify medical coding, increase productivity, reduce denials, and improve revenue cycle management. It helps you off-set productivity and revenue losses during ICD-10 transition.

ICD-9 to ICD-10 transition

ICD-10-CM is a clinical modification of the World Health Organization's ICD-10 which consists of a diagnostics classification system. ICD-10-CM includes the level of detail needed for morbidity classification and diagnostics specificity in the United States.

ICD-10-PCS was developed to capture procedure codes. This procedure coding system is much more detailed and specific than the short volume of procedure code included in ICD-9-CM. The system consists of 87,000 procedure codes.

On October 1, 2015, the ICD-9 code sets used to report medical diagnoses and inpatient procedures will be replaced by ICD-10 code sets. The transition to ICD-10 is required for everyone covered by the Health Insurance Portability Accountability Act (HIPAA) [1].

The transition to ICD-10-CM/PCS will allow for precise diagnosis and procedure codes, resulting in the improved capture of healthcare information and more accurate reimbursement [2].

Benefits of ICD-10-CM/PCS include:

- Greater coding accuracy and specificity
- Improved ability to measure health-care services, quality and safety data
- Expanded ability to conduct public health surveillance
- Improved efficiency and lower costs
- Increased use of administrative data to evaluate outcomes

The Challenge: ICD-10 Implementation

*Productivity losses are expected to range from **30% to 50%** as already evidenced in Canada. It will lead to an increase in coding backlog and Accounts Receivable (AR) days [3].*

ICD-10 implementation will radically change the way coding is currently done and will require a significant effort to implement. It will bring several challenges to hospitals, physician practices, health plans, and in many others areas.

The larger number of codes will have far-reaching implications. Coders who have years of experience with ICD-9 will lose productivity in transitioning to the new codes. It could take twice as long to code and finalize billing of an inpatient record using ICD-10-CM/PCS as compared to ICD-9-CM. As a result, it can create coding backlogs and an increased in "Discharged Not Final Billed (DNFB)" cases that will have a significant impact on operating cost and cash flow.

__The ICD-10__ code sets are not simply increased and renumbered ICD-9 code sets. The ICD-10 code sets include greater detail, changes in terminology, and expanded concepts for injuries, laterality, and other related factors [4].

Key challenges with implementation of ICD-10:

Physician and their documentation

- **More detailed clinical documentation** required to support higher level of specificity in ICD-10 codes
- **An increase in number of CDI or coder queries** due to lack of specificity or missing information in the patient encounter documentation

Coding and HIM

- **Loss of productivity:** An increase in the volume of codes available for assignment; more complex alpha-numeric codes
- **Learning curve:** An increase in the specificity, required knowledge of human body, anatomy and physiology
- **Complete redesign of procedure codes with ICD-10 PCS:** Seven-digit alphanumeric codes selected from complex tables, based on the type of procedure performed, approach, body part, and other characteristics
- **Change in coding guidelines:** Frequent ICD-10 code updates requiring HIM personnel to continuously track and adjust to new updates

Revenue Cycle and Cash Flow Impact

- **Productivity declines** resulting in coding backlogs and an increased DNFB
- **Potential claim denials** due to coding errors, provider errors or payor errors
- **Potential cash flow impact** due to time it takes for rework and re-submission of cases

The transition to ICD-10 is complex and time-consuming. It will touch nearly every healthcare operation and IT processes, and will significantly influence data and financial reporting strategies.
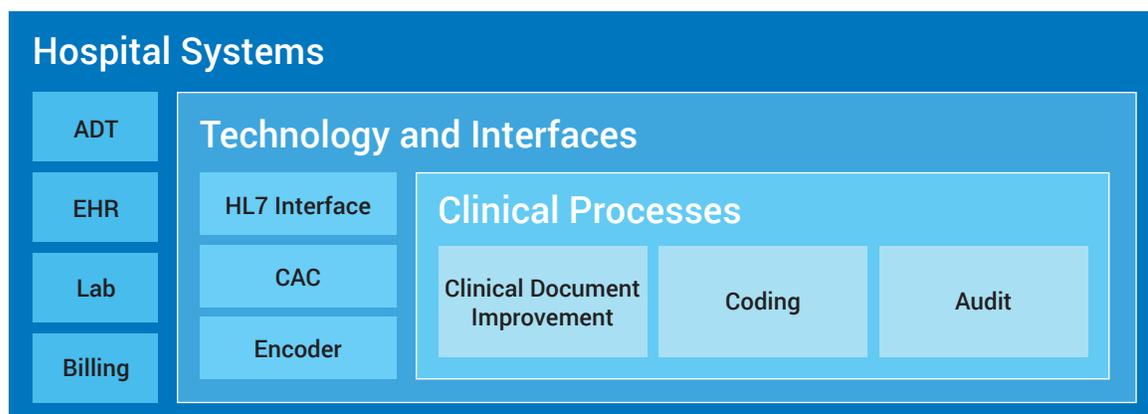
The Solution:
Integrated Computer-Assisted Coding

The challenges Health Information Management (HIM) Departments and coders face can be daunting. There is pressure to drive efficiency within healthcare administrative processes, address documentation issues and backlogs, regulatory changes, the pressure to reduce DNFBs, and with the shortage of highly trained HIM professionals and the coming adoption of ICD-10, the picture gets even more complicated.

An Integrated approach

An approach that is user--centric, process--centric and combines all aspects such as Clinical Document Improvement (CDI), Coding for ICD-9, ICD-10 and CPT, Quality and Compliance Audit, and an Encoder, all necessary to tackle challenges with ICD-10 Implementation.

Integrated Solution

Hospital Systems

ADT		
EHR	**Technology and Interfaces**	
	HL7 Interface	**Clinical Processes**
Lab	CAC	Clinical Document Improvement / Coding / Audit
Billing	Encoder	

What is Computer-Assisted Coding (CAC)?

> *The Computer-Assisted Coding is "The use of computer software that automatically generates a set of medical codes for review/validation and/or use based upon clinical documentation provided by healthcare practitioners."[5]*

Clinical Document Improvement (CDI)

An integrated system takes your clinical documentation improvement program to the next level by allowing CDI staff and Coders to work together. Computerassisted coding software analyzes, abstracts and interprets text from multiple documentation sources created during a patient's hospital stay to identify conflicting, incomplete, or nonspecific provider documentation. It enables CDI staff and Coders to share patient data, physician queries, and the suite of solutions that provides the necessary framework to prepare providers for ICD-10 compliant documentation and improve productivity across the board.

Coding and Billing

The CAC system collects data from disparate source systems and gives the hospital coder a combined view of natural language processing text and scanned handwritten documents. It reads electronically generated documentation, understands the meaning of documented terminology, and accurately assigns ICD-9-CM and procedure, ICD-10-CM and PCS, and CPT/HCPCS codes. It applies all the necessary coding guidelines and presents the codes to the coding professional for review.

The coding professional then reviews and verifies the suggested codes. Upon verification, the codes are released into the billing system. By eliminating mundane manual tasks, it significantly increases productivity, improves accuracy, and reduces denials.

Quality and Compliance Audit

CAC links every assigned code to documentation resulting in an improved audit trail indicating where the medical record text is located to support the use of a specific code. This can assist providers and institutions dramatically in defending their coded data and reimbursement. It is an excellent solution for internal audit processes, ongoing monitoring of the recovery audit contractor (RAC) program and other CMS and payer audits.

Encoder and CAC

Rather than just interfacing a CAC engine and an encoder where two products communicate under limited capacity, a better approach is to embed encoder components within the CAC tool. This level of compatibility allows more productivity as the coding professional is not required to toggle between two systems to complete work. In this kind of CAC workflow, there is no need for a standalone encoder. Coders work directly from the CAC tool and utilize an integrated encoder application strictly as a "validation tool" to ensure accuracy of the codes assigned by the CAC tool.

> *Overall, CAC is not only supposed to "assist" a coder to find a particular code as an encoder would, but it should also read all documentation from a patient's chart, whether it's an outpatient or inpatient, and then present a coder with a set of suggested codes. These codes can be suggested from CAC because it uses state-of-the-art technologies such as Natural Language Processing (NLP) and Semantics [5].*

Computer-Assisted Coding Technologies

Natural Language Processing

NLP uses artificial intelligence to extract pertinent data such as diagnoses and/or procedures and terms from a text-based document and then converts them into a set of medical codes. NLP is also known as "computational linguistics," in which the study of linguistics, semantics, and computer science is used to abstract information from free text.

For example, a natural language processor would determine if the phrase "history of cancer" means the patient does or does not have a personal or family history of cancer by analyzing the context and semantics of the rest of the sentence and the document. With this method of CAC, physicians can document health record information using their preferred terms.

Two qualities of effective NLP:

I. The ability to understand the semantics of the written word and not just patterns of words
II. The ability to identify situations where the system is incapable of detecting things correctly

The first capability is attributed to the use of supporting "ontologies," that are graphical representations of knowledge, such as diseases, human anatomical structures, medications, toxins, procedures, etc. An ontology enhances the NLP system's effectiveness by categorizing and mutually relating concepts present in a medical document [6].

For example, the code 83.88 stands for "Other Plastic Operations of the tendon". Clinical documentation would never have the term Other Plastic Operations. However, an ontology can establish that Myotenoplasty, Tendon fixation, Tenoplasty, Tenodesis, and DuVries operation, all fall under this category and can lead to the code 83.88.

The second capability means that the NLP system has a method to determine its limits and confidence with respect to detecting a concept and suggesting a code. Similar to a human reading a document and being able to understand or not understand the meaning, an NLP system can point out words or phrases it is not confident about. This information can be used with a variety of statistical models and supervised and semi-supervised learning mechanisms to continuously improve the accuracy of detection.

CAC Integration with EMR/ EHR and Billing Systems

Integration with a health information management system throughout the hospital is necessary to take full advantage of CAC technology. It is primarily done through typical clinical data standards such as HL7 and CDA. The complete integration for data collection including dictation-transcribed reports, ADT, Lab and Radiology reports, and scanned handwritten notes enables efficient workflow that results into better productivity since the coding professional is not required to toggle between multiple screens.

High-Level illustration of typical CAC interfaces
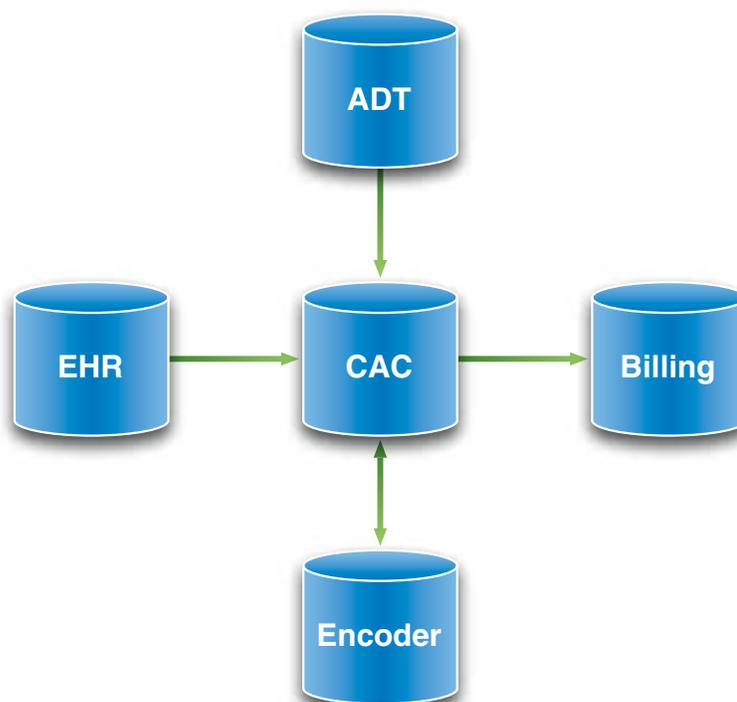
The Benefits of using integrated CAC system

Improved Productivity and Efficiency

American Health Information Management Association (AHIMA) has published several studies on "Computer-Assisted Coding impact on Productivity." The studies clearly indicate how CAC is able to free up coders from mundane duties and allow them to focus on more challenging functions while improving productivity.

The typical productivity gain is 20%-30% with a significant drop in overtime and external audit fees, and increase in Medicare Case Mix Index. It also addresses concerns of "shortage of coding professionals and coder learning curve with ICD-10 transition."

Key reasons for significant productivity gain:

I.   Integrated workflow processes that collect data from disparate source systems and suggest the code for review and verification eliminating the manual task of document sorting and retrieval, abstraction, code lookup and selection, or data entry
II. Streamline workflow and processes for Clinical Document Improvement, Supervisors and Coders; CDI staff and Coders collaborate and share patient data, physician queries and suite of solutions that enable greater transparency
III. End-to-End CDI and coding workflows that include auto case assignment, work queues management, user management, analytics and reports

Improved Quality, Accuracy and Consistency

Accuracy is achieved by recommending accurate ICD-9, ICD-10, CPT and HCPCS codes. The coding output is matched with official guidelines and payor reporting requirements and presented to the coder for verification. CAC provides timely, accurate and consistent coding by ensuring the guidelines are applied consistently over time and across multiple coding resources.

It provides great tools to measure accuracy, to include software output, coder output, and also identification of documentation gaps. The system also learns based on coding professional input, and other acquired knowledge such as CMS. As a result, it can reduce denials and compliance risk. The positive impact is often realized shortly after implementation go-live and it continues to improve as coders become more comfortable using it.

Decreased DNFB and Improved Reimbursement

By workflow automation, accurate and consistent code assignment, CAC systems significantly reduce the coding backlog. It simplifies medical coding, increases productivity, reduces denials, decreases discharged but not final billed, and improves revenue cycle management.

Improved Transparency and Compliance

CAC provides links among the code assigned and the patient encounter, required evidence for a suggested code, an audit trail of all codes assigned and changes made for the final submission. With an integrated solution for QA and an internal audit, the reviews can be conducted prior to billing or after the billing has occurred and payment has been received. You can easily identify coding problems that may translate into reimbursement not received or potential liability for compliance problems. These benefits significantly reduce the preparation work for audits.

Conclusion

I.   CAC technology is an essential tool to meet with current and future coding needs.
II.   Complete integration of CAC technology with the health information management systems and clinical processes leads to better productivity and efficient workflow management.
III. Enhances communication and collaboration between CDI Specialists, Coding Professionals, clinicians and Audit professionals.
IV. Key benefits of using an integrated CAC solutions are;

- Improved Productivity and Efficiency
- Improved Quality, Accuracy and Consistency
- Decreased DNFB and Improved Reimbursement
- Improved Transparency and Compliance

As the ICD-10 deadline approaches, integrating CAC solutions with CDI, Coding, Quality and Compliance Audit, and Encoder can help you offset potential productivity and revenue loss. It streamlines the workflow, trains your staff with dual coding in ICD-9 and ICD-10, and helps you transition seamlessly to ICD-10.

About ezDI, Inc.

ezDI, Inc. was founded with a mission to build technologies to improve patient care and reduce overall healthcare cost. We believe the key is to abstract only meaningful and actionable clinical data from an ever-increasingly unstructured healthcare dataset, and to make it easily accessible and useful by healthcare professionals.

This means developing the technology that can convert "Unstructured Data" into Structured Data, normalize it and map it with various computer-processable nomenclature such as SNOMED-CT, RxNorm, ICD-9, ICD-10, CPT, LOINC, and much more.

ezCAC is a product of ezDI, Inc. ezCAC is an accomplishment of close collaborations amongst an engineering team, a design team, an encoder partner, and members of the coding and HIM community.

ezCAC. Computer-Assisted Coding.

Key Benefits:

1. All-in-one fully integrated product featuring encoder, computer-assistedcoding, clinical document improvement, compliance audit and analytics
2. Solution to off-set potential productivity and revenue losses with ICD-10 transition
3. Seamless integration with health care systems; automates mundane tasks of data collection, abstraction, code assigning and much more
4. Simple, easy-to-use features and rock solid stability; designed to improve coder productivity, compliance, and overall outcome
5. HIPAA compliant cloud based solution; easy-to-deploy and scale

ezCDI. Empower CDI Specialists.

Key Benefits:

1. Provides you the necessary framework to prepare your physicians for ICD-10 compliance
2. Maximizes the efficiency and productivity by concurrent CDI processes
3. Allows auto-allocation, prioritizing, and selecting cases based on target DRGs, payor and other pre-defined parameters;
4. Easily integrates your CDI query templates and creates custom templates
5. Auto-suggests potential physician query opportunities
6. Quantifies data to measure CDI impact for queries, Case Mix Index and revenue, DNFB and multiple other parameters

ezCoding. Code with Compliance.

Key Benefits:

1. Simplify medical coding process, increase productivity and coding consistency, reduce denials, improve revenue cycle management and increase case mix index
2. Accelerate the coding process by automatically suggesting accurate ICD-9, ICD-10, and CPT/ HCPCS code sets
3. Speed up and improve documentation review by linking suggested codes with a specific documentation
4. Streamlines the coding workflow for in-house and remote coders,
5. With dual coding in ICD-9 and ICD-10, transition seamlessly to ICD-10
6. Realize a 20% to 30% typical productivity gain that improves with the effective use of ezCAC

CODER CURRENT WORKFLOW USING HOSPITAL SYSTEMS WITH ENCODER	CODER WORKFLOW USING EZCAC AND INTEGRATED ENCODER
1. Select cases for coding	1. Select cases for coding
2. Review transcribed documents, begin reading history and physical documents from transcription system/EHR	2. Review all documentation required for coding with ezCAC suggested codes
3. Start reviewing scanned documents/ handwriren notes of Progress Notes from scanned image system	3. Use encoder for code lookups and DRG optimization
4. Check lab work - from Pathology, Radiology systems	4. Review code edits, RAC alerts, coding guidelines, code sequencing, and DRGs and validate all coding results
5. Again review Progress Notes	5. Submit to QA or Audit or Billing system
6. Go to document management system to read operative notes	
7. Repeat process until all documentation required for coding has been reviewed	
8. Go to encoder and enter codes	
9. Data entry: encoded data into billing system	
10. "Finalize Bill" in the billing system	

ezAudit. Perform comprehensive audit.

Key Benefits:

1. Reduce compliance risk with an audit trail of all codes assigned with the reasons a particular code was added, deleted or modified
2. Reduce denials and decrease AR days by easily identifying coding problems that may translate into reimbursement not received or potential liability for compliance problems
3. Conduct an internal and external audits with end-to-end workflow
4. Quantify data and improve coding process by comparing coder and auditor versions for coding errors, POA errors, CC/MCC errors, and compliance errors
5. Utilize an extensive analytical audit dashboard and reporting module for audit findings, detailed reporting for coder education, physician documentation findings and trending of audit findings

Encoder and grouper components

Encoder and Grouper

ICD-10 CM/PCS & ICD-9-CM code search	CPT ®/ HCPCS Code Search
MS-DRG/ APC Groupers & Pricers	Medicare and Outpatient Code Editor
Proprietary Relational Code & Modifier Edits	Comprehensive Coding Advice
DRG Validation Assistance	Targeted RAC DRGs Alerts

Clinical Coding References

AHA Coding Clinics for ICD-9-CM & HCPCS	AHA Coding Clinic for ICD-10-CM & PCS Briefing Series
AHA ICD-10-CM & ICD-10-PCS Coding Handbook	AMA CPT Assistant®
ICD-10-CM/PCS & ICD-9-CM Official Coding Guidelines	Channel Publishing Expanded Table of Drugs & Chemicals
Thomson MICROMEDEX® Drug Reference	Coders' Desk Reference
MedLearn Interventional Radiology Coder	Dorland's Medical Dictionary

Optional Components

- Medical Necessity LCD/ NCD Edits
- Specialty Groupers (e.g. AP-DRG, Psych, LTAC, APR-DRG, EAPGs, TriCare etc.)

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References

[1] AMA | Benefits and Opportunities with ICD-10 CM and PCS
[2] Center for Medicare and Medicaid services (CMS)
[3] AHIMA | Kerry Johnson, CCHRA (C) | Implementation of ICD-10
[4] AMA | Fact Sheet "Preparing for ICD-10 Code Set"
[5] AHIMA | Delving into computer-assisted coding
[6] ezDI and Kno.e.sis | Why NLP engines fall short