

Meeting today's coding challenges with computer assisted coding as a focal point for positive change in Health Information Management Stuart Covit¹, M. Elliott Familant, PhD¹, Cecilia Hilerio, RHIA², Joshua Bershad, MD^{2,3}, Andrew B. Covit, MD^{1,2,3}, Artificial Medical Intelligence, Inc, Eatontown, New Jersey¹, Robert Wood Johnson University Hospital², UMDNJ-Robert Wood Johnson Medical School³, New Brunswick, New Jersey.

Introduction

The United States healthcare system is being challenged with increasing regulatory pressures, accelerating bio-medical and clinical technological advances, and tighter more restrictive reimbursement from the financial side. This leads to the shrinking of funds available for new hospital infrastructure. It often results in healthcare information technology priorities and attention being limited to the "anchor system" within the hospital, the clinical information system (CIS). Millions of dollars are committed to revising an aged legacy CIS often decades beyond its end of life cycle. The assumption is that a new homogeneous CIS environment with electronic record capability will be the enviable byproduct of any upgrade initiative. Unfortunately, this is seldom the case as these systems have not yet been able to encompass the entire healthcare clinical-revenue cycle and institutions remain loyal to various established localized systems such as for the laboratory or Radiology.

Since most clinical information systems parallel order entry systems in the business vertical, health information management (HIM) departments consequently have been saddled with the burden of an afterthought mentality within hospital systems. No CIS to date has addressed the Computer Assisted Coding (CAC) opportunity despite the fact that coding and its interrelationship with the healthcare billing process is the epicenter of hospital profitability.

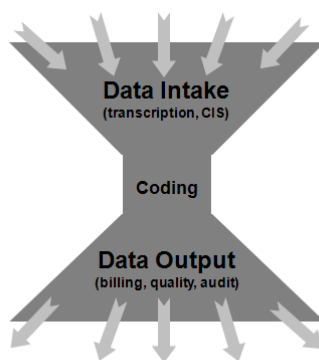


Figure 1

(Figure 1)

Currently, despite the primacy of medical coding to the hospital revenue cycle and with CAC maturing and refining according to Moore's Law mathematical rates (1), these systems are certainly not viewed as a priority for new systems purchase (2,3). The concept that accurately coding a patient's chart directly affects the hospital bottom line is not a new concept (3,4,5,6,7). However, due to the relative newness of CAC, good ROI studies that can be generalized, justified and expanded are rare and incomplete (8,9). Despite the key role medical coding plays in the hospital financial universe, and the inefficient, burdensome manual process that coding presently involves, it seems that CAC solutions of any type nonetheless remain low on the radar screen (2). Yet there is indeed a compelling argument for the

immediate deployment of CAC systems throughout the industry based on the very nature of the present day manual coding process (8,9,10).

The level of acceptance of CAC technology is further hindered by the muddied waters of complexity fomented by a few early CAC developers who have existed in this field for a number of years now. Their methodological approach has been widely trumpeted and reviewed by the existing HIM community as having limitations, due in part to the fact that many of these solutions can only code within specific specialties such as Radiology and or the Emergency Department (8,10). Alternatively, the need to constrain the clinical documentation through use of a template driven system, often viewed by the clinical user as confining and limiting, also slows CAC acceptance (8,10,11). Unfortunately, technological limitations spell disaster when attempting to generate widespread acceptance of the technology until these limitations are alleviated (12,13). One only has to recall the Apple Newton's early failure contrasted to the overwhelming success of Palm and other PDA's as evidence of this phenomenon.

Furthermore, there is a continuing Achilles heel within the medical coding community involving coder accuracy and variability (14,15,16,17). Even before the arrival of CAC systems, there has been no "gold standard" within the coding community (17). However, the appearance of CAC solutions brought into sharp focus the accuracy question. CAC solutions were forced to wear the "inaccuracy" label from coders, when, in reality, coders themselves admit that coding often has no real universal "right answer" (17,18,19). Typically, for any new breakthrough to be accepted there is always the additional challenge of creating a new paradigm. However, with CAC there seems to be an unusual number of obstacles.

- CAC Negative Issues
- Not a hospital information technology priority
 - Minimal data on Return On Investment
 - Perceived complexity of implementation
 - Technological limitations
 - Clinical setting
 - Specialty-Subspecialty specific
 - Accuracy in a world of coder variability
 - Staff replacement

Figure 2

(Figure 2;CAC negatives)

In the case report that follows, we will present a real life situation and use it to illustrate the advantages of a modern CAC technology in improving the coding process and examine some of the obstacles to implementation. We will make the argument that the ROI outweighs the perception of risk in implementing CAC solutions.

Case Study

This case study focuses on increased speed, improved efficiency and the reduction of variability for coding and HIM in general. Our ROI case study was performed at our first site deployment, Robert Wood Johnson University Hospital, a 650 bed high acuity academic medical center located in the central New Jersey region. We presented the business vision that we needed to be able to provide a single HIM view of all coding data and documents from every department for the users to be the most effective with the solution. Creating an electronic coding face sheet actually "tipped" the HIM staff into accepting the solution and incorporating their review of the various medical documents within our solution into their standard operating procedure. Saving significant time in the typical "paper chase" by searching for various documents to code the case correctly set the stage for our ROI study. In order to convince the

skeptics within the facility, we needed to obtain measurable performance success for the hospital and AMI.

To this end, we took very simple outpatient transactions (EKGs, lab tests, chest X-rays, etc.) that were characterized by fast manual processing of these records and minimal to no paper procurement issues despite vastly different information system sources and a large and consistent volume of documents to be coded. Administration originally viewed this type of transaction as being largely unimportant for HIM to apply CAC since the 60 to 90 second baseline transaction time was viewed as being extremely fast and efficient. Under this preconception, the HIM staff initially tried to discourage us from implementing CAC into this category of outpatient records, so there was some reluctance to interfacing to these sources and incorporating these records into the solution, even though the overarching facility goal was to fully integrate the coding solution into all relevant inpatient and outpatient hospital systems. In the end, each system interface took approximately 1 business day to complete and test.

The weekly volume of these transactions averages 2000 records per week. Coders were timed during the baseline manual process and took an average of 80 seconds (range 60 to 90 seconds) to complete a typical record.

In phase 1, processing time was initially reduced from 90 seconds to 10 seconds. EMscribe Dx[®] working with a coder resulted in an 89% time reduction. This equaled 44 hours saved weekly; the HIM department saves the equivalent of one FTE yearly with the use of EMscribe Dx[®]. Additional savings accrued in other HIM areas due to the reduced need for clerical staff supporting these transactions. There were also significant benefits realized from actual decreased time interval to bill, and a decrease in the discharged not finally billed (DNFB) file. Interestingly, this data does not take into account the reduction in the paper chart error correction time required of human coders and reviewers, another considerable source of time efficiency gained in processing these documents.

Though excited with the initial results, the HIM director faced a dilemma created by the introduction of the CAC functionality. The coder assigned to process these cases with EMscribe Dx[®] was now relegated to the pressing of two buttons, “approve” and “submit”, all day long. As expected, this became extremely repetitive and boring as there simply were no machine errors made in the first 3 months of the coder’s assignment. The coder complained to the HIM director about this problem, begged to have this 10 second process bypassed and asked if, in fact, this task could be automated. The AMI staff was eager to comply since this was only a further testimonial for the efficacy of Computer *Automated Coding*. In phase 2, the EMscribe Dx[®] CAC solution provided document processing in 0.5 seconds only requiring an occasional post process audit to ensure that the solution is performing optimally. The hospital now benefits from near zero time processing (i.e. 100% reduction in processing time) with these outpatient records and the subsequent redeployment of this individual for more complex and critical HIM matters was appreciated by both the coder and the HIM director. Increased speed, efficiency, and the reduction of coder variability are irrefutable variables that provide an overwhelmingly strong business case for this CAC solution.

Case Study Data

- 2000 charts per week
- Pre CAC: 60-90 sec. per chart
- Post CAC: 10 sec. per chart
- Time savings (phase 1): 83-89%
- Time savings (phase 2): 99.9%
- Work savings (phase 1): 28 – 44 hours/week
- Work savings (phase 2): 74 hours/week
- Weekly savings (phase 1): 0.5 -1.0 FTE
- Weekly savings (phase 2): 1.8 FTE
- 1 day decreased Time to Bill

Table 1

(table 1; case study)

Discussion

CAC systems have the potential to decrease the inefficiency and variability pervasive in the manual coding process (16,17,18). To date, there remain only a few CAC deployments due to real limitations in some of the older solutions available (8,17). Some of this lack of acceptance appears to stem from the self stated complexity in the methodology creating a negative mindset hindering the implementation of these systems (15). Based on the data presented in this paper, a CAC solution, such as EMscribe Dx[®] can easily serve to improve HIM process flow and document handling efficiency. This new type of CAC system that can process any type of document from any source in any type of format, irrespective of admission status, location or type of service, will likely show an even greater benefit with other more involved and complex types of coding transactions that typically take coders far longer to process since the machine processing time for even the most complex charts comprised of many varied electronic documents still remains less than 3.5 seconds. The simple fact is that time reduction saves money. This provides an easy financial justification for this type of CAC solution.

Another volatile issue, the coder concern about job security can't be understated and this no doubt also adds to the resistance to CAC deployment (8). Yet, this is a false misconception as illustrated in the case, when the coder begged to be redeployed to do more challenging and productive tasks within the department. More importantly, the roles for coders are only becoming more pervasive and complex as new requirements and regulations are enacted. This will be the evolution within HIM, simply paralleling the history of technological innovation within our society. Instead of typewriters, we use computers. So it will be with CAC freeing up staff to implement quality reviews, data analysis, and generating data for impending complex pay for performance requirements.

CAC Advantages

- Improved coder efficiency
 - Decreased coder variability
 - Streamline document handling process
 - Single coder workstation
- Connectivity through centralized interfaces
- Clinical environment neutral (ER, inpatient)
- Coder redeployment to mission critical tasks

Figure 3

(figure3; CAC positives)

Conclusion

CAC, whether as Computer Assisted Coding, or Computer Aided Coding, or Computer Automated Coding, continues to evolve as the technology of Language Processing, often referred to as Natural Language Processing, does (10,20). CAC solutions now can provide a variety of innovative and useful abstractions of clinical information which can be seamlessly provided to healthcare workers, clinicians and patients alike, thus improving the delivery and efficiency of healthcare. CAC solutions that can provide analysis of the full array of medical documentation can play a focal role in managing the ever increasingly complex requirements facing the hospital HIM department. The promise of the underlying technology can be viewed as the next leap in the healthcare information age and we should all stay tuned to the upcoming developments.

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