

Strategies for Implementing Computer-Assisted Coding Technology

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Introduction

Nationwide, computer-assisted coding (CAC) tools are being tested, trialed and implemented. Early results indicate a significant impact on coding productivity and quality. Why, however, has the prevalence of such coding engines been so slow to enter the market? Are they difficult to implement?

Background

CAC is generally defined as the use of computer software to “read” clinical documentation and automatically generate medical codes which are then reviewed and validated by a trained “human” coder.

The CAC engine reads electronic documentation through natural language processing (NLP) or the use of structured text and automatically assigns the appropriate codes. To ensure compliance, the codes are then validated by a coder prior to billing.

The CAC engines of today have been built around those outpatient specialty areas that have a high volume of cases utilizing similar clinical terminology and a limited amount of source documents (which are in electronic text format). NLP-based CAC has been implemented in those medical specialties where the terminology is more limited and where the source documents are limited in number. Therefore, typically included in the NLP-based applications are such specialties as Emergency Medicine, Pathology, Cardiology and Radiology. CAC utilizing structured input, on the other hand, has been implemented in medical specialties that are more procedural driven, where the documentation is very predictable and repetitive, including Gastroenterology, Urology, Podiatry, Orthopedics and Pulmonary Medicine.

The development of CAC on the inpatient side has been slow due to the complexity and vast number of diagnoses and procedures, the use of multiple forms and reports, the variety of formats, the numerous providers documenting in one record and the lack of a complete electronic health record (EHR).

Each year more hospitals are considering the utilization of a CAC coding engine. At last year’s American Health Information Management Association (AHIMA) convention a survey was conducted on “Technology in Coding”. The participants in the survey included 400 coders and 100 HIM Directors from across the country. The survey found that approximately five percent of the coders were currently using some type of CAC system. Approximately 33 percent of the coders and 60 percent of the HIM Directors said they were

familiar with CAC and how it works. Their main concern was the accuracy of CAC tools. Twenty-nine (29) percent of the coders cited CAC accuracy as a barrier to implementing such systems.

CAC engines can code hundreds of cases per minute. Early results from the use of CAC on the outpatient side indicate improved coder productivity of 20 to 30 percent and better consistency in code assignment. The accuracy of CAC engines is reported to be between 70 and 100 percent depending on the service being coded (e.g., radiology versus outpatient surgery).

As Borgess Medical Center (“Borgess”) located in Kalamazoo, Michigan, proceeded to undertake many new initiatives to improve revenue cycle performance in 2005, the Director of Health Information Management (HIM) was looking for solutions that would improve coder productivity while, at the same time, maintain the quality of coding. Improved coding productivity would assist her in reaching some of her cost reduction goals through reduced utilization of backlog coding vendors and through reduced FTEs. The Director decided to trial computer-assisted coding (CAC) in her department.

As discussed above, current CAC applications work best where there are limited numbers of source documents for coding, a high volume of repetitive cases, and a limited clinical vocabulary, and, therefore, most CAC applications have been implemented in areas such as Pathology, Emergency Department and Radiology.

At Borgess, however, it was determined that due to the complexity of outpatient surgery coding (with the requirement of both CPT and ICD-9-CM codes), a CAC engine for ambulatory surgery coding would provide the best value for the hospital. The PLATOCODE[®] CAC product from Plato Health Systems was selected and planning for its implementation was initiated in the fall of 2005. The most difficult type of ambulatory surgery coding, the orthopedic and podiatry cases, would be tested first.

Methodology

Borgess uses an electronic medical record (EMR) system to store transcribed and scanned documents, and an encoder application to process codes to be sent for billing and other purposes.

When a patient is discharged, their case is loaded into a “workbasket” in the EMR. To initiate the coding process, coders select a case in the workbasket and electronically review transcribed documents and scanned notes. Appropriate ICD-9-CM and CPT codes are then assigned and entered into the encoder software.

This process is summarized in Figure 1.

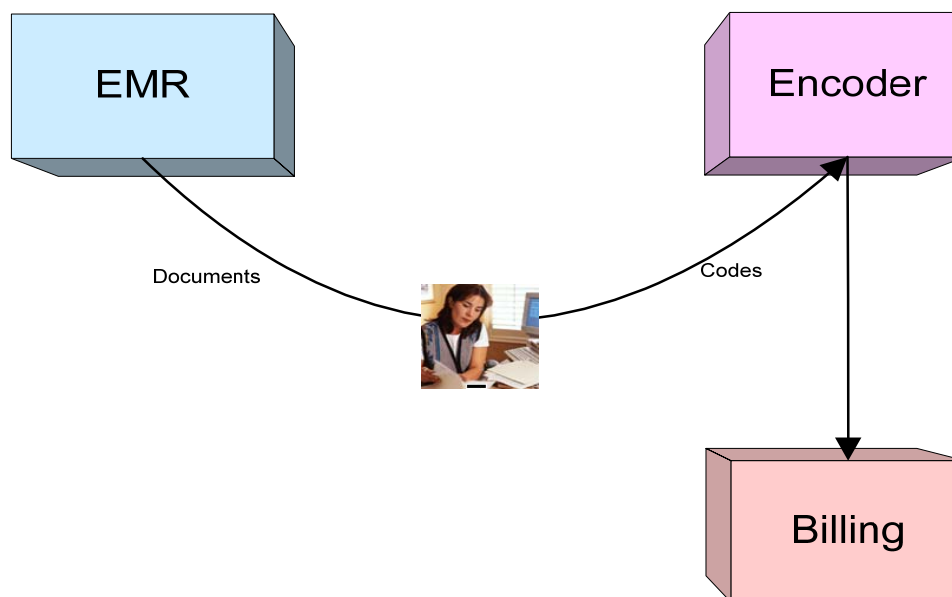


Figure 1: Coding Process at Borgess Medical Center

There are two obvious approaches to introduce CAC to this process. The first approach is to use a “live” process, where a document is submitted for CAC when the coder selects the case. This approach provides certainty that the very latest document versions are harnessed and also allows maximum flexibility. The other approach is to submit cases as a “batch” to the CAC engine and the resulting codes are stored until the coder comes to process that chart. This approach is preferred if the process of getting the information to the CAC is a time-consuming process (i.e., where there may be access or infrastructure issues).

At Borgess, a batch-coding process was used for Phase 1 to confirm that cases are coded properly. For Phase 2 (i.e., implementation) we decided to use a “live” approach, since the engine was able to return ICD-9-CM and CPT codes in a second or two. The “live” CAC application provided significant advantage for coding as will be described below.

The Live CAC Process

At Borgess, the EMR product was configured to display a button to start the CAC process. When the coder clicks the button, it activates the PLATOCODE® CAC application. The CAC application collects the relevant documentation from the EMR, submits it for CAC, and displays the result. This process only takes a few seconds.

The coder then audits the resulting codes by clicking each code, in turn, to examine its source (i.e., the location in the document where that diagnosis or procedure is documented). The

source document, which in ambulatory surgeries is the operative report, is displayed for the coder with relevant sentences and paragraphs highlighted. If codes are derived from more than one part of the document, several sentences may be highlighted to justify the selected code.

Relevant CCI edits are also displayed to assist coders in validating the appropriate codes. Coders can add and remove codes as necessary.

The “live” CAC process is illustrated in Figure 2.

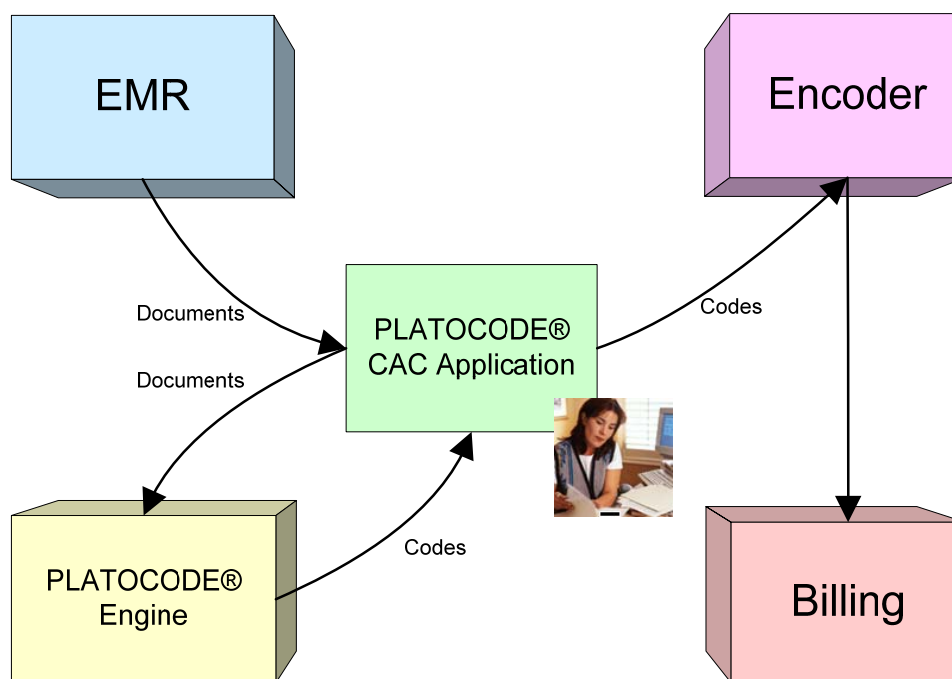


Figure 2: Process with PLATOCODE CAC tool

The Borgess CAC Implementation Experience

Phase 1 of the CAC implementation process at Borgess consisted of evaluating the PLATOCODE coding engine’s results for orthopedic ambulatory surgery cases, using transcribed operative reports. Approximately 700 reports were extracted from the Borgess transcription department in late October and early November 2005. Borgess was unable to extract the reports directly from their current EMR due to difficulty in identifying all orthopedic physicians. In the Borgess clinical information system, there is no easily

identifiable information that is specific to orthopedic ambulatory surgeries. However, in the transcription area, the operative reports can be pulled by a physician identifier. This proved to be a lengthy task as these reports had to be identified first and then downloaded from the current transcription system into a file that could be submitted for CAC. Several files were created due to the volume of cases.

Before the files could be sent to the PLATOCODE engine, necessary HIPAA documentation had to be completed. The extremely secure 448-bit Blowfish encryption was selected for all transferred patient data as well as the use of SSL transfers to further protect this encrypted data. This protection was implemented without difficulty and has worked seamlessly since that time.

Once the documents were coded by the PLATOCODE CAC engine, the next task was to get the coded documents back to the Borgess outpatient surgery coding staff for review and comparison. In mid-November 2005, Plato provided Borgess with information on how to install a PLATOCODE CAC user interface onto coders' personal computers (PCs) to view the first 20 coded documents. However, due to the facility's policies regarding installation of software on PCs, the installation could not occur immediately. The HIM Director was eventually able to download the user interface and look at the coded documents in mid-December.

On February 3, 2005, additional cases coded by the PLATOCODE engine were made available in the CAC tool for the coding staff's review. Again, facility policies at Borgess meant that these cases were not accessible to the coders. After several weeks of attempts, they were still able to pull up only the first 20 documents sent from Plato (in November); they were not able to view the second set of cases. It was not until a browser version of the CAC screen was provided by Plato, on March 25, 2006, that the coders were able to view all the documents.

The coding staff found minimal errors in the coding. One of the items found was duplicate codes, i.e., the code would be pulled from both the "name of procedure" section as well as the body of the operative report. This issue was reported back to Plato and was fixed immediately.

Once it was established that the coding through the PLATOCODE engine was proceeding smoothly, work began on implementation for live production. Several barriers were encountered.

Barrier 1: Interface to the EMR

Prior to beginning the CAC implementation, Borgess had an EMR in place and the coding staff was working from this EMR. Borgess needed to have the PLATOCODE system interface with their EMR provider so as to allow work to be done from an EMR coding "workbasket".

Initial meetings took place to identify all potential areas of work that needed to be done, i.e., interfaces to the EMR as well as the encoding system used by Borgess. The initial proposal from the EMR vendor to install the interface considerably exceeded the available budget. An abbreviated solution was subsequently offered that provided most of the necessary functionality. This interim solution would allow Borgess time to identify coding productivity increases and to realize a cost reduction in outsourcing. This, in turn, would substantiate the cost for the complete integration of the PLATOCODE tool and the EMR provider.

Barrier 2: Interface to the Encoder Software

To provide maximum benefit, the codes, after they are validated by the coders, need to be loaded into the facility's encoder or abstracting system so that billing and other processes can continue as usual.

Unfortunately, it has not been possible to create an interface into the encoder product currently used at Borgess. Work to overcome this barrier is still underway at the time of writing this paper.

Implementation

During the week of May 8, 2006, Plato staff came onsite to load the latest PLATOCODE CAC software, which was needed for the system to go "live", onto the coding workstations. The software was tested and worked well. Later that week, the server was brought onsite as well, and a real-time feed into the PLATOCODE system occurred.

The coding staff noted an extremely quick turn around time when sending the document to the CAC tool and, similarly, a quick return of a coded document. Borgess initiated monitoring of the productivity increase of staff on the orthopedic cases.

As mentioned above, an issue they continue to work on is the CAC interface to an encoder product, preferably that of the incumbent vendor. Once this interface is complete, the coded document will come back and the codes will be in the encoder for the staff to validate, complete and drop the bill in very minimal time. It will have a definite impact on productivity.

Findings and Results

Of the 700 orthopedic ambulatory cases that were initially compared, over 50 percent had code differences between what the hospital coding staff coded and what the PLATOCODE tool coded. While this seemed very alarming at first, we quickly realized that "differences" in themselves may not reflect accuracy and may not affect reimbursement. To understand the differences, a detailed analysis of 100 of the cases was performed.

The results were very encouraging. Many of the code differences revolved around “technical” issues such as acute tears versus chronic tears, and the coding of arthritis. The PLATOCODE engine is very good at correctly classifying these types of cases.

The PLATOCODE engine also found several cases where additional revenue might have been able to be claimed. For example, a clinician documented a “medial meniscectomy” but mentioned in the text description that he also trimmed the lateral meniscus. Bilateral meniscectomy could, therefore, be coded and billed.

For the purposes of analysis, differences were grouped into **technical issues** (with no impact on billing), frank **overcoding** errors and **opportunities** for additional reimbursement. The results are summarized in Figure 3.

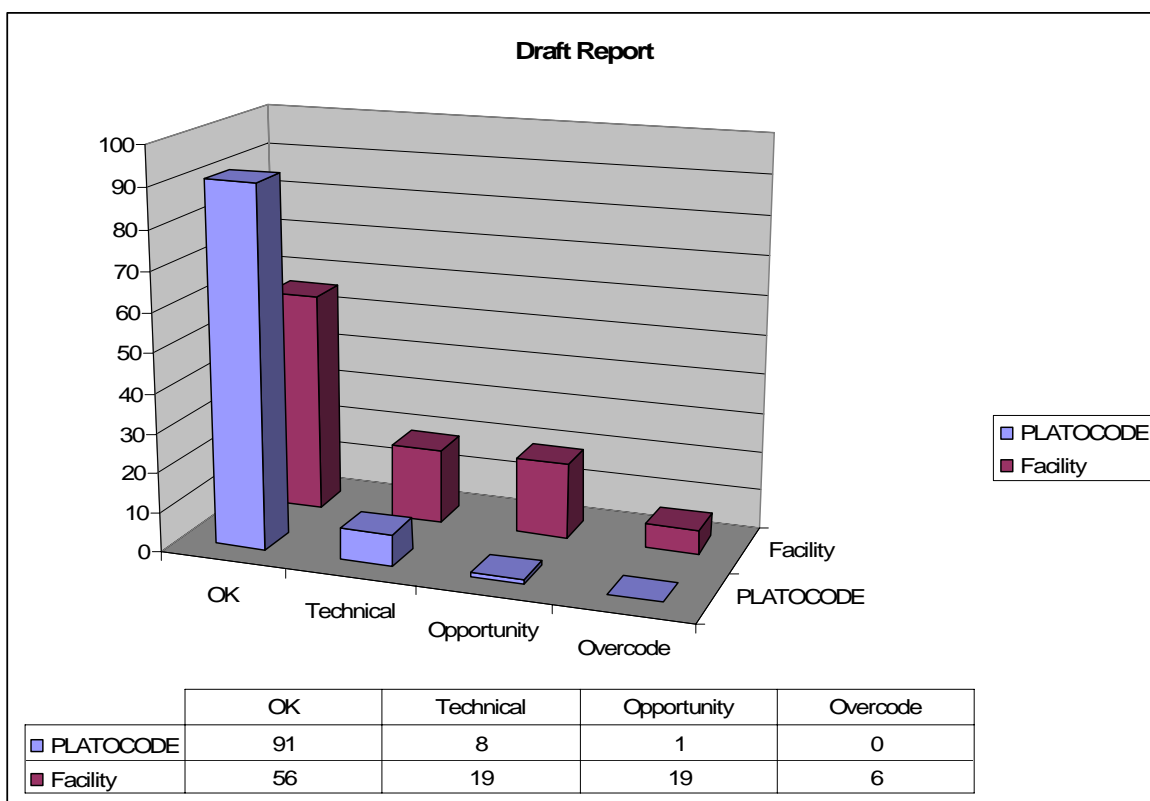


Figure 3: Draft Analysis of 100 coded cases. (Subject to change; analyses still underway.)

Definitions Utilized in the Analysis

The **technical issues** include cases where co-morbidities were entered by coders based on handwritten H&P records which were not available to the CAC engine. The majority of PLATOCODE technical issues are in this category. Technical issues also include cases where Coding Clinic would define the scenario as acute when it has been coded as chronic, or vice versa. The majority of facility technical issues are in this category.

The **opportunity issues** for the hospital coders will need careful review. Opportunity was flagged if the electronic operative report supported a CPT code or codes with higher value than those determined by the coders. This was most commonly associated with laterality, where the physician documented that a procedure was medial or lateral (or left or right) but then proceeded to describe surgery on the other side as well. It seems likely that, in at least some cases, **this is a documentation error**. It was, therefore, determined that these cases are **not a proper reflection of accuracy**; the coder may have reviewed other documented material to reach his/her conclusion.

Similarly, the **overcode issues** occur where the online operative report does not support the codes derived by the coder. More detailed review is needed to determine whether the coder reviewed other documentation to reach her decision. In the implementation at Borgess, the only document that was sent to the engine to code was the transcribed operative report.

The important point is that the PLATOCODE CAC engine is highly accurate in coding online documents that are presented to it. The reverse side of that coin is that the engine's accuracy **is totally dependent on the completeness and accuracy of the online documentation**.

It is also clear that assessing a CAC tool is not about comparing results between machine and human to declare a winner. Careful analysis is required. No matter what emerges, this analysis is extremely valuable. It identifies opportunities for the organization and sets an expectation that a coder using a CAC tool will combine the best of both approaches to deliver robust coding results.

The "live" phase of implementation has now been underway since May 2006, confirming the above impressions.

Further Issues

Other opportunities have become apparent such as those involving add-on HCPCS codes like G0289, for use in arthroscopic knee surgery. This code is for chondroplasty or removal of foreign body in a different knee compartment from another coded arthroscopic procedure, as long as certain documentation criteria are met.

In the documents we reviewed, physicians were not recording sufficient detail to justify this add-on code. Our view was that if coders could be assisted to increase coding throughput, time could be "ring fenced" to seek clarification from physicians and/or educate them on ways to assist coders to extract maximum revenue.

However, for this to be measurable, coders would need to be processing large numbers of cases with an organized process to review results with physicians. As the Borgess process was limited to Orthopedic cases, we did not have the case volume to demonstrate this benefit.

Return on Investment

We had hoped to have more precise ROI information available before the AHIMA conference in October 2006, but this has not proven possible. As noted, it is difficult to measure benefit without significant case volume. With the process limited to orthopedic cases at Borgess, an individual coder might not need to use the PLATOCODE service all day, leaving the reviewer with nothing to measure.

We therefore arranged for coders to collect sets of ten orthopedic cases to be coded as a batch. The coders were able to push these cases briskly through the system, but could not demonstrate significant benefit because they still had to transcribe the results into the Encoder product.

It is clear that while ROI can be expected from improved accuracy and throughput, this will not occur unless the “human” part of the coding process can also be automated.

Conclusion

Widespread adoption of CAC technologies has not yet occurred. One barrier is the amount of time needed for HIM departments to work with their Information Systems (IS) departments to install appropriate interfaces. Many observers have noted that this can be a time-consuming and expensive process. The process itself is not difficult, just lengthy! It took Borgess six to nine months to get to the point of going “live” with the CAC engine.

The need to integrate with other vendor products was the major barrier during this implementation. The EMR vendor was responsive when asked to assist the facility but little progress could be made with an interface to the encoder product.

Another barrier is the lack of solid, published results to establish return on investment statistics, especially in ambulatory surgery. Efforts are continuing to measure the efficiency and effectiveness of CAC. It may be too soon to say what cost savings may be obtained from productivity gains, but coding accuracy and error detection are important even without quantification.

The need to document and implement HIPAA compliance was not a barrier. Consultants and other suppliers are able to offer excellent compliance programs and there are strong technical options available to support a facility’s HIPAA documentation.

Over the next several years, CAC technologies will become more prevalent in the coding market. They will be bolstered by improved implementation strategies and proven enhancements in coding productivity and quality.

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