Advancing Technology Connects Transcription and Coding: The Developing Role of NLP, NLU, and CAC in HIM

By Julie A. Dooling, RHIT

For many years transcription and coding departments have been two separate and independent structures within health information management (HIM).

While these areas have always been interdependent regarding their need to share documentation, their technology platforms have operated in silos. The ability of an HIM department to capture discrete data and mine data from transcribed reports was virtually unheard of until recent years. But today, organizations are striving for improved data-made necessary by quality measurement, public health, research, organizational monitoring, and performance and reimbursement. These initiatives are driving the implementation of new technologies that create, abstract, and repurpose data more effectively and efficiently.[1] This has led to a better connection between transcription and coding-linking them together through advanced technology.

Natural Language Processing Synergies

Natural language processing (NLP) is widely recognized in computer-assisted coding (CAC) applications, but many healthcare organizations are also leveraging speech recognition combined with NLP to promote data capture, improve turnaround times, streamline workflow, and offer advanced analytics and reporting to all users of the health record. With advances in CAC and transcription technologies, synergies are being formed today between the two, especially when NLP is incorporated into both systems.

Since over 80 percent of information today is unstructured and based on natural language, NLP can be used as an analytic tool to capture the otherwise "hidden" patient information in transcribed documents.[2]

Many organizations are promoting a hybrid speech recognition approach to documentation on the front and back end. NLP lends its ability to analyze words contained in the narrative while converting them into a standard coded terminology by using a controlled medical vocabulary such as SNOMED CT.

Natural Language Understanding

Natural language understanding (NLU) is a closely related technology used in conjunction with NLP. This technology is emerging as an effective way to analyze phrases within the narrative and produce structured data, such as data contained within a Health Level Seven (HL7) Clinical Document Architecture (CDA) document. This concept takes the technology to the next level by not only capturing words, but understanding and bringing meaning to the narrative phrases that can then be extrapolated into coded data.

Once discrete data elements are coded or structured documents are created, they can be sent to the CAC, repurposed in the electronic health record (EHR), or sent to other clinical decision support systems throughout the enterprise. This speeds the cascade of information throughout the healthcare continuum. In the recent release of the stage 2 meaningful use notice of proposed rulemaking (NPRM), a consolidated CDA is being recognized as the standard for the summary care record. The rule states that the consolidated CDA will "lead to increased innovation and spur innovation…" The NPRM states:

> "The Consolidated CDA is the most appropriate standard to achieve this goal because it was designed to be simpler and more straightforward to implement and, in relation to this rulemaking, its template structure can accommodate the formatting of a summary care record that includes all of the data elements that CMS is proposing be available to be populated in a summary care record."[3]

Value Added Services

The following are examples of how NLP/NLU technologies add value to HIM processes and should be considered by facilities for evaluation or implementation. These technologies:

- **Improve computer-aided abstracting:** Previously, abstracting distinct data elements was extremely labor intensive due to manual processes; new technologies assist in automation to satisfy various reporting requirements such as the Joint Commission core measure sets and meaningful use EHR incentive program attestation
- **Create and maintain problem lists:** NLU can be used to mine structured data for an up-to-date problem list; providers often find that documenting by the sole use of structured templates and drop-down menus is time consuming and may lack the necessary detail for adequate documentation
- **Aid clinical documentation improvement (CDI) programs:** These technologies help move key processes to the point of service, such as integrating CDI prompts with voice recognition tools; it helps to fill gaps and ambiguities in the dictated note and alerts physicians with pertinent and focused suggestions to improve the documentation narrative
- **Aid research:** The technologies satisfy physician and administrative requests for information about patients and cases
- **Offers clinical decision support:** NLU creates opportunities to mine clinical facts from documents, combine them with other data, and enable analysis-including sending the information to various systems

Technologies Continue Merging

Technologies are ever-changing and the connections between transcription, capturing clinical data, and coding are becoming increasingly interdependent. Understanding how speech recognition, NLP/NLU, and CAC are connected is key to effectively creating, managing, and sharing health information to support evolving advances in patient care activities.

Notes

1. McNickle, Michelle. "5 tips for ICD-10 success." *Healthcare IT News.* September 19, 2011. www.healthcareitnews.com/news/5-tips-icd-10-success.
2. Giles, Thomas and Wilcox, Randall. "IBM Watson and Medical Record Text Analytics." HIMSS Presentation. 2011. www-01.ibm.com/software/ebusiness/jstart/downloads/MRTAWatsonHIMSS.pdf.
3. "Health Information Technology: Standards, Implementation Specifications, and Certification Criteria for Electronic Health Record Technology, 2014 Edition; Revisions to the Permanent Certification Program for Health Information Technology; Proposed Rule." *Federal Register* 77:45 (March 7, 2012). http://www.gpo.gov/fdsys/pkg/FR-2012-03-07/html/2012-4430.htm.

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Julie Dooling (julie.dooling@ahima.org) is a director of professional practice at AHIMA.

Article citation:
Dooling, Julie A. "Advancing Technology Connects Transcription and Coding: The Developing Role of NLP, NLU, and CAC in HIM" *Journal of AHIMA* 83, no.7 (July 2012): 52-53.