Meaningful Use as a Driver for EHR Adoption

How Nuance Healthcare Can Help Bridge the Gap to Structured Data Entry

NUANCE

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EXECUTIVE SUMMARY

For many caregivers, narrative dictation is comfortable, comprehensive, and detailed, which is why it is the preferred method for clinical documentation by physicians. Dictation allows detail that is difficult to capture using EHR templates and menus. However, the end result of dictation is a document and not structured clinical data, limiting utilization for EHR population, clinical research and analysis.

This paper describes a new approach for clinical knowledge capture that Clinical Language Understanding (CLU) technologies can bridge the gap between dictated patient narratives and the structured data entry that is required to satisfy the criteria for Meaningful Use of EHR. CLU leverages advancements in Natural Language Processing (NLP) and Artificial Intelligence (AI) to create tailored solutions for healthcare informatics.

The clinical knowledge capture approach stresses usability and respect for the physician's time and emphasizes efficient and comprehensive clinical documentation. It helps deliver on the promise of the EHR while avoiding the factors that may encumber adoption.

A successful clinical knowledge capture solution must:

1. Streamline EHR population from the narrative by automatically extracting and structuring clinical facts from dictation.
2. Integrate into physician and enterprise workflows, enhancing acceptance.
3. Help accelerate EHR adoption so providers can realize the value of their HIT investment .

4. Support compliance with CCHIT EHR certification criteria.

INTRODUCTION

There is a growing demand for structured, 'actionable' information to be extracted from unstructured (dictated) medical documents. This demand is significantly fueled by the government's initiative for 'Meaningful Use', which is aimed at promoting health care reform through improved quality, safety and efficiency. Healthcare organizations will be required to collect and report on quality and safety metrics, with the aim of improving the cost/quality equation in healthcare. Additionally, such discrete data (unlike free-form narrative) will facilitate seamless and consistent interoperability and exchange of data between systems and sharing of information among providers within an integrated care continuum. In the long run, it will also enable broader application of evidence-based medicine and clinical decision support systems, providing the basis for a transition from pay-for-reporting to pay-for-performance.

The currently proposed solution by the industry is to rely on structured data input into EHR systems through the use of 'point-and-click' user interfaces to select entries from pick-lists, instead of traditional free dictation methods. Nuance® Healthcare research shows that physicians strongly resist these solutions, which are viewed as less efficient than direct dictation, and are highly limiting in their ability to capture and document the unique clinical story for each patient encounter.

Key findings of the Nuance Healthcare survey, based on responses from 1,000 physicians, include:

- 93% stated that the EHR did not reduce time spent documenting care

- 67% cited time associated with reliance on keyboard and mouse to document within an EHR as a major hurdle for adoption

- 97% selected narrative over structured data entry as the more valuable documentation method to treating patients

- 96% expressed concern that they may lose the patient's unique story with transition to point-and-click EHRs

It is well-known that physician adoption and utilization of EHRs are lagging far behind what healthcare provider organizations expected and what the government is trying to achieve. In many EHR implementations, physicians continue to use traditional dictation for documenting clinical encounters, thereby decreasing the expected value of EHRs as a tool to enhance patient care and reduce costs.

There are several studies and publicly available data that point to the same observations, for example:

- According to a survey published in June 2008 by the online edition of the New England Journal of Medicine, only 4% of clinicians have adopted a fully-functional EHR and only 13% use a basic EHR system (where the basic EHR does not include certain order-entry capabilities and clinical-decision support).

- According to a report published by The AC Group, a nationally-reputed Health IT consulting firm, there is a 73% failure rate of EHRs through 2007, due to usability frustrations, where failure was defined as not using EHR for 80% of their patients.

- The AC group also conducted a review of 573 charts and reported that entering data into the EHR took an average of 9 times longer than using dictation to document a patient encounter.

EMERGING HYBRID DOCUMENTATION MODEL

Narrative dictation is natural, comprehensive, and detailed, which is why it is preferred by physicians. It is equally critical that major HIT vendors provide a long-term path to structured data entry. The near term challenge for the healthcare industry is to leverage technology to bridge the gap between the clinician's preferred documentation models of unstructured dictation with the need for structured information.

MEANINGFUL USE OF EHR

The American Recovery and Reinvestment Act of 2009 (ARRA) has established financial incentives beginning in January 2011 for Eligible Physicians (EP) and hospitals, in an effort to improve the quality, safety and efficiency and accelerate the deployment and acceptance of EHR systems, and to promote the development and reporting of tangible measures to improve the quality, safety, and cost-effectiveness of patient care. ARRA calls for multiple years of Medicare incentive payments to hospitals and physicians who meet the requirements of 'meaningful use of certified EHR technology'. EPs and hospitals who are not meaningful EHR users by 2015 will start facing penalties.

For EPs, the incentive payment is equal to 75 percent of Medicare allowable charges for covered services in a year, subject to a maximum yearly payment for the first five years of $15,000, $12,000, $8,000, $4,000, and $2,000, respectively. Early adopters could receive a maximum first payment of $18,000 for 2011 or 2012. There are no payments for EPs who become meaningful users in 2015 or later. EPs who qualify in a health professional shortage area (HPSA) could quality for an additional 10%.

Payments will adjust downward for EPs who don't qualify as meaningful EHR users by 1%, 2%, 3% for 2015 through 2017 and by between 3% to 5% thereafter. The reduction amount might be increased by an additional 1% for each year up to a total of 5%, if the proportion of meaningful EHR users is less than 75% of EPs by 2018.

Eligible hospitals that are meaningful EHR users could receive up to four years of financial incentives, beginning with fiscal year 2011 through 2015. Incentive payments would be calculated based on the product of the initial amount of $2 million and other factors including Medicare share and a transition factor that decreases with each subsequent year; 1, 3/4, 1/2, 1/4 for 2011 through 2015 respectively. There are no payments thereafter.

Reduced payment updates beginning in FY 2015 will apply to eligible hospitals that are not meaningful EHR users.

Please visit http://www.cms.gov/EHRIncentivePrograms/ for more details on payment and schedules.

EHR CERTIFICATION

In response to the ARRA initiative, the Certification Commission for Health Information Technology (CCHIT) continues to align EHR certification standards and criteria to those published under the ARRA program, thus multiplying benefits derived from patient data capture solutions.

Please visit http://healthit.hhs.gov/StandardsandCertification/ for more details on certifications criteria.

How do providers qualify?

To be eligible for the incentive payments, hospitals and physicians must satisfy the specific criteria that are outlined by the Meaningful Use Matrix within a specified time frame, between 2011 and 2015.

Please refer to http://healthit.hhs.gov for a copy of the Meaningful Matrix.

MEANINGFUL USE OF EHR GOALS

The spirit of the Meaningful Use initiative is to ultimately enable significant and measurable improvements in population health through a transformed health care delivery system, with the following key goals for Meaningful Use of EHRs:

1) Improve quality, safety, efficiency, and reduce health disparities.
2) Engage patients and families.
3) Improve care coordination.
4) Improve population and public health.
5) Ensure adequate privacy and security protections for personal health information.

THE HIT POLICY COMMITTEE VISION FOR 2015

The HIT Policy Committee* considers the following vision to be achievable by 2015:

- **Prevention, and management, of chronic diseases**

  – A million heart attacks and strokes prevented
  – Heart disease no longer the leading cause of death in the US

- **Medical errors**

  – 50% fewer preventable medication errors

- **Health disparities**
  – The racial/ethnic gap in diabetes control halved

- **Care Coordination**
  – Preventable hospitalizations and readmissions cut by 50%

- **Patients and families**
  – All patients have access to their own health information
  – Patient preferences for end of life care are followed more often

- **Public health**
  – All health departments have real-time situational awareness of outbreaks

The approach is phased with specific focus on Data Capture and Sharing in 2011, on Advanced Clinical Processes in 2013, and on Improved Outcomes by 2015.

*Source: HHS-Office of the National Coordinator for HIT—Presentation June 16, 2009

The following table highlights some of the objectives for 2011:

Table 1: Meaningful Use Certification Criteria (Selected Objectives)

Proposed meaningful use Stage 1 objectives	Certification criteria to support the achievement of meaningful use Stage 1 by eligible professionals and hospitals
Maintain an up-to-date problem list of current and active diagnoses based on ICD–9–CM or SNOMED CT®	Enable a user to electronically record, modify, and retrieve a patient's problem list for longitudinal care (i.e., over multiple office visits) in accordance with the applicable standards
Maintain active medication list	Enable a user to electronically record, modify, and retrieve a patient's active medication list as well as medication history for longitudinal care (i.e., over multiple office visits) in accordance with the applicable standard
Maintain active medication allergy list	Enable a user to electronically record, modify, and retrieve a patient's active medication allergy list as well as medication allergy history for longitudinal care (i.e., over multiple office visits)
Record and chart changes in vital signs: • Height • Weight • Blood pressure • Calculate and display: BMI • Plot and display growth charts for children 2–20 years, including BMI	1. Enable a user to electronically record, modify, and retrieve a patient's vital signs including, at a minimum, the height, weight, blood pressure, temperature, and pulse 2. Automatically calculate and display body mass index (BMI) based on a patient's height and weight 3. Plot and electronically display, upon request, growth charts (height, weight, and BMI) for patients 2–20 years old
Record smoking status for patients 13 years old or older	Enable a user to electronically record, modify, and retrieve the smoking status of a patient to: current smoker, former smoker, or never smoked
Incorporate clinical lab-test results into EHR as structured data	1. Electronically receive clinical laboratory test results in a structured format and display such results in human readable format 2. Electronically display in human readable format any clinical laboratory tests that have been received with LOINC® codes 3. Electronically display the information for a test report

The other certification criteria are concerned with the utilization of Computerized Physician Order Entry (CPOE) to manage orders such as Medications and Radiology/Imaging procedures, implementation of automated drug/allergy checks and other clinical decision support systems (such as Radiology imaging decision support), quality measures, communication with patients claims management, exchange of clinical information, medication reconciliation, surveillance and data protection.

THE ROLE OF NEW CLINICAL KNOWLEDGE CAPTURE TECHNOLOGY TO MEET MEANINGFUL USE REQUIREMENTS

The good news for healthcare providers is that most of the information that is needed to satisfy the above measures for 2011 are routinely collected during patient encounters and are regularly captured in patient records. Although some of the information is typically collected by the nursing staff and is entered directly into the EHR, other data is gathered by physicians and is dictated as part of the clinical documentation process. This information is currently locked in unstructured free narrative dictations and is not readily available for automatic extraction, analysis or reporting.

One of the frequent concerns expressed by physicians is that relying on EHR templates significantly reduces their productivity, takes their focus away from the patient and limits their ability to accurately document the patient's story. It is possible, albeit costly, to hire teams of dedicated editors with clinical experience to solve this problem using manual editing and validation of text reports. A current and active debate in the healthcare informatics community is how to best leverage technology to develop a cost effective solution to automatically extract clinical facts from narratives and enter them into structured documentation to facilitate downstream processing and analysis.

Advanced CLU technologies are being developed as a solution to bridge the gap between the clinician's preferred narrative dictation method and the desired structured data output. CLU allows the physicians the best of both worlds—satisfy the meaningful use and EHR certification criteria while not imposing the rigid structure of the EHR on their documentation process. This paper will now explore how CLU technologies will be used to extract structured data from free form narrative and then use that data to populate it into an EHR, registry or other third party clinical system.

BUILDING THE NEXT GENERATION CLINICAL DOCUMENTATION SOLUTIONS

Nuance Healthcare is creating a family of solutions that use advanced NLP to process text documents that are produced using our Best in KLAS® dictation and speech recognition systems, and then extract and structure key medical data such as problems, medications, allergies, procedures, vital signs, social history, lab results etc., to facilitate automated EHR population. This will help unlock valuable patient information which today remains trapped in text records, and will then make it readily available to the EHR, enabling seamless creation of structured data, increasing adoption, and helping providers and organizations to meet the Meaningful Use and EHR certification requirements and beyond.

How does CLU work?

There are two approaches that are currently being developed: real-time and deferred clinical knowledge extraction from narrative.

In the real-time clinical knowledge capture model, dictated patient narrative is converted to text automatically using the Nuance Healthcare speech recognition system. Simultaneously, the text

is processed using the Nuance Healthcare CLU technology. This highly-sophisticated clinical knowledge capture engine identifies and tags relevant patient data. Physicians have the opportunity to immediately and interactively edit the information and sign the report.

In the case of deferred processing, dictated patient narrative is converted to text and CLU is applied using the Nuance Healthcare system. The finalized report with associated extracted medical facts is presented to the physician for final sign off. Similar to speech recognition, the clinical knowledge capture engine will adapt to users' preferences, addressing personal documentation styles and formats.

Figure 1: Flowchart of real-time and deferred clinical knowledge capture models
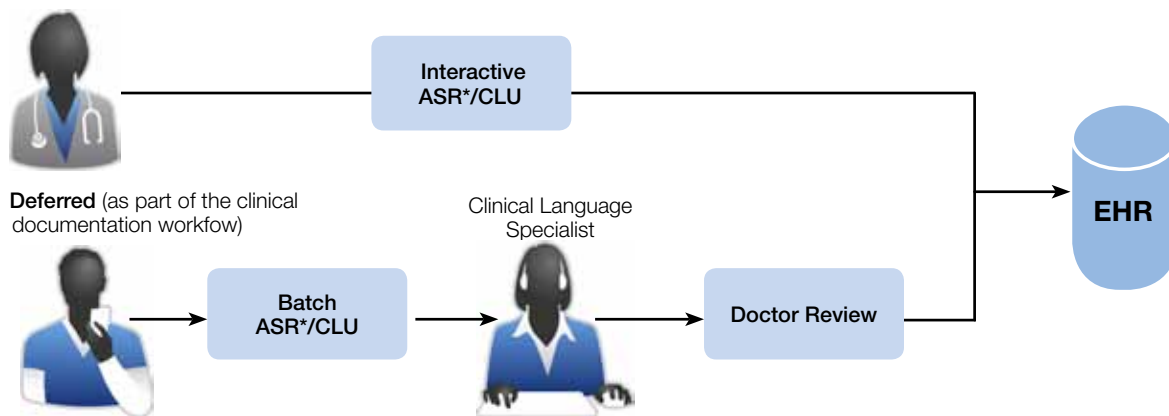
*Automated Speech Recognition

CLU technology is capable of integrating seamlessly with either scenario, to make it easy for users to gain the full benefit of structured data with minimal impact on established workflow. The extracted medical facts are formatted to industry standard, such as HL7-CDA, to facilitate interoperability with, and consumption by, EHRs and other systems downstream.

NUANCE HEALTHCARE'S VISION OF SPEECH TO TEXT TO DATA TO KNOWLEDGE

While many approaches have been devised to feed the data needs of the EHR, the core ingredient of truly viable and robust clinical documentation continues to be the detailed interpretive patient information created by physicians. Today, most patient records are created through the process of verbally dictating a narrative report. Very little data arrives as structured data or is manually entered by physicians. Narrative dictation is the preferred mode of clinical documentation for most physicians.

Nuance Healthcare is very well positioned to be the right partner to help physicians and organizations transition to structured data creation, while enhancing adoption and utilization of EHR. Nuance Healthcare leverages its considerable speech technology assets—the industry's largest portfolio, extensive knowledge and experience, and integration of cutting-edge communication and mobile devices—to create the right solutions for each physician. Moreover, Nuance Healthcare's deep technical partnerships with all the major EHR vendors ensures that whether or not you use Epic®, Allscripts®, Cerner®, or any of the other leading EHR solutions, clinicians will have direct access to their choice of clinical documentation workflow and their data will populate the right elements of the EHR.

Results from a recent study at Fallon Clinic* show that Nuance Healthcare's Dragon® Medical 360, when used as part of an EHR deployment, is a major contributor to higher levels of physician satisfaction, improved availability of information, enhanced note quality and reduced costs associated with medical documentation. The study reports a 99% percent reduction in the average number of minutes after a patient leaves for the final note to be available in the EHR system. The Fallon Clinic study shows that turnaround time went from an average of 3.8 days to 46 minutes. Additionally, there was a 57% average improvement in physician satisfaction with generating notes in the EHR. Quality in peer-reviewed medical records also improved by an average of 26%.

Through close integration of dictation, speech recognition and NLP technologies, Nuance Healthcare creates a progressive blend of technologies to create a comprehensive solution for physicians and healthcare organizations to address today's challenges, while facilitating seamless transition to realize their future vision.

The Nuance Healthcare solution is an information-rich, yet physician-friendly, environment that combines the best of narrative dictation with the structure and organization of clinical data. It provides a seamless way to populate the EHR, accelerating adoption and helping facilities realize the full potential of their HIT investments. It is designed to fit in the workflow, style and work habits of users, empowering physicians to focus on taking care of their patients without having to worry about the underlying technology. With clinical knowledge capture technology, detailed clinical documentation is naturally produced as a by-product of routine medical practice, and helps deliver safer, higher quality patient care. ■

*http://www.nuance.com/news/pressreleases/2010/20100216_fallon.asp

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