Speech Recognition:

Accelerating the Adoption of Electronic Health Records

NUANCE

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Summary

Electronic Health Record (EHR) systems offer the potential to dramatically improve the cost and quality of health-care. However, despite their potential and market forces favoring their adoption, EHR software is fully used by only 4% of clinicians in the U.S. today, according to a recent study[1] in the *New England Journal of Medicine*.

This white paper identifies forces both driving and inhibiting EHR adoption. EHR systems' inflexibility and other limitations often prevent them from being used effectively by a broad range of physicians – without help from enabling technologies.

Speech recognition is one such technology. It has proved effective at helping physicians create electronic health records. Today, over one hundred thousand clinicians use real-time voice recognition to dictate findings into electronic records – far more than those documenting findings solely via typing or mouse-clicks.

The benefits of speech-enabled EHR systems include:

- Dramatically reduced transcription expense
- Improved patient care via complete documentation immediately available
- Reduction in time spent documenting care
- Increased per-patient revenue by enabling physicians to document a more complete patient note

Some speech recognition solutions offer physicians multiple methods by which to dictate – a critical requirement. While all physicians in a department or practice might use the same clinical system, they may have widely different styles of documentation, which EHR systems alone cannot address.

As more EHR systems become web-enabled, new speech platforms will be needed to serve clinicians in an "on demand" manner, offering all dictation modalities as a web service. The EHR vendors with the largest market shares support the seamless use of speech recognition within their applications, further accelerating EHR adoption.

Forces Are Driving the U.S. Towards Electronic Health Records…

The era of Electronic Health Records is finally on the horizon.

What's driving U.S. healthcare towards EHR adoption?

- **Federal government initiatives.** Nearly $40B of the January, 2009 American Recovery and Reinvestment Act (ARRA) includes the HITECH Act which provides incentive payments for physicians to purchase EHRs. Physicians can accrue between $45,000 and $64,000 in incentive payments from CMS[2] if they install an EHR by 2011. The Office of the National Coordinator for Health Information Technology is driving the creation of interoperability standards.

- **Recent changes in IRS regulations.** Not-for-profit hospitals can now cover up to 80% of the purchase cost of referring physicians' EHR equipment for their own use – a seismic shift given the initial estimate of $15,000 – $22,000 per physician, according to Frost & Sullivan.

- **Significant cost savings.** According to Dr. Blackford Middleton, executive director for Partners Health-care's Center for Clinical Information Systems Research, a standardized electronic healthcare information

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1 *Electronic Health Records in Ambulatory Care — A National Survey of Physicians*, Catherine M. DesRoches, Dr.P.H.,
  Eric G. Campbell, Ph.D., et al. *New England Journal of Medicine*, Volume 359:50-60, July 3, 2008, Number 1.

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exchange could save $337 billion over a 10-year period in over-head and unnecessary spending.

- **Higher standards of care.** In its landmark 2001 study, *Crossing the Quality Chasm*, the Institute of Medicine (IOM) identified health information technology (HIT) as one of the single most significant tools that could help improve healthcare quality.

- **A change in reimbursement philosophy.** U.S. healthcare is evolving from "fee for service" to "pay for quality" and "pay for performance." Private and government payors base a portion of reimbursement on measurable outcomes. EHR systems are needed to keep score.

- **Regional Centers of Excellence.** The **HITECH Act** provides grants for the establishment of Health Information Technology Regional Extension Centers offering technical assistance, guidance, and information on best practices to support and accelerate health care provider's efforts to become meaningful EHR users.

- **Regional pilots.** Numerous high-visibility EHR programs across the country have been well underway. One program, the Massachusetts eHealth Collaborative, has created a network of EHR systems. Blue Cross Blue Shield of Massachusetts has spent over $50 million on this initiative.

…Yet EHR Adoption Remains Slow

Despite strong government, payor, and employer support, however, EHR adoption remains low. According to a 2008 study published in the New England Journal of Medicine, less than 5% of 600,000 clinicians have a fully-deployed EHR.

Why are doctors so reluctant to use EHR systems?

Some physicians say that EHRs slow them down and prevent them from documenting care in a manner that accurately depicts the patient encounter.

"Much of the meaning and inference that can be gleaned by the clinician through the use of narrative is lost when a rigidly structured template is used, and the ability to communicate complex ideas in an efficient and fluid manner diminishes," notes Jason S. Shapiro, MD of Columbia University's Department of Bioinformatics. Experienced EMR users agree. "Although our EMR system is an exceptional product, you cannot make a template to cover every situation and scenario," said Dr. Steve McCullough, a nephrologist based in Paducah, Kentucky, and strong advocate and user of electronic medical records in his internal medicine practice.

2 For more information on the HITECH Act, please visit http://healthit.hhs.gov/portal/server.pt

"Interviewees reported that most physicians using EHRs spent more time per patient for a period of months or even years after EHR implementation. The increased time costs resulted in longer workdays or fewer patients seen, or both, during that initial period…"

"Most respondents or their colleagues considered even highly regarded, industry-leading EHRs to be challenging to use because of the multiplicity of screens, options, and navigational aids. Problems with EHR usability—especially for documenting progress notes—caused physicians to spend extra work time to learn effective ways to use the EHR. These substantial initial time costs are an important barrier to obtaining benefits, as greater burdens on physicians' time decrease their use of EHRs, which lowers the potential for achieving quality improvement. …"

Physicians' Use Of Electronic Medical Records: Barriers And Solutions

Robert H. Miller and Ida Sim, UCSF

Health Affairs Magazine

While some information is necessarily captured via "point and click" – choosing from a list of meds or allergies – documenting the substance of an encounter requires the physician to use his or her own words. Clinical findings, history of the present illness, patient descriptions, past medical and social history, assessment, and plan, as well as referral letters and consult notes, all require that the physician "dictate" using unrestricted free text.

Clinicians Agree: Speech Makes EHR Systems Faster and Easier to Use

For the U.S. healthcare system to gain the benefits of electronic records, physicians must broadly adopt computerized medical systems. But there is no hard and fast requirement for their use. Since the majority of physicians own their own practices – they are their own CEO, CMO, CFO and CIO – they must be clearly convinced that their cost, productivity, and ease-of-use concerns are addressed.

Speech recognition is one technology that offers an inviting on-ramp for clinicians to drive EHR systems. Speech recognition technology has been shown to:

• Help physicians use EHR systems without changing their documentation methods.

• Convert EHR systems into a cost-saving and revenue-enhancing technology.

This finding was supported by a report issued by KLAS (www.klasresearch.com) identifying that:

• Three-quarters (76%) of the clinicians using "desktop" speech recognition – directly controlling an EHR system via speech – report faster turn-around time as the largest benefit – better service to patients and faster reimbursement.

• Nearly 3 in 10 cited sharply reduced costs and increased productivity (13%) as other benefits. Cost-savings from EHRs are realized by both reductions in transcription and overhead associated with the billings and collection process.

"Dragon® Medical lets me describe the patient encounter in my own words," says Dr. Dan Field, an emergency physician for Kaiser Permanente in Northern California. "It's embedded in our EHR system so I can use free-text dictation anywhere. I can also quickly navigate to different parts of the chart using my spoken commands."

Clearly, physicians find EHR systems more effective when driven by speech.

"If I didn't have speech recognition, I couldn't use the EHR. I can't type, and I'm not going to point-and-click all day. Speech recognition and an EHR is the ideal combination," says Andrew Fireman, a cardiologist at Abington Medical Specialists, a 20 physician practice in Abington, Pennsylvania, which uses eClinicalWorks EHR.

Speech recognition software can be customized to record voice macros – pre-defined templates with standard elements to guide the physician's documentation – which can also keep physicians in compliance with guidelines established by the Centers for Medicare and Medicaid Services (CMS). These voice macros are easy to create and are an important time-saving feature.

Frequently-accessed information and frequently-visited parts of an EHR can easily be accessed with macros or by speech-enabling the EHR system.

Major Health Systems Are Major Speech Recognition Users

Clinicians at many of the leading healthcare delivery networks rely on speech recognition to document patient encounters, including:

100% of the U.S. News and World Report Honor Roll Hospitals
74% of the Most Wired Hospitals
73% of the Top 15 Connected Healthcare Facilities

These healthcare providers have recognized the positive impact of speech recognition on the quality and cost of care and have deployed speech recognition for use by its clinicians:

The Johns Hopkins Hospital
Partners Healthcare
Kaiser Permanente
Intermountain Healthcare
Cleveland Clinic
The Mayo Clinic
Brigham and Women's Hospital
New York-Presbyterian Hospital
Duke University Medical Center
Barnes-Jewish Hospital/Washington
    University

University of California,
    San Francisco Medical Center
University of Washington Medical Center
University of Michigan Hospitals and
    Health System
Stanford Hospital and Clinics
Hospital of the University of
    Pennsylvania
Lahey Clinic
University of Pittsburgh Medical Center
Providence Health
Lifetime Health

United States VA Hospital System
Baylor Health Care System
Advocate Health
USC – Keck School of Medicine
NYU Medical Center
University of Virginia Health System
UCLA Healthcare
Catholic Healthcare West
Massachusetts General Hospital
Sutter Health
St. Joseph's Healthcare
Wellspan

Benefits Are Substantial

Speech-driven EHR users report the following benefits:

- **Reduced transcription expense.**

    – *EHR systems driven by speech can enable clinicians to dictate substantial sections of the medical record in "free-text" directly into the EHR, using their own words, without having to rely on transcription. Speech-driven EHR systems can reduce or eliminate the ongoing cost of transcription by providing physicians greater flexibility to document findings.*

- **Dramatically increased physician productivity.**

    – *Studies show that the average physician spends up to 15 hours a week documenting encounters. The average encounter takes 3-4 times as long to document in an EHR using keyboard and mouse as it does to dictate. Speech recognition systems reduce time-on-documentation by as much as 50% - freeing up the physician to spend more time with patients.*

- **Improved patient care via more detailed documentation and faster results delivery.**

    – *Patient notes created via speech contain deeper and more descriptive information – vital detail needed for a complete patient assessment.*

> – *The immediacy of information means that treatment plans are formulated more rapidly, reducing the chance of adverse medical effects.*

- **Increased cash flow and revenue by the near-immediate completion of the patient note, which reduces acute care length of stay and maximizes reimbursement in outpatient settings.**

  > – *A recent study by Fallon Clinic (Worcester, MA) measured the impact of speech recognition on clinical workflow and quality of care and found substantial opportunities to maximize reimbursement per physician using speech recognition with an EHR.*

"We have saved enough on transcription costs using Dragon to pay for the software many times over," says Kaiser's Dr. Field. "Dragon Medical is one of the most successful cost savings investments I've ever seen. We're expanding its use both in the ED and in other departments across Kaiser."
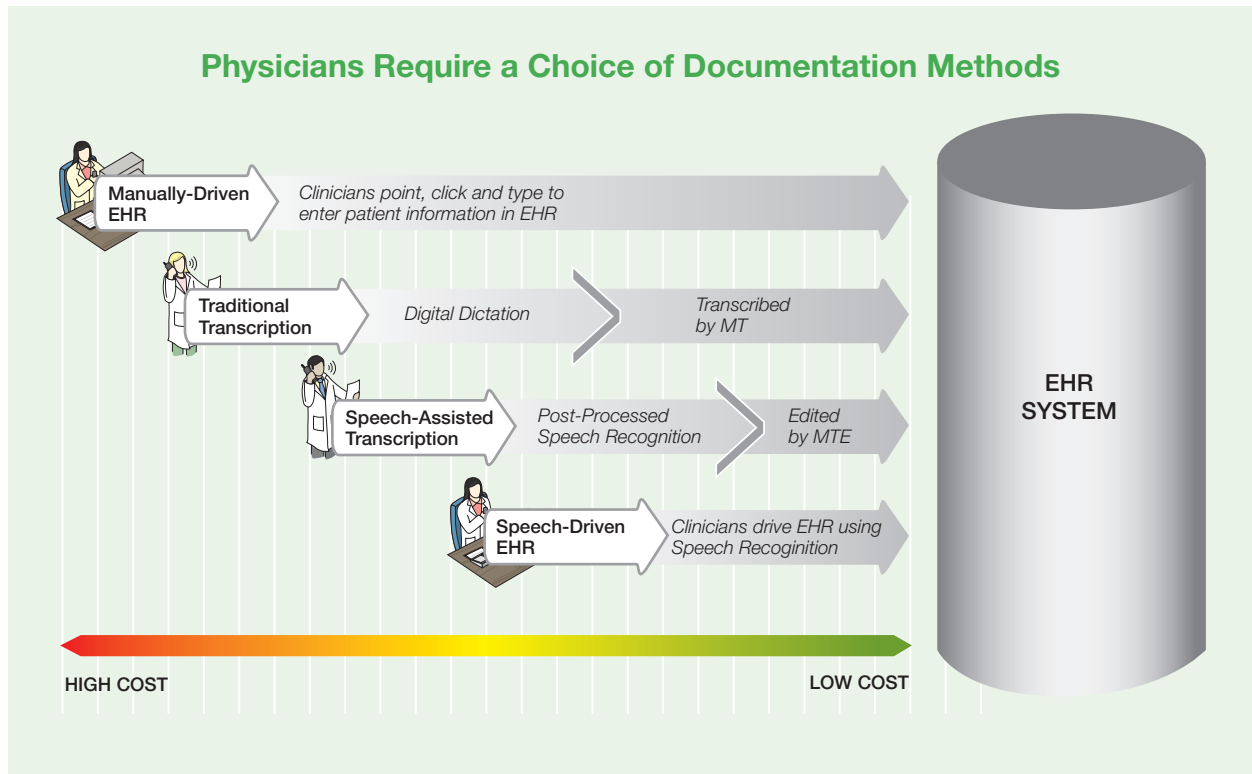
Speech Recognition Supports Many Physician Documentation Styles

Physicians understandably exhibit a wide range of comfort with using medical software. While Physician A may readily adapt to controlling an EHR by speech, Physician B may resist abandoning standard dictation. Similarly, some clinicians may be comfortable using "point and click" methods – with some keyboard use – to run their EHR, while others feel that typing takes their attention away from the patient – or changes their thought process.

Technology to capture patient data by speech has evolved to offer clinicians a range of documentation methods, from traditional to automated. The methods include:

- **Manually–driven EHR,** where clinicians use neither traditional nor speech-assisted transcription services within the EHR for creating free-text narratives. In this instance, clinicians become typists. While transcription savings are significant, they are more than overshadowed by the often significant reduction in physician productivity.

- **Traditional transcription.** A clinician dictates into a digital microphone or standard telephone, which is then transcribed by a medical transcriptionist before being released for review and signature by clinicians in the EHR systems. Traditional dictation is the most labor-intensive and therefore the least cost-effective method of documenting findings in an EHR.

- **Speech–assisted transcription,** in which a clinician's dictation is captured and is "recognized" by a speech recognition engine as a first-pass step. The initial recognition is then reviewed, edited and corrected by a Medical Transcription Editor and then released for review and signature within the EHR. Studies have shown that this "back end" (i.e., in the background) recognition, in conjunction with manual editing after the initial recognition has been completed, reduces the cost of creating medical records vs. traditional transcription by as much as 50%.

- **Speech–driven or speech-enabled EHRs**, where clinicians can dictate directly into free-text fields of the EHR and observe their findings on the screen, and can make edits as needed. This "front end" approach represents the fastest and most cost effective method for clinicians to document findings, requiring far fewer process steps (see graphic below). Voice macros – allowing clinicians to navigate any EHR system with a single voice command – improve ease of use immensely.

These 4 methods are identified in the figure on the proceeding page.

Physicians Require a Choice of Documentation Methods

Manually-Driven EHR — *Clinicians point, click and type to enter patient information in EHR*

Traditional Transcription — *Digital Dictation* — *Transcribed by MT*

Speech-Assisted Transcription — *Post-Processed Speech Recognition* — *Edited by MTE*

Speech-Driven EHR — *Clinicians drive EHR using Speech Recoginition*

EHR SYSTEM

HIGH COST — LOW COST

Freedom of Speech Will Increase Chances of EHR Success

With an expanded range of choices that facilitate EHR use, we recommend that:

- **Physicians should be offered 'freedom of choice' within a practice or hospital.** Physician A should be able to use an EHR system driven by his voice, while Physician B uses a more traditional transcription solution where "back end" speech recognition processes physician dictation, presenting the editor with a draft they edit and can upload directly into the EHR for that patient.

- **The speech technologies offered should allow all clinical records to be stored in the same EHR system regardless of how they were created.**

EHR Vendors Embed Speech into Their Products

Leading EHR and Healthcare Information Technology (HCIT) vendors now directly support the use of speech recognition solutions such as Dragon Medical to control their products:

- **Allscripts** (www.allscripts.com) offers an open, physician-friendly speech recognition strategy. Allscripts EHR products such as MyWay, Professional and Enterprise are available with Dragon Medical. Physicians who use Allscripts EHR products purchase a commercial Dragon Medical license and install it on their local computer. Allscripts software automatically identifies the Dragon software and clinicians can use speech recognition to run the Allscripts EHR system with no programming necessary.

  "It's a lot of fun. I really enjoy it and have probably saved about $20,000 in the last two years in transcription costs." —Dr. Steven McCullough, Allscripts TouchWorks and Dragon Medical user, Western Kentucky Kidney Specialists, Paducah, KY

- **Epic Systems** (www.epicsys.com) offers a library of voice macros for Dragon Medical so any Epic Hyperspace user can create progress notes, order-entry comments, and any other text related to patient care. Voice-activated commands enable users to navigate within Hyperspace, dramatically reducing the number of mouseclicks needed to complete a workflow process. Using Dragon Medical, a Hyperspace user can achieve a seamless process of documentation and navigation using voice to improve efficiency. Health systems using Dragon Medical with Epic include Kaiser (Northern CA), Cleveland Clinic, Atrius Health (Dedham, MA), Group Health Cooperative (Seattle, WA), Premier Health (Dayton, OH), Advanced Healthcare (Milwaukee, WI), Swedish Medical Center (Seattle, WA), and Fallon Clinic (Worcester, MA).

  "I use Dragon Medical daily to perform all of my medical documentation... We see a significant workflow efficiency advantage when a physician can document directly into our EpicCare® EHR… We also leverage Epic's intrinsic charting tools with voice by building custom commands in Dragon Medical to voice activate those charting tools… This can reduce the number of "mouse-clicks" to complete a particular section of the EHR." —Dr. Robert Frank, Epic and Dragon Medical user, Advanced Healthcare, Milwaukee, WI

- **NextGen** (www.nextgen.com), a provider of integrated practice management and EHR systems, has found its customers also adopt the clinical documentation module more quickly with Dragon Medical.

  "At my former practice, I felt the pain of dealing with this total point and click world. The dream of speaking into the note instead of typing to supplement my point and clicks is now becoming a reality... With Dragon, the note stares me in the face so I'm able to recognize that I've documented appropriately, and, if appropriate, I can bump the code level up to where it belongs." —Dr. Douglas Golding, NextGen and Dragon Medical user, Medical Director and Chief of Healthcare Informatics, Lifetime Health Medical Group, Buffalo, NY

- **Practice Partners** (www.practicepartners.com), now a division of McKesson Provider Technologies, is a Dragon Medical authorized reseller. Clinicians use voice commands for many tasks when editing a progress note. For example, voice commands such as "Insert Template", "Insert Problem", "Insert Quicktext", and "Insert Procedure Code" can make entering notes even more efficient.

Other HCIT and EHR vendors which support Dragon Medical include the following vendors:

eClinicalWorks	GE	McKesson Practice Partner	eMDs
Eclipsys	Cerner	Meditech	Amazing Charts

Case Study: University of Washington Physicians Network

EpicCare®, developed by Epic Systems Corporation, is one of the most widely used EHRs in physician practices and clinics. Dragon® Medical speech recognition technology has been embedded into EpicCare for use by over 3,000 clinicians, who use computer-generated templates to create patient documentation. Using Dragon Medical, Epic EpicCare, and Epic Hyperspace have been speech-enabled to improve their ease of use, and in turn, the efficiency and productivity of medical professionals. Clinicians can use voice macros to select values from drop-down menus and use free-text dictation when needed.

The University of Washington Physicians Network (UWPN) has over 100 providers who use EpicCare powered by Dragon to create 95-97% of chart notes without the use of outside medical transcription. Prior to deploying speech recognition, UWPN providers required between 40% and 100% of their notes to be transcribed, incurring significant costs and delays in chart completion. Annualized transcription savings for UWPN run into the millions of dollars annually.

Conclusion

A perfect storm of prevailing market winds and advances in technology is poised to usher in the long-awaited era of electronic health records. The final tack needed to ensure widespread EHR adoption – making EHR software accessible to physicians in a way which supports their documentation preferences – is now within reach.

Recent physician surveys confirm that speech technology is an essential technology which makes EHR systems accessible and user-friendly – and improves clinician satisfaction.

"Not having patient notes in the appropriate charts at point-of-care affected our workflow and created significant difficulty with cross-coverage and ongoing patient care," said Dr. Betty Rabinowitz, M.D., associate professor of clinical medicine, University of Rochester School of Medicine. "Now, using Dragon Medical, physicians articulate the thought process behind their diagnostic and therapeutic decisions….We believe the presence of unique narrative sections that are specific to the patient and the encounter enable URMC to provide the best patient care."

New speech technology will make EHR software more usable regardless of location or client technology.

"I am not a typist," says Dr. Field. "Every EHR I have worked with requires the skills of a data entry clerk. When I have to type, I cut corners to save time and clicks on my hands. With Dragon speech recognition I capture my patient encounter, deliver excellent documentation to my colleagues through the EHR and produce a medical record that will stand up in court, if that should ever be necessary. I can't imagine using any EHR system without Dragon."

As speech accelerates physician adoption of EHR systems, the U.S. healthcare system will gain the benefits of slower healthcare inflation, improved outcomes and higher patient and clinician satisfaction alike.

The experience speaks for itself™

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