Speech Recognition: Accelerating the Adoption of Electronic Medical Records

NUANCE

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Summary

Electronic Medical Record (EMR) systems offer the potential to dramatically improve the cost and quality of healthcare. However, despite their potential and market forces favoring their adoption, EMR software is used by only 20% of clinicians in the U.S. today.

This white paper identifies forces both driving and inhibiting EMR adoption. EMR 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 medical records. Today, tens of thousands of clinicians use voice recognition to dictate findings into electronic records – far more than those documenting findings via typing or mouse-clicks.

The benefits of speech-enabled EMR systems include:

- Dramatically reduced transcription expense

- Improved patient care via complete documentation and faster results delivery

- Reduction in time spent documenting care

- Increased cash flow and revenue by the near-immediate completion of the full 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 EMR systems alone cannot address.

As EMR systems become web-enabled, new speech platforms will soon serve clinicians in an "on demand" manner, offering all dictation modalities as a web service. EMR vendors are embedding speech recognition seamlessly into their applications, further accelerating EMR adoption.

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

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

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

- **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 exchange could save $337 billion over a 10-year period in overhead 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 per-formance." Private and government payors base a portion of reimbursement on measurable outcomes. EMR systems are needed to keep score.

- **Federal government initiatives.** The Bush administration has set a goal of all Americans having an electronic health record by 2014. 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 provide staff physicians EMR equipment for their own use – a seismic shift given the initial estimate of $15,000 – $22,000 per physician, according to Frost & Sullivan.

- **Regional pilots.** Several high-visibility EMR programs are underway. One program, the Massachusetts eHealth Collaborative, has created a network of EMR systems. Blue Cross Blue Shield of Massachusetts committed $50 million to the initiative.

- **Support from employers who bear most healthcare costs.** Wal-Mart, Intel, British Petroleum and other major employers have launched an employee-owned electronic medical records system initiative linking physicians, hospitals, and pharmacies.

…Yet EMR Adoption Remains Slow

Despite strong government, payor, and employer support, however, EMR adoption remains low. According to Frost & Sullivan, only 20% of 900,000 clinicians use an EMR.

Why are doctors so reluctant to use EMR systems?

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

"Based on extensive, personal experience," says Eric Fishman, M.D., an orthopedic surgeon at Good Samaritan Medical Center in West Palm Beach, FL, and an expert on EMR systems. "I can unequivocally state that production of a medical record with a system that restricts the user to point and click templates exclusively is far from perfect. The predetermined templates of most EMRs simply cannot anticipate the full spectrum of facts presented by the patient which must be incorporated into the historical portion of their health record."

While some information is captured via "point and click" – choosing from a list of meds or allergies – the substance of an encounter requires the physician to use his or her own words. Clinical findings, patient descriptions, past medical and social history, and correspondence all require that the physician "dictate" using unrestricted free text.

"Interviewees reported that most physicians using EMRs spent more time per patient for a period of months or even years after EMR 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 EMRs to be challenging to use because of the multiplicity of screens, options, and navigational aids. Problems with EMR usability—especially for documenting progress notes—caused physicians to spend extra work time to learn effective ways to use the EMR. These substantial initial time costs are an important barrier to obtaining benefits, as greater burdens on physicians' time decrease their use of EMRs, 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

Clinicians Agree: Speech Makes EMR 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 onramp for clinicians to drive EMR systems. Speech recognition technology has been shown to:

- Help physicians use EMR systems without changing their documentation methods.

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

This finding was supported by a May 2007 report issued by KLAS (www.healthcomputing.com) identifying that:

- Three-quarters (76%) of the clinicians using "desktop" speech recognition – directly controlling an EMR 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 EMRs 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 EMR 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 EMR systems more effective when driven by speech. Searches, queries, and form filling are all faster to perform by voice than using a keyboard. Charting, prescription writing, aftercare instructions, order entry, database searches, and clinical documentation are all highly conducive to control by speech.

Speech recognition software can be customized to record voice macros or templates of frequently used reports. These macros – pre-defined templates with standard elements to guide the physician's documentation – 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 EMR can easily be accessed with macros or by speech-enabling the EMR system using a software development kit.

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	University of California, San Francisco Medical Center	United States VA Hospital System
Partners Healthcare	University of Washington Medical Center	Baylor Health Care System
Kaiser Permanente	University of Michigan Hospitals and Health System	Advocate Health
Intermountain Healthcare		USC – Keck School of Medicine
Cleveland Clinic	Stanford Hospital and Clinics	NYU Medical Center
The Mayo Clinic	Hospital of the University of Pennsylvania	University of Virginia Health System
Brigham and Women's Hospital		UCLA Healthcare
New York-Presbyterian Hospital	Lahey Clinic	Catholic Healthcare West
Duke University Medical Center	University of Pittsburgh Medical Center	Massachusetts General Hospital
Barnes-Jewish Hospital/Washington University	Providence Health	Sutter Health
	Lifetime Health	St. Joseph's Healthcare
		Wellspan

Benefits Are Substantial

Speech-driven EMR users report the following benefits:

- **Reduced transcription expense.**

  – *EMR systems driven by speech can enable clinicians to dictate substantial sections of the medical record in "free-text" directly into the EMR, using their own words, without having to rely on transcription. Speech-driven EMR 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 EMR 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.**

    – *Length of stay can be affected by the immediacy and completeness of documentation. Average variable cost per bed in the U.S. is between $300 and $800 per day. By having patient notes immediately available for hospital case workers and discharge planners, unreimbursed days can be reduced, improving cash flow and revenue.*

    – *As patient charts created using speech recognition are available almost immediately, outpatient practices can deliver charge capture information, a superbill, and supporting clinical information to billing far more readily – in a matter of minutes – than handwritten notes.*

    – *Voice-enabled speech templates can require capture of "pay for performance"-related documentation, increasing reimbursement and practice revenue.*

"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."

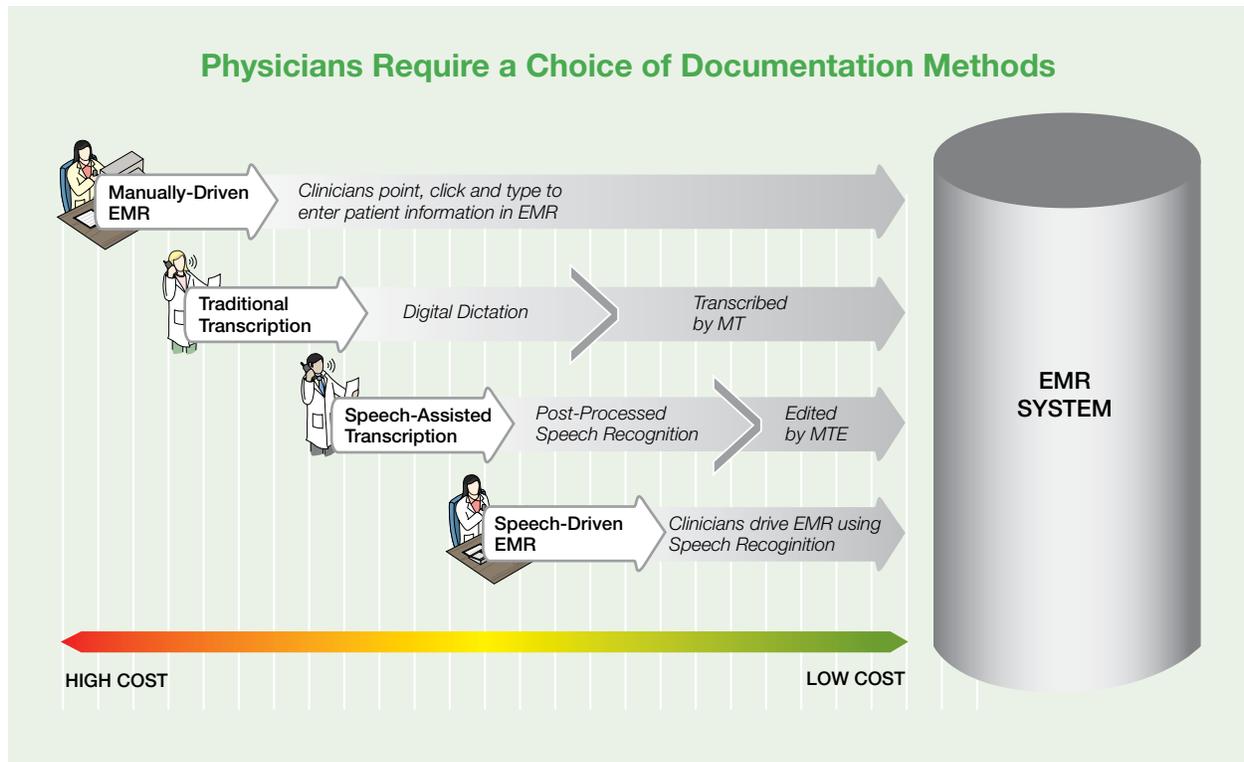## Speech Recognition Supports Many Physician Documentation Styles

Physicians understandably exhibit a wide range of comfort with using medical software. While Physician A may readily adapt to controlling an EMR 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 EMR, 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 EMR,** where clinicians use neither traditional nor speech-assisted transcription services within the EMR 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 EMR systems. Traditional dictation is the most labor-intensive and therefore the least cost-effective method of documenting findings in an EMR.

- **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 EMR. 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 EMRs**, where clinicians can dictate directly into free-text fields of the EMR 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 EMR system with a single voice command – improve ease of use immensely.

These 4 methods are identified in the figure below.

Physicians Require a Choice of Documentation Methods

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

Traditional Transcription — Digital Dictation → Transcribed by MT

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

Speech-Driven EMR — Clinicians drive EMR using Speech Recoginition

EMR SYSTEM

HIGH COST — LOW COST

Freedom of Speech Will Increase Chances of EMR Success

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

- **Physicians should be offered 'freedom of choice' within a practice or hospital.** Physician A should be able to use an EMR system driven by his voice, while Physician B uses a traditional transcription solution where dictation is stored in the EMR.

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

"The historical portion of the patient medical record should not be truncated to fit a narrow range of template options and speech recognition technology enables the physician to dictate the entire patient history and any other patient data into the EMR," says Fishman.

EMR Vendors Embed Speech into Their Products

Leading EMR 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 EMR products for ED, small physician practice EMR and TouchWorks have been released with a standard, "plug and play" interface with Dragon. Physicians who use Allscripts EMR 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 EMR 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® EMR… 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 EMR." —Dr. Robert Frank, Epic and Dragon Medical user, Advanced Healthcare, Milwaukee, WI

- **NextGen** (www.nextgen.com), a provider of integrated practice management and EMR 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 ocumented 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 EMR vendors which support Dragon Medical include the following vendors:

eClinicalWorks	**GE**	**McKesson**	**Siemens**
Eclipsys	**Cerner**	**Meditech**	**Athenahealth**

Case Study: University of Washington Physicians Network

EpicCare®, developed by Epic Systems Corporation, is one of the most widely used EMRs 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 medical records. The final tack needed to ensure widespread EMR adoption – making EMR 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 EMR systems accessible and user-friendly – and improves clinician satisfaction.

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

"I am not a typist," says Dr. Field. "Every EMR 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 EMR and produce a medical record that will stand up in court, if that should ever be necessary. I can't imagine using any EMR system without Dragon."

As speech accelerates physician adoption of EMR 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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