



Speech Recognition in Electronic Medical Records

A Review of Industry Impact

A Cyber Records, Inc. White Paper

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A Little Bit Of History

For centuries, physicians all over the world practiced medicine without the need *for* or benefit *of* medical records. In the past 80 years or so, medical records have evolved considerably, in line with increasing complexities involved with healthcare delivery. Today, dramatic changes in the U.S. healthcare delivery system have put enormous pressure on medical service providers to reduce costs, improve the quality of care given, and to provide best-of-care in less costly settings.

These pressures cannot be effectively addressed without the compilation and utilization of patient data across hospital/clinical boundaries. Clearly, all care providers in the patient circle must have access to care outcomes, different treatments rendered and their costs, and tools to monitor the quality of care provided. Thus, accurate, accessible, shareable, and real time health information is critical to meet the challenges.

Ineffective Medical Documentation Comes At A High Expense

In traditional times, the U.S. healthcare system has been inundated with illegible, inaccurate, outdated, or incomplete medical documentation that prevents healthcare organizations and professionals from meeting patient quality of care expectations. According to a June 2002 Report On Information Capture and Report Generation by the Medical Records Institute, a poor quality medical records management system affects five primary areas in our healthcare system:

- 1) **Patient Safety** — To provide for the utmost patient safety, medical information must be legible and accurate to avoid misinterpretations.
- 2) **Public Safety** — Public health is threatened by the inability to collect information in a coordinated, timely manner at the provider level, especially in the case of an epidemic or the threat of terrorism.
- 3) **Continuity of Patient Care** — Quality patient care cannot be consistent when information is not (or cannot be) shared across patient care provider systems.
- 4) **Healthcare Economics** — The cost of information capture and report generation (currently estimated to be well over \$50 billion annually) adversely affects healthcare economics.
- 5) **Clinical Research and Outcomes Analysis** — A lack of uniform information capture that is needed to facilitate the derivation of data from routine patient care documentation adversely affects outcomes.

The Evolution Of Medical Records

Documenting patient care information involves two core processes: 1) capturing data from the patient *and* during the care delivery process; and 2) generating the appropriate medical reports.

In the past, medical records were comprised primarily of handwritten notes and charts. However, this method of creating health records has many critical disadvantages such as illegibility, wasted time in producing and interpreting records (time consuming), errors in

diagnoses, treatment, and billing, the process is fatiguing for healthcare professionals, and lost or misplaced records.

After many years of generating handwritten medical records and reports, the process of creating medical records through transcription evolved — which offers its own set of challenges. Transcribed medical records are extremely costly to produce and lack a *real-time* element, which often leads to detrimental delays and oversights in treatment and diagnoses. Although transcription does eliminate the problem of illegibility, as charts are stored and retrieved as computer files, because they are purely text-based, they lack connection with databases, simply existing as standalone records — unable to be integrated with other records and provider systems.

In recent years, computerized patient records (CPRs) or electronic medical records (EMRs) have caught the attention of healthcare delivery organizations and providers, and have facilitated the creation of automated medical records systems, with document imaging and interfaces to core components of healthcare delivery across care delivery facilities and practices (e.g., consultations, referral notes, prescriptions, ordering and procuring laboratory tests, and patient billing). More advanced systems enable connection between one more healthcare enterprises, enabling information sharing and unified patient care profiles.

Why Do We Need EMRs?

There are significant advantages to storing health records electronically, including:

- ▶ Real time Information sharing among geographically dispersed medical service providers' systems
- ▶ Reduced or contained healthcare delivery costs
- ▶ Improved documentation that supports billing service levels (better coding)
- ▶ Meets HIPAA and other new requirements of legal, regulatory, or accreditation standards
- ▶ Enables remote and mobile access to patient records
- ▶ Eliminated transcription costs and reduced materials expenses
- ▶ Enhanced practice growth due to greater patient satisfaction
- ▶ Better time utilization and accurate, cost-effectively reproduced medical records
- ▶ Automatic bill creation and immediate charge-capture

Why Voice Recognition?

NLP (natural language processing) enables medical text to be converted to the discrete facts that it contains. Speech is critical to effective, real time medical record generation because it enables text to be input rapidly and flexibly (from remote, mobile, and physical locations).

Implementing a speech-based user interface allows medical professionals to input information into the medical record in the most natural, least distracting way possible. Additionally, information is updated throughout the medical record system for truly, up-to-date patient data. Report generating and imaging complements voice technology in EMRs, by creating a

simplified, cost- and time-effective method of creating and maintaining records that can be shared across multiple provider platforms. The future promises speech-input capabilities from any device such as PDAs, PCs, handheld microphones, and headsets from any location and real time accessibility from any touch point.

Additionally, because speech is captured and converted to text instantaneously, the process enables real-time or near real-time feedback to the user to verify the accuracy of speech recognition. Today, the use of speech recognition is becoming routine in several specialty settings such as radiology and pathology.

According to Gartner, by 2005, speech recognition will be the preferred method of physicians and nurses for capturing text data. Moreover, specialty customized and controlled medical vocabularies (CMVs) will help to standardize medical data flowing through EMRs. A CMV provides a central dictionary of medical terms that a healthcare facility's systems can use and recognize for automated record and report generation. Gartner suggests that by year-end 2004, a CMV will be critical to supporting the clinical documentation and decision support functions of the EMR that healthcare delivery professionals demand.

Key Industry Trends

Emerging EMRs with sophisticated, natural language processing is critical to healthcare transformation. Specifically, voice recognition capability in EMR generation effectively addresses the most crucial pressing issues in the industry identified by Gartner:

- ▶ **The Health Insurance Portability and Accountability Act (HIPAA)** — As a sub-section of this act, the Department of Health and Human Services (DHHS) was directed to establish patient privacy rules, as well as patient data confidentiality and security rules.
- ▶ **Reduced Medical Errors** — In 2000, the Institute of Medicine published a report entitled *To Err is Human: Building a Safer Health System*, which estimated that up to 100,000 Americans die each year in hospitals due to medical errors, at a cost of up to \$30 billion. EMRs have been promoted as a method of reducing medical errors, as EMRs can be used to deliver point-of-care decision support
- ▶ **A Renewed Focus On Bioterrorism** — Since September 11th, there has been a greatly renewed focus on bioterrorism. As outlined in a 1999 Institute of Medicine report entitled *Chemical and Biological Terrorism: Research and Development to Improve Civilian Medical Response*, a vital need in the event of a bioterrorist attack is the ability to rapidly detect unusual spikes in infectious disease prevalence in a given geographic area, and this can only be done via the wide integration of EMR systems. Washington is realizing the need to integrate EMR systems to combat this threat, even if this leads to the loss of some patient privacy.
- ▶ **Rising Healthcare Costs** — Tremendous pressure is on healthcare providers to deliver highest quality care at the lowest cost possible. EMRs have proven to reduce the cost of care delivery, significantly.

About Cyber Records, Inc.

Founded in 1995, Cyber Records, Inc. is a privately owned and operated corporation, headquartered in Lawrence, New York.

Cyber Records develops and markets state-of-the-art electronic medical records applications and tools, including interactive voice recognition technology and digital imaging to streamline and automate the medical records process for healthcare professionals.

Cyber Records' flagship product, MediChart Express™ (electronic medical record software with voice recognition and medical vocabulary technologies), and Endo Express™ (voice activated reporting tool for endoscopy procedures) are sophisticated, proven electronic medical records with voice recognition solutions deployed in a growing client base. Cyber Records provides practice support services, including physician office technology assessments and products installation and training, in order to ensure a seamless technology adoption process for healthcare professionals.

Our Mission & Vision

To resolve a primary deficiency in current clinical applications — the lack of a sophisticated electronic medical records solution with voice recognition capability. We envision a reformed healthcare industry through utilization of innovative information technologies. We strive to enable care delivery professionals to make a smooth technology migration for optimum care delivery and effective patient relationship management.

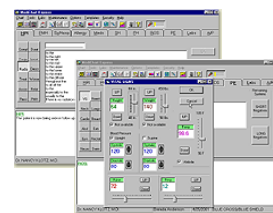
Our Solutions

MediChart Express™ is a comprehensive electronic medical records technology that addresses the critical challenges raised by the need for shareable, accurate, and accessible healthcare information in the healthcare industry.

Endo Express™ is a voice activated reporting tool for endoscopy procedures, that automates the creation of computerized gastrointestinal (GI) consult letters and endoscopic reports.

MediChart Express™ and Endo Express™ have a strong set of ingredients for success, including 99% proven dictation accuracy, modest training requirements, digital imaging functionality, and the ability to adapt to a variety of client-specific workflows.

MediChart Express™ is a near complete product under testing, scheduled for commercial launch in January 2003. Endo Express™ is currently functioning in a growing base of medical centers and private physician groups.



MediChart Express™



Endo Express™

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