Voice Recognition as part of an Electronic Health Record at the North Bronx Healthcare Network

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2003 CHIME INNOVATOR OF THE YEAR AWARD SUBMISSION
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Abstract

In December, 2001, Jacobi Medical Center (JMC), a member of the New York City Health and Hospitals Corporation, embarked on a two year adventure which would radically change the way in which health care processes would be delivered. Beginning with executive planning and negotiations, including requirements collection, workflow redesign, network infrastructure construction, workspace redesign, system development, staff training, and hard work. the entire hospital participated in this milestone project.

On February 4, 2001, the first few units "went live" and began the process of using the Voice Recognition as a means of recording daily progress notes for physicians directly into our electronic health Record. Our EHR is a product from MYSIS (formerly Per-Se Technology called Patient 1. Clinicians use this product to manage all aspects of clinical care including order entry and results reporting. Admission physicals, consults, vital signs, patient histories, allergies, medications, orders, surgical encounters ect, were already incorporated into the system, and daily progress notes form patient encounters were the final element needed to complete the EHR.

This submission will describe the nature of the evolution of Voice Recognition in the electronic health record at the North Bronx Healthcare Network and outline evidence to show that the initial needs which justified the system were met and provided an increase in functionality for our clinical staff.

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OVERVIEW OF THE ORGANIZATION

As the largest health care delivery system in the Bronx and one of the largest in New York City, the North Bronx Healthcare Network (NBHN) has developed a worldwide reputation of distinction. It is renowned for its primacy in the delivery of emergency and trauma services, has developed an image of excellence as a provider of choice subspecialty care, and is widely recognized for its devotion to the health care needs of the large and diverse community it serves.

The NBHN, an academic affiliate of the Albert Einstein College of Medicine, is a member network of the New York City Health and Hospitals Corporation (HHC). As the biggest municipal health system in the country, the HHC oversees the delivery of public health care in all five boroughs. It provides one-fifth of the total number of discharges and more than one-third of the emergency services and hospital-based clinic visits in all of New York City.

The NBHN's acute care facilities are located at both Jacobi Medical Center (JMC) in the Northeast Bronx and North Central Bronx Hospital (NCBH), and comprise approximately 975 beds. These facilities have developed a reputation for expertise in a number of specialty areas. Jacobi's Level 1/Trauma Emergency Department is one of the busiest in New York City. Treating nearly 180,000 patients per year, it has achieved international recognition in the field of trauma care. Jacobi's Pediatric Emergency Department was lauded by *New York Magazine* as one of just four of the best Pediatric ERs in New York. Jacobi's Burn Unit is considered a pioneer in early surgical intervention to preserve skin and minimize infection. Its Hyperbaric Chamber is the only multi-person chamber in the tri-state area. New York State has recently recognized Jacobi's Neonatal ICU for its excellence in this highly-specialized field by designating it as a Regional Perinatal Center, one of only nineteen facilities across the state to earn such designation. NCBH is a leader in the field of primary care. Its Midwifery Program is the largest of its kind in New York City. Its Partial Hospitalization Program is a unique and highly successful approach to services for the mentally ill, providing daily therapeutic intervention while allowing patients to live at home. Additional outpatient care is provided at four satellite ambulatory care clinics: the Health Centers at Crotona, Gunhill, Tremont, and Glebe.

Professional services are provided on a contractual basis by the New York Medical Alliance (NYMA), representing 863 employed physicians. The NBHN employs Nurse Practitioners, Midwives, Physician Assistants, and Registered Nurses, all of whom work under the supervision of the aforementioned attending physicians. As a teaching affiliate of the Einstein College of Medicine, the NBHN also has significant numbers of residents and medical students serving rotations in most of the clinical specialties, under the direct supervision of the attending doctors.

The NBHN is located in Bronx County, one of the five boroughs of New York City. With more than 1.3 million inhabitants and an 11% increase in population between the years 1990 and 2000, the Bronx is considered one of the fastest-growing counties in New York State.

Much of this population growth is due to accelerated migration. Nearly 30% of the borough's total population was born outside the U.S., and an additional 13% were born in Puerto Rico. Hispanics account for nearly one-half of the borough's population.

The Bronx is New York City's poorest borough, with a median household income considerably lower than city, state, and national averages. Close to 30% of the total population has an income below the federal poverty level. Per capita income in the Bronx is at $20,319, significantly below the national average of $28,546.

The Bronx has consistently demonstrated the highest annual percentage of infants with low birth weight over other boroughs (peaking at 10% in both 1997 and 1998). Percentage of births to women less than 20 years of age is also substantially higher in the Bronx. Generally, the Bronx demonstrates high rates of serious illness (including HIV/AIDS, asthma, diabetes, heart disease, and cancer), high rates of sexually-transmitted diseases, an unusually high proportion of chronic substance abuse, and generally high morbidity and mortality rates.

With the patient at the center of our efforts, the North Bronx Healthcare Network's mission as a public health facility is to serve the Bronx community by providing high-quality, cost-effective health care in a respectful way for all, regardless of ability to pay. Although profit is not the primary incentive in the provision of these services, the challenge in this time of limited fiscal resources and stringent budget restrictions is to maintain a standard of clinical excellence while striving for unprecedented levels of efficiency and cost-containment. Clearly, the Computerized Patient Record has and continues to be the key to meeting this challenge.

During the ten years in which the Electronic Health Record (E.H.R) has been implemented at the NBHN, A Dramatic increase in user acceptance and functionality was realized in 1999 when to corporation hired Daniel Morreale as it's new Chief Information Officer. Mr. Morreale brought a vision of a consolidated EHR and implemented a series of projects and initiatives to enable the system to more closely resemble the clinical workflow, and provide for easy access and input into the electronic record.   This voice recognition project marks yet another successful project realizing an increase in revenue and ease of use by all staff.

PROBLEM

The organization had an electronic health record which contained all information concerning a patient's care with the exception of progress notes from clinical visits which were still done on paper. Because of the large volume of visits provided by the North Bronx Healthcare Network the medical record department needed to deliver over 1800 charts per day to five different buildings on the campus. This represented a significant cost to the organization. In addition the handwriting in the notes was often difficult to read, and did not always capture all of the procedures performed during a visit. The lack of detail was jeopardizing revenue, because the billing department was unable to bill at an optimal level. Physicians acknowledged the problem but complained they were too busy to type the notes into the EHR. Billing claims were being denied at almost 49% due to poor or unreadable documentation. Facing a potential multimillion loss of revenue the organization initiated this project to improve clinical documentation and quality.

PROJECT OBJECTIVE

To improve patient safety and reimbursement by using voice recognition technology to generate a structured clinical note with appropriate diagnosis and procedure codes in the treatment environment which will reduce claim denials by at least 30%

<u>PLANNING</u>

Based on its previous successful implementation record for systems of various types, Mr. Morreale acquired funding and assembled a team of physicians, executives, IT professionals, and vendors to build a series of voice recognition product templates to provide the physician with a structured progress note to document a clinical visit with a patient.

From the project's inception, Mr. Morreale played a pivotal role in championing the development of the system. By actively soliciting and securing clinical participation including endorsement and support from the Medical Staff, serving as the chair I.T. Executive Committee, and advocating tirelessly to assure adequate funding as well as project control from the corporate leadership, the CIO was a critical component to the ultimate success in transition to VR.

A cross-disciplinary Project Team was created, comprised of well-recognized medical, nursing, and administrative staff. The institution's Medical Director was designated Physician Project Leader, and the Deputy Director of Nursing was designated Nursing Applications Project Leader. In addition, the institution's Risk Management Department, General Counsel, and Defense Counsel participated regularly in discussions and planning during both development and implementation.

IMPLEMENTATION

Over the course of two months an exhaustive collection of work flow information was amassed by the Project Team. In keeping with the hospital's method of operation, this task was organized by clinical service. Representatives from each department provided the attention to detail that proved critical to the development of methodologies which would ultimately be found acceptable by end users. Working with a local vendor, (VoiceBrook, INC.) a leader in voice recognition technology, the project team completed a model using DragonSpeak, Medical Version, as the foundation of its VR initiative. Departmental clinical workflow was defined and the pertinent data elements to each encounter were identified. Voice recognition templates were created by service, providing a list of diagnosis and procedure codes by frequency of use in each department. Additionally a review of system workflow was developed into the VR template to assist the clinician in the completion of a comprehensive progress note. The templates provided the opportunity to capture discreet data needed for billing and clinical analysis as well as narrative information often useful in treating patients successfully. When the System was determined acceptable for use, user training began. For one month prior to activation and one month after implementation all clinical users were provided around the clock support and training.   In addition band width and desktop computers were upgraded. Each PC was furnished with a Philips Speech Mike to provide optimum recognition. Dragon Speak, Medical Edition – Enterprise version, was loaded onto a high speed, highly reliable server, which also housed individual voice files for each of the 450 physicians A customized interface was developed to upload the dictated and electronically transcribed treatment file into the Patient 1 system.
As the clinical moved through he structured voice recognition template the system would identifying and catalog the appropriate CPT-4 codes and diagnosis codes associated with appropriate billing.

EVALUATION

Pursuant to JCAHO Management of Information standards, numerous indicators were identified, monitored monthly, and reported to the HIS Executive Committee. High on-line availability was a primary goal to ensure system acceptability and credibility. In this fashion, the quality and integrity of the CPR was assured. The first (pilot) units to go paperless were the GI and Urology Clinics. With the enthusiastic support of the Chiefs of those services, the project began auspiciously in spring 2001. .

After piloting for several months, it was time to go forward with other units, for the following inpatient and outpatient services: Adult Medicine Pediatric Medicine, Neonatal ICU, OB/Gyn, Labor and Delivery, Respiratory Therapy, and Radiology.

During these months there was a slow but steady increase in use of the VR system. Six months after the system was used by a department for at least 90% of their visits, the medical record department stopped delivering paper charts. By April 2003 all adult and pediatric visits were documented via VR, and all high volume sub-specialties were also live on the system. This represented 82% of the nearly 1,000,000 visits.

By June 2003 that number of denied claims for poor or lack of documentation was reduced to 17%. This improvement resulted in improved cash flow and reduced denials. In addition, better quality notes and documentation are now stored on the electronic medical record providing a more consistent delivery of care and treatment for scheduled and non- schedules patients. The organization realized an improvement in revenue of nearly $8,000,000, and a reduction in AR of 13 days.

The investment in the project was:

Personal Computers	480,600
Licensure	430,000
Template Development	324,000
Phillips Speech Mikes	60,592
Installation, Hardware and Software	257000
Training and Support	105,300
TOTAL INITIAL INVESTMENT	**$ 1,657,492**

This provides a ROI of nearly 4 to 1. The project was deemed a success by the organization, and plans are now being made to bring the smaller clinics and services on line with Voice Recognition.