



# CRESCENDO



## *Wireless Speech Recognition in the ER: a North American First*

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> *Spread the word...*



> *Introduction*

# Stephen E. Rosenthal, M.D.

Sir Mortimer B. Davis-Jewish General Hospital, a teaching hospital of McGill University in Montreal, Quebec, Canada

- Emergency Medicine Specialist
- Associate Director of Medical Informatics
- Admissions Coordinator and an Associate Director of the Emergency Department

Vice-president, Emergency Specialists, Québec

Member of the Canada Health Infoway Standards Committee for Interoperable EHR

Participates on committees for the Ministère de la Santé et des Services Sociaux (Quebec Minister of Health) on Emergency Department overcrowding and computerization



# The Jewish General Hospital in Montreal, QC

637 beds

One of the three busiest hospitals in Quebec with **65,000** ER visits / year

**1000+** Physicians





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> *Spread the word...*



> *Project History*

# No headline news...

Missing clinical information at the point of care results in either:

- Delayed care
- Inefficiencies
- Potential duplicate medical service

Documenting care properly in an over-congested ER Department where there is with a lot of patient movement is extremely difficult

Handwritten documentation may not be legible

Traditional dictation-transcription is not an option because of the mobility requirements inherent to the ER Department



# Initial project objective

Based on these facts, it made sense to us that the dictation process was the central beam to be consolidated, with the following objectives:

- Put an end to handwritten medical documentation
- Accelerate turnaround
- Allow for immediate accessibility of patient history / clinical documentation
- Ensure critical data availability at the point of care

At the same time, we needed a system that would fit our working conditions, not the other way round

Project initiated in 2003 with:

- PDA dictation, without any speech recognition
- Speech recognition pilot started in 2004



# Knocking out initial challenges

## Wireless system

- Managing WiFi network (slowness, delays, etc.)
- PDA technology WiFi readiness

Fine-tuned WiFi software and hardware

## Microphone sound quality

Unidirectional PDA microphone particularly efficient on iPaq 6900

## Background noise

SpeechMagic background noise cancellation provide top-notch output quality

## Physicians' initial skepticism re:

- Speech Rec. overall efficiency
- Time required for charting process
- Ease of patient selection

Communications plan and training

Physicians were surprised by accuracy rate and ease of use

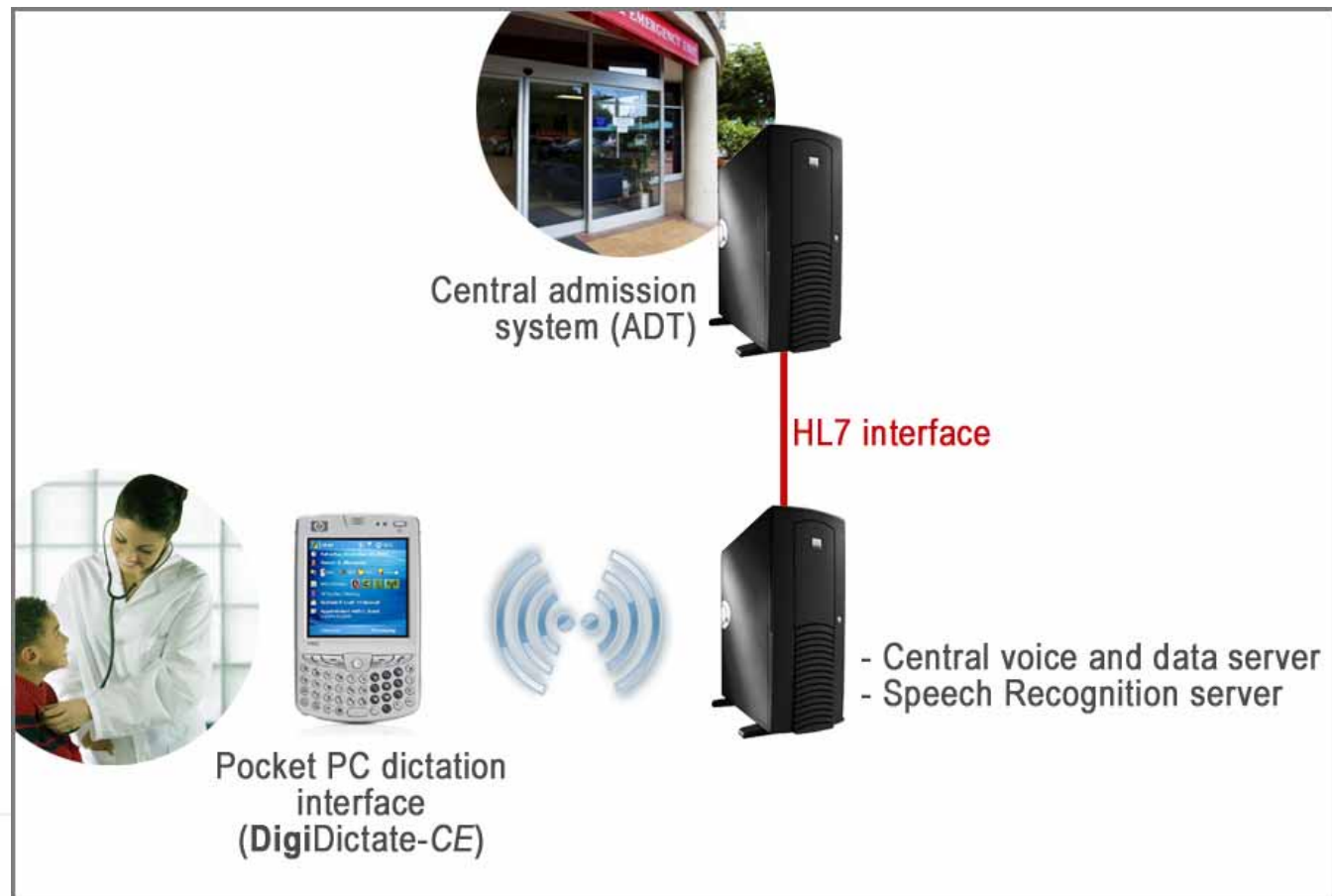


# Today

A department-wide wireless speech recognition system:

- Using PDAs as dictation devices
- Integrated with central ER and ADT system

A first in the management of ER documentation





# CRESCENDO

> *Spread the word...*



> *From the ER  
physician's perspective*

# 1. Patient list and ADT Interface

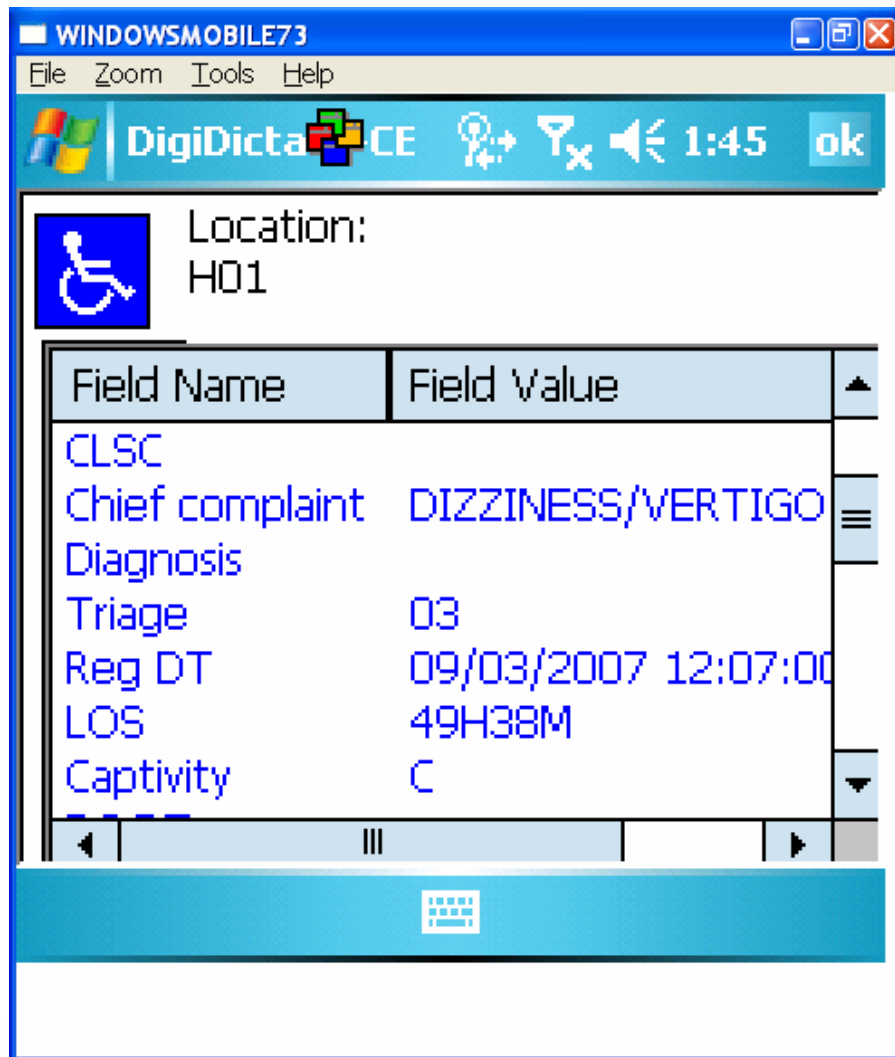
E...	...	Pat Name
BL	D	E., JOHN
BL	D	M., CATHY
COR	A	J., SARAH
COR	A	M., STEVE
COR	A	D., BILLY
COR	D	H., WILLIAM
H01	A	P., HANS JR.
H03	A	H., CHRISTOPHER

HL7 ADT Interface recognizes subject and related demographic data inside the ER system (as populated by the ADT and ER systems) and merges them into the central dictation-transcription database

Every time a new patient is admitted, related data is instantly populated on the screen, thereby eliminating the need for manual data entry



## 2. Case details



The screenshot shows a Windows Mobile application window titled "WINDOWSMOBILE73". The interface includes a menu bar with "File", "Zoom", "Tools", and "Help". Below the menu is a status bar with the text "DigiDicta CE", a signal strength indicator, a filter icon, a speaker icon, the time "1:45", and an "ok" button. The main content area displays "Location: H01" next to a wheelchair accessibility icon. Below this is a table with two columns: "Field Name" and "Field Value".

Field Name	Field Value
CLSC	
Chief complaint	DIZZINESS/VERTIGO
Diagnosis	
Triage	03
Reg DT	09/03/2007 12:07:00
LOS	49H38M
Captivity	C

At the bottom of the screen is a keyboard icon and a navigation bar with back, home, and forward buttons.

Physician clicks on patient name to view case details

Details such as bed location are updated in real-time from the central ER system thanks to the wireless ports and the Crescendo software interface



# 3. Dictation

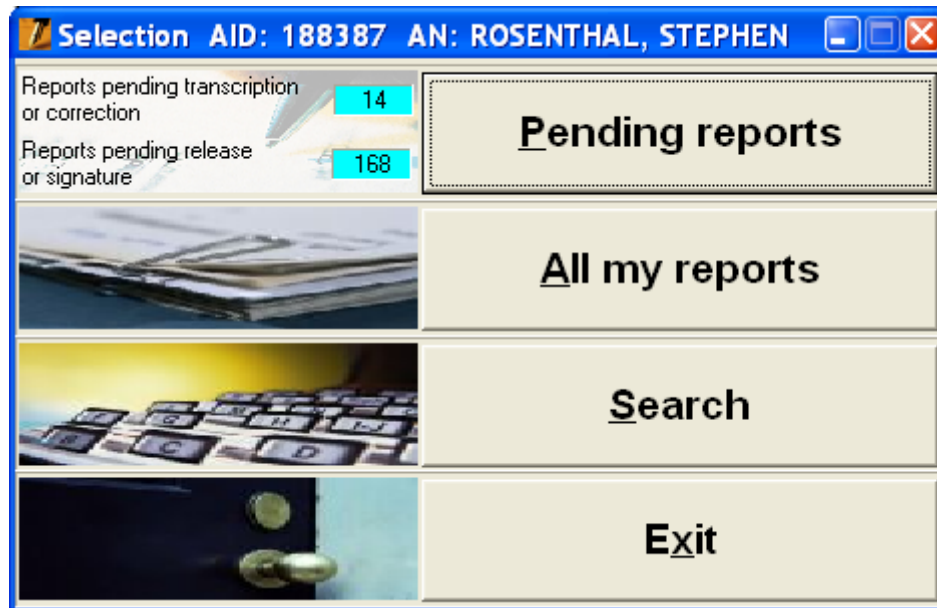
To start a dictation, the physician simply selects a patient from the list and presses the record button

Physician dictates directly with built-in PDA microphone

Dictation immediately streamed to the speech recognition server upon completion through wireless connection



# 4. Correction



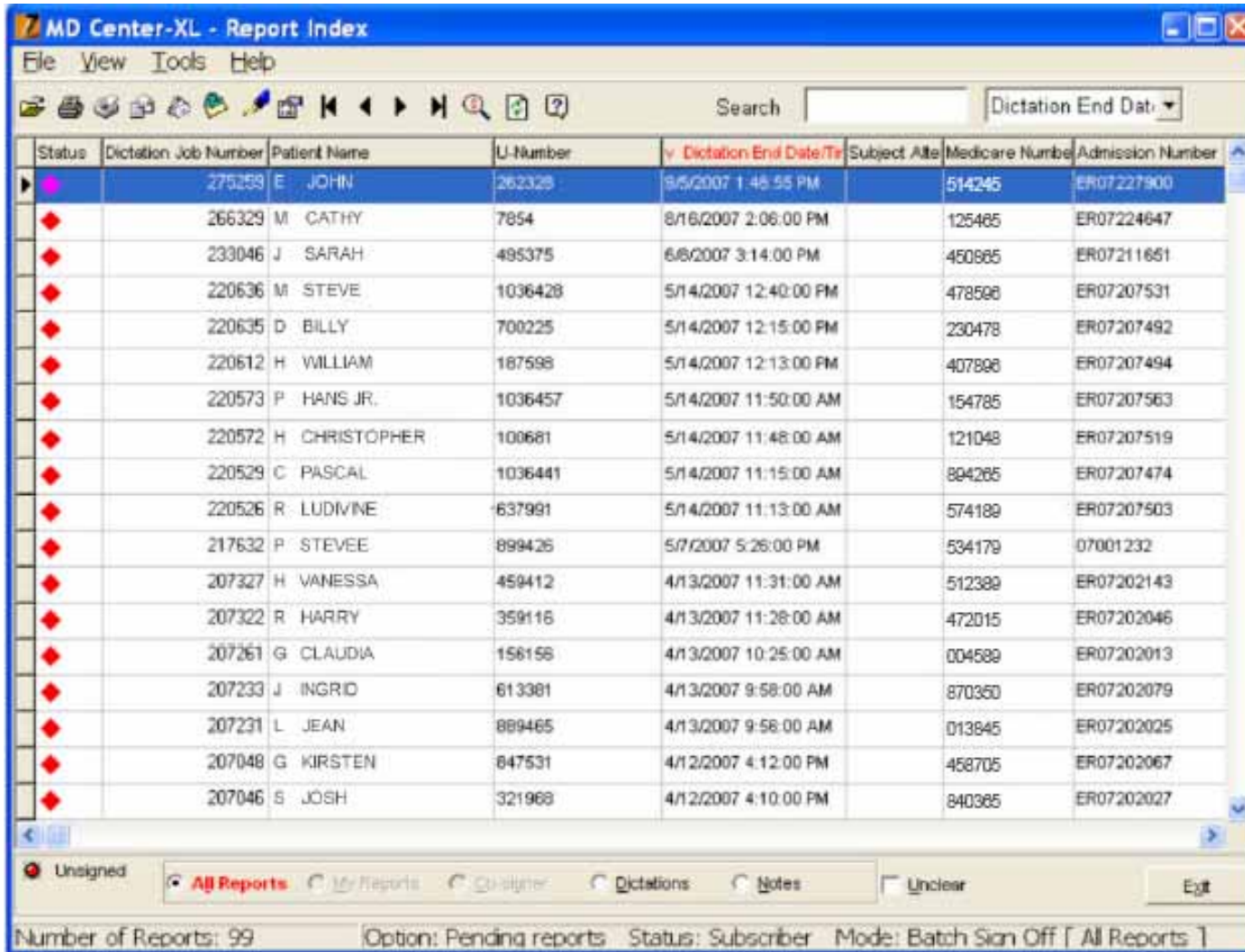
Report returned within a couple of minutes

Can see number of pending reports

- To be corrected
- To be signed off



# 4. Correction (cont')



The screenshot shows the 'MD Center-XL - Report Index' application window. It features a menu bar (File, View, Tools, Help), a toolbar with navigation icons, and a search field. The main area is a table with columns: Status, Dictation Job Number, Patient Name, U-Number, Dictation End Date/Ti, Subject Aite, Medicare Number, and Admission Number. The first row is highlighted in blue. All other rows have a red diamond icon in the Status column. The bottom status bar shows 'Number of Reports: 99', 'Option: Pending reports', 'Status: Subscriber', and 'Mode: Batch Sign Off [ All Reports ]'.

Status	Dictation Job Number	Patient Name	U-Number	Dictation End Date/Ti	Subject Aite	Medicare Number	Admission Number
	275259	E JOHN	262328	9/5/2007 1:48:55 PM		514245	ER07227900
◆	266329	M CATHY	7854	8/16/2007 2:06:00 PM		125465	ER07224647
◆	233046	J SARAH	495375	6/6/2007 3:14:00 PM		450865	ER07211651
◆	220636	M STEVE	1036428	5/14/2007 12:40:00 PM		478568	ER07207531
◆	220635	D BILLY	700225	5/14/2007 12:15:00 PM		230478	ER07207492
◆	220612	H WILLIAM	187598	5/14/2007 12:13:00 PM		407898	ER07207494
◆	220573	P HANS JR.	1036457	5/14/2007 11:50:00 AM		154785	ER07207563
◆	220572	H CHRISTOPHER	100681	5/14/2007 11:48:00 AM		121048	ER07207519
◆	220529	C PASCAL	1036441	5/14/2007 11:15:00 AM		894265	ER07207474
◆	220526	R LUDIVINE	637991	5/14/2007 11:13:00 AM		574189	ER07207503
◆	217632	P STEVEE	899426	5/7/2007 5:26:00 PM		534179	07001232
◆	207327	H VANESSA	459412	4/13/2007 11:31:00 AM		512389	ER07202143
◆	207322	R HARRY	359116	4/13/2007 11:28:00 AM		472015	ER07202046
◆	207261	G CLAUDIA	156156	4/13/2007 10:25:00 AM		004589	ER07202013
◆	207233	J INGRID	613381	4/13/2007 9:58:00 AM		870350	ER07202079
◆	207231	L JEAN	889465	4/13/2007 9:58:00 AM		013845	ER07202025
◆	207048	G KIRSTEN	847531	4/12/2007 4:12:00 PM		458705	ER07202067
◆	207046	S JOSH	321968	4/12/2007 4:10:00 PM		840365	ER07202027


Correction takes place on desktop computer  
Physician selects dictated file that he wants to correct and sign off



# 4. Correction (cont')

Doc#: 209387 SN: RYHPAN, JULIA SID: 262328 AN: ROSENTHAL, STEPHEN FID: 1 WTID: 55 (unsigned reports.) - Report

File Edit View Insert Format Help FlashPaper Type a question for help

	Hôpital Général Jaf Sir Mortimer B Davis Jewish General Hospital	U-26328 F. MONIQUE
	URGENCE EMERGENCY NOTES DE MEDECINE DOCTOR'S NOTES	1959-03-17 <u>5953171531</u>

This patient is here for abdominal pain.  
She is known for scleroderma as well.

On exam, her abdomen is benign.  
The plan is for admission and for workup including colonoscopy and gastroscopy.

Stephen Rosenthal, MD  
Médecin Traitant / Attending Physician  
D: 2007-09-05 13:46:55 SR: T: 2007-09-05  
275259


- ▶ Automatic template pull up
- ▶ Over 90% accuracy
- ▶ Correction using synchronous playback

Slp Sign Off Previous Next Save & Exit

00:00 DD: 300, SP, VlanAuth: 00:36

# 5. Electronic Signature

The screenshot shows a medical report viewer window. The title bar reads "Doc#: 209387 SN: RYSHPAN, JULIA SID: 262328 AN: ROSENTHAL, STEPHEN FID: 1 WTID: 55 (unsigned reports.) - Report". The menu bar includes "File", "Edit", "View", "Insert", "Format", "Help", and "FlashPaper". The toolbar shows various icons and a "100%" zoom level. The main content area displays a document with a header table and a signature verification dialog box.

	Hôpital Général Just Sir Mortimer B Davis Jewish General Hospital	U-362328 P. MONTQUE
	URGENCE/EMERGENCY NOTES DE MEDECINE DOCTOR'S NOTES	1959-03-17 <u>3953121531</u>

This patient is here for abdominal pain.  
She is known for scleroderma as well.

On exam, her abdomen is benign.  
The plan is for admission and for workup including colonoscopy and gait analysis.

Stephen Rosenthal, MD  
Médecin Traitant / Attending Physician  
D: 2007-09-05 13:46:55 : B.R. T: 2007-09-05  
275259

**Signature Verification**

You are now ready to sign off the displayed report(s). By signing off the report(s) you acknowledge that you have viewed its completed content and that it meets with your approval.

Password:

At the bottom of the window, there are navigation buttons: "Skip", "Sign Off", "Previous", "Next", and "Save & Exit".

## 6. Distribution

**Final report is now immediately available for review, either online or in print**

**Final report can also be automatically distributed by e-mail, fax or printer to all appropriate recipients (i.e.: referring physician, etc.)**

- As per rules set up in Crescendo the Management Console





# CRESCENDO

> *Spread the word...*



> *What's changed*

# High-quality documentation

## Medical reports in electronic format are:

- Readable (no more deciphering)
- Shareable
- Searchable
- Immediately available on patient return

## Final report is typically available prior to:

- The physician leaving at the end of his shift
- The patient being discharged

**No more running around looking for charts**

**No more time wasted hand-writing reports**



# Putting patients first

## **A solution that saves physicians significant charting time**

- Less time documenting = more time with patients
- No more frustrations!

## **A solution that fits the mobile working conditions of an ER physician**

- All information and actions concentrated on one device: the PDA
- PDA follows the physician everywhere (“walk & talk” approach)

## **A solution that ensures optimal confidentiality**

- No punching in numbers, no names to say

## **A solution that's future-proof**

- Standard based (Windows mobile, HL7, etc.) for easy integration with future systems (e.g.: pharmacy, EMR)



# The future

**Front-end speech recognition (being rolled out)**

**New interactive module for clinical notes**

- Accelerates the processing of clinical notes thanks to macros, pull down selection, check boxes, free-form speech recognition, etc.)

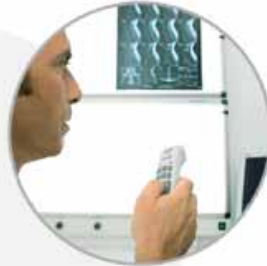
**Hospital-wide roll out (1000+ users)**





# CRESCENDO

> *Spread the word...*



> *Thank you!*

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