



## **Automating the Emergency Department Record**

What has become of the “Holy Grail” of documentation: the paperless medical record? This course examines the current state-of-the-art computerized charts, bedside data entry, and voice recognition technology. Limitations will be described. Current solutions will be compared, and future directions will be examined.

- Review the products available for automating the emergency department record and identify potential problems.
- Examine methods for automatically devising template-driven charts.
- Discuss the ways to incorporate evidence-based clinical information and guidelines into electronic emergency medicine charts.
- Learn how to capture quality and cost data from computerized records.

TH-204  
Thursday, October 14, 1999  
9:00 AM - 9:55 AM  
Room # N227  
Las Vegas Convention Center

## **FACULTY**

Todd B Taylor, MD, FACEP

Affiliate Assistant Professor, Arizona College of Osteopathic Medicine;  
Attending Emergency Physician,  
Good Samaritan Regional Medical  
Center and Phoenix Children’s  
Hospital, Phoenix, Arizona;  
President, CompuGraphics Computer  
Consulting Firm, Tempe, Arizona

# Emergency Department Management System Vendors

Up date	Corporation	Product	Vr	Phone\Fax\URL	Contact\E-Mail
1-99	Array Systems Corporation 2225 Avenue J Arlington, TX 76006	Emergisoft		817-633-6665 817-633-1239 (fax) www.emergisoft.com	Vicki Judd, Executive Assistant VJudd@emergisoft.com
1-99	Cerner Corporation 2800 Rockcreek Parkway Kansas City, MO 64117-2551	FirstNet EM Info Sys - HNA Classic & Millennium	Beta	816-221-1024 816-474-1742 (fax) www.cerner.com	Kathryn Barnds, RN, Brand Manager kbarnds@cerner.com
4-99	CyberPlus 800 Brazos Street, #1200 Austin, TX 78701	EmStat		800-876-7732 512-472-5245 (fax) www.cyberplus.com	Debra Good  debra.good@emstat.com
1-99	Datamedic Clinical Systems 20 Oser Avenue Hauppauge, NY 11788	EMstation	4.1	800-446-4021 516-435-8820 (fax) www.datamedic.com	Rick Seiger, VP Sales for EMstation rseiger@datamedic.com
9-99	Ibex Systems Group, Ltd. 551 Roosevelt Road, Suite 318 Glen Ellyn, IL 60137	PulseCheck™ PulseCharts™		630-969-8299 630-968-9085 (fax) www.ibex-systems.com	sales@ibex-systems.com
4-99	LifeServ Technology, Inc. 12910 Automobile Blvd Clearwater, FL 34622	LifeServ	Beta	800-833-0365 813-573-1677 (fax) www.lifeservtech.com	Rick Sullivan, VP Sales 888-671-0490 ricks@lifeservtech.com
1-99	Lancet Technology, Inc. 1000 Massachusetts Ave-4 <sup>th</sup> flr Cambridge, MA 02138-5304	Emergency One	3.61	800-352-6238/617-492-6663 617-492-5522 (fax) www.medsw.com	Christine Linnane, Director of Marketing chris@medsw.com
1-99	MedHost, Inc. 420 Madison Avenue, Ste 1002 Toledo, OH 43604	MedHost EDMS		888-218-4678/419-241-5285 419-241-6614 (fax) www.medhost.com	Patty Crosby, Marketing Manager pcrosby@isarent.com
4-99	MediMouse Systems 10315 South California Chicago, IL 60655	MediTrak, MediChart, MediReporter	2.1	773-779-8833 773-779-8833 (fax)	Tom Walsh Sales & Marketing twalshgfcsmm@worldnet.att.net medimouse@worldnet.att.net
1-99	Nine Rivers Technology 701 Corporate Ctr Dr., Ste 125 Raleigh, NC 27607	CurrentCare™ ER	2.0	919-233-8845 919-233-1340 (fax) www.nrt.com	Jeff Reese, Technical Director Healthcare Informatics Jreese@nrt.com
4-99	Spacelabs PO Box 97013 Redmond, WA 98073-9713	Emergency Chart (Formerly: Orca Medical Sys)		800-251-9910 425-883-0939 (fax) www.spacelabs.com	Carl Lombardi, Jr  CarlLjr@slmd.com
4-99	TeleMed/RLIS, Inc. 15600 San Pedro, Suite 203 San Antonio, TX 78232	TeleMed ED	1.5	800-496-7547 210-490-1800 (fax)	James E. Ross, MD, FACEP  jerossjr@compuserve.com
1-99	Wellsoft Corporation 605 Franklin Blvd., Suite 5 Somerset, NJ 08873	Wellsoft Integrated Clinical Management System	6.51	800-597-9909 732-249-5071 (fax) www.wellsoft.com	Denise Helfand, VP Sales & Marketing wellsoft@wellsoft.com

# Emergency Department Tracking System Vendors

Up Date	Passive Tracking	Product	Vr	Phone\Fax\URL	Contact\E-Mail
4-99	Com-Net Med. Display Sys. 3728 Benner Road Miamisburg, OH 45342	Emergency Patient Tracking System		937-859-6323 937-859-7511 www.comnet-fids.com	Les Carter National Sales Manager lcarter@comnet-fids.com
1-99	Executone Information Sys. 478 Wheelers Farms Road Milford, CT 06460	INFOSTAT Integrated Locator System (ILS™)		800-807-1305 203-882-2736 (fax) www.executone.com	Rosalyn Ben-Chitrit Bus. Unit Mngr, Software App Benchitrit@executone.com
4-99	SofTouch Applications, Inc. 716 Long Run Road McKeesport, PA 15132	ED System		412-751-9024 412-751-9101 (fax)	Richard E. Rost, Pres Softouchai@aol.com Arlene Ricker, RN 724-873-1904
4-99	Wescom 9446 Phillips Hwy Jacksonville, FL 32256	NurseCall System 3000 & Wescom ILS		800-793-7266/904-260-6334 904-262-3661 (fax) www.nursecall.com	Dennis Bazemore, VP Sales wescom5@aol.com
4-99	Zettler Systems (Tyco Intl. Co.) 75 Columbia Aliso Viejo, CA 92656	NurseCall		877-403-8853/949-448-9560 949-448-9557 (fax) www.zettlersystems.com	Cathy Harrington (x240) charrington@tyco.geis.com Rainer Rahauer rrahaeuser@tyco.geis.com

Up Date	Active Tracking	Product	Vr	Phone\Fax\URL	Contact\E-Mail
9-99	Tenet Information Services 4885 South 900 East, Suite 107 Salt Lake City, UT 84117	EDNet		801-268-3490	Frank C. Overfelt
9-99	Xylor Medical Systems, Inc. 118 East Smith Ave. Bloomington, IL 47104	Access		812-331-2179	Judith Vitaliano
9-99	MedAmerica Info. Services 588 Blossom Hill Road San Jose, CA 95123	CEPIS- Emergency Management System		408-988-0891	Benjamin Young
9-99	National Microcomputer Corp. 8601 Skyline Drive Los Angeles, CA 90046	EDNet		408-727-2774	Ira Goodberg
9-99	Emergency Medical Software 9325 NW 50 <sup>th</sup> Doral Circ. Nrth Miami, FL 31378-2067	E D Manager			Perry Robinson, MD Probins3@ix.netcom.com
1-99	Logicare PO Box 224 Eau Claire, WI 54702	Logicare III		800-848-0099 715-839-8035 (fax) www.logicare.com	Debbie Foss, Marketing debbief@logicare.com solver@logicare.com

## Emergency Department Management Systems:

- Vendor List
- Model Request for Proposal (RFP)
- Other resource material

Available for download (Microsoft Word for Windows format) from the internet at:

<http://www.acep.org/COMMSECT/SE000400.HTM>

# Emergency Department Charting System Vendors

Up date	Corporation	Product	Phone\Fax\URL	Contact\E-Mail
	ChartWare, Inc 101 Golf Course Dr., Ste A220 Rohnert Park, CA 94928	ChartWare	800-642-4278 707-586-3989 (fax) www.chartware.com	David Tully-Smith, MD, PhD  chartware@chartware.com
	Compass Systems Corporation 2714 Union Ave. Ext D, # 305 Memphis, TN 38112	ED-Chartpad	901-458-5732 901-458-0403 (fax)	Errol Dunn Glen Cummins
1-99	TransQuick 1777 Phoenix Parkway, Ste 101 Atlanta, GA 30349-5446	VoiceQuick	800-745-2442 770-944-4631 (fax)	Cheryl Smith  cg.smith@worldnet.att.net
1-99	Fonix Corp. - Healthcare Group 600 West Cummings Park Woburn, MA 01801	PowerScribe for EM, ver.1.1	800-418-8949/781-935-5656 817 329-5097 (fax) www.powerscribe.com	Translation Engine: Dragon John Wald, VP Sales jwald@fonix.com
	Alien Robotics, Inc. 6905 Merton Road Pittsburgh, PA 15202	VoiceDoc for ED	412-732-9000 412-732-9002 (fax) www.AlienRobotics.com	Translation Engine: IBM ViaVoice
	Lernout & Hauspie 52 Third Avenue Burlington, MA 01803	Voice Xpress for Medicine	800-634-8723 x5100  www.lhs.com	Translation Engine: Voice Xpress
	Vocalex, Inc. 6718 Loop Road Centerville, OH 45459	Vocalex	888-VOCALEX voice@voicerecognition.com	Translation Engine: SpeechMagic  74347.2541@compuserve.com
	Emergency Servcs Consultants 4020 McEwen Drive, Suite 281 Dallas, TX 75244	T-System *Paper-based	972-503-8899	
	LYNX Medical Systems, Inc. 15325 SE 30 <sup>th</sup> Place, Suite 200 Bellevue, WA 98007-6595	E/Map Paper-based but Comp. Generated	800-767-5969  www.lynxmed.com	Nancy Carlyle, RN nancylynxmed.com
	PDM Medical Systems, Inc. 14455 N. Hayden Rd. Suite 224 Scottsdale, Arizona 85260	MedSpeak (IBM Corp.)	800-966-0180/602-955-0180 602-443-0329 (fax) pdmmed.com/medspeak.html	Translation Engine: IBM ViaVoice  Medspeak@pdmmed.com

## References

### ED Integrated Software Review & Product List by Mark L. DeBard MD, FACEP

[http://ourworld.compuserve.com/homepages/debard/edcis\\_cv.htm](http://ourworld.compuserve.com/homepages/debard/edcis_cv.htm)

### Speech Recognition:

“Future User Interfaces” PC Magazine, March 25, 1997, pp206-213

“Voice Recognition Makes Itself Heard” Windows Magazine, August 1998, pp62-68

“Computer, Take a Memo” PC Magazine, January 6, 1998, pp235-238

“Watch What You Say” PC Magazine, March 10, 1998, pp129-148

### Transcription:

Craven RA. Centralized Off-Premise Transcription Service: A Model. JEM. 1995; 13:697-702

### Computerized Clinical Records:

“Computerized Clinical Records Enhance Practice Integration” – AMA News – Dec 16, 1996, pg. 1

Cabral JDY. Poor Physician Penmanship. JAMA 1997; 278: 1116

The Lead Pencil Club, PO Box 380, Wainscott, New York 11975

Lampe KS. Implementation of a Computerized Record in the Emergency Department (Abstract). Annals EM 1998; 32:3; p. S25

### Legal Issues:

“Let the record show” – AMA News – May 26, 1997, pg. 11

# Automating the Emergency Department Record

ACEP Scientific Assembly - Thursday, October 14, 1999 - (TH204)

Todd B. Taylor, MD, FACEP

## Automated Records

Some tools change the way we work . . . Forever

The Wheel

The Future

Todd B. Taylor, MD, FACEP  
Past Chair, ACEP Section for Computers in Emergency Medicine  
President, CompuGraphics Computer Consulting Firm

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## The Problem

Computing today is “perhaps analogous to the period when scribes had to know as much about making ink or baking clay as they did about writing.”

M. Weiser  
“The computer for the twenty-first century”  
Scientific American  
1991; 256: 94-104

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## The Need

- ◆ Emergency Medicine
  - ✓ Substantial number of patients per shift
  - ✓ Requisite complete documentation for each patient
  - ✓ Generates a disproportionate amount of paper compared to other medical encounters
  - ✓ Modern healthcare demands providers capture & share unprecedented amounts of information about their work & patients.

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## The Need

“Why do we need electronic medical records? In part because patients have an average of 13.7 medical records floating around out there.”

Paul Carpenter, MD, Consultant  
Mayo Clinic

“You must computerize the clinical record if you want to survive in managed care.”

Rosemary Hager, Vice-President for Operations  
Medical Assets Management

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## The Need

“Assuring continuity across providers is like trying to plug the holes in a sieve. When computerizing clinical records, the goal should not be to get rid of paper charts. You’ll know that you’re ready to go paperless when and if you find lots of dust on the paper charts because no one is using them.”

Ed Lowenstein, MD, President  
Orlando Health Care Group

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## The Need

The three words most commonly uttered in the typical ED of 1998 may well be:

“Where is the Chart?”

Mark Smith & Craig Feted  
“The Next-Generation Emergency Department”  
Ann Emerg Med  
July 1998; 32: 65-74

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## The Need

“The time that is wasted looking for singular representations of information in the ED will be recaptured when each patient’s clinical information can be accessed in many different ways, in multiple locations, with no time lag in the ubiquitous availability of new information once it has been gathered or generated.”

Mark Smith & Craig Feied  
“The Next-Generation Emergency Department”  
Ann Emerg Med  
July 1998; 32: 65-74

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## The Transition

- ◆ Concerns About Digital Medical Records
  - ✓ **Security:** Prying eyes
  - ✓ **Glitches:** Computers makes bad things happen faster
  - ✓ **Data Integrity:** Undetectable alterations
  - ✓ **Backup Systems:** Downtime
  - ✓ **Completeness:** Easier to ignore missing information
  - ✓ **Education:** Relearning of a basic human function

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## The Survey

- ◆ Handwritten
- ◆ Structured Computer Generated
  - ✓ Voice Input
  - ✓ Mouse/Pen/Touch Screen Input
- ◆ Dictation/Transcription
- ◆ Other



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## Handwritten Records

- ◆ Advantages
  - ✓ Low tech
  - ✓ "Inexpensive"
  - ✓ Ubiquitous
  - ✓ No training required (residents/students)

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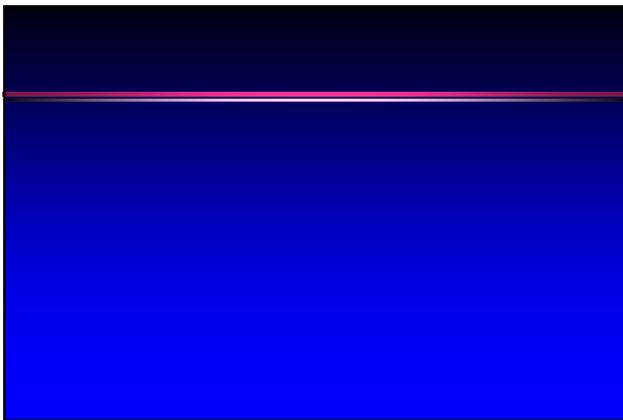
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## Handwritten Records

- ◆ Disadvantages
  - ✓ Low tech
  - ✓ "Inexpensive"
  - ✓ Illegible
  - ✓ Often not billable
  - ✓ Often poorly documented
    - Ave. written record = 54 words vs dictated = 156 words
  - ✓ Finished product sequestered

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## Handwritten Records

### ◆ Availability

- ✓ Paper charts are unavailable in 30% of medical encounters
- ✓ 11 % of lab tests are reordered because the provider does not have access to the results in the medical record

*The Wall Street Journal*

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## Handwritten Records

### ◆ Legibility

- ✓ "Handwritten notes took 11 seconds (46%) longer to read than typed notes, but there was only a minimal difference in comprehensibility favoring typewritten notes."

*JAMA, October 1, 1997 - Vol 278, No. 13, page 1116*

- ✓ "25% of records are at least difficult to read if not illegible."

*Francis R. Coughlin, Jr., MD  
Cardiovascular Surgeon & Legal Consultant*

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## Handwritten Records

### ◆ Innovative Compromise Solutions

- ✓ Hand write simple charts & dictate difficult ones
- ✓ Scribes
- ✓ Check-off forms
  - pre-printed
  - computer generated

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## Check-Off Forms

Web-based Application (Numedica)

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## Dictation vs. Handwriting

The average person can dictate at 85-95 wpm vs. writing at 20 wpm

Type of Report	Ave. # of Lines	Ave. Dictation Time	Estimated Time to Write Report
Level V ED Report	90	4.5 min	20.2 min
Operative Report	80	4 min	18 min
ED Report Routine	45	2 min	9 min
Clinic Progress Note	30	1.5 min	6.7 min

Source: Med-Tech Resources, Inc.

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## Dictation / Transcription

- ◆ Advantages
  - ✓ Medium tech
  - ✓ Ultimate flexibility
  - ✓ Relatively ubiquitous (POTS vs. hardwire)
  - ✓ Minimal training required (residents/students)
  - ✓ Legible/Billable
  - ✓ Accurate (*What you say is what you get*)
  - ✓ Finished product available digitally

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## Dictation / Transcription

- ◆ Disadvantages
  - ✓ “Expensive”
  - ✓ Structured, but not complaint specific
  - ✓ Minimal search capability
  - ✓ No real time QA/CQI

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## Dictation / Transcription

- ◆ “Expensive”

**\$7<sup>00</sup>**  
per chart

Source: TransQuick

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## Dictation / Transcription

“EM produces the most paper per minute of any specialty. Typically the highest paid staff (physicians & nurses) generate the most paper least efficiently – while the clerical staff typically generate computer forms. The generation of paper work is much more costly than generally imagined and is a major source of inefficiency in emergency medicine. Unfortunately, dictation and transcription are the most expensive ways to create physician charting unless you consider the value of time. When physician time is considered, transcription is probably the most cost-effective methodology in busy emergency departments. In slow emergency departments it doesn't matter what system is used.”

Richard Bukata, MD  
Emergency Medical News, December 1996

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## Dictation / Transcription

### Doing the Math

Average ED charge \$400\*

Average patients treated per hour equals 3

Total revenue per physician hour = \$1200

For every minute spent charting:

\$20 could have been generated seeing another patient.

\* Williams RM. The Cost of Visits to Emergency Departments  
NEJM 1996; 334: 635-641 & 657-658

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## Structured Computer Generated

Voice            Pen  
                         Stylus

### INPUT

Mouse            Touch  
                         Screen

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## Structured Computer Generated

- ◆ Myths
  - ✓ It saves time
  - ✓ It saves money
  - ✓ It's easy
  - ✓ A single workstation is enough
  - ✓ Voice is the preferred method of input
  - ✓ Speech recognition is here today (accuracy)

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## Structured Computer Generated

### ◆ Truths

- ✓ Improved documentation
  - marginally as compared to dictation
  - significantly as compared to handwritten
- ✓ Cost to whom ever is paying for transcription can be significantly reduced ( $1/2$  to  $1/10^{\text{th}}$  the cost)
- ✓ Works best in low to moderate volume ED's
- ✓ Works best in low acuity areas (i.e. fast track)

1998 ACEP Research Forum Abstract # 96

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## Structured Computer Generated

### ◆ Disadvantages

- ✓ You must adapt to the computer's way of doing things
- ✓ Steeper learning curve
- ✓ All your charts tend to look & sound the same
- ✓ May inadvertently document incorrectly

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## Structured Computer Generated

### ◆ Advantages (potential)

- ✓ Real-time QA/CQI
- ✓ Diagram capability
- ✓ Structured search capability
- ✓ Integrated ancillary data potential (i.e. EKG, x-ray)
- ✓ Chart immediately available
- ✓ May qualify for a malpractice discount
- ✓ Charting costs may be as little as \$2-5 per chart (TCO)

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## Structured Computer Generated

- ◆ Innovative Compromise Solutions
  - ✓ Structured documentation with ability to integrate dictation when necessary
  - ✓ Separate dictation and computer charting systems that allow each to be used as appropriate.
  - ✓ Handheld/tablet computers for bedside charting may provide the necessary economy to justify use

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## Structured Computer Generated

- ◆ Handheld/Tablet Computers
  - ✓ Allows bedside & remote charting
  - ✓ Digital ink
    - "The rich man's written chart"*
  - ✓ Handwriting recognition

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## Digital Assistant™ on PalmPilot V

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## Dictation vs. Structured

"Charting Olympics"

Simple Chart - Billing: Level III - Complaint: Bug Bite - # Words: 403 - # Lines: 65

Method (product)	Time to Dictate (speak the words)	Time to Process (computer time)	% errors (# errors/total words)
Dictated	2'5"	17'20"	99.5%
PowerScribe* by MRC Group	3'12"	0'5"	95.5%
VoiceDoc for ED* by Allen Robotics, Inc.	5'9"	continuous	94.1%
Voice Xpress** by Lernout & Hauspie	4'53"	continuous	95.8%
Vocalex by Vocalex, Inc.	N/A	N/A	N/A

\*Tested Dec 97    \*\*Tested June 98 formerly Kurzweil

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## Computer ED Record

Reimbursement Impact

Question (1 = very negative / 5 = very positive)	Survey 1 (7/97)	Survey 2 (10/97)
Proficiency using C-MR system?	4 (3-4)	4 (1-4)
Satisfied with documentation quality?	2 (1-3)	2 (1-3)
Impact of C-MR on patient care?	2 (1-3)	2 (2-3)
Impact of C-MR on resident education?	2 (1-2)	2 (1-3)

1998 SAEM Annual Meeting Abstract # 092

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## Computer ED Record

Reimbursement Impact

Estimated Time (minutes) to Complete a Medical Record

CPT E&M Code	Baseline (T-MR)	Survey 1 (C-MR)	Survey 2 (C-MR)	p-value
Level 2 (99282)	2 (2-3)	5 (5-9)	5 (5-8)	< 0.01
Level 4 (99284)	5 (3-5)	10 (9-15)	11 (7-15)	< 0.01

**Conclusion:** Use of a C-MR decreased reimbursement, increased charting time, and adversely affected patient care and resident education. There was no improvement in charting time or physician satisfaction over the study period.

1998 SAEM Annual Meeting Abstract # 092

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## Speech Recognition

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## Speech Recognition

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## Speech Recognition

- ◆ Microsoft's Chief Technology Officer responsible for strategic & business planning
- ◆ Advanced Technology & Research Group with \$2 billion R&D budget

Nathan Myhrvold, Ph.D.

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## Speech Recognition

“Only 5% of medical documentation is generated through speech recognition programs. And physicians using the new programs still need medical language specialists to review the documentation.”

Molly Malone, Executive Director  
Medical Transcription Alliance  
American Medical News - February 15, 1999

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## Speech Recognition

It's not ready for prime time, but one day it will be hugely successful. The problem with speech recognition is that 95% accuracy isn't good enough. I said 5 years ago that good products were still 5 years away, and today I'll say it again: Good products are still 5 years away. Even if they take 25 years they'll be worth it, but I always say 5 years because anything longer sounds like infinity.

Nathan Myhrvold, Ph.D. - PC Magazine - September 9, 1997

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## Computer Interface

- ◆ The quality of the user interface is very subjective and difficult to grade, but in many cases determines whether users like the program or hate it . . . use it or refuse it.
  - ◆ For the new user, an intuitive interface (one with good affordance) is important. For the experienced user, an interface with good idioms and that is efficient (minimal clicks/keystrokes/words to accomplish common tasks) is more important.
- Keith Conover, M.D., FACEP  
www.pitt.edu/~kconover

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## Computer Interface

If you want to herd sheep, you should use a sheepdog. You shouldn't use a human trained in herding. The dog may not be smart, but has a specialized skill and understands the problem. It has a voice interface ( the bark), and sheep are afraid of it. We just need to get [computers] to be as smart as the dog. They don't need to be as smart as a human.

Nathan Myhrvold, Ph.D.

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## Mobile Computing

Palm VII

IntelliWorXX

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## The Future

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# Automating the Emergency Department Record

ACEP Scientific Assembly - Thursday, October 14, 1999 - (TH204)

Todd B. Taylor, MD, FACEP

## Speech Recognition

- ◆ IBM VoiceType Dictation System Error Rate
  - ✓ English language vocabulary = 17%
  - ✓ Background Noise: With 28% - Without 11%
  - ✓ EM Vocabulary = 9%

NJ Zimmel, et al  
Status of VoiceType Dictation for Windows for the Emergency Physician  
J Emerg Med 1996; 14:511

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## Continuous Speech

### Continuous Speech Recognition Technology

- ◆ SpeechMagic by Philips
- ◆ ViaVoice by IBM
- ◆ Voice Xpress by Lernout & Hauspie
- ◆ Naturally Speaking by Dragon

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## Speech Recognition

- ◆ Intel Pentium III
  - ✓ PIII-optimized software
  - ✓ Decreases "training time" to about 5 minutes
  - ✓ Increased accuracy (?)
  - ✓ Increases speed processing

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## New Speech Recognition Devices

Lernout & Hauspie  
Voice Xpress  
Mobile Professional

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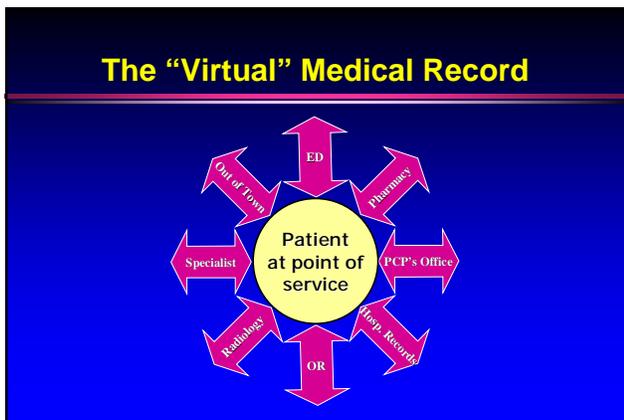
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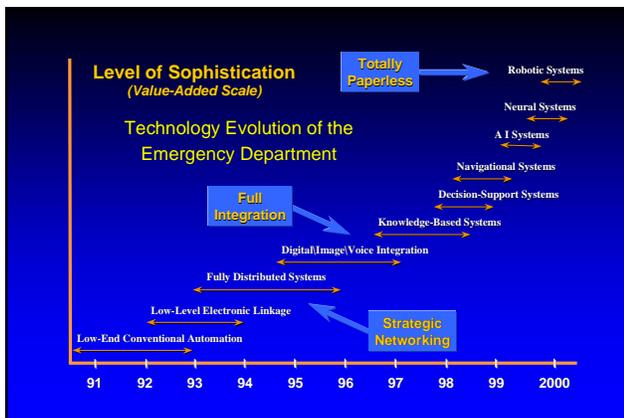
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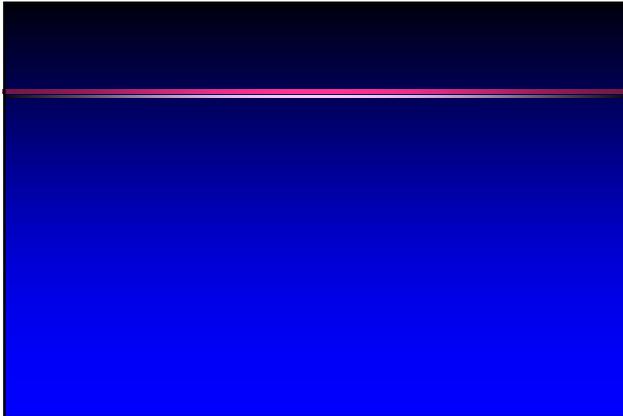
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## Summary

"Implementing a new clinical information system can be extremely disruptive and difficult. It's best to tell physicians up front that computerization might make their life worse before making it better."

Michael Guerriere, MD  
Vice-President of Utilization Management  
Toronto Hospital, Ontario

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## Summary

"Physician buy-in may be just that:  
You will have to compensate physician leaders for directing the selection and implementation of new systems. An plan dinners, prizes, special benefits, and other expenditures for the rank and file as you roll out a new system."

Bruce Berg, MD  
Lung Associates of Sarasota, Florida

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## Summary

“The bottom line:

Physicians are data-driven and information-hungry. They will embrace a new system and master it quickly if it offers a real value and saves them time.”

Kenneth Geoly, MD, Clinical Information Consultant  
INOVA Health Systems, Falls Church, Virginia

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## What's Out There?

### ◆ Stand Alone - Charting Only

- |                         |                 |
|-------------------------|-----------------|
| ✓ ChartWare, Inc        | ChartWare       |
| ✓ Compass Systems Corp. | ED-Chartpad     |
| ✓ TransQuick            | VoiceQuick      |
| ✓ MRC Group             | PowerScribe     |
| ✓ Alien Robotics, Inc.  | VoiceDoc for ED |
| ✓ Lernout & Hauspie     | Voice Xpress    |
| ✓ Vocalex, Inc.         | Vocalex         |

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## What's Out There?

### ◆ Stand Alone - Comprehensive Systems

- |                        |                               |
|------------------------|-------------------------------|
| ✓ Array Systems        | Emergisoft                    |
| ✓ BRC Health Care      | EmStat                        |
| ✓ Datamedic            | EMstation                     |
| ✓ Lancet Tech., Inc.   | Emergency One                 |
| ✓ MediMouse Systems    | MediMouse                     |
| ✓ Nine Rivers Tech.    | CurrentCare ER                |
| ✓ Space Labs           | Formerly Orca Medical         |
| ✓ RLIS, Inc.           | TeleMed                       |
| ✓ Wellsoft Corporation | Integrated Clinical Mgmt. Sys |

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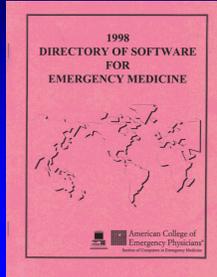
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## Resources



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## Reality

*"Lorraine! Come look at this fabulous screen saver."*

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## James Carville, Democratic Consultant

"When it comes to health care, the bridge to the 21<sup>st</sup> Century will be a toll bridge."

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