

# Data Quality Management and EMR Entry

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## About the Team

- Centre for Evaluation of Medicines (CEM)
  - Independent Academic Research Institute
    - situated at St. Joseph's Hospital, Hamilton Ontario
    - affiliated with McMaster University
  - Areas of expertise include pharmacoepidemiology, pharmacoeconomics and informatics

# About the Team

- **COMPETE Project Team**

(Computerization Of Medical Practices for the Enhancement of Therapeutic Effectiveness)

- research, teaching, trial coordination, medical practice and database expertise
- functional core team crucial, strong alliance with venter partners - provides unified support to study physicians

## Project Goals

- To develop a Primary Care EMR network
- Research the benefits and risks of computerization
- Research prescribing of medications
- Comparison of Computer Decision-Support vs. “Usual Practice” - (i.e. mailing of guidelines to the physician)

## Goals - Success Definition

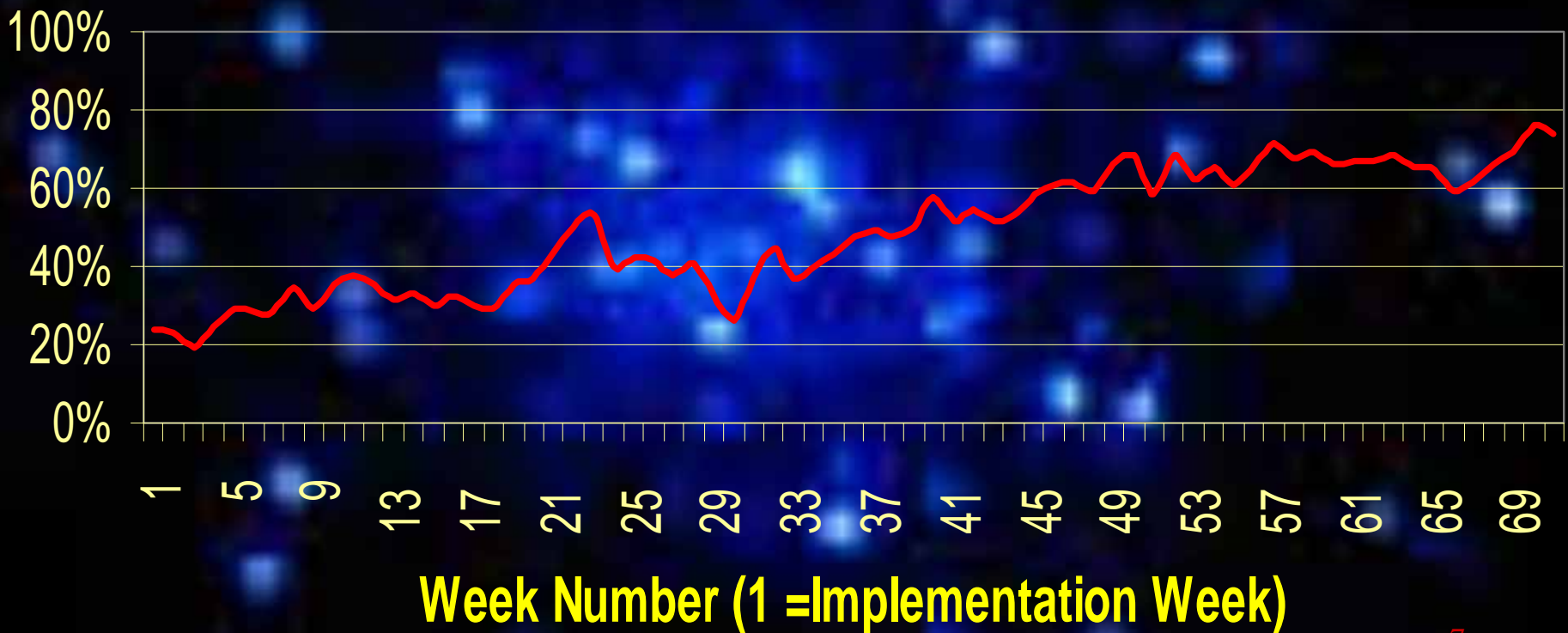
- Ambitious goal to:
  - Recruit 100 physicians to participate in the study
  - Introduce EMRs to family physicians in a limited geographic area
  - Have 80% of patient visits charted in real time
  - Capture structured data on each patient visit
  - Introduce computerized decision-support to each physician

## Achievements of Goals to Date

- Recruited 32 physicians
- Went slightly outside of our proposed area to get recruits
- Still working on getting physicians to chart patient encounter in real-time. Multi-complaint patients and counselling patients remain a challenge. Not all physicians like to chart in real time, (about 56% of patients are charted in real time.)
- When physicians use the EMR properly, data is quite well structured. ( i.e. 90% of diagnoses coded in ICD-9 and 95% of medications are coded)
- To have successful CDSS, need structured data entry in real-time

# Physicians' Ramp Up Data

## Percent of Patients Charted in EMR - Normalized



## Maintaining Physician Data Entry

- Previous graph shows normalized ramp up for the first year after start up. There is a natural increase, then data entry plateaus
- Some physicians do not catch on to the EMR, or lose their momentum after start-up
- Case Management process is necessary to reach desired goals: (high level chart entry into structured data fields)

## Case Management Process - Visits

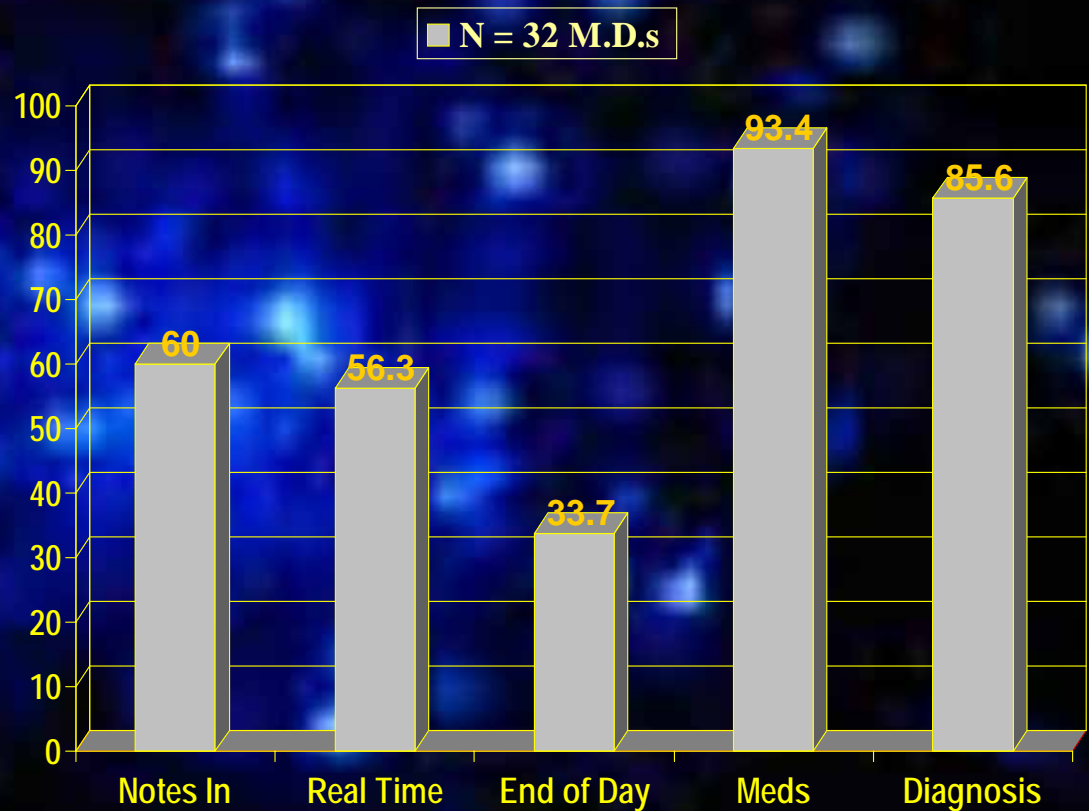
- Case Manager (visit to all sites between January 99 and October 99) - 32 physicians were interviewed to obtain their perceptions and determine problem areas
  - Cycle 1- Jan/Feb 99 (8 physicians)
  - Cycle 2 - Mar/April 99 (6 physicians)
  - Cycle 3 - April 99 (3 physicians)
  - Cycle 4 - May/June 99 (2 physicians)
  - Cycle 5 - Aug 99 (5 physicians)
  - Cycle 6 - Sept/Oct 99 (8 physicians)

## Case Management Process - Reports

- Data reports developed by data manager from EMR and billing data extracted from each site
- Data reports sent to physicians in form of a feedback letter
- 1st report (letter) - wasn't well formatted
  - data presented from site start date to Sept 99 - too long a review period & had no peer comparison provided
  - data reporting inconsistencies, were not corrected
- 2nd report (letter) - was better prepared
  - 2 month period covered from Sept 99 - Nov 99
  - provided peer average comparison of key variables

# Physician's Perceptions of How They Use the EMR

- Notes In = % of patient notes entered into the EMR
- Real Time = % of encounters entered into the EMR in real time
- End of Day = % of encounters entered into the EMR at the end of the day
- Meds = % of patients' medications entered into EMR notes
- Diagnosis = % of patients' diagnoses entered into EMR notes



# Perceptions Vs Actual EMR use

- Physician's perceptions of how they use the EMR are quite accurate when compared to the actual data

	PERCEPTION	ACTUAL
NOTES	60% notes entered same day	57% notes entered same day
MEDS	93% patient's current meds	96% patient's current meds
DIAGNOSIS	86% patient's current visit	85% patient's current visit

# Case Management - Interventions

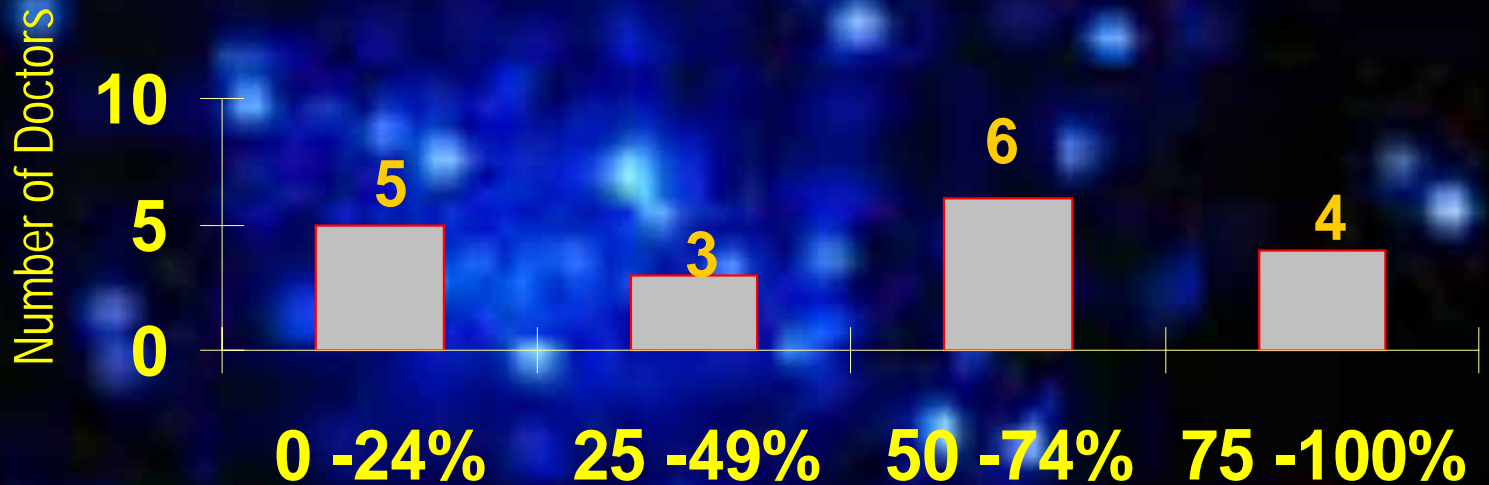
- Major Influences:
  - initial training & hand holding sessions for each site
  - user group meeting April 99
  - CM visits to obtain feedback
  - extra training class offered
- Report 1- Mailed to Sites (data from start-up to Sept 99)
- Major Influences:
  - Report 1- Feedback on Physician's Progress
  - Ad-Hoc CM visits & extra training classes offered
- Report 2 - Generated (data from Sept 99 to Nov 99)

# Case Management - Interventions

- Major Influences:
  - user group meeting Nov 99
  - C.M. visits with structured one on one training for sites, visits targeted from previous report 2 findings
- Report 3 - Mailed to Sites (data from Nov 99 to Jan 00)

# Physician EMR entry-Report 1

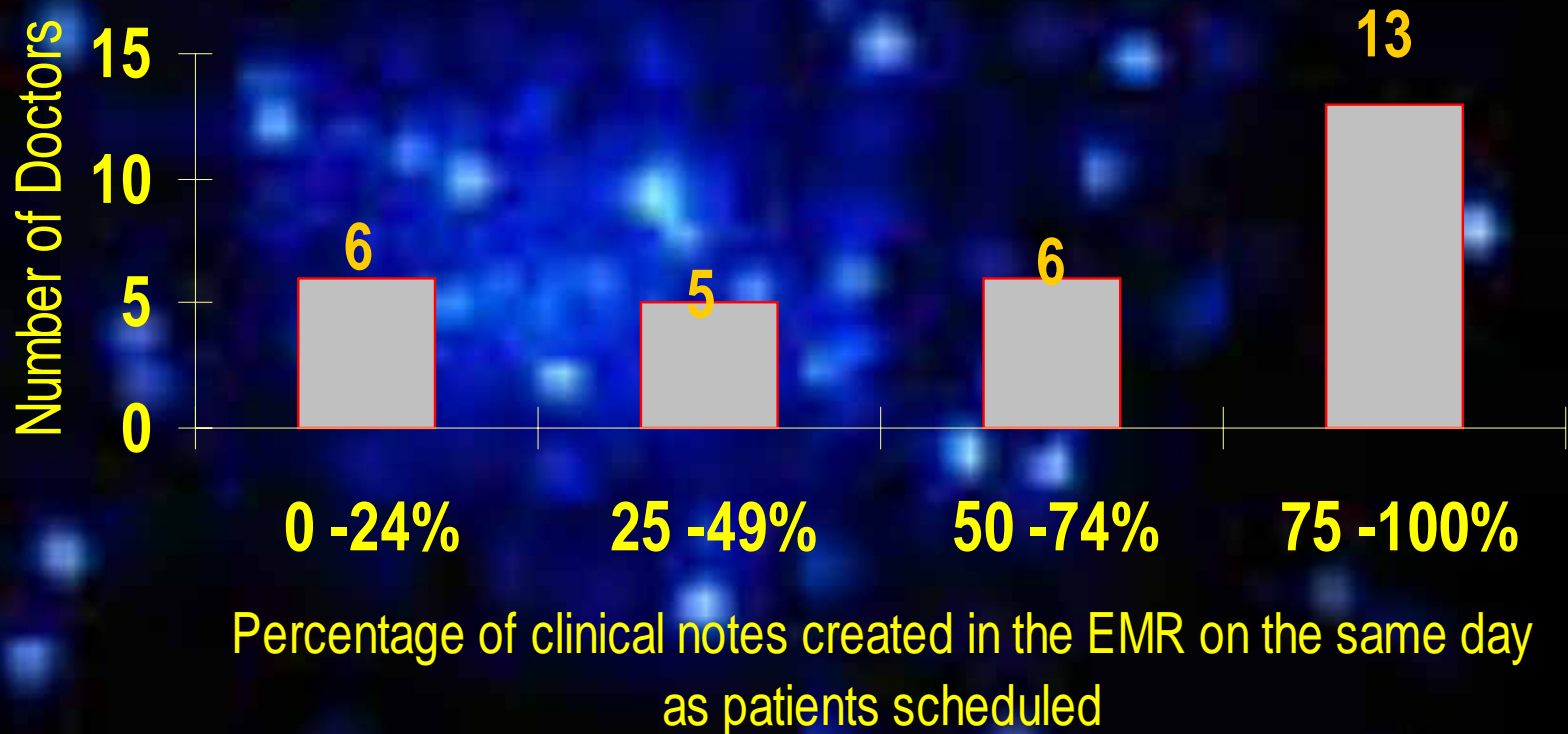
Histogram (April 8- June 7 1999)  
18 physicians



Percentage of clinical notes created in the EMR on the same day as patients scheduled

# Physician EMR entry-Report 2

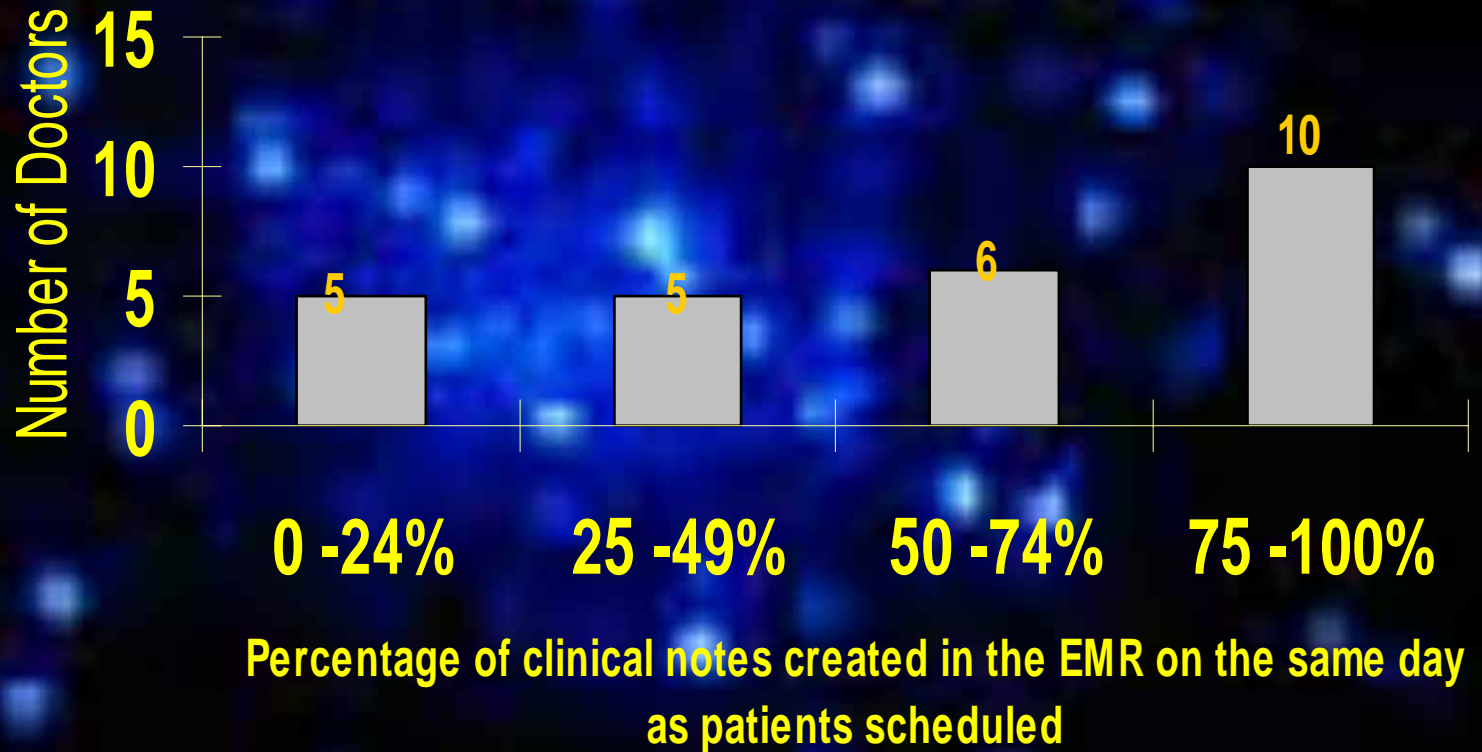
Histogram (Sept 8 to Nov 7 1999)  
29 physicians



# Physician EMR Entry - Report 3

Histogram (Nov 8 to Jan 7 2000)

26 physicians



## EMR Entry Reports - Over Time

- Slight change / improvement is noted when reviewing EMR entry data in aggregated graph form. (i.e. Reports 1 - 3)
- However, substantial improvements are noted when comparing individual physicians data entry levels over time, who have received intense one on one retraining and coaching (i.e. tables for site 4, 12 & 16)

# Case Management-One on One

- A comparison of a multi physician site that has shown considerable improvement in (EMR entry) due to one on one retraining sessions

Site	April98 - June 98	April99 - June99	Sept99 - Nov99
4 A	7%	61%	65%
4 B	8%	56%	42%
4 C	16%	58%	51%
4 D	14%	69%	63%

- Site had many office work flow issues & technical difficulties
- Had several C.M.visits, extra training sessions for both physicians and staff. Dedicated extra time to solve technical issues. Set milestones and goals for all site staff

# Case Management-One on One

- A comparison of 2 sites slightly later time frame, that have shown considerable improvement in (EMR entry) due to one on one retraining sessions

	April 99 -June 99	Sept 99 -Nov 99	Nov 99 - Jan00
Site 12 A	19%	81%	89%
Site 12 B	1%	44%	47%
Site 16 A	21%	29%	51%

- Sites had a number of CM issues, i.e. an inefficient workflow & inability of physicians to prioritise their workloads. Staff also demonstrated resistance to change.
- Several C.M.visits, extra training sessions for both physicians and staff. Conducted Practise Management review of office.

## Hind-Sight

- Selection of sites & physicians is crucial
  - start with an efficient practice with motivated staff and physicians who are ready for change, eager to learn and want to use the computer
  - allow for ample training time and engage in learning
  - 8 hours of training not enough, must adopt an ongoing process with training, practice and refreshers
  - necessary to have constant feedback about appropriate data entry, (i.e. correcting quirks and inconsistent charting methods.)

## Conclusion

- Report Feedback alone is not very successful
- User Group Meetings - efficient methods of problem solving but difficult to get full physician participation
  - time to set up meeting, hold meeting and then disseminate decision to group after discussion, i.e. non attendees
  - initiates peer pressure and guidance
- Additional training classes for slower learners and new staff is a real benefit
  - small cost and time to set up, but fairly effective
- One to one retraining & hand holding visits are very helpful, but costly and time consuming

## Future Directions

- Aligning Financial Incentives with data entry and data quality
  - right now we subsidize 75% of computer costs
  - in future might subsidize 50%, but give them an opportunity to earn the additional 25% through the provision of good data
  - have a mix of data quantity and quality requirements
- Provide decision-support tools that require good data entry
  - can improve patient care if data quality is high