Successful Computerization in Small Primary Care Practices:

A Report on 3 Years of Implementation Experience

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C.O.M.P.E.T.E

Who We Are

- Centre for Evaluation of Medicines [CEM]
  - Independent Academic Research Institute
    - situated at St. Joseph's Hospital, Hamilton Ontario
    - affiliated with McMaster University
- COMPETE [Computerization of Medical Practices for the Enhancement of Therapeutic Effectiveness].
- COMPETE is a three year project to evaluate the impact of EMR on practice efficiency, quality of care and privacy concerns and to assess the effectiveness of computer generated educational interventions.
- EMR use is rare in mainstream family practice in Canada, considerable time and effort were applied to selection of EMR software and recruitment of Family physicians.

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C.O.M.P.E.T.E. EMR System

- Recruited 32 family physicians in 18 practices in Hamilton-Wentworth area
- 12 physicians are reimbursed through a capitation system, the rest are fee for service primary care physicians.
- Physicians are community-based, computer skills vary widely
- Physician pays a nominal monthly fee, which includes a server, 4 workstations and printers
- Software is Purkinje's (DCI) version 1.4, the system includes practice management software for billing and scheduling
- DCI is a structured template-based EMR with integrated prescription module, real time drug interaction checks, diagnostics module for ordering and reporting, a cumulative patient profile and knowledge look-up resources

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C.O.M.P.E.T.E. EMR System

- Server has mirrored hard-drives & system back-ups are done nightly.
- Sites have a service contract, 4-hour fix for server, 8-hour fix for all other equipment. System downtime has been less than 2%
- Physicians and staff were trained in several sessions prior to system implementation. COMPETE staff provided onsite technical and software use support as needed.
- Change Management was an important component of implementation.
- Data quality management was actively pursued
- Most, physicians enter patient data electronically, 65% of patients seen have encounter information entered into EMR. Multiple complaints, counseling entered on paper.
- 11 of the 18 sites receive lab results electronically, patient information consult notes, x-ray reports come into the office on paper.

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Best Practices in EMR Implementation

- Conducted a systematic review of the literature for best practices in EMR implementation
  - Conducted a literature search in MEDLINE, EMBASE and HealthStar databases
  - Found 15 articles that fit the inclusion/exclusion criteria
  - Used a consensus methodology to extract best practices from the literature

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Best Practices in EMR Implementation

- The first cluster of best practices:
  - Involving multiple stakeholders,
  - providing training and
  - having a stable and supportive governance structure
    - These items scored 27 points each, of a maximum 33
- Getting stakeholder buy-in is an important part of change management and helps to empower those who will be most affected by the change.
- Training was seen as important in getting physicians and staff oriented to the software and to help them visualize how they would do their work in the new system. Training is also found to be an ongoing process.
- Support of senior management and stable sources of funding were deemed to be critical in achieving success in EMR implementation. Computerization of practices is only the first step in a long journey toward the use of technology in clinical practice.

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Best Practices in EMR Implementation

- The next cluster of themes that seemed to appear in many authors' accounts of their implementations included:
  - the need to sell the benefits of computerization and to help address and lower barriers to uptake.
  - the need to start planning early.
  - the need to be prepared for and to pro-actively solve the problems that will inevitably arise during EMR implementation.
  - To provide project leadership that has the authority and accountability for achieving results.
    - These scored a total 24 of a maximum of 33

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Best Practices in EMR Implementation

- The final cluster of important themes involves:
  - workflow redesign, vendor support, providing implementation support and the process of choosing software.
  - Workflow redesign, vendor support and providing implementation support in the early phase of implementation are all elements of good project management.
    - These items scored 21 or less, of a maximum of 33
  - Surprisingly, being able to customize the software did not score as well as we had anticipated.
    - There was little mention whether software was customizable, or if customization of EMR software was important to achieve success in implementation.

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Best Practices

Best Practice	Score*
Involving Multiple stakeholders	27
Training	27
Governance support	27
Sell benefits/ Address obstacles	24
Develop early planning strategies	24
Problem solving	24
Project leadership	24
Vendor support	21
Workflow redesign	18
Process of Choosing Software	15
Provide implementation	15
Customizability of software	6

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Method of Implementation

- Based on the best practices described, we developed a methodology to implement EMRs in small primary care physician practices. Our project management implementation process involved a highly structured, hectic 5-week cycle with 5 main activities:
  - Sales
  - In-depth site assessment
  - Hardware integration
  - Software application and support
  - Practice Management

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Implementation Steps

- Sales
  - Explain process to site & obligations of participation
  - Initiate Change Management training
  - Conduct site assessment including a site map
  - Sign contract
- In-depth site assessments
  - Practice management assessment
  - Technical team walk-through
  - Equipment order finalized

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Implementation Steps

- Training week
  - Training - staff and physician classes
  - Practice units delivered to offices
- Cabling and Practice
  - Cabling day in offices - quite disruptive, minimal patient visits or shut down office
  - Encourage practice on training units
  - One-on-one training for those that learned poorly in class

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Implementation Steps

- Installation and Administration ‘Go Live’
  - Offices need to shut down for computer installation - too disruptive to see patients
  - Administration ‘go live’
    - Cold turkey the best
  - “Hand-holding” session
- Physician(s) ‘Go Live’
  - Advanced training for physician(s)
  - Physician ramp up begins - easy does it
  - “Hand-holding” sessions - answer questions that come up

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Post Implementation Steps

- Case Management
  - Measure data quantity and quality
  - More training for physician(s) & staff
  - Extra “Hand-holding” sessions for those that need it
- Practice Management
  - Clear lines of communication were important in ensuring confidence and commitment to the project during times of problems.
- Project Management
  - Managing vendors and ensuring adequate support of sites is critical to achieving a successful project

Results


Centre for Evaluation of Medicines


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University
Hamilton, Ontario

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Administrative Processes

Prepare Day Sheet (min)	9.1	4.8	1.2
Pull Charts for Day Visit (#)	29.2	27.4	22.2
Pull Charts for Day Visit (min)	46.4	37.1	16.5
Pull Charts for Inquiries (min)	43.5	38.4	20.6
Writing in Chart - Staff (min)	33.0	44.0	71.9

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Clinical Processes

PHYSICIAN TASKS	Pre-EMR	6 Mos Post	18 Mos Post
Writing in Chart - MD (min)	101.3	149.3	102.8
Percent paper use (%)	100.	52.6	39.0
Script writing and renewals (min)	16.2	14.2	21.3
Consult Reports Review (min)	14.9	14.6	23.4
Lab Report Review (min)	14.3	15.1	12.1
Number of Patients Seen/Day	20.9	21.8	21.8

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Clinical Processes

- Where is the extra time coming from?

	LESS	SAME	MORE
Do you…			
Work a longer day?	0	12	6
Spend more time charting?	0	6	12
Have work left at day's end?	3	11	4

  - Probably from the patient
- Could be that the increased time is really 'cognitive dissonance'
  - On paper, script writing and lab review are not 'charting'
  - In the electronic world, these two functions are now done on the computer -- making it difficult to tease them out from 'charting'

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Clinical Processes

- Is the extra time worth it?

Are you…	NO	YES
Getting a better quality chart?	7	11
Saving time elsewhere during the day?	3	15

- Where are the time savings to be found?

Where are you saving time?	Number of Replies
Reviewing E-Lab Results (N=11)	8
Referral Letters automatically done	4
Faster prescriptions/repeat scripts	3
Follow-up Notes are easier to do	1
Administrative tasks faster	2

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Conclusion

- Computerization of practices is challenging and requires many things to go right
- Dramatic improvements in administrative functions are likely due to training and retraining
- Computerization requires time
  - May take over a year to achieve the highest level of use
  - Benefits take many months to be realized
- Patients pay the price of computerization with less attention being paid to them

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Future Research Areas

- Focused use of voice recognition technology to aid speed of EMR ramp up
- Use of IP video technology to provide remote ‘super user’ support
- Development of forms to aid in charting specific conditions; e.g., well baby visits
- Training videos to model good EMR use in front of patients