

EVIDENCE-BASED EMR SOFTWARE SELECTION

The COMPETE Study

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COMPETE -- The Study

- Computerization Of Medical Practices for the Enhancement of Therapeutic Effectiveness
 - ◀ A three year project to study appropriateness of prescribing in three areas: GI, CVS and MSK
 - ◀ To be conducted in a research network of 100 community-based Family Practitioners who use an electronic medical record to capture drug use data
 - ◀ to conduct a controlled trial of academic detailing vs. computer-based patient-specific audit and feedback
 - ◀ Investigate impact on efficiency, satisfaction and quality of care, especially influence on prescribing

COMPETE -- The Study

- Who is conducting the study?
 - ◀ The Centre for Evaluation of Medicines (CEM)
 - ◀ An Independent Academic Research Institute
 - situated at St. Joseph's Hospital
 - affiliated with McMaster University
 - ◀ The Founding Director is Dr. Stuart MacLeod
 - ◀ The Principal Investigator is Dr. Anne Holbrook
 - ◀ Other investigators include Dr. Mitch Levine, Dr. Stuart MacLeod, Dr. Rolf Sebaldt, Dr. Charlie Goldsmith and Dr. Karim Keshavjee

The Challenge

- To find an Electronic Medical Record that:
 - ◀ Functions well in the clinician's office
 - Chart summary, visit notes, prescribing,
 - lab processing, health maintenance, consultation, patient education, Ontario Billing
 - ◀ Captures discrete data for research purposes
 - ◀ Will grow over time, as EMR technology is still in its infancy
 - ◀ Has a stable vendor that can meet multiple needs
 - Training, Software support, Customize software to project needs
 - Participate in furthering EMR technology
 - ◀ Is reasonable in cost

The Challenge

- To choose an EMR where no well-established criteria for choosing EMRs exist
 - ◀ Hence a need to develop our own methodology
- To introduce electronic medical records into a population where
 - ◀ Voluntary usage of EMRs is less than 5% and closer to 1%
 - ◀ EMR discontinuation rates are as high as 80-90%
- To conduct a study requiring decision-support at a time when there are
 - ◀ Few good examples of successful decision-support studies in primary care settings
 - ◀ Few good examples of decision-support tools in primary care

The Environment

- A changing healthcare system with budget constraints
- Primary Care Reform is an important trend
- New Healthcare Legislation being introduced which add complexity in terms of confidentiality and privacy concerns of EMRs

EMR -- How was it chosen?

METHODOLOGY

- Medline search, attendance at conferences, journal advertisements
 - ◀ Many systems available
 - Wintel platform was chosen early on
 - Chose to go mostly with companies that exhibited at major conferences or had excellent reputations in the industry
 - ◀ Found 25 EMRs
 - Many more which were glorified word processors
 - The rest were hospital-based systems being promoted as primary care systems
 - Some proprietary systems
 - 11 commercial systems for primary care were finally chosen

EMR -- How was it chosen?

- Review of 11 EMRs
 - ◀ Two Family Physicians from the Hamilton area graded 8 of the 11 systems
 - Viewed demos or used actual systems
 - 2 EMR vendors were not interested in the Canadian market
 - 1 EMR vendor had a demo, but no real system!
- Able to short list to 4 EMR systems



EMR -- How was it chosen?

- The Four finalists were reviewed in an intensive process

- ◀ Vendor #1 -- Quebec, Canada
- ◀ Vendor #2 -- California, USA
- ◀ Vendor #3 -- Washington, USA
- ◀ Vendor #4 -- Georgia, USA



EMR -- How was it chosen?

- In-depth demonstration
 - ◀ 3 hour demonstrations of each system
 - review by 4 researchers and 4 FPs
 - Reviewed for Family Practice and Research needs
 - ◀ RESULT:
 - All EMRs appeared to be solid candidates -- no glaring deficiencies were found
 - Quality of EMR appears to correlate with quality of person demonstrating -- not the quality of the software

EMR -- How was it chosen?

- Interface “Look and Feel” review by 25 Family Physicians (45 minute demonstrations)
 - ◀ RESULT:
 - All EMRs were favored by some, disliked by others -- no statistically significant differences were found
 - Quality of demonstrator correlates better with perceptions of physicians than actual software

EMR -- How was it chosen?

- Site visits to vendor's premises to ensure:
 - ◀ Vendor has capability to support the software
 - ◀ Vendor will grow over time
 - ◀ Vendor is researching better ways of charting
 - ◀ Vendor is well capitalized
 - ◀ Vendor is not frittering money on non-essentials
 - ◀ RESULTS:
 - All are solid companies with long-term growth potential
 - One company was significantly behind the others in development of their system
 - One company had a very long history in the field and had an outdated DOS database structure
 - One had a small development team with a 'star programmer'

EMR -- How was it chosen?

- Site visits to Family Practice users of system:
 - ◀ Does the company have an installed user base?
 - ◀ If so, how many users do they have?
 - ◀ Are physicians using them?
 - ◀ Are physicians happy with them?
 - ◀ RESULTS:
 - One EMR was used by physicians who dictated their notes --not representative of physicians in our study
 - One had no installed base of users
 - Regardless of system, most physicians who use them, like them and would not go back to paper

EMR -- How was it chosen?

- Hands-on review of each system by 11 FPs
 - ◀ We obtained an evaluation copy of each system
 - ◀ FPs spent an hour with each system entering their own patient information assisted by a trained user
 - ◀ RESULTS:
 - One EMR was found to be significantly worse in actual usage by Hamilton area physicians
 - One EMR was found to be difficult to get started easily, but it was felt that training could overcome this
 - Two others were considered flexible and user friendly
 - ◀ Most informative of all reviews of the software

EMR -- How was it chosen

- Site visit to research institutions using two of the systems under review
 - ◀ One academic research centre
 - ◀ One private company that resells data
 - ◀ RESULT:
 - It is extremely difficult to do research with text-based systems --it requires significant resources be applied
 - Getting physicians to enter data in a form that is easier to analyze is very difficult

EMR -- How was it chosen?

- The bottom line:
- *Vendor #3*
 - ◀ Good company
 - ◀ Best for physicians who dictate
 - ◀ Has underlying DOS structure --old fashioned and slow
- *Vendor #4*
 - ◀ Good company
 - ◀ Incomplete EMR
 - ◀ Excellent database
- *Vendor #2*
 - ◀ Good company
 - ◀ Well-liked interface
 - ◀ Good underlying database
- *Vendor #1*
 - ◀ Good company
 - ◀ Busy, but usable interface
 - ◀ Excellent database

Narrowing down The Choice

- FINAL TWO
 - ◀ expert user of each system invited to demonstrate efficiency of use -- arms length from vendor
 - ◀ negotiation regarding partnership, deficiencies, strategic directions, capitalization, research initiatives
 - ◀ Triangulation of 4 domains:
 - Research: database and training
 - Software: user interface and usability, training
 - Hardware: setup, support, cost
 - Team Capabilities: complementary skills

The Finalist

- Vendor #1
 - ◀ Has Ontario Billing software integrated into EMR -- critical for getting buy-in from area physicians
 - ◀ Able to provide training and help-desk support
 - ◀ Able to provide hardware installation and hardware support
- Clearly, training, hardware installation and software/hardware support are critical to success of implementation

Gem of the Conference

- Dr. Peter Waegemann, Executive Director of the Medical Records Institute (MRI) stated at TEPR 98:

Those who have been successful in implementing EMRs have been those who have focused on the homework of choosing their EMRs; truly understanding the EMR they have chosen -- its positives and negatives. Those who have chosen their EMR on the basis of “best system” have rarely been able to make it work.

- Understanding the deficiencies of your EMR allows you to lessen the impact of those deficiencies

EMRs -- Many challenges, some successes

- Several groups have now got successful implementations in the US
 - ◀ An award has been instituted by the Computer-based Patient Records Institute (CPRI) to recognize these successful groups and encourage others to emulate these groups
 - ◀ The award is called the Davies award after Dr. Nicholas E. Davies who was a tireless promoter of EMRs and died in a car crash recently

Davies Award Winners

- Margret Amatayakul, Vice President, Sheldon I. Dorenfest Associates stated:

“In studying successful CPR implementations, there are some key characteristics that consistently emerge and appear to contribute to an organization’s ability to justify, select, and accomplish adoption of CPR systems. These characteristics are commonly found in organizations with advanced CPR implementations. Organizations early on the migration path to a CPR may want to consider adopting some of these approaches in their environments”

Davies Award Winners

- Have addressed the four critical success factors for CPR implementation:
- Organizational readiness (**management**)
 - ◀ a vision and a commitment to bringing the value of information to health care
- Payback issues (**impact**)
 - ◀ Encompasses multiple benefits: (1) quality, (2) cost, (3) access, and (4) satisfaction.
- Suitable products (**functionality**)
 - ◀ Ability to support patient care, management, and other processes
- Resistance to change (**technology**)
 - ◀ Including all major stakeholders in decision-making and continuous communications

Davies Award Winners

- “Perhaps the single most important characteristic of successful CPR implementations is the view that the implementation is not finished, and that any CPR implementation is a means to achieve improvements in health care quality, cost, and access, not an end in itself”
- **Key management characteristics:**
 - ◀ shared vision
 - ◀ sustained investment, longevity of program
 - ◀ tenure of leaders, source of leadership
 - ◀ clinician involvement, end-user focus
 - ◀ and system support with local implementation

Davies Award Winners

- Demonstrating **Impact** of EMRs
 - ◀ prior to implementation of their CPR (at Kaiser-Permanente), only 55 percent of patients referred to specialty care were seen within two weeks
 - ◀ that percentage rose to more than 80 percent with referral management assisted by the CPR system
- **Functionality** Characteristics
 - ◀ Characteristic of exemplary CPR systems is the fact that the projects have taken a practical, rather than purist view of the CPR.
 - ◀ Again, the emphasis was on providing value, not on achieving the CPR as an end product

Davies Award Winners

- “It is in the degree of structure in data that the exemplary CPR projects rise above others and where the impact of the lack of comprehensive terminology standards is most evident.”
- Structured data is the only means by which data elements can be manipulated. The more granular, or highly structured, the data are, the more ability there is to process data into useful forms.
 - ◀ Columbia-Presbyterian Medical Center is one of several of the Davies award recipients that has developed a controlled vocabulary, models data and their relationships, and enforces use of data standards.

Davies Award Winners

- Closely related to structured data is data integrity. Davies awardees view data integrity as one of the biggest problems with which developers struggle
- Some solutions have been auto loading as much data as possible from monitoring devices and other equipment, incorporation of reasonableness checks, standardization, and tracking compliance with documentation requirements
- **One of the best means of ensuring data integrity is direct entry of data by the clinician**

Davies Award Winners

- Overcoming Resistance to Change
 - ◀ Generally agreed that there are no major breakthroughs in technology required to achieve the ideal CPR, it is also found that current technology does not completely satisfy all requirements.
 - ◀ Data entry technology is probably the biggest hurdle as it relates most closely to user acceptance/user resistance to change
 - ◀ Related to data entry devices are system response time and reliability
 - ◀ Security is also a major concern

DISCUSSION

- Sparse literature on EMR selection
- No registry of EMRs
- Clinical, technical and research imperatives differ - all need to be considered
- Rigorous selection is time consuming and expensive
- Success of demonstrations reflects the quality of the demonstrator not the quality of the software
- Systems are constantly evolving --hard to know what you're evaluating --reality or vapourware
- Rapidly changing field
- No perfect system --trade-offs are inevitable and articulating the trade-offs are challenging