Rapid Response Evaluation for Physician Office Electronic Medical Records

Morgan Price, MD, PhD, CCFP
May 21, 8:30am-10:15am
Rapid Evaluation Approaches

Morgan Price notes – to be provided prior to class

- Ref #14 – UVic eHealth Observatory Rapid Response Evaluation Methodology- Resource Tools section
  - What are the eHealth evaluation tools on this website? Refer to http://ehealth.uvic.ca/resources/tools/tools.php (opens new window)
  - Can you apply these tools in your organization? If yes, how? If no, why not?
  - What are the implications? (i.e., what needs to be in place within the organization to apply these tools)

- Ref #15 – UVic eHealth Observatory Rapid Response Evaluation Methodology- Resources Study Planning section
  - What are the eHealth evaluation tools on this website? Refer to http://ehealth.uvic.ca/resources/studyPlanning/StudyPlanning.php (opens new window)
  - Can you apply these tools in your organization? If yes, how? If no, why not?
  - What are the implications? (i.e., what needs to be in place within the organization to apply these tools)

May 21, 10:30am-12:30pm
Rapid Evaluation Case Study

Morgan Price notes – to be provided prior to class

- Ref #16 – A Proposed Formative Evaluation Study to Examine the Effects of Deploying a Physician Office EMR on Patient Care
  - What are the questions? What are the approaches used?
  - Are the approaches used in this study valid/important/relevant to your organization? If yes, how? If no, why not?
  - Can you apply these study approaches in your organization? If yes, how? If no, why not?
  - What are the implications? (i.e., what needs to be in place within the organization to apply these approaches)

Please email any comments or suggestions to: HINF Webmaster

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Updated by Francis Lau PhD; Last updated on: January 4, 2010
Who am I?
Who am I?

Researcher at eHealth Observatory
Who am I?

Researcher at eHealth Observatory

Family Doctor: Cool Aid CHC
Who am I?

Researcher at eHealth Observatory

Family Doctor: Cool Aid CHC

UBC Family Medicine
Lead Faculty, Informatics
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Adjunct Faculty, Comp Sci
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UBC Family Medicine
  Lead Faculty, Informatics

Adjunct Faculty, Comp Sci

Informatics Consultant
Ground Rules

Please Interrupt Me with Questions!
Who are you?
My Assumptions
(about you)

• You have some knowledge in terms of EMR functionality.

• Wanting hands-on / practical advice on evaluation of adoption.

• Want discussion, not lecture

• You are a mix of providers and IT / informatics professionals.
Anything specific you want to discuss today?
Objectives

- Appreciate Current State on EMR adoption evaluation
- Appreciate EMR adoption is a process
- Review formative evaluation methods that can help practices adopt EMR successfully.
Activities

• Review Background from the Literature
• Overview of our evaluation framework
• Overview of the methods and tools
• Trial one of the tools
• Review Two Case Studies
• Discuss Discuss Discuss Discuss
We are completing a systematic review of EMR benefits in office practice.
Question:
What are the impacts of EMR systems on physician office practices?
Flowchart of Study Selection Process: Final Results

15,847 Papers

Records identified from Medline: 14,234
Duplicate records removed: 645
Combined Medline/CINAHL records: 15,847
Duplicate records removed: 805
Records eligible for initial screening: 15,042
Records rejected on title or abstract: 14,042
Records eligible for full-text screening: 1,000
Non-English publications not retrieved: 66
Full-text not available online: 170
Records screened by full-text: 764
Records rejected on full-text: 620
Potential records for review: 144
Records rejected by reviewer consensus: 64
Records selected for inclusion in review: 80
Analysis Studies: 15
Descriptive Studies: 39
Surveys: 26

EMR Review
April 11, 2010
15,847 Papers

Flowchart of Study Selection Process: Final Results

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Tuesday, July 13, 2010
26 published surveys

<table>
<thead>
<tr>
<th>Percentage</th>
<th>Outcome Description</th>
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<tbody>
<tr>
<td>9 (35%)</td>
<td>clearly positive outcomes</td>
</tr>
<tr>
<td>14 (54%)</td>
<td>reported mixed outcomes</td>
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<tr>
<td>2 (8%)</td>
<td>reported negative outcomes</td>
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<tr>
<td>1</td>
<td>had ambiguous results</td>
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</tbody>
</table>
72% of indicators were for User Satisfaction
15 analytic studies - 9 (60%) with positive outcomes.
90% of measures were focused on Net Benefits

System Quality
Information Quality
Service Quality

Use
User Satisfaction

Net Benefits
Quality
Access
Productivity
Only 2 studies looked at clinical outcomes (no positive findings)
Description of the Descriptive studies

In Progress
There is some evidence of mixed benefits... lots of room for improvement
We wanted to add to EMR evaluation.
Overview of our Framework
How to Evaluate?

How to Provide Feedback?
We wanted something timely, comprehensible, and useful for clinicians.
We wanted something timely, comprehensible, and useful for clinicians.
We wanted something that could also aid in adoption.
We considered the premise that stepwise adoption limits change and maintains productivity.
From Stead, 2007

**Clinical Team Performance**

- **Time**
  - **Clinical Documentation**
  - **CPOE**
  - **Communication Tools**
  - **Results Viewer**

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We assumed that offices adopt functions more organically over time.
Increasing Performance with Practice Improvement
Adoption increases over time when change is manageable and improvements are perceived.
Adoption may fail where benefit not seen.
Support change by showing improvements and by providing guideposts.
Our framework is built on two sources: HIMSS & IOM.
HIMSS Analytics
HIMSS is well known for its 7 Levels for Hospitals
(and it has 5 levels for ambulatory care).
Paper Charts for Clinical Information
<table>
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<tr>
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<th>Online access to reference materials</th>
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<tr>
<td>0</td>
<td>Paper Charts for Clinical Information</td>
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<td>Hybrid Electronic - Paper Chart</td>
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| 5 | EMR Integrated within Health System  
Point of Reflection CDSS |
|---|----------------------------------|
| 4 | Electronic Chart with Advanced Point of Care  
Clinical Decision Support |
| 3 | Electronic Medical Record Used  
(more passive record) |
| 2 | Hybrid Electronic - Paper Chart |
| 1 | Online access to reference materials |
| 0 | Paper Charts for Clinical Information |
Institute of Medicine
IOM created a report on the Key Capabilities of an EHRS (IOM 2003)
IOM focused on care delivery functions and not infrastructure / data standards.
IOM - 8 Core Functions
IOM - 8 Core Functions

Reporting & Population Health
IOM - 8 Core Functions

<table>
<thead>
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IOM - 8 Core Functions

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We created a complex matrix...

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<table>
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and ended up with a simple graph
Next, we developed tools to assess adoption
Next, we developed tools to assess adoption

- Impact Assessment (I)

- EMR Adoption (I)

- Workflow Modelling / Rx Functions (I)

- Usability Benchmarking (O)

- Practice Reflection (G)

- EMR System Analysis (I / S)
Next, we developed tools to assess adoption

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Tuesday, July 13, 2010
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All resources are available at ehealth.uvic.ca

(version 2.0 coming)
METHOD: we travel on site, tools in hand.
Two researchers
Three days
EMR System Assessment
Should be completed before site visits.
Evaluation of functionality to provide “ceiling” on scores.
Necessary to know what the clinic can and cannot do.
Aligned our evaluation with existing functional requirements.
Our focus was on Medication Management
Impact Assessment
Interview
Two part interview

• Part 1
  • Impact Assessment
  • Mainly open-ended questions

• Part 2 (Pare)
  • Focused on Change Management / Deployment
  • 23 questions, 5 point scale
Impact Assessment

Examples

- What do you think about the quality of the system in terms of functionality and performance?

- What opportunities do you see with the use of the EMR as compared to how things were previously done?
EMR Deployment Examples

• 1-5 Scale of Agreement to statements like:
  • There was alignment of the system with local practices and processes.
  • There were positive attitudes on the part of project team members.
  • It was a small and simple project.
EMR Adoption Interview
EMR Adoption
Interview

• Covers all eight functional areas

• Currently an interview
  • Could be survey, after validation

• Each question scored based on current use

• Developing MOA and MD versions.
EMR Adoption Interview is a good level of detail for an office.
We are going to trial this 25 question interview today.
Activity: (45 min)
EMR Adoption Interview
Break
(and scoring)
Debrief the Interview - what did you find?
SCORES
Anything Unclear
Anything we missed?
Any surprises from the scores?
Workflow Modeling / Medication Management Interview
Explores detailed processes of medication management.
Takes a broad view of the workflows of medication management.
Distilled to a set of questions with answers that map to the five levels.
Some questions BC specific.
(Special Authority)
These questions also tend to educate.
Usability Benchmarking
Observation (in this case) of prescribing activity.
We developed six standardized cases.
Standardized cases allow for comparison at three levels: user, clinic, & EMR.
Feedback: early to users, later to users and to vendor.
First, we open the floor to their reflection, as a group.
We provide feedback and recommendations
Focus Group reviews findings, agrees to priorities and discusses how to implement.
Finally, we repeat the study.
and look for change over time.
and look for change over time.
and look for change over time.
and look for change over time.
and look for change over time.
and look for change over time.
and look for change over time.
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and look for change over time.
Two Case Studies
Case Study 1
Here are the scores.

- **Health Information**: 3
- **Order Entry**: 2
- **Results Management**: 3
- **Decision Support**: 2
- **Electronic Communication**: 2
- **Patient Support**: 1
- **Scheduling Billing**: 3
- **Practice Reflection**: 1

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Change Management -
variable, based on role.
Prescription Management

- Variable use of EMR
- No alerting
- Not using advanced features
Usability

- Multiple errors from system / GUI
- Users did not use tools efficiently
- Drug selection issues (generic / brand)
- Complexity for newer users
  - icons not clear
- Complex prescriptions not handled well.
Other Issues

• Participants quick to highlight challenges.

• Many are *relative* complaints:
  • it is slower *now*
  • scanning takes *way more* mouse clicks than it used to.

• Technical glitches: freezing

• Training issues.
They didn’t complain about what they didn’t know.
Case Study 2

(more briefly)
Here are the scores.

Tuesday, July 13, 2010
Let’s Compare the Two Cases
Case 1

- Health Information
- Order Entry
- Results Management
- Decision Support
- Electronic Communication
- Patient Support
- Scheduling Billing
- Practice Reflection

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Who implemented when?
Case 2 implemented 10 years before Case 1
Why so little difference?
User Challenges
I know how paper works...
I didn’t know what I didn’t know
Short term fixes have long term implications
Terminology,
shmerminology - let me write down what I want.
System Challenges
“Flexible Data models”
“Add your own terminologies”
From my office...

- Hepatitis C - genotype 2
- Hepatitis C - with cirrhosis
- Hepatitis C -- PCR +ve
- Hepatitis C -- PCR +ve 2001
- Hepatitis C -- PCR Neg
- Hepatitis C geno 1a
- Hepatitis C geno 1b
- hepatitis C PCR +ve 2003
From my office...
From my office...
From my office...

<table>
<thead>
<tr>
<th>Condition</th>
<th>Code</th>
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<tbody>
<tr>
<td>Hepatitis C treated with Rebetron</td>
<td>572</td>
</tr>
<tr>
<td>hepatitis C-PCR +ve 2002</td>
<td>572</td>
</tr>
<tr>
<td>hepatitis c-genotype 3</td>
<td>572</td>
</tr>
<tr>
<td>hepatitis C-genotype 3a</td>
<td>572</td>
</tr>
<tr>
<td>hepatitis C-PCR +ve 2004, genotype 1b</td>
<td>572</td>
</tr>
<tr>
<td>Hepatitis Carrier</td>
<td></td>
</tr>
<tr>
<td>Hepatitis Chemical</td>
<td></td>
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<tr>
<td>Hepatitis Chronic</td>
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</table>
From my office...
From my office...

HAS NON COOL AID HEALTH CENTRE  780
HCV - chronicity NYD
HCV geno 1a
HCV genotype = 3a
HCV PCR + geno 1a
HCV PCR Undetectable  572
From my office...
From my office...
From my office...
From my office...

Heroin addiction  304
heroin addiction   304
heroin dependency  304
heroin induced leukoencephalopathy  304
heroin withdrawal  304
heroin abuse        304
heroin dependency   304
heroin induced leukoencephalopathy  304
From my office...
How can I see my practice with data like that?
How can we share data in the future?
Thank you to the team

- Dr. Francis Lau and the eHealth Chair
  - Tyrone Austen
  - Jesdeep Bassi
  - Heidi Bell
- UBC Enhanced Skills
  - Dr. Jeanette Boyd
  - Dr. James Lai
  - Dr. Colin Partridge
Materials available at ehealth.uvic.ca