Physician Perceptions of Two EMRs: CPRS and GE Centricity

Lisa Grabenbauer, M.S.
Anne Skinner, B.S.
John R. Windle M.D.
University of Nebraska Medical Center
Disclosures

John Windle-No conflict of interest

Anne Skinner-No conflict of interest

Lisa Grabenbauer-No conflict of interest
Research Overview

Objective

• Examine physicians’ perspective on the benefits and limitations of current Electronic Medical Records (EMR)
Research Overview

Context

• Compare environments and culture
• Veteran’s Administration Medical Center (VAMC) paperless system (VistA and CPRS)
• The Nebraska Medical Center’s (TNMC) GE Centricity Enterprise system
Poll#1

• What is your role?
  – Clinician
  – Researcher
  – Administrator
  – Other (fill in the blank)

• How long have you been using CPRS?
  – Don’t use
  – Less than 3 years
  – 3-5 years
  – 5-10 years
  – Longer than 10 years
Study Design

Participant Profile

- 18 physicians who practice at both institutions
- 9 academic faculty
- 9 residents and fellows
Study Design

- **Saturation**
  - **Inter-rater reliability testing**
  - 5 Themes
  - Review of themes

- **Saturation Reached**

  - **6 Transcripts**
  - **2 Additional Interviews 2 subjects**
  - **4 Themes 2 Major 2 Minor**
  - Rater Team Analysis
  - Individual Coding - LG

- **6 Focus Group Sessions 18 Subjects**
  - 6 Transcripts
  - Individual Coding - LG

- November 2008 February 2009 September 2009
Study Design

Data Collection

• Focus group format
• Open-ended questions about interaction with respective EMR systems and the systems perceived benefits and limitations
• Conducted in November 2008 through February 2009
Study Design

Analysis

- Group proceedings audio-recorded and transcribed
- Data elements systematically coded and analyzed using NVivo v8.0 software
- Iterative identification of themes unique and similar across all groups
- Themes revised until consensus achieved
Findings

- Work Flow
- Communication
- Outcomes and Research
- Education and Learning

Major themes:
- Workflow
- Communication
- Outcomes and Research
- Education and Learning
Major Themes Defined

Workflow

• Physical interaction of the healthcare provider with information and with patients, which includes the amount of time needed to capture, retrieve and process information.
Major Themes Defined

- Interaction between the healthcare provider team, and the methods needed to facilitate the exchange of information.
Major Themes Defined

- Use of data in a structured and summarized way to satisfy research, outcomes and billing, including capture of data in the appropriate formats.
Major Themes Defined

Education/Learning

- Use of HIT to support the provider’s medical education, as well as any learning that is required to effectively use the EHR system.
Workflow

Benefit

- Availability of patient data both spatially and temporally
- VA system more comprehensive
- University system better organized
- Templated notes save time and improve documentation
Workflow

Cost

- Time consuming retrieval of select patient information
- VA system very difficult to search, contained significant redundancy
- University system less comprehensive and required searching several disconnected data sources
Workflow

Cost

- Templated notes decrease readability and comprehension
- Too much “copying and pasting” in the VAMC’s EMR
Workflow

Impact on Patient Care

- Availability at point of care
- Information input and retrieval overhead reduces time with patient
Workflow

Physician Quotes

• “So, we don’t type in our clinic notes at this point. But we spend a lot of time outside of clinic documenting.” (TNMC - FAC)
• “I just finished clinic and I now have 12 charts to dictate sometime today.” (TNMC - FAC)
“Follow up involving order entry takes at least 5-10 minutes per patient, so if you add that on to the end of your day – it is at least an extra hour, because nothing goes on paper, and it’s not convenient to enter info until you’re finished with seeing all patients. (VA – RES)”
Workflow

• “The longer you are at the VA, the more tricks you learn about using it and it becomes more and more powerful but sometimes that learning curve is very steep. “ (VA – FAC)
Workflow

Physician Quotes

• “I want it to be intuitive ... I don’t want to have to ask somebody to make it for me.” (VA - FAC)
• “… the issue related to templates and progress notes has made every note look identical ... it’s watered down the quality of the documentation ... the history and physical.” (VA – FAC)
Workflow

Physician Quotes

• “You have chaplain notes, you have PT notes, you have everything and literally you’re looking at a list that for one patient’s hospitalization may be a list of 300 notes.” (VA – FAC)
Workflow

Physician Quotes

• “When I go back to the VA, I’ve got to page and scroll back through things or I got to know specific archaic commands.” (VA – FAC)
• “… the medical records becomes kind of the all, the omni-present power … you actually have more interaction with the damn computer than the patient.” (VA – FAC).
Communication

Benefit

• Ability to share patient-centric information
• Other providers
• Patients
Communication

Cost

• Reduced direct communication between health care providers
• No transparency between VAMC and TNMC EMR systems or external EMR
Communication

Impact on Patient Care

- Patient access to information
- Redundancy creates frustration
Communication

• "I don’t think that you can rely on the medical record system to provide you all the communication that you need because any electronic system still needs to be overridden by human initiation in terms of a phone call or a page.”

(BOTH – FAC)
Communication

Physician Quotes

• “Lots of interaction with nurses, they get to know who you are and often provide additional information about your patient - that happens just because of physical presence – it provides another opportunity to share relevant information that doesn’t happen at the VA because there is less interaction. This collaboration also provides more reliability that orders are followed. “(TNMC – RES).
Poll #2

• Are your perceptions of the impact of EMR workflow on patient care ...
  – Mostly negative
  – Mostly positive
  – Balanced

• Are your perceptions of the impact of communication using EMR on patient care ...
  – Mostly negative
  – Mostly positive
  – Balanced
Outcomes and Research

Benefit

- VA system is comprehensive and can link across the country
- Reliable data at the point-of-care can improve outcomes
Outcomes and Research

Cost

• VAMC data entry is driven by and through physicians and impacts on time with patient
• TNMC’s EMR doesn’t support structured data
Outcomes and Research

The potential to improve patient outcomes holds great promise.

That promise is not easily recognized in either current system.
Education and Learning

- Both faculty and residents were positive about the impact of web-based educational content such as Up-to-date and Google scholar.
- Residents were more positive about its impact than faculty.
Education and Learning

Cost

- The positively cited materials were outside of either EMR
- Internal alerts were viewed “fairly useless” and in many cases forced workarounds.
Education and Learning

Impact on Patient Care

- Availability at point of care, just-in-time learning
- Alerts require an over-ride to prescribe, this was perceived as a larger problem at the VAMC than NMC
Poll #3

• Are your perceptions of the impact of outcomes and research using EMR data on patient care ...
  – Mostly negative
  – Mostly positive
  – Balanced

• Are your perceptions of the impact of education using EMR on patient care ...
  – Mostly negative
  – Mostly positive
  – Balanced
# EMR Comparison

<table>
<thead>
<tr>
<th>Strength</th>
<th>TNMC</th>
<th>VAMC</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Logically organized</td>
<td>Comprehensive</td>
</tr>
<tr>
<td>Weakness</td>
<td>Limited information in primary EMR</td>
<td>Not intuitive</td>
</tr>
<tr>
<td></td>
<td>Too many different clinical databases that don’t work together</td>
<td>Labor intensive</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Too much information repeated</td>
</tr>
<tr>
<td>Meets physician needs</td>
<td>NO</td>
<td>NO</td>
</tr>
</tbody>
</table>
Technology Acceptance Model (TAM)

- Proposed by Davis, 1989
  - Predictor of acceptance of an information system
  - Valuable in systems design

- User acceptance can be measured by their behavior, and is determined by two beliefs
  - Perceived usefulness – how well does it help me do my job?
  - Perceived ease of use – how much effort is required to use it?
## Physician Perceptions

<table>
<thead>
<tr>
<th>Perceived Usefulness</th>
<th>Perceived Ease of Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Quality of Information</td>
<td></td>
</tr>
<tr>
<td>• Structured Data supports outcomes, research, education</td>
<td></td>
</tr>
<tr>
<td>• Quality of System</td>
<td></td>
</tr>
<tr>
<td>• User Interface inhibits workflow and communication</td>
<td></td>
</tr>
</tbody>
</table>
Research Direction → Workflow

Identify needs of physicians
- Identification of values
- Prototype design features

Explore collaborative design methodologies

Test usefulness and usability of interfaces
Conclusions

Physicians optimistic about EMR potential for systematic collection of data to improve patient care

Current EMR frustrates physician with cumbersome interfaces and processes

EMR must provide seamless and flexible interfaces across system boundaries, for data input as well as data retrieval. The EMR should facilitate patient and team interactions, not inhibit them.
Adoption of Technology

“...on the whole, both systems are better than the paper systems we had years ago.”
Questions
Contact Info

Lisa A. Grabenbauer, MS, MBA
Cardiovascular Knowledge Engineering Group
Research Project Manager

University of Nebraska Medical Center
Internal Medicine - Cardiology
Phone: 402-559-8051