Building More Usable Electronic Health Records (EHRs) Supporting the Needs of Developers “Focus on Faster & Usable Clinical Documentation”

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Outline

- Usability references
- Usability framework of future Electronic Health Records (EHR)
- Recommendations from literature
Electronic Health Record (EHR) References

- **Study**: Physician Perceptions of Two Electronic Medical Records (EMRs): VistA* (VA) and GE Centricity
  Lisa Grabenbauer, University of Nebraska Medical Center (2009)

- **Research Objective**: Examine physicians’ perspectives on the objective benefits and limitations of current EMR

- **Conclusions**: Current EMR frustrates physician collection of data to improve patient care with cumbersome interfaces and processes

- **Recommendations**:
  - EMR must provide seamless and flexible interfaces across system boundaries, for data input as well as data retrieval
  - EMR should facilitate patient and team interactions, not inhibit them

*Veterans Health Information Systems and Technology Architecture*
A Qualitative Study of the Electronic Medical Record

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

Introduction

Research Objectives
- Explore the sources of resistance to EMR adoption by the physician community
- Examine physicians’ perspective on the benefits and limitations of current Electronic Medical Records (EMR)

Research Context
- Compare environments and culture between Veteran’s Administration Medical Center (VAMC) paperless system (VistA and CPRS) and The Nebraska Medical Center’s (TNMC) GE Centricity Enterprise system

Study Design
- Grounded theory
- Small group semistructured interviews
- 19 participants practicing at both institutions, including residents, house staff and academic physicians
- Open-ended questions about EMR interaction
- Conducted in November and December 2008
- Groups audio-recorded and transcribed
- Data elements coded using NVivo v8.0 software

Findings

<table>
<thead>
<tr>
<th>Theme</th>
<th>Benefit</th>
<th>Cost</th>
<th>Impact on Patient Care</th>
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<tbody>
<tr>
<td>Workflow</td>
<td>Availability of patient data both spatially and temporally</td>
<td>Time consuming retrieval of select patient information</td>
<td>Availability at point of care</td>
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<td></td>
<td>- VA system more comprehensive</td>
<td>- VA system difficult to search with significant redundancy</td>
<td>Information input and retrieval overhead reduces time with patient</td>
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<td></td>
<td>- University system better organized</td>
<td>- University system less comprehensive, requires disconnected data sources</td>
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<td></td>
<td>- Templated notes save time and improve documentation</td>
<td>- Templated notes decrease readability and comprehension</td>
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<td></td>
<td>- Too much “copying and pasting” in the VAMC’s EMR</td>
<td>- Too much “copying and pasting” in the TNMC’s EMR</td>
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<tr>
<td>Communication</td>
<td>Ability to share patient-centric information</td>
<td>Reduced direct communication between health care providers</td>
<td>Patient access to information</td>
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<td></td>
<td>- Other providers</td>
<td>- No transparency between VAMC and TNMC EMR systems or external EMR</td>
<td>Redundancy creates frustration</td>
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<td></td>
<td>- Patients</td>
<td>- No transparency between VAMC and TNMC EMR systems or external EMR</td>
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<td>Outcomes and Research</td>
<td>VA system is comprehensive and can link across the country</td>
<td>- Reduced data entry driven by and through physicians at the expense of patient care</td>
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<td></td>
<td>- Reliable data at the point-of-care can improve outcomes</td>
<td>- TNMC’s EMR doesn’t support structured data</td>
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<td>- VA system is comprehensive and can link across the country</td>
<td>- The potential to improve patient outcomes holds great promise</td>
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<td>Education and Learning</td>
<td>Faculty and housestaff were positive about the impact of web-based educational content using Up-to-date and Google scholar</td>
<td>- Positively cited materials were outside of either EMR</td>
<td>Availability at point of care, just-in-time learning</td>
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<td>- Housestaff were more positive about its impact than faculty</td>
<td>- Internal alerts were viewed as ‘fairly useless’ and forced workarounds</td>
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<td>- Positively cited materials were outside of either EMR</td>
<td>- Availability at point of care, just-in-time learning</td>
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Discussion

Perceived Usefulness
- Quality of Information
- Structured Data
- Supports Outcomes and Research
- Education and Learning

Perceived Ease of Use
- Quality of System
- User Interface
- Supports Workflow
- Communication

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<thead>
<tr>
<th>Strength</th>
<th>TNMC</th>
<th>VAMC</th>
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<td>Logicaly organized</td>
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<td>Comprehensive</td>
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<td>Weakness</td>
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<td>Limited information</td>
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<td>Not intuitive</td>
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<td>Too many clinical</td>
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<td>databases that don’t work together</td>
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Limits physician needs NO NO

Summary of Conclusions
- Physicians are optimistic about EMR potential for systematic collection of data to improve patient care
- Current EMR systems frustrate physicians with cumbersome interfaces and processes
- EMR systems must provide seamless and flexible interfaces across system boundaries, for data input as well as data retrieval.

Limiting physicians’ perceived ease of use must be further explored to improve physicians’ attitude and intent to use EMR functionality.

AMIA 2009, American Medical Informatics Association poster section.
Electronic Health Record References

- “THE ‘WE COMPUTERIZED THE PAPER, SO WE CAN GO PAPERLESS’ FALLACY”
- Taking the data elements in paper-based healthcare system and computerizing them is unlikely to create an efficient and effective paperless system
- This surprises and frustrates Health Information Technology (HIT) designers and administrators
- The reason is designers do not fully understand how the paper actually supports users’ cognitive needs
- Computer displays are not yet as portable, flexible or well-designed as paper

“THE ‘WE COMPUTERIZED THE PAPER, SO WE CAN GO PAPERLESS’ FALLACY”

Paper persistence problem recently explored at large Veterans Affairs Medical Center where EHRs have existed for 10 years
- Paper continues to be used extensively
- Why? Paper forms are not simple data repositories that, once computerized, could be eliminated

User-created paper artifacts typically support patient-specific cognition, situational awareness, task and information communication, and coordination, all essential to safe, quality patient care

Paper will persist and should persist, if HIT is not able to provide similar support
Usability Framework for Electronic Health Records

- We must produce faster and usable clinical documentation solutions which:
  - Are easy to learn (and re-learn)
  - Are efficient to use (performance)
  - Are effective to use (completion)
  - Prevent errors (not cause harm)
  - Are satisfying to use (subjective impression)
Recommendations From Literature

- Remove tension between free text versus structured documentation
- Clinical documentation needs to support both seamlessly
- Usability and semantic interoperability go hand in hand
- Refuse systems that do not deliver both
- Remove tension between clinician/physician documentation as a billing vehicle and as a clinical documentation tool
- Improved data input and richness of documentation can coexist if you design the system properly
- Usability is perhaps more crucial than interoperability
- The question of interoperability will be unresolved if clinicians fail to accurately record the data
“Observe, record, tabulate, communicate. Use your five senses. Learn to see, learn to hear, learn to feel, learn to smell, and know that by practice alone you can become expert.”

“There is no more difficult art to acquire than the art of observation, and for some men it is quite as difficult to record an observation in brief and plain language.”
Electronic Health Record Usability Literature

Electronic Health Record Usability Literature, continued


Electronic Health Record Usability Literature, continued

Contact Information

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