Assessing EHR Implementation Decisions to Improve Usability and Reduce Burden for Clinicians
PRESENTERS

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  Director of Digital Health, RTI International

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  Health Research Scientist, RTI International

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  ONC Medical Director for Systems Safety, US Department of Health & Human Services

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  MedStar Health National Center for Human Factors in Healthcare

• Raj Ratwani, PhD
  Director of the MedStar Health National Center for Human Factors in Healthcare

• Moderator:
  LaVerne Perlie MSN, RN
  ONC Health Scientist, US Department of Health & Human Services
Project background

- Jonathan Wald, MD, MPH
  Director of Digital Health, RTI International
EHR Users are facing critical usability problems

- **Go-live is just the beginning!**
  - Many usability problems surface after an EHR is in regular use
  - Making changes, and testing the changes to improve usability, are essential activities
  - Medium-to-low-resource practices have limited time and know-how to address usability challenges
What is Usability?

- **Usability**: the extent to which a system supports a user to efficiently and effectively achieve desired goals.\(^1\)

- Part of the scientific discipline of human factors.

- Can be measured quantitatively by examining error rates and time-on-task, and can be assessed qualitatively by talking with users.

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EHR Users are facing critical usability problems

- Ratwani et al (2016) findings from interviews and a literature review on usability and EHR implementation:
  - Products implemented differed considerably from products demo’d
  - Few practical tools to identify usability-related safety issues
  - EHR customization not informed by human factors principles can add to risk
  - Workflow decisions are often uninformed by best practices
  - Limited improvements or ongoing training after go-live are typical

- Smaller healthcare practices and institutions need to:
  - Select products with high marks for UCD
  - Implement with appropriate expertise and support
  - Identify EHR aspects that *should be* customized
  - Identify and ameliorate usability-related issues in implemented systems

To promote usability...

• A Change Package is being developed
  » To collect and present resources that enable and accelerate usability improvements
  » Targeted toward users who are EHR implementers and QI project leaders
  » Serving practices having medium-to-low resources
Project approach

- **Resources**
  - Identify and collect an initial set of resources
    - Publicly available
    - Helpful to non-experts
  - Test those resources in-the-field
  - Produce a Final Change Package and guide for its use, including case examples
Project activities

- **Project team**

  » RTI International | Medstar | Clinovations Government+Health

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**Sep '16**

- **Draft CP**
  - TEP input

- **Test CP**
  - TEP input
  - 4 sites

- **Finalize CP**
  - TEP input

**Mar '18**
Usability IRL (in real life)

• Raj Ratwani, PhD
  Director of the MedStar Health National Center for Human Factors in Healthcare
What does Usability look like in the clinical environment?

User Interface Design
- Context Independent
  - Font Sizes
  - Icons
  - Colors & Contrast
  - Layout

Cognitive Task Support
- Context Dependent
  - “Workflow Design”
  - Visualization
  - Memory Aids
  - Error Anticipation
• General lack of applicable tools and resources
• Lack of detailed, step-by-step “how to” guidance
• Variability of user need

<table>
<thead>
<tr>
<th>Roles</th>
<th>Administrative Expertise</th>
<th>Clinical Expertise</th>
<th>Informatics Expertise</th>
<th>Usability Expertise</th>
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<tbody>
<tr>
<td>Practice Manager</td>
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• **Step-by-step vignettes to demonstrate tool usage**

• **Design around variable user needs**

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<thead>
<tr>
<th>Roles</th>
<th>Learn about Usability</th>
<th>Identify Problems and Approaches</th>
<th>Identify Tools and Implement</th>
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<tr>
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<td>Introduction &amp; EHR Checklist</td>
<td>Preparing For Change</td>
<td>Problem Finding</td>
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The Usability Change Package (UCP)

• Laura Marcial, PhD Health Research Scientist, RTI International
UCP Test sites

- Aaron (Zach) Hettinger, MD, MedStar Health National Center for Human Factors in Healthcare
Test Sites Overview

<table>
<thead>
<tr>
<th>#</th>
<th>Care Setting</th>
<th>Population Served</th>
<th>Resource Availability</th>
<th>End User(s)</th>
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</thead>
</table>
| 1  | Ambulatory          | Suburban             | Lower                 | • Practice Manager  
                   |                     |                      | • Physician          |
| 2  | ~100 Bed Hospital   | Suburban/Rural       | Higher                | • Director of IT  
                   |                     |                      | • Clinical Informatics Specialist |
| 3  | Ambulatory          | Rural                | Lower/Moderate        | • Regional Medical Director                 |
| 4  | ~700 Bed Hospital   | Urban                | Higher                | • CMIO  
                   |                     |                      | • Nursing Informaticist  
                   |                     |                      | • Clinical Performance Specialist |
Site Familiarity with EHR Usability

Survey Responses
(N = 9)

- How long have you been at your current position?
- How long have you been involved with implementing or optimizing electronic health records?
- Do you have any formal training in implementing/optimizing electronic health records?
- How familiar are you with the term "usability" as it relates to electronic health records?

Total Number of Responses

<table>
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<tr>
<th>Position Duration</th>
<th>&lt;1 year</th>
<th>2-5 years</th>
<th>6-10 years</th>
<th>&gt;10 years</th>
<th>Yes</th>
<th>No</th>
<th>Not at all</th>
<th>I have heard of it</th>
<th>Unsure</th>
<th>Somewhat</th>
<th>Very Familiar</th>
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Survey Responses (N = 9)
Site 1: Project: Optimizing the workflow of communication around surgical orders and scheduling
  – Outcome: Changed internal workflow, Vendor Collaboration

Site 2 Project: Implementing EHR radiology Clinical Decision Support (CDS)
  – Outcome: EHR Upgrade Challenges, Regulatory Coordination

Site 3 Project: Effect of EHR Upgrades on Colon Cancer Screening
  – Outcome: Impact of EHR upgrades on quality metrics, Increased awareness for near-future EHR conversion

Site 4 Project: Integration of a patient transportation communication system integrated into the EHR to prevent delays and patient safety events.
  – Outcome: Assessment of EHR Usability, *Pending data analysis
Lesson Learned from Sites

- Workflow analysis and data collection assists with optimization
- Role of EHR with quality metrics
- Coordination with EHR improvements and regulatory requirements
- Communication between the healthcare organization and the EHR vendor is critical to success
- Unintended consequences of EHR software upgrades on usability improvements
ONC Comments

• Justin Cross, MD
  ONC Medical Director for Systems Safety, US Department of Health & Human Services
THANK YOU FOR YOUR PARTICIPATION

FOR MORE INFORMATION:

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