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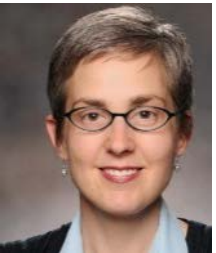
Assessing EHR Implementation Decisions to Improve Usability and Reduce Burden for Clinicians

PRESENTERS

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- Laura Marcial, PhD Health Research Scientist, RTI International

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

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

- Justin Cross, MD ONC Medical Director for Systems Safety, US Department of Health & Human Services

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

Project background

- Jonathan Wald, MD, MPH
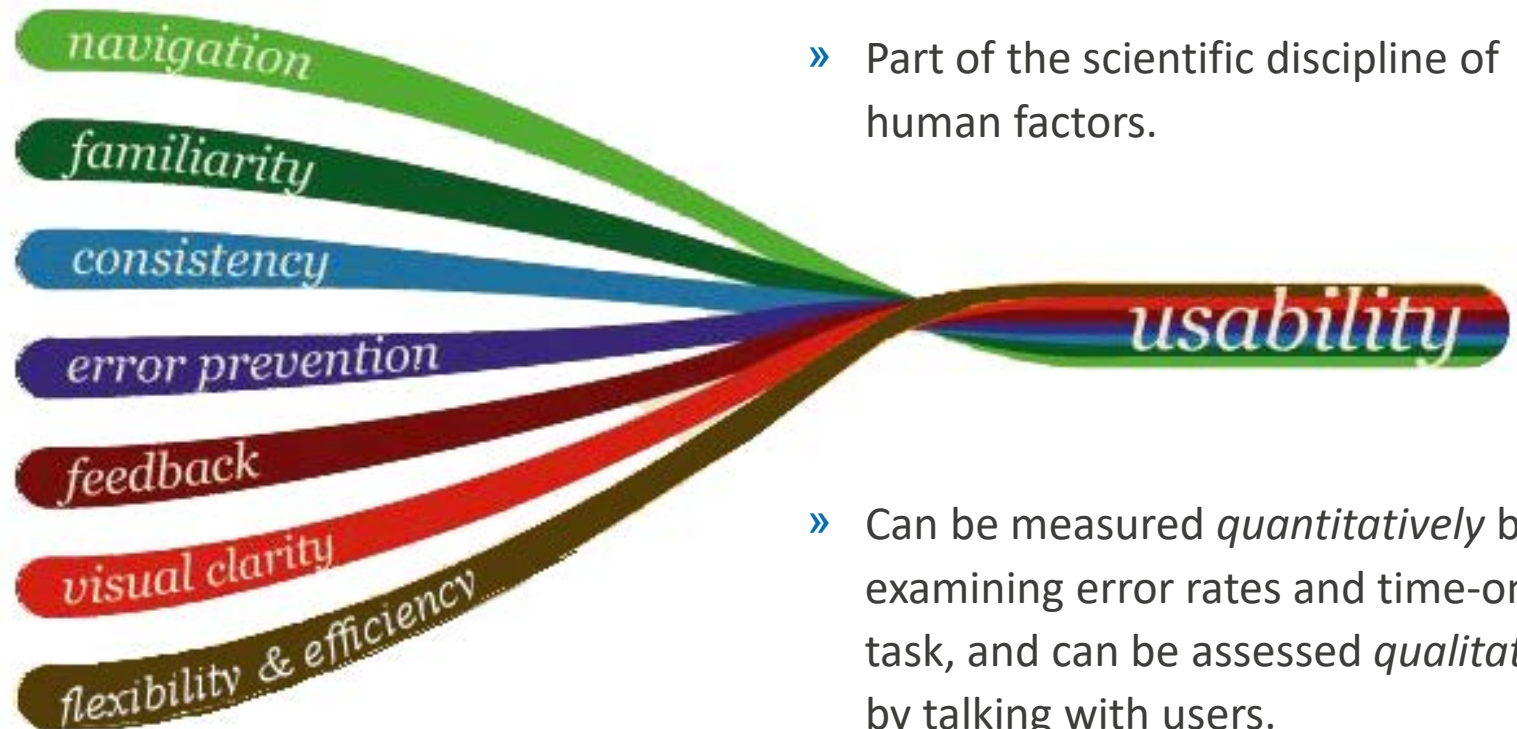 Director of Digital Health,
  RTI International

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- **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

- **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.

[1] *ISO 9241-11; https://www.iso.org/obp/ui/#iso:std:iso:ts:20282:-2:ed-2:v1:en*

EHR Users are facing critical usability problems

- Ratwani et al (2016) findings from interviews and a literature review on usability and EHR implementation:

  » <u>Products implemented</u> differed considerably from products demo'd

  » <u>Few practical tools</u> to identify usability-related safety issues

  » <u>EHR customization</u> not informed by human factors principles can add to risk

  » <u>Workflow</u> decisions are often uninformed by best practices

  » <u>Limited improvements</u> 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

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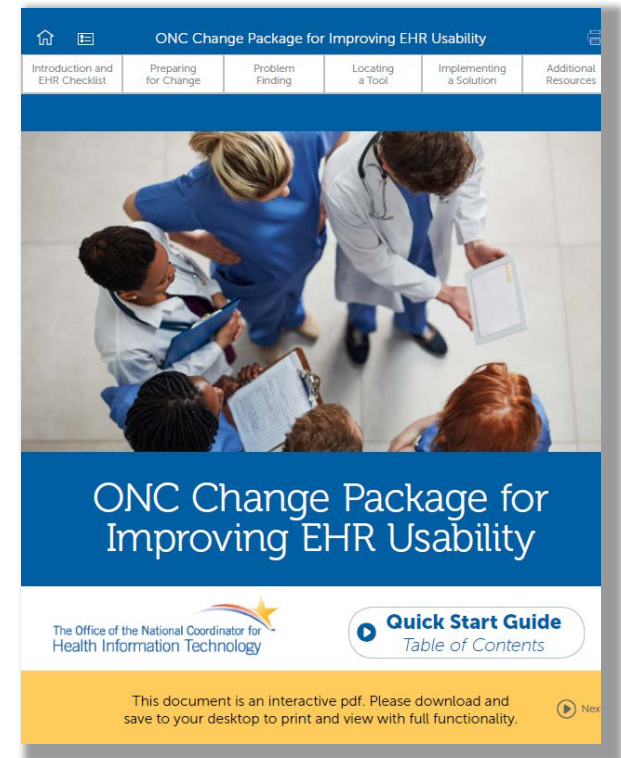Health Information Technology

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
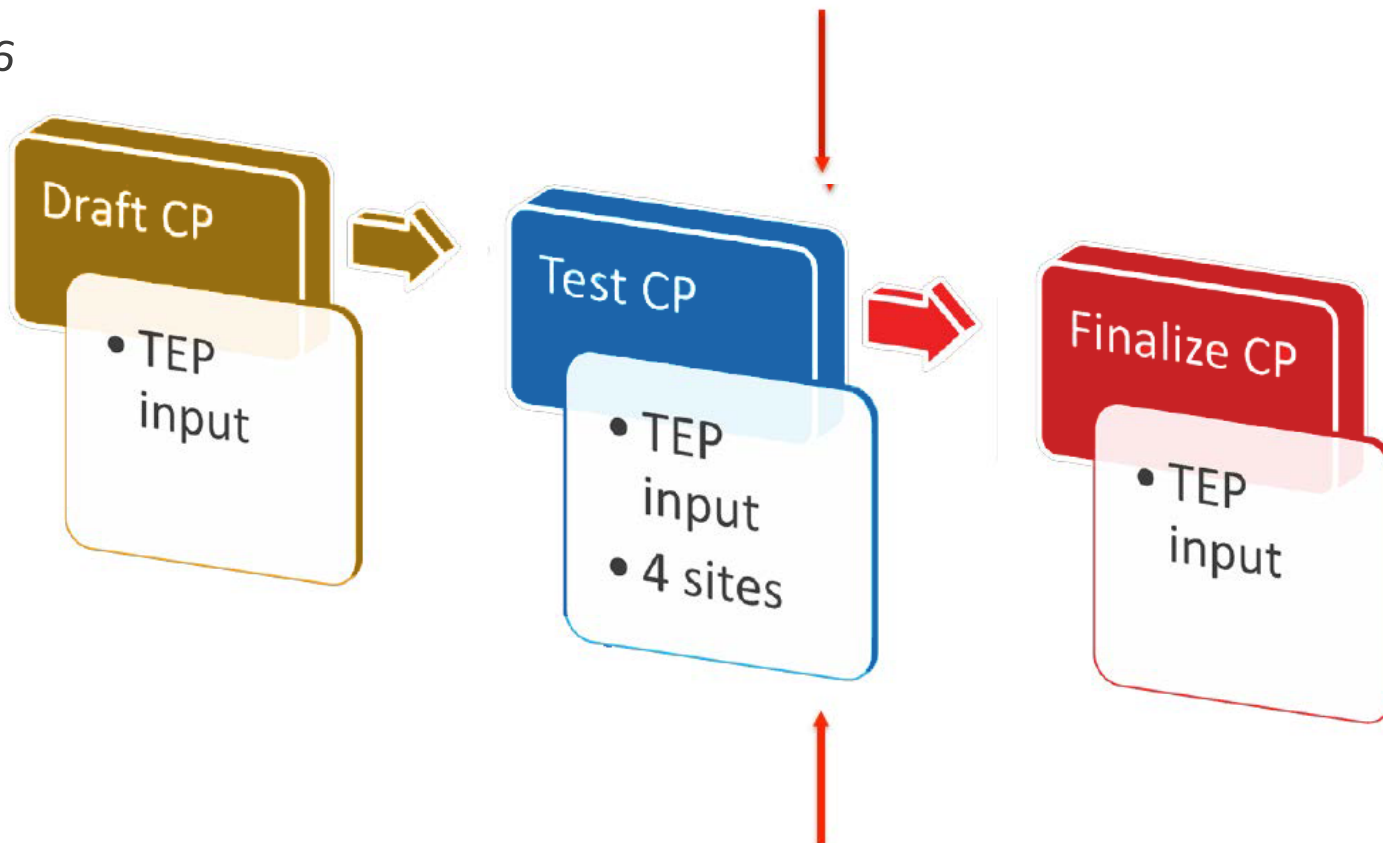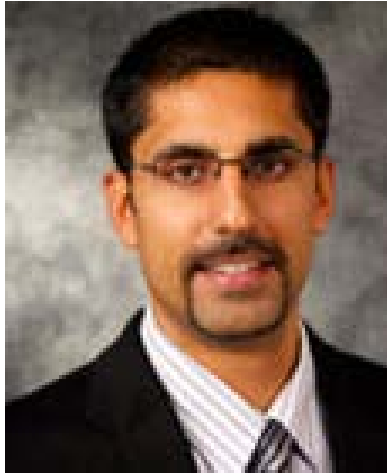
- Project team
  - » RTI International | Medstar | Clinovations Government+Health

Sep '16

Mar '18

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Usability IRL (in real life)

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

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Photo Credit: Bob Wears, MD

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

Cognitive Task Support
Context Dependent
"Workflow Design"
Visualization
Memory Aids
Error Anticipation

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Resource Gaps

- General lack of applicable tools and resources

- Lack of detailed, step-by-step "how to" guidance

- Variability of user need

Roles	Administrative Expertise	Clinical Expertise	Informatics Expertise	Usability Expertise
Practice Manager	■			
Physician		■		
Informatics RN		■	■	
Director of Informatics	■		■	■
CMIO	■	■	■	

Optimization through the Change Package

- Step-by-step vignettes to demonstrate tool usage

- Design around variable user needs

Roles	Learn about Usability		Identify Problems and Approaches		Identify Tools and Implement	
	Introduction & EHR Checklist	Preparing For Change	Problem Finding	Locating a Tool	Implementing a Tool	Additional Resources
Practice Manager	■	■	■			
Physician	■		■			
Informatics RN	■			■	■	■
Director of Informatics	■				■	■
CMIO	■	■	■	■	■	■

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

#	Care Setting	Population Served	Resource Availability	End User(s)
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

Survey Responses (N = 9)
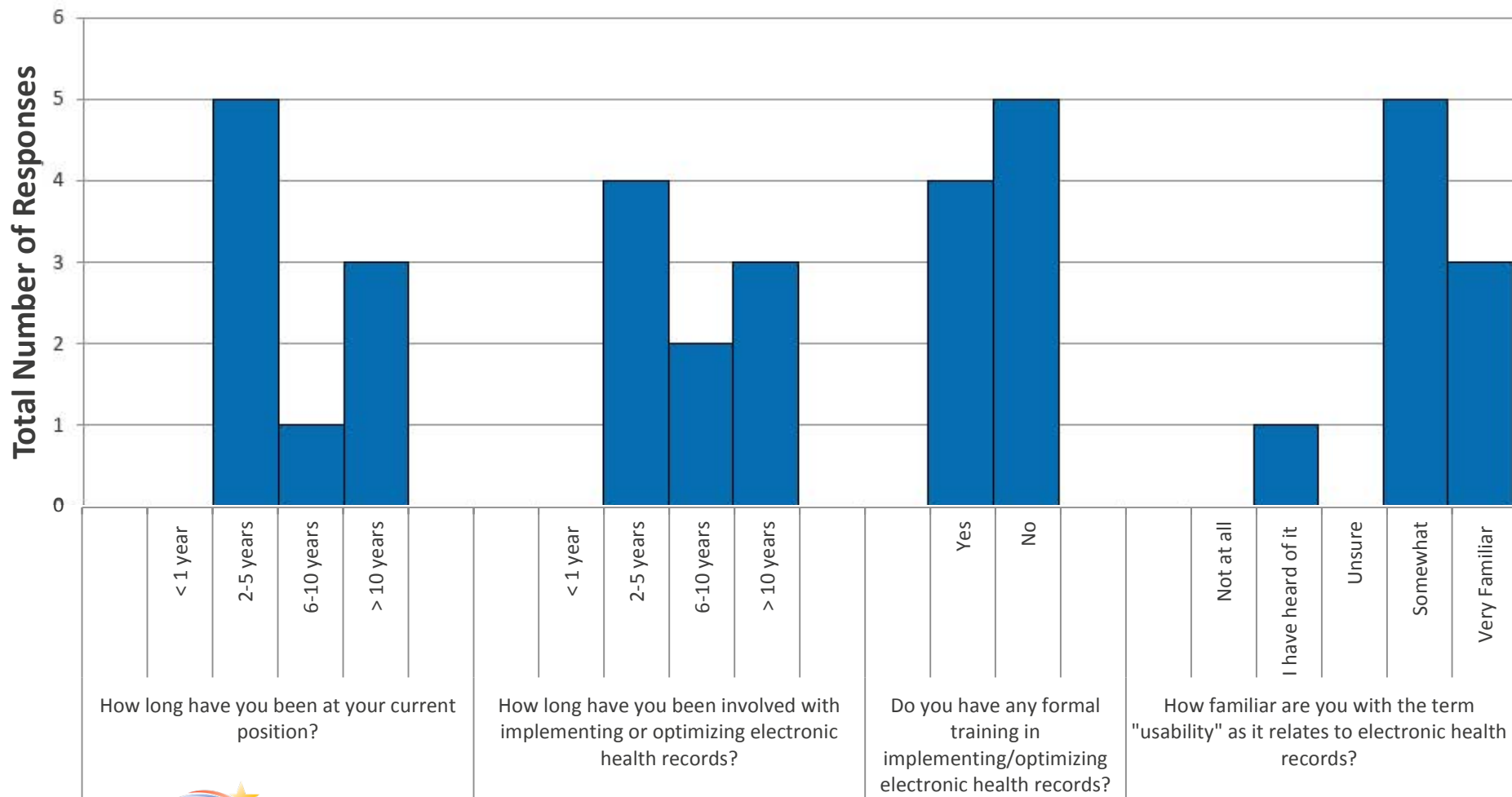
Site-Specific Projects

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

- Workflow analysis and data collect assists assisting 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

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ONC Comments

- Justin Cross, MD
  ONC Medical Director for Systems Safety, US Department of Health & Human Services

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THANK YOU FOR YOUR PARTICIPATION

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