Usability and the eye of the Beholder

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Contemporary Forces

- Prevalence of Chronic Disease
- Burgeoning of the Senior population
- Increasing Longevity
- Growing populations of Minorities, immigrants & underserved (Disparities)
- Increasing costs
- "Core" Healthcare system challenge

Select Healthcare Impacts

- Shorter LOS
- Greater use of nontraditional care settings
- Increased engagement of patients, caregivers as well as Providers
- Focus population health and prevention

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Vision of EO 13355

▸ "widespread adoption of interoperable Electronic Health Records within 10 years"
  ◦ Systems
  ◦ Providers
  ◦ Patients

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Lessons Learned

- **Conversion is challenging**
- **Electronic versions of paper records are inadequate**
- **Improvements in Usability**
    - ◦ **2010 Report from AHRQ**
        - Uncommon use of
            - 1) end users throughout the product life cycle,
            - 2) formal usability testing,
            - 3) the use of user-centered design processes,
            - 4) Usability and HFE expertise and personnel
            - 5) Increase research and development of best practices guidance

NIST's Goal

▸ *Disseminate the best scientific evidence regarding best practices for the technical design and validation of EHRs so that they can be produced in a way that enables safe, effective, satisfactory and error free utilization by all who need to use them.*

Our "core" Team

- **L. Lowry, Ph.D., M. Quinn, Ph.D. M. Ramaiah MD**, NIST

- **Robert Schumacher, Ph.D.**, Managing Director, User Centric

- **Bob North, Ph.D.**, Chief Scientist, Human Centered Strategies, LLC

- **Emily S. Patterson, Ph.D.**, Assistant Professor at the Ohio State University in the College of Medicine, School of Allied Medical Professionals, in the Health Information Management and Systems Division

- **David Brick, MD,** Village Cardiology Associates

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- **Ben-Tzion Karsh, Ph.D.,** Karsh and Associates LLC.

- **Jiajie Zhang, PhD.,** Associate Professor Associate Dean for Research. School of Health Information Sciences · University of Texas at Houston

- **Chris Gibbons, M.D., M.P.H.,** Assistant Professor & Associate Director, Johns Hopkins Urban Health Institute

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Our "core" Expertise

- Medicine
- Nursing
- Pediatrics
- Public Health
- Urban Health
- Human Factors Engineering
- Usability
- Informatics
- Racial and Ethnic Healthcare Disparities

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Our Objectives

▶ **Provide Technical guidance based on**
- ◦ Available scientific evidence (medical, HF/E)
- ◦ Expert Consensus (Academicians, Industry)
- ◦ Practitioner Review (MD, Nurses)
- ◦ Accepted current and historic precedent (FDA)
  - • Regarding the relationship between EHR Usability and patient safety (**NISTIR 7804**)
  - • Formal usability testing using a standardized EHR Usability Protocol (**NISTIR 7804**)
  - • Reducing the potential for increasing disparities with the use of EHRs (**NISTIR 7769**)
  - • Enhancing usability when using EHRs to support Pediatric patient care (Pending)

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EHR Usability Protocol (NISTIR 7804)

- The EUP provides a methodology for identifying and eliminating risks to patients due to poor user interface design.
- EUP focuses on the <u>most critical</u> issues first.
- <u>Does not</u> prescribe the 'look and feel' of the user interface; therefore,
- <u>Does not</u> stifle competition or creativity

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Human Factors Guidance to Prevent Healthcare Disparities with the Adoption of EHRs (NISTIR 7769)

- Recognizes the reality that a diverse healthcare workforce will increasingly be using the EHR
  - Doctors and Nurses
  - Allied health professionals
  - Medical Assistants, Midwives
- As patient engagement increases so too will be their use of the EHR
  - Navigators, Community based workers
  - Patients
  - Caregivers
- Persistent and unique usability issues will likely be associated with increased patient harm and increased health care disparities.

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Current Projects

- **A Human Factors Guide to Enhance EHR Usability of Critical User Interactions when Supporting Pediatric Patient Care**

- Pediatric patients have unique characteristics that translate into unique EHR usability challenges.

- EHRs by pediatric care providers has lagged behind adoption for adult care providers.

- Chicagotribune.com – June 2011
  - Baby Burkitt> Data entry error> 60x recommended dose NaCl > death

Future Projects

- *If EHRs remain electronic versions of the paper record, we will continue to get the same results as we did before, only faster.*

- There is a need to better understand the relationship between clinical workflows, EHR usability and patient safety to ensure that EHRs enhance clinical workflows (reduce redundancies, work around) without negatively impacting patient outcomes.

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