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
Vision of EO 13355

“widespread adoption of interoperable Electronic Health Records within 10 years”

- Systems
- Providers
- Patients
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
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
- Patricia Abbott, Ph.D., R.N., F.A.C.M.I., F.A.A.N., Associate Professor, Johns Hopkins Center for Global Health
- 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
Our “extended” Team

- Ayse Gurses, PhD, Johns Hopkins University,
- Daniel Essin, MA, MD, USC Keck School of Medicine,
- Susan Torrey, MD, NYU Langone Medical Center,
- Roberts Wears, MD, PhD, University of Florida Health Center Jacksonville,
- Debora Simmons, PhD, RN, CCNS, St. Luke’s Episcopal Health System,
- Mary Patterson, MD, Med, Akron Children’s Hospital,
- Deepa Menon, MD, Johns Hopkins University,
- Dean Sittig, PhD, University of Texas Houston,
- Marta Hernanz–Schulman MD, Vanderbilt Children's Hospital,
- Arthur Smerling, MD, Morgan Stanley Children’s Hospital of New York–Presbyterian,
- Kevin Jones, MS, Ohio State University,
- Colleen McLaughlin, MPH PhD, Patient Safety Center, New York State Dept. of Health,
- Sean Petty, RN, Jacobi Medical Center, Bronx, NY
- Anne B. Francis, MD, Elmwood Pediatric Group, Rochester, NY,
- George Kim, MD, Johns Hopkins University Children’s Center,
- Rainu Kaushal, MD, MPH, Weill Cornell Medical College,
- Marta Hernanz–Schulman MD, Vanderbilt Children’s Hospital,
- David Kreda, Social Research Corporation, PA
- Willa Drummond, MD, University of Florida College of Medicine,
- Andrew Kroger, M.D., M.P.H., National Center for Immunization and Respiratory Diseases, Arthur Smerling, MD, Columbia University College of Physicians and Surgeons,
- Herschel R. Lessin MD, The Children's Medical Group, Poughkeepsie, NY
- S. Andrew Spooner, MD, MS, Cincinnati Children’s Hospital Medical Center,
- Eugenia Marcus, MD, Pediatric Health Care at Newton Wellesley, Newton, MA
- Scott Finley, MD, MPH, Westat and VHA, Office of Health Information,
- Yiannis L. Katsogridakis, MD, MPH, Children's Memorial Hospital, Chicago, IL
- Michael S. Victoroff, MD, University of Colorado School of Medicine,
- Nancy F. Krebs, MD, MS, University of Colorado School of Medicine,
- Anne Bobb, R.Ph, Children’s Memorial Hospital. Chicago, IL
Our “core” Expertise

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

Provide Technical guidance based on

- Available scientific evidence (medical, HF/E)
- Expert Consensus (Academics, 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)
The EUP provides a methodology for identifying and eliminating risks to patients due to poor user interface design.

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

EUP focuses on the most safety critical issues.

Does not prescribe the ‘look and feel’ of the user interface; therefore,

Does not stifle competition or creativity.
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.
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
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.