

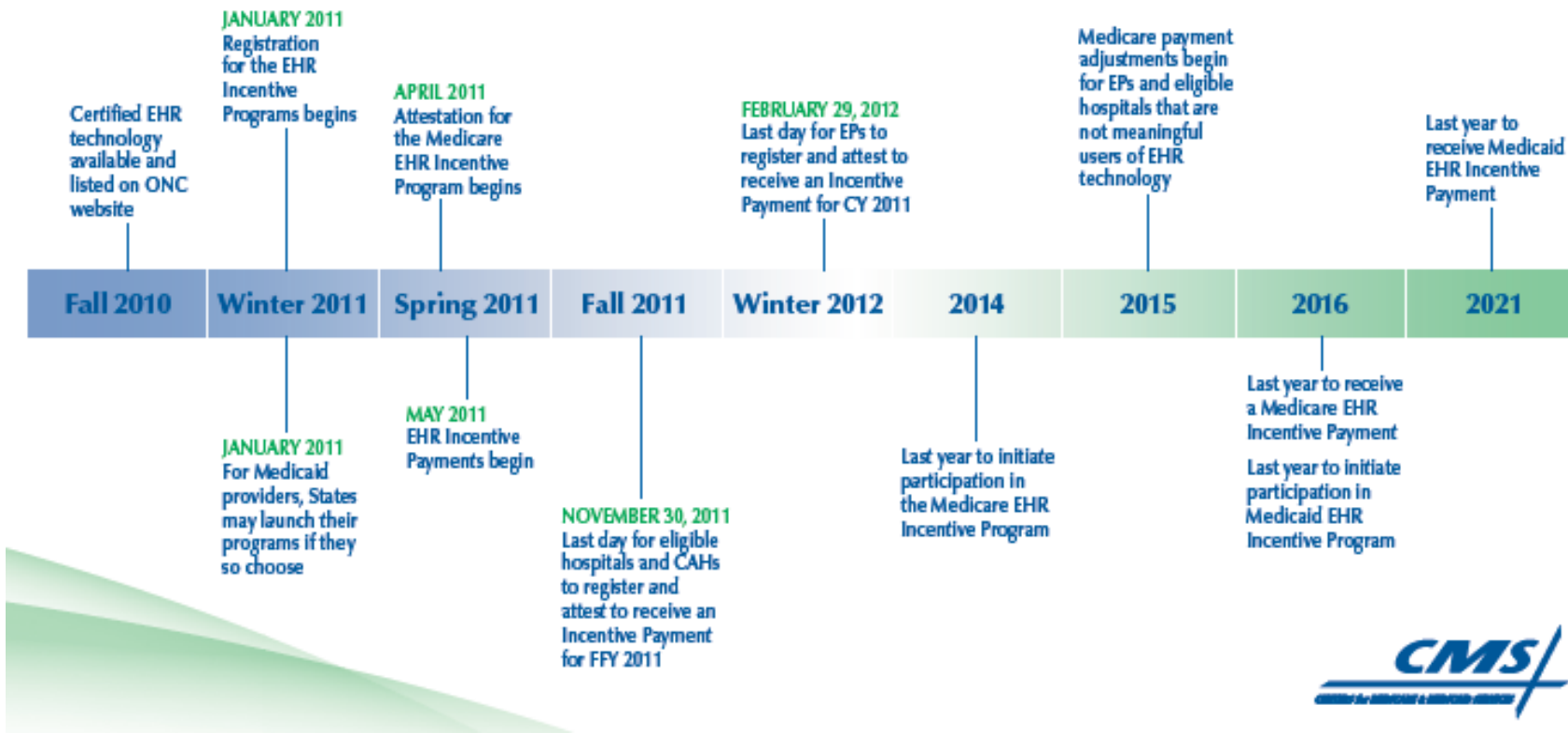


Current context for usability of EHRs

- Impetus provided by Recovery Act funding for Electronic Health Records
- Center for Medicare and Medicaid Services incentive program to reimburse healthcare organizations for adoption of EHRs
- “Meaningful Use”
- Usability discipline continuing to mature; at least in certain areas (web design, aviation, military systems) becoming part of the process
- Industry, government regulatory bodies considering whether and how usability should be part of the process of evaluating and “certifying” EHRs



CMS Medicare and Medicaid EHR Incentive Programs Milestone Timeline





Meaningful Use: 15 Core Objectives for Eligible Professionals

1. Computerized provider order entry (CPOE)
2. E-Prescribing (eRx)
3. Report ambulatory clinical quality measures to CMS/States
4. Implement one clinical decision support rule
5. Provide patients with an electronic copy of their health information, upon request
6. Provide clinical summaries for patients for each office visit
7. Drug-drug and drug-allergy interaction checks
8. Record demographics
9. Maintain an up-to-date problem list of current and active diagnoses
10. Maintain active medication list
11. Maintain active medication allergy list
12. Record and chart changes in vital signs
13. Record smoking status for patients 13 years or older
14. Capability to exchange key clinical information among providers of care and patient-authorized entities electronically
15. Protect electronic health information



Meaningful Use: 14 Core Objectives for Hospitals

1. Computerized provider order entry (CPOE)
2. Drug-drug and drug-allergy interaction checks
3. Record demographics
4. Implement one clinical decision support rule
5. Maintain up-to-date problem list of current and active diagnoses
6. Maintain active medication list
7. Maintain active medication allergy list
8. Record and chart changes in vital signs
9. Record smoking status for patients 13 years or older
10. Report hospital clinical quality measures to CMS or States
11. Provide patients with an electronic copy of their health information, upon request
12. Provide patients with an electronic copy of their discharge instructions at time of discharge, upon request
13. Capability to exchange key clinical information among providers of care and patient-authorized entities electronically
14. Protect electronic health information



But not everyone is onboard

- Industry concerns:
 - Cost of implementation, return on investment
 - Reliability of usability measures
 - Stifling innovation
- Government concerns;
 - “Usability is in the eye of the beholder”
 - Is usability a science?
 - Is usability practice mature enough to support a certification process?



Challenges in evaluating usability of EHRs

- Variety of settings, user roles, tasks
 - From sole practitioners to “paperless” hospitals
 - From temporary help to attending physicians and health system managers
 - Telemedicine
- Variety of products, functionality
 - ePrescriptions
 - Medical histories, record keeping
 - Billing
 - Etc, etc, etc
- Variety of platforms, media
- Lab to field transition
 - Work settings can be chaotic – distractions, interruptions
 - Team performance not just individuals
 - Interoperability among systems, interfaces with devices
- Need to consider workflows, not just screen designs



What has been done thus far

- Agency for Healthcare Research and Quality (AHRQ) reports
 - Electronic Health Record Usability: Evaluation and Use Case Framework
 - Electronic Health Record Usability: Interface Design Considerations
 - EHR Usability: Vendor Practices & Perspectives
- NIST reports
 - [\(NISTIR 7769\) Human Factors Guidance to Prevent Healthcare Disparities with the Adoption of EHRs](#)
 - [\(NISTIR 7741\) NIST Guide to the Processes Approach for Improving the Usability of Electronic Health Records](#)
 - [\(NISTIR 7742\) Customized Common Industry Format Template for Electronic Health Record Usability Testing](#)
 - [\(NISTIR 7743\) Usability in Health IT: Technical Strategy, Research, and Implementation](#)
- Certification Commission for Health Information Technologies (CCHIT) usability certification of ambulatory medical systems
- Conferences on usability of EHRs
- Office of the National Coordinator (ONC) policy committee “hearing”



CCHIT Usability Rating Model

- Trial basis -- Usability is rated as part of the CCHIT Certified 2011 Ambulatory EHR Certification Program
- Utilizes the clinical juror observations during the regular inspection process (about 30-40 minutes) to gather data
- Jurors answer a series of questionnaires based on observations
 - After Scenario Questionnaire (ASQ) –jurors rate perceived efficiency (time and effort), learnability, and confidence after viewing scenarios
 - 4 questions after each scenario –16 overall
 - Strongly Disagree → Strongly Agree 1-5
 - Perceived Usability Questionnaire (PERUSE)–jurors rate screen-level design attributes based on reasonably observable characteristics
 - 20 questions divided among each of the scenarios; Jurors are allowed to revisit answers to these questions
 - Strongly Disagree → Strongly Agree 1-4 (no mid-point)
 - System Usability Survey (SUS) –jurors rate the assessment of usability, and satisfaction with the application
 - 10 questions after all four scenarios have been demonstrated
 - Strongly Disagree → Strongly Agree 1-5



Ongoing efforts that will push the envelope

- NIST Usability Framework project
- AHRQ usability methods project
- “SHARP” R&D projects from the Office of the National Coordinator
- Others?



Lessons from other usability certification efforts?

- Usability certification a long-standing controversy in the field
 - Certification of usability practitioners
 - Usability certification of products
- Energy Star initiative on usability certification of programmable thermostats
- NIST initiative on usability of voting systems
- Human Factors International **proprietary** usability certification of products
- Others?



What needed in general re usability evaluation of EHRs

- Win hearts and minds! Convince industry and government regulatory bodies that usability measurement is scientifically valid and reliable
- Research to continue to refine usability measures
 - Agree on procedures, protocols to increase reliability (a cookbook that is not a cookbook)
 - Research on methods, tools to manage the user-centered design process
- Demonstrate (publicize) return on investment
 - Usability Professionals Association initiative
 - Mike Wiklund book (but focused on medical devices)
 - But much more needed ...
- Do we need:
 - EHR-specific design guidelines?
 - Accreditation of testing entities?



What needed specifically re EHR usability evaluation

- Life cycle perspective; user-centered design approach, iterative testing
- At least late in development, test products where they live (in the clinical setting with representative users)
- Focus on user workflow as much as screen design
- Focus not only on task scenarios that pertain to a given workstation but on the flow of information between them
 - Between user roles
 - Between product modules
- Develop tools to facilitate the usability evaluation process
 - Managing changes, implementation of recommendations
 - Modeling workflow of a particular workplace
 - Managing EHR customization for a given workplace without invalidating previous, generic “certification”