Technical Evaluation, Testing, and Validation of the Usability of Electronic Health Records

This document provides the empirical rationale for critical patient safety-related usability guidelines for standardization, as well as requirements for validation testing to ensure safety-enhanced design. These standardization guidelines are targeted at eliminating 'never events' and associated patient harm by proactively addressing and mitigating the root causes of use errors from EHR design and implementation elements, as characterized in our framework on the relationship between usability and patient safety (NISTIR 7804).

Requirements for validation testing are instantiated through realistic use cases that can be applied during design and evaluation of Electronic Health Record (EHR) systems and for user performance testing. The ultimate goal is to drive and empower effective and safe human performance in the use of EHRs. The objective of this research is to enhance safety-related usability with empirically derived guidance in order to improve the effectiveness and efficiency of EHRs by eliminating or reducing the most critical and likely causes of patient harm from mistakes and errors in interaction.

This research drew upon five different methods of empirical human performance data collection, using crosscutting analytic methods, with a diverse set of analysts from different disciplines, backgrounds, and perspectives. Researchers applied this mixed method approach in order to capture user expectations, knowledge, and outcomes regarding EHRs. Multiple forms of data were collected from a variety of user types, allowing for a comprehensive view of EHRs. Two large, multi-hospital healthcare systems in the U.S. served as sites for most of the data collection, including observations and interviews. Data collection included: 1) an online survey; 2) site observations; 3) follow-up interviews with users; 4) usability testing of five different EHRs; and 5) expert reviews of the same EHRs. Research results demonstrate strong congruence among the data, methods, and the analysts.

The attached zip file includes:

- Intro Page.pdf
- Terms and Conditions.pdf
- UsabilityOfElectronicHealthRecords.pdf