

POSTER ABSTRACTS

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Discount Usability Testing of Computer-Generated Clinical Alerts Uncovers Flaws

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Background: Real-time medication prescribing alerts can improve clinical performance and patient safety, albeit on a smaller scale than predicted. Attempting to elucidate this disparity, investigators have identified "flaws" in alert logic, data triggering alerts, and in the alert display. Discount usability testing can be used to evaluate computer applications according to their learnability, efficiency, memorability, error rate, and user satisfaction. Four techniques are employed: user and task observation, pre-defined scenarios, thinking aloud, and heuristic evaluation. We undertook a formative evaluation to discover potential flaws in a clinical alert system in development.

Methods: Following IRB approval, all 11 primary care clinicians from one clinic were asked to participate in a 30-minute usability session in their office. All usability sessions were tape recorded for later review and qualitative analysis. Trained usability testers read a script that provided each user with an introduction to the study, obtained their consent, and described 7 hypothetical cases complete with the patient's age, gender and a statement of their clinical condition. The user was instructed to perform a particular action using the electronic medical record system while using the "think aloud" technique in which a user verbalizes his/her reasoning process while performing the activity.

Results: Five clinicians completed usability tests of all 7 cases. All clinicians took appropriate action when the alerts occurred immediately following the entry of an order for an alert triggering medication. Four clinicians had trouble comprehending the warnings received during their charting work flow without having initiated an order for a medication. Clinicians had difficulty reading the alert message text due to the: long length of text lines; use of upper and lower case letters; minimal contrast between the black text of letters and the gray background; perceived time pressure during the simulated cases, and a tendency to cancel the alert before reading it completely. The lack of consistency in the appearance of the messages limited the ability of users to transfer learning from one alert type to another.

Conclusions: Discount usability testing was successful in uncovering several flaws in the display of clinical alerts within our electronic order entry system.