

An Analysis of the Usability of Inpatient Insulin Ordering in Three Computerized Provider Order Entry Systems

Aaron Neinstein, M.D.,¹ and Russ Cucina, M.D., M.S.²

Abstract

Background:

Insulin is a highly scrutinized drug in hospitals since it is both frequently used and high risk. As the insulin ordering process makes a transition from pen and paper to computerized provider order entry (CPOE) systems, the effective design of these systems becomes critical. There are fundamental usability principles in the field of human-computer interaction design, which help make interfaces that are effective, efficient, and satisfying. To our knowledge, there has not been a study that specifically looks at how these principles have been applied in the design of insulin orders in a CPOE system.

Method:

We analyzed the usability of inpatient insulin ordering in three widely deployed CPOE systems—two commercially marketed systems and the U.S. Department of Veterans Affairs VistA Computerized Patient Record System. We performed a usability analysis using aspects of three different methods. Our first goal was to note each instance where a usability principle was either upheld or not upheld. Our second goal was to discover ways in which CPOE designers could exploit usability principles to make insulin ordering safer and more intuitive in the future.

Results:

Commonly encountered usability principles included constraints, obviousness/self-evidence, natural mapping, feedback, and affordance. The three systems varied in their adherence to these principles, and each system had varying strengths and weaknesses.

Conclusion:

Adherence to usability principles is important when building a CPOE system, yet designers observe them to varying degrees. A well-designed CPOE interface allows a clinician to focus more of his or her mental energy on clinical decisions rather than on deciphering the system itself. In the future, intelligent design of CPOE insulin orders can be used to help optimize and modernize management of hyperglycemia in the hospital.

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Author Affiliations: ¹Division of Endocrinology, University of California, San Francisco, San Francisco, California; and ²Division of Hospital Medicine, Department of Medicine, University of California, San Francisco, San Francisco, California

Abbreviations: (CPOE) computerized provider order entry, (CPRS) Computerized Patient Record System

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Corresponding Author: Aaron Neinstein, M.D., Division of Endocrinology, University of California, San Francisco, 400 Parnassus Ave., Ste. A550, San Francisco, CA 94143-1222; email address aaron.neinstein@ucsf.edu