Comparing Speed of Provider Data Entry: Electronic Versus Paper Methods

LCDR Kevin M. Jackson OD, MPH[1], Gail Kaiser PhD[2], Lyndon Wong OD[1], Daniel Rabinowitz PhD[3], and Michael F. Chiang, MD, MA[4,5]

State University of New York, State College of Optometry, New York, NY[1]
Departments of Computer Science[2], Statistics[3], Ophthalmology[4], and Biomedical Informatics[5], Columbia University College of Physicians and Surgeons, New York, NY

Abstract

Electronic health record (EHR) systems have significant potential advantages over traditional paper-based systems, but they require that providers assume responsibility for data entry. One significant barrier to adoption of EHRs is the perception of slowed data-entry by providers. This study compares the speed of data-entry using computer-based templates vs. paper for a large eye clinic, using 10 subjects and 10 simulated clinical scenarios. Data-entry into the EHR was significantly slower (p<0.01) than traditional paper forms.

Introduction

In most electronic health record (EHR) systems, providers must document examination results with user interface widgets such as pull-down menus, checkboxes, and text boxes. Resistance to this perceived burden has long been cited as a major barrier to the implementation of EHR systems[1].

There is little published literature addressing computer-based data entry into EHRs compared to that of traditional paper-based entry[2]. This will significantly influence the acceptance and efficacy of EHRs, although end-users may be unaware of this before purchasing new systems[3]. This study addresses this gap in knowledge by conducting a direct comparison of electronic and paper data entry methods by measuring the speed of eye examination findings entry from hypothetical clinical scenarios.

Methods

The study was conducted at the State University of New York College of Optometry primary care clinic. Three years ago, this clinic migrated to a customized version of an institutional EHR system (Touchworks v10.2.1.19; Allscripts, Chicago IL). All providers used the same computer-based template for data entry, which was based upon the structured paper templates that had previously been used by all providers.

Institutional Review Board approval was obtained. Ten clinicians with at least five years on staff, and who were experienced with both paper and electronic systems, consented to participate in the study. Ten patient cases were adapted from a web-based medical journal (Digital Journal of Ophthalmology, http://www.djo.harvard.edu/). All cases were scripted and visually reinforced with photos where appropriate. Every subject completed two sessions, each of which consisted of recording of the first 5 cases using paper, and the second 5 cases using the EHR. During the second session, the EHR was used for the first 5 cases, and the paper template was used for the second 5 cases. Cases were presented and timed by a single observer (KMJ).

Data were evaluated using a mixed effects linear regression model to compare effects of EHR vs. paper on time to completion. Analysis was performed using statistical software (SAS; Cary, NC).

Results

Regression analysis indicated statistically-significant differences based on subjects, tasks, and the effect of sequence. The difference between EHR and paper was found to be significant (t=11.75, p<0.01), with the EHR estimated to take, on average, 162 seconds longer to complete, than paper.

Conclusions

Documentation of ocular examination findings by providers is more time-consuming with an electronic system than paper templates. Further studies are required to compare the total time requirements and quality of data capture by these systems.

References

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