

Careful experiments advance the science of informatics

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If biomedical informatics is a *science*, we believe it best prospers by the careful application of the scientific method to testable hypotheses. From time to time this may require the use of simplified models to prove cause and effect or the lack thereof. Our experiment applied a controlled model of a clinical encounter and focused on the question of whether the use of an electronic health records system (EHR) on a computer is the cause of decrements in communications. As appropriate for a controlled experiment, cognitive load, except for use of the EHR, was balanced across both study arms. Our findings suggest that EHR use per se is not a problem but an advantage for residents, communications-wise.¹

However, as Hauser and Zeng² suggest, in practice the number and types of tasks that EHRs ask users to perform is far higher than typical with paper charts. These tasks are valuable but add to the cognitive load of the users; thus, in practice the cognitive load from using an EHR system might be far higher than in our controlled study. This does not invalidate the findings of our study or render it “simplistic.” Rather, it suggests that the next plausible hypothesis to test is whether higher user cognitive loads due to specific interface designs and/or additions of new tasks or interruptions are the cause of perceived problems with examination room communications.

This hypothesis does have implications for strategies on how to address the issue of the perceived negative effects of computer usage in the examination room. If the problem is not the computer per se but the user’s cognitive load, then strategies such as LEVEL (Let the patient Look-on; Eye-contact; Value the computer; Explain actions; Log off) that focus on integrating the computer into the interview are not enough.^{3,4} They will be successful only to the degree that they slow care down

and thus *secondarily* reduce cognitive load. Moreover, to answer Hauser and Zeng’s question about “why (would) a physician greets a patient more warmly, when walking into a room with a laptop,” the answer is, “Yes, if it takes less effort to come to understand a patient’s prior history and symptoms, it may be easier to remember to be social in complex environments.” There is an optimistic note in this—better designs for EHRs that reduce cognitive burden for providers may allow patients to have a more pleasant and person-centric experience.

The science of informatics requires both carefully controlled experiments and real-world observational studies. To dismiss the structured experiment merely because it is structured is to dismiss an important part of the science of informatics.

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