Reducing Clinician Cognitive Burden Through EMR Office Note Redesign

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INTRODUCTION
• Clinician burnout has been attributed to EMR design in several studies (Shanafelt 2014)
• Standard workflow in the EMR requires the clinician to navigate separate sections of a chart, review and filter clinical data, and then use working memory to transcribe this information into a clinically relevant encounter note
• High number of mental task necessary for this process
• Reducing cognitive workload during EMR use could result in improved clinical outcomes.
• Study aims to measure the impact of cognitive workload between differing EMR user interfaces

METHODS
1. Subjects included 7 Internal Medicine residents randomly selected to perform a history on a simulated patient.
2. Subjects document their clinical encounter using a standard and enhanced office note template.
3. After completion of each note, the subject completes a NASA-TLX questionnaire. The NASA-TLX score is a validated tool that measures cognitive workload, from 0-100. Its use has been studied in a variety of settings as “averse as aircraft certification, operating rooms, nuclear power plant control rooms, simulated combat, and website design” (Hart 2006).
4. The results were analyzed for significance using a paired t-test for within subject design.

RESULTS
• There were significant differences in the NASA-TLX scores for the standard note (M=64, SD=17.01) versus the enhanced note (M=25, SD=21.35) t(5)=2.82, p < .05.
• These results suggest that altering the display of information in an EMR can meaningfully reduce the cognitive burden associated with caring for patients.

DISCUSSION
This study concludes that reducing cognitive workload is possible using current commercially available electronic medical records. By refocusing the design of the office note to display relevant information on problem list items or potential problem list items, we can reduce the cognitive workload from both the clinician and the computer. This work will inform EMR designers to understand the interaction of cognitive workload on EMR user interfaces. Although our study did not show a statistically significant improvement on clinical performance, other studies have demonstrated that clinical performance can be improved by different EMR displays (Shanafelt 2013). Future research is necessary to the role of cognitive workload in clinician burnout related to EMR design.

Problem lists can be burdensome. Displaying clinical information with a problem list reduces clinician cognitive workload.