

Letters

RESEARCH LETTER

PHYSICIAN WORK ENVIRONMENT AND WELL-BEING

Clinician Experience of Electronic Health Record Configurations Displaying 1 vs 4 Records at a Time

Most electronic health record (EHR) systems have the capability to display more than 1 patient record at a time; however, there is wide variation in practice. Among health care facilities with EHRs capable of displaying multiple records at once, 42% allowed ≥ 3 open records, 18% allowed 2 open records, and 41% allowed only 1 open record at a time.¹ Chief medical information officers cited the need to balance concern for patient safety (by limiting the number of records displayed at a time so as to reduce wrong-patient errors) with concern for efficiency (by allowing concurrent display of multiple records to achieve gains in efficiency).¹

Prioritizing patient safety and citing expert opinion, the National Coordinator for Health Information Technology² and the Joint Commission³ have recommended limiting the number of records clinicians can open to 1 at a time. Recently, a randomized clinical trial (parent study) demonstrated that restricting clinicians to opening 1 record at a time did not reduce wrong-patient orders.⁴ Research that examines clinicians' satisfaction with and perceptions of the efficiency and usability of different configurations is needed to further inform national recommendations and local configuration decisions.

Methods | In the parent study, all clinicians with the authority to place orders were randomly assigned to use either a configuration limiting the display to 1 open patient record at a time (restricted group), or a configuration allowing display of up to 4 patient records simultaneously (unrestricted group).⁴ We subsequently surveyed all parent study participants, from October 16 to November 16, 2017, to assess their experience with their assigned EHR display configuration. The study was approved by the institutional review boards of Albert Einstein College of Medicine and Columbia University Irving Medical Center. The survey was distributed by email and included an initial page describing the study. Participants provided electronic consent by clicking "Continue" to proceed to the survey questions. The survey was based on the "TURF" (task, user, representation, function) usability framework,⁵ adapted from validated instruments, and revised on the basis of feedback from patient safety experts and a clinician focus group. Survey domains included user satisfaction as well as efficiency and usability of the EHR configuration. There were 5 structured questions, and 2 unstructured questions (1 on patient safety and 1 on efficiency) allowing free-text responses. Responses to structured questions were dichotomized for analysis; free-text responses were analyzed using thematic analysis. Statistical analyses were performed with Stata 15.1 software (StataCorp LLC) using *t* tests for continuous variables and χ^2 tests for categorical variables.

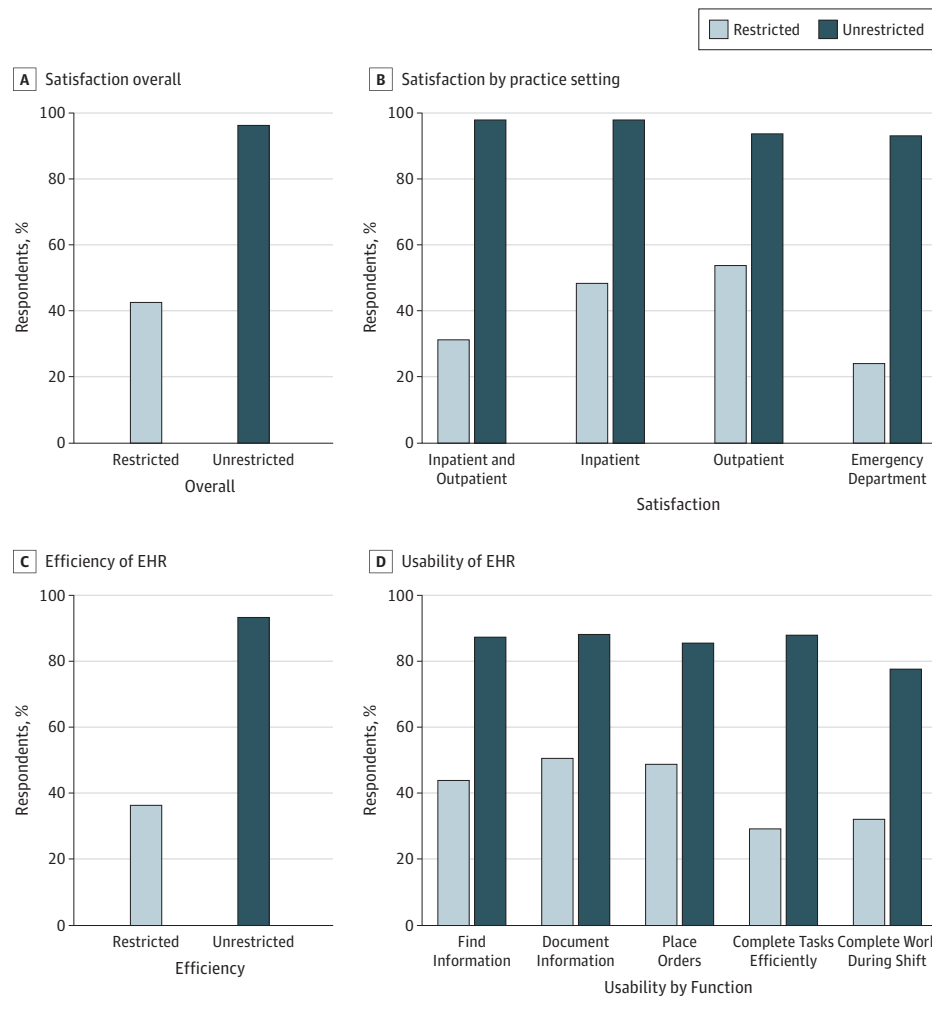
Results | Of the 3356 clinicians randomized and included in the parent study, 496 were no longer at the institutions with which they had been affiliated during the parent study. Of the remaining 2860 survey-eligible clinicians, 1236 responded (43.2%); however, 99 who did not know their EHR configuration were excluded, yielding a total sample of 1137 respondents (mean [SD] age, 41.3 [11.8]; 661 [58.1%] female; 576 from the restricted group and 561 from the unrestricted group). Satisfaction with the EHR configuration was significantly higher in the unrestricted group than in the restricted group, both overall (96.2% vs 42.7%; $P < .001$) and in the 4 subgroups defined by practice setting: inpatient and outpatient (97.9% vs 31.3%), inpatient only (97.8% vs 48.4%), outpatient only (97.9% vs 31.3%), and emergency department (93.1% vs 24.1%; $P < .001$ for all comparisons) (Figure). Compared with respondents in the restricted group, respondents in the unrestricted group were significantly more likely to rate their display configuration as efficient (93.3% vs 36.4%; $P < .001$) and to report that their configuration was highly usable. Respondents in the unrestricted group were significantly more likely to "agree" or "strongly agree" with the statements "I can easily and efficiently find the information I need" (87.3% vs 43.8%); "document and write notes" (88.1% vs 50.5%); "place orders" (85.5% vs 48.7%); "complete tasks without unnecessary steps" (87.9% vs 29.1%); and "complete work during my shift" (77.6% vs 32.0%; $P < .001$ for all comparisons) (Figure).

In free-text responses, clinicians in both groups reported continuously multitasking and managing interruptions. In the restricted group, clinicians expressed frustration with their EHR configuration and said that the configuration limited their ability to multitask. They reported devising work-arounds to compensate, such as using colleagues' log-in credentials, accessing the EHR on multiple computers, using paper notes for reference, copying and pasting information across charts, and giving verbal orders. They also reported hazards associated with their display configuration, including delayed, incomplete, and forgotten tasks; abandoned orders; and incorrect or omitted notes.

Discussion | In the setting of a randomized clinical trial, respondents who were allowed to access up to 4 records at a time were significantly more satisfied with their EHR configuration, and rated it more efficient and usable, than respondents who were restricted to access 1 record at a time.

It has been assumed that limiting clinicians to 1 patient record at a time prevents errors.^{2,3} However, Wachter et al warn of potential unanticipated consequences associated with "logical patient safety fixes."⁶ Despite a suboptimal response rate (43.2%), our survey reports that restricting the EHR display to 1 record at a time led some clinicians to devise work-arounds that could pose risks to patient safety and compromise patient care/or health information confidentiality. Findings in the

Figure. Clinician Ratings of Restricted vs Unrestricted Electronic Health Record (EHR) Display Configurations



A-B, Satisfaction with EHR configuration overall (A) and by practice setting (B): Percentages of respondents reporting "satisfied" or "very satisfied" on a 5-point Likert scale from *Very Dissatisfied* to *Very Satisfied* are shown. C, Efficiency of EHR configuration: Percentages of respondents reporting "good," "very good," or "excellent" using a 5-point Likert scale from *Poor* to *Excellent* are represented. D, Usability of EHR configuration: Percentages of respondents reporting "agree" or "strongly agree" using a 5-point Likert scale from *Strongly Disagree* to *Strongly Agree* are represented. $P < .001$ for all comparisons.

Restricted indicates a configuration limiting display to 1 open record at a time; unrestricted, a configuration allowing display of up to 4 open records concurrently.

parent study that restricting the display to 1 open record at a time were not associated with a reduction in clinician errors,⁴ coupled with respondents' opinions favoring an unrestricted configuration and their reports of potential hazards associated with a restricted configuration, appear to support consideration of an EHR configuration that allows the simultaneous display of multiple open records.

William N. Southern, MD, MS
Jo R. Applebaum, MPH
Hojjat Salmasian, MD, PhD, MPH
Jerard Kneifati-Hayek, MD
Eileen J. Carter, PhD, RN
Jennifer A. Sumner, PhD
Jason S. Adelman, MD, MS

Author Affiliations: Division of Hospital Medicine, Albert Einstein College of Medicine, Bronx, New York (Southern); Montefiore Medical Center, Bronx, New York (Southern); NewYork-Presbyterian Hospital, New York, New York (Applebaum, Kneifati-Hayek, Carter, Adelman); Brigham and Women's Hospital/Harvard Medical School, Boston, Massachusetts (Salmasian); Columbia University Irving Medical Center, New York, New York (Kneifati-Hayek, Carter, Sumner, Adelman).

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Corresponding Author: William N. Southern, MD, MS, Division of Hospital Medicine, Albert Einstein College of Medicine/Montefiore Medical Center, 111 E 210th St, Bronx, NY 10467 (wsouther@montefiore.org).

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