

Letters

RESEARCH LETTER

Multitasking and Silent Electronic Health Record Use in Ambulatory Visits

Electronic health record (EHR) implementation may affect time allocation during patient visits.¹ Clinicians may use EHRs in silence, risking lower patient satisfaction,² or by multitasking while talking with patients. Concurrent multitasking (performing ≥ 2 tasks simultaneously) is associated with increased error risk and time to complete tasks.³ We studied time allocation and transitions into and out of silent EHR use in clinics after EHR implementation.

Methods | This observational study (2013-2015) included 5 primary and specialty safety-net clinics transitioning from basic to fully-functional EHR. Eligible study participants had been enrolled in a study about basic EHR use and communication, which included 47 English- and/or Spanish-speaking adults with chronic conditions and 39 physicians and nurse practitioners.⁴ This analysis includes 25 clinicians and 25 patients with visits after a fully-functional EHR was implemented. Research assistants video recorded visits 3 to 16 months (median, 9) after the implementation of the EHR. After visits, patients rated recent quality of care (poor to excellent). All participants provided written informed consent and

received \$5 to \$20 gift cards for each study procedure. The University of California, San Francisco, institutional review board approved the study.

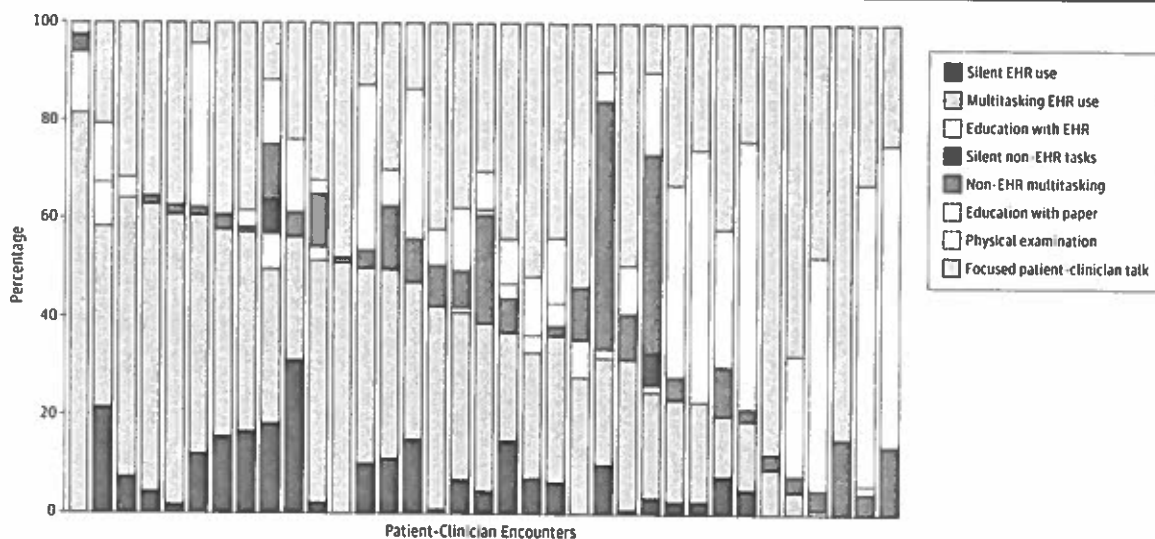
Two researchers (N.R. and G.Y.M.) coded visits using mutually exclusive categories (Figure): multitasking EHR use (while clinician or patient spoke); silent EHR use (≥ 3 -second silence); non-EHR multitasking; silent non-EHR tasks; education with EHR; education with paper; physical examination; and focused patient-clinician talk. For each category, we calculated total proportion of visit time and sample medians (interquartile ranges).

We qualitatively coded EHR tasks conducted silently and communication transitioning into and out of silent EHR use. We compared patients rating care as "excellent" after visits above and below median multitasking EHR use, using generalized estimating equations regression.

Results | Among 35 visits between 25 patients and 25 clinicians, 17% were in Spanish and 40% of relationships were longer than 5 years (Table). Median visit length was 20.6 minutes.

The Table shows visit time proportions. Multitasking EHR use comprised 30.5% of visit time, silent EHR 4.6%, multitasking non-EHR tasks 4.3%, and focused patient-clinician talk 33.1%. The Figure shows that multitasking time exceeded silent EHR use.

Figure. Time Allocation in a Study of Electronic Health Record Use in Primary and Specialty Care for 35 Encounters



Multitasking EHR use indicates clinicians used EHR while clinicians or patients spoke; silent EHR use, clinicians used EHR in silences for longer than 3 seconds; non-EHR multitasking, clinicians completed non-EHR tasks while clinicians or patients spoke; silent non-EHR tasks, clinicians completed non-EHR tasks in

silences longer than 3 seconds; education with EHR, clinicians used EHRs to counsel patients; education with paper, clinicians used paper to counsel patients; physical examination, clinicians examined patients; focused patient-clinician talk, clinicians and patients spoke with no clinician tasks.

Table. Patient, Clinician, and Encounter Characteristics in a Study of Electronic Health Record Use in Safety-Net Primary and Specialty Care

Characteristic	Value
Patients (n = 25)	
Mean age, y (SD)	56.8 (11.0)
Women, n (%)	11 (44.0)
Hispanic, n (%)	12 (48.0)
Asian, n (%)	6 (24.0)
White, n (%)	4 (16.0)
African-American, n (%)	2 (8.0)
Multiethnic, n (%)	1 (4.0)
Primary language Spanish, n (%)	10 (40.0)
Limited English proficiency, n (%) ^a	6 (24.0)
≤8th grade education, n (%)	2 (8.0)
Some high school or graduate/GED, n (%)	7 (28.0)
Some college or college graduate, n (%)	16 (64.0)
Limited health literacy, n (%) ^b	5 (20.0)
Incomes ≤ \$20 000 per year, n (%)	23 (92.0)
Clinicians (n = 25)	
Mean age, y (SD)	44.9 (11.9)
Women, n (%)	14 (66.7)
Primary care clinic, n (%)	14 (56.0)
Diabetes clinic, n (%)	5 (20.0)
Cardiology clinic, n (%)	3 (12.0)
Rheumatology clinic, n (%)	3 (12.0)
Physician, n (%)	21 (84.0)
Nurse practitioner or physician assistant, n (%)	4 (16.0)
Years since professional degree, mean (SD)	15.7 (11.3)
Encounters (n = 35)	
Relationship length years at baseline, n (%)	
<1 y	2 (5.7)
1-5 y	19 (54.3)
>5 y	14 (40.0)
Language during encounter, n (%)	
English	29 (82.9)
Spanish	5 (14.3)
Spanish interpreter	1 (2.9)
Electronic health record (EHR) use during visit, n (%)	
Multitasking EHR and Silent EHR Use	26 (74.2)
Multitasking EHR only	6 (17.1)
No EHR use	3 (8.6)
Visit length in minutes, median (IQR)	
	20.6 (16.7-32.2)
Proportion (%) of visit time during encounters, median (IQR)	
Multitasking EHR use	30.5 (20.4-41.2)
Silent EHR use	4.6 (0.0-11.1)
Patient education using EHR	0 (0.0-1.0)
Multitasking non-EHR tasks	4.3 (2.0-10.8)
Silent non-EHR tasks	0 (0.0-0.0)
Patient education using paper	0 (0.0-0.4)
Physical examination	9.0 (0.0-30.5)
Focused patient-clinician talk	33.1 (0.24-44.2)

^a Spanish-speaking patients who reported English proficiency less than "very well."

^b Somewhat, a little bit, or not at all confident "filling out medical forms by yourself."

Patients rated care "excellent" after 66.7% of low-multitasking EHR use visits and 76.5% of high-multitasking EHR visits ($P = .65$).

Silent EHR use ($n = 193$ instances) occurred while clinicians viewed (39.4%) or entered (24.4%) information, prescribed (13.5%), reconciled medications (8.3%), arranged appointments (5.2%), ordered tests or referrals (5.2%), and sought or typed patient education (3.1%). The median silent EHR use lasted 16.2 seconds, shortest for viewing information (4.6) and longest for patient education (34.0).

Qualitative analysis revealed that clinicians demonstrated various transitions into silent EHR use. Sometimes clinicians signaled a need to focus ("Give me a minute, I want to review in the computer what we've done before."). Other times, clinicians shifted into silence without warning ("There aren't specific treatments...but they're going to...uh...uh...").

Patients often broke silent EHR use with small talk ("So, how is your family?"), or by introducing concerns ("Oh yea, what did the x-ray show about my shoulder?").

Discussion | Clinicians mostly multitasked with EHRs. Transitions to silent EHR use could be ambiguous. Patients sometimes broke EHR silences for social and medical reasons.

Multitasking increases risk for errors³ in EHR tasks and communication (eg, missing patient concerns). Risks are affected by the cognitive complexity of the information, EHR usability, documentation support and teamwork, and clinician-patient dynamics.^{3,5} Certain EHR (eg, prescribing high-risk medications) and communication tasks (eg, depression assessment) may require focus.

Safety net patients could benefit from silence, since clinician talk typically dominates visits and imposes literacy burdens.⁶ However, clinicians must attend to emerging patient concerns and decide whether to address those concerns, defer them to complete EHR tasks safely, or attempt to complete both, despite multitasking risks.³

Limitations include sample size, single setting, time-frame after implementation, and lack of clinical outcomes. Study strengths are inclusion of a diverse provider and patient population.

Conclusions | Studies should explore strategies for negotiating multitasking and silent EHR use, engaging patients "actively" during silent EHR use, and ensuring clinicians detect emerging patient concerns.

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