Changes in Clinician-Patient Communication with Safety Net Electronic Health Record Implementation
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Background: The effects of electronic health record (EHR) implementation on safety net communication may depend on how clinicians adapt to a new EHR. Clinicians may multi-task by typing and talking with patients, alternate conversation with periods of silent computer use, or chart after encounters. We investigated the associations between changes in computer use before and after EHR implementation and changes in communication behaviors during safety net primary and specialty care visits.

Methods: We conducted an observational study in 5 academically-affiliated U.S. public hospital clinics transitioning from a basic EHR (reviewing results, ordering prescriptions and referrals, and optional narrative note-writing) to a fully functional EHR (the above plus mandatory structured note-writing and more complex medication and test order entry). We video-recorded encounters between English- or Spanish-speaking patients with diabetes, rheumatoid arthritis, and/or congestive heart failure and their primary and specialty care clinicians. We assessed amount of computer use by summing observer ratings (Cronbach $\alpha$ =0.67, score range 0-12) for amount of computer data review, typing or mouse-clicking, lack of eye contact with patients, and non-interactive pauses. We assessed communication behaviors using the Roter Interaction Analysis System. We categorized change in computer use as increased (dyads with $\geq$3 point increase in computer use score), decreased ($\geq$3 point decrease in computer use score), or unchanged (-2 to +2 point change in computer use score). We calculated change in communication by subtracting pre-EHR from post-EHR communication counts/scores. Finally, we investigated the association between change in computer use and change in communication, accounting for clustering by clinician and controlling for clinician years in practice, clinic, and change in visit length.

Results: The sample included 28 pre-EHR and 28 post-EHR visits between 21 patients and 21 clinicians. Patients averaged 57 years in age; 43% were women, 48% were Hispanic/Latino, 19% had limited English proficiency, and 24% had limited health literacy. Among clinicians, 67% were women, 57% were primary care providers, 43% were specialists, and 85% were physicians. They averaged 16 years since earning degrees. One-quarter of encounters were in Spanish. Computer use (Figure) was unchanged in 12 dyads (43%), decreased in 4 dyads (14%), and increased in 12 dyads (43%). Compared with no change in computer use, an increase in clinician computer use was associated with less positive clinician affective tone (-6.4, p<0.01). Compared with no change in computer use, a decrease in clinician computer use was associated with less chit-chat (-19.6, p=0.03) and more lifestyle/psychosocial questions (+4.4, p=0.01) by patients and fewer biomedical questions (-49.2, p=0.02) from clinicians.

Conclusions: Transitioning to a fully functional EHR, most safety net clinicians maintained or increased their computer use during visits; an increase in computer use was associated with less positive clinician affect. Some clinicians decreased their computer use, which was associated with more patient-centered content. However, by reducing electronic charting during visits, clinicians likely shifted this work between or after visits, potentially affecting provider satisfaction and burnout. Future research should explore how EHR interfaces, trainings, and implementations could foster relationship-centered communication and support sustainability for safety net clinicians.