Increasing Use of Patient-Generated Health Data

Sending reminder messages focused on provider accountability increased patients' use of electronic blood glucose flow sheets

Target a Priority Outcome The Office of the National Coordinator for Health Information Technology (ONC) in the Department of Health and Human Services is tasked with coordinating nationwide efforts to implement and use health information technology (IT). Patient-generated health data—information regarding an individual's health that is collected by the patient—is identified as an important area for advancing person-centered and self-managed health.[1] Amid advances in technology, it has become easier for providers to engage with their patients electronically, as a means of inviting and supporting individuals' health decision making and self-management. However, use of these newer modes of communication remains far from universal.

Translate Evidence-Based Insights

Electronic sharing of patient-generated health data between visits is a potentially valuable tool for patients with diabetes performing self-monitoring of blood glucose, who can share their glucose levels with their providers via electronic blood glucose flow sheets.[2] This information can then be used by providers to monitor patients' glucose levels between visits frequently and more effectively, potentially even substituting away from conducting other monitoring tests in the office or making adjustments to medications. Evidence suggests that periodic reminders could increase patient engagement with these tools.[3] ONC, Inova Health System, and the Office of Evaluation Sciences (OES) designed three bi-weekly reminders encouraging patients to use flow sheets: a generic reminder signed by Inova ("Basic"), a reminder signed by the patient's primary care doctor stating that the patient-entered data will be discussed at the patient's next office visit ("Provider

Accountability"), and a generic reminder signed by Inova with a chance to win a $50 gift card ("Gift Card"). Simultaneous research from the same collaborators revealed that fewer than 5% of patients use the flow sheets.[4]

Embed Tests The evidence-based reminders were tested by assigning 2,182 patients with flow sheet orders to one of four groups based on the first letter of their last name: Basic, Provider Accountability, Gift Card, or a business-as-usual control group with no reminders ("No Reminder").[5]

Analyze Using Existing Data Data from electronic health records were used to compare (1) flow sheet use, (2) number of prescriptions ordered, and (3) A1c test frequency (a lab test measuring average blood glucose control over the last 3 months) across the four groups over a 14-week period.[6] Reported treatment effects are adjusted for baseline outcomes and patients' demographic characteristics from electronic medical records.[7]

Results The Provider Accountability reminder increased patient use of flow sheets by 3.1 percentage points relative to a 5.8% use rate in the No Reminder group (p = .052, 95% CI [0.0, 6.2]), while the Gift Card and Basic reminders did not result in significantly different flow sheet use rates.

Receiving the Provider Accountability reminder

[1] Office of the National Coordinator for Health Information Technology. *Federal Health IT Strategic Plan 2015-2020.* 2014. Available at https://www.healthit.gov.

[2] Kirk JK, Stegner J. Self-Monitoring of Blood Glucose: Practical Aspects. *Journal of Diabetes Science and Technology.* 2010;4(2):435-439.

[3] Friedman, David et al. Doctor-Patient Communication, Health-Related Beliefs, and Adherence in Glaucoma. *Ophthalmology.* 2008. 115(8): 1320-1327.

[4] We have reported separately on this intervention involving provider training and encouragement. See Office of Evaluation Sciences, *Increasing Use of Patient-Generated Health Data with Provider Encouragement*, U.S. General Services Administration, 2019.

[5] Allyson Root, Season Majors, Mary Ann Friesen, and Christopher Connolly. (2018). Blood Glucose Monitoring in Electronic Health Records. Identification No. NCT03542487. Retrieved from: https://clinicaltrials.gov/ct2/show/NCT03542487.

[6] Unless otherwise noted, analysis reported was prespecified in an analysis plan, which can be found at https://oes.gsa.gov. Other outcomes evaluated but not reported here are described in the analysis plan. No significant impact of the intervention was detected for these other outcomes.

[7] There were minor demographic differences between reminder assignment groups; reported estimates control for these differences. Falsification tests were also conducted to verify these differences do not confound results.

also led to 1.8 fewer prescriptions ordered during the outcome period (p = .009, 95% CI [-3.2, -0.4]) and 0.2 fewer diabetes-related prescriptions (p = .014, 95% CI [-0.4, 0.0]), compared to 5.8 prescriptions ordered and 0.8 diabetes-related prescriptions in the No Reminder group. There was no significant difference in prescriptions for the Gift Care or Basic reminder groups relative to the No Reminder group.
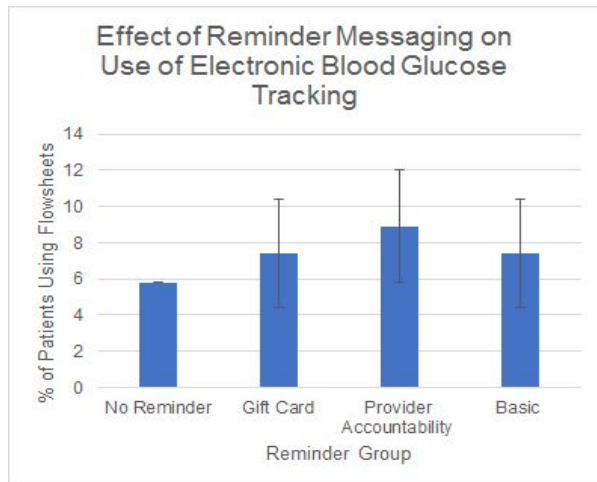
Finally, an exploratory analysis revealed that patients receiving the Provider Accountability reminder were 8.0 percentage points (p = .011, 95% CI [-14.1, -1.8]) less likely to receive an A1c test during the study period, relative to 46.4% who were tested in the No Reminder group, potentially indicating that patient tracking and sharing of data via flow sheets may be a substitute for conducting other monitoring tests (such as A1c for average blood glucose control) or making adjustments in prescriptions. There was no significant difference in testing rates for the Gift Card or Basic reminders relative to the No Reminder group.

Build Evidence This study shows that reminders focused on provider accountability and engagement with the provider can increase patient-generated health data. The increase in patient-generated health data can spur downstream impacts on patient care; future studies might consider further exploring potential cost-saving resulting from availability of patient-generated health data.

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