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Lipid Management Study Shows Value of Electronic Health Records in Improving Quality of Care

By James Gill, MD, MPH

Despite evidence that controlling cardiovascular risk factors reduces cardiovascular disease morbidity and mortality in persons with and without coronary heart disease, research has shown that physicians in clinical practice often do not follow national guideline recommendations for the detection and treatment of hyperlipidemia.[1-3] In addition to promoting better organization of patient data such as medications and test results, studies have concluded that computerized systems, including the electronic health record (EHR), can aid in improving the quality of care by:

- Providing automated reminders of needed tests.[4]
- Highlighting detection/ treatment guidelines during office visits.[5]

Although several studies showed improvement in lipid testing when EHR aids were used, few examined the impact of the EHR on lipid control (ie, test outcomes).

Study design

To better determine the benefits of EHRs in lipid management, researchers conducted a randomized, controlled study to examine the impact of an EHR-based intervention for lipid management in a network of primary care practices. The intervention integrated nationally recognized Adult Treatment Panel III (ATP-III) guidelines from the National Cholesterol Education Program (NCEP) at the point of care using the EHR. The hypothesis was that patients of physicians at the intervention offices would be more likely to have up-to-date lipid testing, to be at their lipid goal, and to be on medications if not at goal than patients at nonintervention offices (control group).

The study's primary focus was to determine whether the intervention group showed greater improvement than the control group on 4 main outcome measures: (a) lipids at goal, (b) lipid testing completed, (c) appropriate use of lipid medications in high-risk patients, and (d) lipid diagnoses recorded. The study included 25 primary care practices within the Medical Quality Improvement Consortium (MQIC), which uses the Centricity® outpatient EHR and regularly downloads de-identified clinical data into a secure central repository. All active patients, ages 20 to 79, for each of the 105 participating physicians were included and categorized as high, medium, or low risk based on modified ATP-III criteria. Overall, there were 64,150 patients in this study with 26,696 in the intervention group and 37,454 in the control group.

Study intervention

An interactive, point-of-care EHR disease management tool was integrated into the physician's usual EHR encounter form in the following manner:

- The *screening page* appeared during a patient visit if lipid testing was overdue or if lipid goals were not met.
- The *assessment page* highlighted the patient's lipid goal and whether or not he/she met that goal, using information from the EHR. The physician could modify that information (and possibly change the patient's lipid goal) and/or access more information on the ATP-III criteria.
- The *management page* allowed the physician to add or change medications, order lab tests,

print patient education handouts, and document counseling, as well as directly access Web sites for physician or patient education about hyperlipidemia.

The intervention employed other reporting tools to identify patients who were not seen in the office and who did not meet lipid management criteria. These tools generated lists of patients who had not been recently tested for hyperlipidemia or were not at goal for lipid management, and provided personalized letters for physicians to send to these patients. Intervention offices were asked to run these reports once at the beginning of the study and again after 6 months.

Outcome Variables

The 3 main outcome variables were:

- Proportion of patients tested adequately for hyperlipidemia (a full lipid panel within 1 year for persons at high risk, and within 5 years for all others);
- Proportion of patients whose most recent low-density lipoprotein cholesterol (LDL-C) was at goal (<100 for high risk, <130 for moderate risk, and <160 for low-risk patients);
- Proportion of high-risk patients with an LDL-C >130 who were prescribed lipid-lowering medications. Patients with no LDL-C or whose LDL-C was nonnumerical (eg, "unable to calculate" or "normal") were excluded from the analyses of lipids at goal and medication use.

Results and Discussion

Results showed that the likelihood of achieving the desired outcomes increased significantly from baseline to end point for all groups, with few exceptions. However, the increases were generally modest; the largest increase (7%) was in the likelihood of high-risk persons being on lipid-lowering medication if their lipids were not at goal. Of interest, the increases were observed equally in the intervention and control groups.

After controlling for differences in patient and physician characteristics between the 2 groups and for the "clustering" effect, the only outcome for which the intervention group showed a significant improvement was lipid testing for high-risk patients. These results are surprising given that EHR interventions have been shown to improve preventive care. The researchers cited possible reasons for the marginal differences between the intervention and control groups 1 year after implementing the EHR-based disease management intervention:

- The Hawthorne effect (ie, persons who know their behavior is being observed may be more likely to improve that behavior);
- Potential for similar quality improvement interventions implemented within the control group during the study period (eg, managed care disease management initiatives);
- High baseline parameters that left little room for improvement (Note: rates in this study were higher than those found in previous studies);
- Physicians, in general, approaching lipid management more aggressively than in previous study periods;
- Lack of office staff involvement in the intervention.

Despite the relatively small increase in quality of care reflected in the study, most physicians surveyed said they found the intervention both helpful and useful in their practices.

Conclusion

Researchers concluded that, although EHRs are useful tools, they are not a panacea for improving quality without changing other components of usual office care. They suggest that future studies may need to examine more comprehensive interventions that include office staff in a team approach to care.

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