Editorials

Do Electronic Health Records Improve Processes and Outcomes of Preventive Care?

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A recent national survey on the use of preventive health services in the United States found that men were 30 to 60 percent less likely than women to have received blood pressure screenings, cholesterol testing, and influenza vaccinations.[1] Consequently, the review of evidence-based components of the adult well male examination by Drs. Heidelbaugh and Tortorello in this issue of *American Family Physician*[2] could not be more timely. To remove financial barriers to preventive care, the 2010 Affordable Care Act mandated eliminating copayments for screening tests and immunizations recommended by the U.S. Preventive Services Task Force and the Centers for Disease Control and Prevention.[3] However, making services "free" does not necessarily mean that they will be provided more often; at one health plan in Minnesota, eliminating cost sharing for colorectal cancer screening and mammography did not increase eligible patients' use of these services.[4] Even when physicians are aware of guideline recommendations, competing acute and chronic health concerns may result in neglect of patients' preventive care needs.[5]

Electronic health records (EHRs) are thought to be valuable tools to prompt physicians to provide preventive services. For example, a recent article in *AAFP News Now* quoted several family physicians as saying that EHR-generated clinical reminders helped them track preventive and ongoing care services for patients with diabetes mellitus, high cholesterol, or hypertension.[6] If these electronic reminders can be shown to improve patients' health outcomes, they provide a good reason for practices to invest in EHRs with these enhancements, rather than more affordable basic EHRs. How strong is the evidence that EHRs can improve processes and outcomes of preventive care?

A systematic review identified 12 randomized controlled trials and five observational studies of electronic clinical decision support systems (CDSSs) in primary care practices, with only four studies reporting patient outcome measures.[7] Although the review found some small improvements in processes of care, the authors noted that "there is wide variation and interpretation in CDSS implementation, and most studies can truly speak only to the effectiveness of a particular CDSS product used in a particular setting."[7] A national cross-sectional analysis found few associations between the presence of EHRs and CDSSs and performance on a range of ambulatory care quality measures, including prescribing for chronic conditions, appropriate antibiotic use, preventive counseling, and screening tests.[8]

Single-institution experiments with the use of CDSSs to improve utilization of individual preventive services have produced modest results. During the 2006-2007 influenza season, 20 primary care practices in Philadelphia, Pa., were randomly assigned to usual care or an EHR-based clinical alert for influenza vaccination in patients with asthma. Compared with the previous year, the absolute percentage of children with asthma who received influenza vaccinations improved by only 3.4 percent more in practices with the EHR-based alert than in control practices; however, more than 80 percent of eligible children still did not receive influenza vaccination.[9]

In the Veterans Affairs health system, a clinical reminder to provide brief screening and counseling for unhealthy alcohol use produced mixed results.[10,11] Interventions to increase quitline referrals and use of the 5A's behavioral counseling framework for tobacco counseling have small effects on physicians' behaviors, but no discernible effect on rates of smoking cessation.[12] Explanations for the failure of increased counseling to affect patient outcomes in these studies could include limited sample size and length of follow-up, or documentation of counseling interactions that did not really occur, a previously described phenomenon.[13]

Implementing CDSSs for multiple preventive services has shown more promising results. In before-and-after comparisons, the Mayo Clinic's Generic Disease Management System[14] and Kaiser Permanente's Panel Support Tool[15] were associated with statistically significant improvements in the provision of screenings recommended by the U.S. Preventive Services Task Force, although it is difficult to isolate the effect of these tools from other quality interventions, such as financial incentives for physicians.

In summary, the evidence is far from conclusive that EHRs and CDSSs improve preventive care processes and outcomes in primary care settings. The small number of mostly nonrandomized studies makes it hard to determine whether changes in physicians' behaviors were the result of implementing CDSSs, or if other factors

were responsible. Also, the most promising studies to date were performed in large practices of employed physicians, rather than in small physician-owned practices. Finally, all but a few studies measured only guideline adherence, rather than patient-oriented health outcomes. To be worth the investment, EHR-enabled CDSSs must ultimately be shown to not only improve processes of preventive care, but also reduce morbidity and mortality and improve quality of life.

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